



An
Bord
Pleanála

Inspector's Report

HA0053

MA0014

File References

04.HA0053 – M28 Cork to Ringaskiddy Motorway Scheme

04.MA0014 – Cork to Ringaskiddy Motorway Scheme, Protected Road Scheme and Service Area 2017

Development

M28 Cork to Ringaskiddy Road Project and Motorway Scheme with Service Area at Ringaskiddy

Applicant

Cork County Council

Type of Applications

HA0053 – Strategic Infrastructure Development, S51(2) Roads Act 1993

MA0014 – Local Authority Projects – M28 Motorway Scheme Project Cork to Ringaskiddy; Protected Road Scheme; and Service Area Scheme

Dates of Oral Hearing

7th-10th November; 14th to 17th November; 28th Nov.to 1st December

24th July, 25th July, 18th October, 26th

Date of Site Inspections

October, 27th October, 11th November,

13th November, 2017

Inspector

Mary Kennelly

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Board

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1 Introduction

Cork County Council has made an application for the provision of a Motorway Scheme between Cork and Ringaskiddy, referred to as the proposed M28 Road Scheme. The proposed scheme comprises 12.5km. It commences at the Bloomfield Interchange on the existing N28/N40 junction and terminates at the Port of Cork to the east of the village of Ringaskiddy. Part of the Scheme is online along the route of the N28, (approx. 2km) but a substantial part of the scheme is off-line, from Carr's Hill to Ringaskiddy. The final 1.6km section of the road from Barnahely is a single carriageway, Protected Road Scheme and there is a proposed Service Area near the termination point.

The report considers two concurrent applications, HA0053 and MA0014.

HA0053 - The Planning Authority is seeking approval for the Motorway Scheme Project together with an Environmental Impact Statement and a Natura Impact Statement in accordance with Section 50 of the Roads Acts 1993-2015 and Part XAB of the Planning and Development Acts 2000-2015, Strategic Infrastructure Development. This application was submitted to the board on 16th May 2017.

MA0014 – The Planning Authority is seeking approvals for a Motorway Scheme, a Protected Road Scheme and a Service Area Scheme under Section 49 of the Roads Acts, 1993-2015. The Order was made pursuant to the powers conferred on the local authority by the Planning and Development Acts 2000-2015, the Housing Acts 1996-2014, the Roads Acts 1993–2015 and the Local Government Acts 1925-2016. If confirmed, the Order would authorise the local authority to acquire compulsorily circa 141.5ha of lands, which are described in the schedules to the proposed schemes. In addition, the proposed schemes entail the extinguishment of a number of public and private rights of way.

The full extent of the lands required for the schemes as described, including the public and private rights of way, are shown outlined in red and coloured grey, blue, yellow and green on the deposited maps Drawing Nos. M28-MO 01-07; M28-PR-01; and M28-SA-01. The Drawings were received by the Board on 2nd June 2017, with the exception of M28-MO-02, which was re-submitted with corrections on 22nd June 2017. The submission of the revised drawing necessitated the republication and re-notification of all notices, which was undertaken by the applicant.

2 Site Location and Description

The existing N28 travels southwards from the existing Bloomfield interchange at the junction of the N40 (South Ring Road) and the N28 (Cork to Ringaskiddy). It is characterised by a range of road types with variable quality. The northernmost section comprises a short length of dual carriageway as far as Carr's Hill interchange. The remainder of the national road is single carriageway with limited hard shoulder and overtaking opportunities. The horizontal and vertical geometry is sub-standard in many places and the cross-section varies along its length.

The N40 provides access to the City Centre, the N25 (Waterford Road) and the M8 (Dublin Road) via the Jack Lynch Tunnel and the Dunkettle interchange to the northeast of the Bloomfield junction. In a westerly direction, the N40 provides access to the western parts of the city, the city centre, Cork International Airport and to routes leading to West Cork and Kerry. Some of the key junctions on the western section of the N40 have been significantly improved by means of grade separated interchanges during the past decade. However, significant levels of congestion exist on the network, particularly in respect of queues arising from delays at the Dunkettle interchange, which result in traffic backing up through the tunnel and onto the N28.

The northern part of the route traverses the built-up suburban areas of Douglas and Rochestown and the land use changes to predominantly agricultural south of Carr's Hill. The existing N28 continues southwards as far as Shannonpark roundabout, (to the north of Carrigaline), from where it continues in an easterly direction towards the villages of Shanbally and finally, Ringaskiddy. The national primary route provides access to a wide range of strategic land uses in Cork, including Carrigaline town (14,775 pop.); Shanbally village and Ringaskiddy village; the Ringaskiddy Strategic Employment Area which includes the Port of Cork lands and several large scale biological and life sciences companies; the Irish Naval Service at Haulbowline and the National Maritime College of Ireland and its associated technology campus.

The section of the existing N28 between Bloomfield and Carr's Hill interchanges incorporates a number of junctions which are described in the EIS as substandard. In addition to N40/N28 traffic, the Bloomfield Interchange also provides local access to and from the R610, Rochestown Road, (for traffic to/from the N40). However, the Bloomfield Bridge over the Douglas River Estuary is a single lane in each direction.

The traffic travelling from the east (Blackrock/Mahon, the tunnel) towards Rochestown veers left to exit at Rochestown and N28 traffic veers right. Traffic travelling from the west of the city must cross the lanes travelling south towards Ringaskiddy/Carrigaline to exit at Rochestown. Similarly, north-bound traffic entering at Rochestown must weave and segregate quickly before merging with east bound and west bound N40 traffic lanes. Southbound N28 traffic can exit at Mount Oval residential estate, but the off-ramp is very short and steep. Northbound traffic can enter the N28/N40 from Maryborough Hill, but again the ramp is short and steep. The next junction (in a southerly direction) is Carr's Hill, where the Carrigaline Road (R609) intersects with the N28. Here there is another substandard on-ramp and off ramp with an existing underbridge.

The off-line section of the proposed route diverges from the existing N28 and travels to the southwest and south of it from Carr's Hill until it reaches Barnahely. It generally follows the direction of the N28 through Shannonpark to the north of Carrigaline town. The route bypasses Shanbally and Ringaskiddy Villages, respectively, but traverses the southern sections of both of these villages. The route crosses the R613 at Barnahely, to the south of the western entrance to the port. Thereafter, the proposed route becomes a single carriageway Protected Road and crosses the Loughbeg Road to the south of the ferryport entrance. It rejoins the existing N28 to the east of Ringaskiddy Village. The proposed service area is located to the north of the eastern end of the proposed route on port lands.

3 Proposed Development

3.1 TEN-T Core Route

- 3.1.1 The proposed M28 forms part of the TEN-T core route serving the Port of Cork. This is a strategic route of European and National importance which will be described in greater detail under Section 5.0 of this report. It commences at the Bloomfield Interchange. The first 2km of on-line motorway will be achieved by widening the N28 which will incorporate new bridges and retaining walls. Northbound traffic from the M28 and from Rochestown Road will be streamlined by the provision of a new dedicated M28 to N40 westbound link road and by dedicating one lane each on the Rochestown Road on-ramp to westbound and eastbound traffic. The east side of the

road to the south of Bloomfield will be widened as far as the off-ramp to Rochestown Road. In addition, the northbound side from Maryborough Hill to Rochestown Road will be widened, as will the east side to facilitate the upgraded off-ramp to Mount Oval village. These improvements will require additional land take through what is locally known as the Mulcon Valley. This is a steep-sided and wooded valley, through which the N28 travels in a deep cutting, with several residential areas and housing estates at elevated levels on either side of the woods. The proposed new N-40 diverge lane cuts through the woods on the western side of the road and will require the widening of the overbridge over Rochestown Road,

- 3.1.2 The section of Rochestown Road (R610) from the existing underbridge to the junction with Clarke's Hill will be upgraded and widened to provide for a series of signalised junctions and improved pedestrian and cycle facilities. This includes a signalised junction at Clarke's Hill which will facilitate right-turning traffic. The substandard on-ramp from Maryborough Hill will be closed and the sub-standard off-ramp at Mount Oval will be retained and upgraded. The overbridge at Maryborough Hill will have to be demolished and rebuilt to accommodate the additional width of the mainline M28. There is a proposed two-way link road between Carr's Hill and Maryborough Hill which runs alongside the proposed mainline route between Douglas Golf Club and the proposed road. This will require additional land take at the golf club.
- 3.1.3 From Carr's Hill to Barnahely (south-west of Ringaskiddy) the proposed route will comprise a new offline motorway for approx. 8.9km. The existing Carr's Hill underbridge will be widened and the junction will be upgraded to a full (dumb-bell) interchange. To the south of this junction, the proposed route veers off-line into agricultural land to the west of the N28 on an embankment and crosses the L6465 (referred to as Board of Works Road or Ballinrea Road) at chainage 3,350m, where a new bridge will be constructed to allow the existing local road to pass underneath. The new route will continue across agricultural lands in a south-easterly direction towards Shannonpark roundabout, where the R611 Carrigaline Road meets the existing N28. It will pass through a significant cutting before crossing on an embankment over the R611, where an underbridge is planned.
- 3.1.4 The Shannonpark junction will be partially grade-separated with an additional new roundabout to the south-west of the existing roundabout and slip roads to facilitate

access to Carrigaline. The proposed route then travels eastwards towards Shanbally and Ringaskiddy. The gradient of the route rises to an embankment where it crosses over the Rock Road, (Ballyhemiken Road), where a further underbridge is proposed. From here the proposed route passes to the north of Fernhill Golf Course and travels through the southern part of Raffeen Quarry. The section of road within the quarry will require a substantial amount of filling. Thereafter, the route will continue in a south-easterly direction, crossing the L6472, (Cogan's Road). It is proposed to close this road and to provide alternative access by means of a new link road to the south of the mainline route from L6472 to L2492 (Twomey's Lane) at Shanbally.

- 3.1.5 The mainline route itself will continue in an easterly direction on an embankment towards the proposed partially grade-separated interchange at Shanbally. It will traverse an area between two residential estates, Marian Terrace to the north and Coolmore Close to the south. The motorway will be elevated above the local road linking these two estates passing overhead on a new underbridge. There will be a new roundabout to the north of the mainline leading to the existing N28 at the centre of the village. This new interchange will also provide a further link road (to the south-east of the roundabout) using part of an existing private access road (IDA – Janssen complex). This private road will be designated as a public road and linked to the existing N28.
- 3.1.6 The proposed M28 route will then travel north of the ESB substation and generally follow the line of the Janssen Biologics road to the R613 at Barnahely, where it would terminate (as a motorway) at a new roundabout. The R613 will travel north (to Ringaskiddy) and south (to Carrigaline) and the proposed route will continue eastwards as a Protected Road (Type 1 single carriageway) towards the L6517, Loughbeg Road. It will follow an existing (green) undeveloped services corridor, between pylons and poles towards the L6517, the majority of which would be at grade. The route will then pass over the Old Post Office Road, (which is to be closed to vehicular traffic on either side of the new road). An underpass will be provided to facilitate the continuation of pedestrian and cyclist access to the existing national school to the south, (Ringaskiddy Lower Harbour National School).
- 3.1.7 The proposed road continues on cross-country from Old Post Office Road, across Loughbeg Road. It is proposed to provide an at-grade roundabout at Loughbeg Road and thereafter, the alignment will continue eastwards to the local road L2545, close

to the end of the peninsula, on the eastern side of Ringaskiddy village. A proposed roundabout (Ringaskiddy Roundabout) will be constructed where the proposed road meets the existing local road and will provide access to the proposed service area, the eastern entrance to the port and to Haulbowline Island (via the L2445).

3.2 Declassified N28

3.2.1 At Carr's Hill, the proposed M28 motorway will diverge from the existing N28, and the latter will be realigned through the new interchange to link up with the R609. This is the Carrigaline Road, which links Carr's Hill with the Fingerpost Roundabout in Douglas. These two roads together will become an all-purpose Regional or Local road which will form the primary route for all Non-Motorway Users between Carr's Hill and Ringaskiddy. The proposed new Carr's Hill South Link Road, will extend from the proposed eastern roundabout at Carr's Hill for a distance of 350m to the N28. There are further upgrades planned for short sections of existing local and regional roads as part of the overall development, which are described in Chapter 3 of the EIS (Vol. 2) and shown in the accompanying drawings (Vol. 5). In addition, Figure 3.2 of the main volume of the EIS shows the Non-Motorway Users routes between Bloomfield (and beyond) and Ringaskiddy, Carrigaline and Passage West.

3.3 Structures and associated roads

- 3.3.1 There will be realignment of many side roads including several regional roads, such as Rochestown Road (R610), the Douglas Link road (R609), as well as roads such as Maryborough Hill. These works are varied and include widening, realignment, removal of roundabouts, introduction of signals at junctions, provision of pedestrian crossings, cycle facilities and footpaths, etc. In addition, there will be several instances where new link roads are introduced as complimentary measures within the overall network. For example, the Maryborough Hill to Carr's Hill Link Road will replace the sub-standard on-ramp from Maryborough Hill.
- 3.3.2 The proposed motorway project includes nine bridges, six of which will be underbridges and two pedestrian/cyclist underpasses. Two of the underbridges are existing and will be upgraded (Rochestown Road and Carr's Hill) and one new overbridge will be constructed (in place of the existing one at Maryborough Hill).

There are also several new/upgrade retaining walls proposed as well as a new surface water drainage system. The proposed road will cross a number of local watercourses which will necessitate stream realignments, new culvert crossings and extensions of existing culverts.

3.4 Relocation of pylons

- 3.4.1 There are two overhead 110kV lines in the vicinity of the proposed interchange at Shanbally. The line closest to the village is a single phase line for which a diversion will be required. It is proposed to remove two polesets and one tower and to replace them with one poleset and two towers. The second line is a double circuit line, which will also need to be diverted. It is proposed to remove four towers and replace them with six towers. The proposed diversions are shown on Drawing no. DG0210.

3.5 Service Area

- 3.5.1 The proposed service area has been designed in accordance with the TII Design Manual for Roads and Bridges DN-GEO-03028, and specifically, with the Location and Layout of On-Line Service Areas. The site for the proposed Service Area is located on Port of Cork lands at Ringaskiddy and covers an area of 1.77ha. The facility is intended to provide services for long-distance inter-urban, inter-regional traffic to and from the Port of Cork and is designed to cater for HGVs and coaches. It is designed to be unattractive to short-term local trips.
- 3.5.2 The proposed facility building is 500 sq.m in area. The forecourt will be for HGVs only and there will be secure HGV and coach parking, with 45 HGV spaces and a facility for refuelling.

4 Planning History

- 4.1 **PA0003 – Port of Cork** – Planning permission under Section 37G of the P & D Act 2000 (as amended) was refused by the Board for the redevelopment at the Deep Water Port and Ferry terminal at Ringaskiddy. The proposal involved the relocation of commercial freight activities of the Port of Cork from its existing location at Tivoli Docks in the City Centre to Ringaskiddy, including the construction of a container terminal and a multi-purpose ro-ro berth. The Board Order noted that Tivoli Docks is

served by a railway line and has reasonably direct access to the national road network, whereas Ringaskiddy is not connected to the national rail system and is completely reliant on road-based transport. While the Board accepted the need to move port activities from Tivoli Docks, it was considered that the development would be contrary to the proper planning and sustainable development of the area because it would:-

- Result in much of the port related traffic traversing the city road network which would adversely impact on the carrying capacity of the strategic road network in and around Cork City and in particular the carrying capacity of the strategic interchanges at Bloomfield, Dunkettle and Kinsale Road and the Jack Lynch Tunnel which it is necessary to preserve; the proposed development would exacerbate serious traffic congestion at these strategic interchanges; and
- Be unable to make use of rail freight carrying facilities in the future and would, therefore, represent a retrograde step in terms of sustainable transport planning.

The Inspector's report (9.3) had noted that a recurring issue was the premature nature of the development pending the upgrading of the N28 and that the parties were in agreement that the port redevelopment would not become operational until after the N28 had been upgraded.

4.2 HA0039 – Dunkettle Interchange Improvement Motorway Scheme - The Board granted approval on the 24th April 2013 for an improved interchange at the intersection of the N8, the N25 and the N40 comprising the following (in summary)-

- A series of direct road links between the N8, the N25 and the N40 and links to the R623 Regional Road in Wallingstown to Burys Bridge in Dunkettle and Kilcoolishal;
- A grade-separated junction at the existing N25 – approx. 650m to the east of the Dunkettle Interchange;
- 4 no. roundabouts and 43 no. major structures (including overbridges, underbridges, underpasses and retaining walls), and modifications to the northern approach to the existing Jack Lynch tunnel as well as culverts and the provision of cycling and pedestrian facilities.

A condition of the approval was that the NRA would review and upgrade the regional traffic model at intervals not exceeding 24 months, which should include the input of extant grants of planning permission within the Cork Metropolitan area. In addition, it was required that an automatic traffic counter be provided on a permanent basis on the N40 in close proximity to the Jack Lynch Tunnel to provide ongoing recording and monitoring of traffic flows on the road network at the interchange, having particular regard to capacity constraints at the tunnel.

4.3 PA0035 – Port of Cork Redevelopment – the Board granted a 10 year planning permission under Section 37G of the P & D Act 2000 (as amended) on the 21st May 2015 for the redevelopment of the existing port facilities consisting (in summary) of –

- At Ringaskiddy East - a new 314-metre multipurpose container berth and a 200-metre container berth including the installation of a link span comprising a floating pontoon and access bridge, dredging and ancillary works;
- At Ringaskiddy West – a new 182-metre extension of the Deep Water berth including a filled quay structure and dredging works;
- Road improvements - to the external road entrance to the port and to the internal link road between Ringaskiddy East and West;
- Road improvements at Ringaskiddy East - within the existing harbour and to the internal road network to facilitate future access to the N28 National road;
- Paddy's Point – construction of a new public pier, slipway, boarding platform, boat storage etc.

The Board's Reasons and Considerations listed the matters which it had had regard to in coming to its decision, which included the strategic nature of the port and the policy framework which supports the continued commercial development at Ringaskiddy. In addition, the Board had regard to the improving accessibility of Ringaskiddy for road-based transport by virtue of completed improvements to the Southern Ring Road interchanges, the permitted improvements to the Dunkettle Interchange and the proposed improvements to the N28.

A further matter which had been taken into account was the proposal to operate an intelligent transport management system to alleviate road traffic impact associated with port traffic, (the Ringaskiddy Mobility Management Plan). The RMMP was

designed to restrict peak-hour port-related traffic on the network to the 2018 Do Minimum levels and to otherwise make use of spare capacity in the network in the interpeak period. The Inspector's report (9.5.4) describes the Freight MMP as a vehicle booking system (VBS) designed to optimise the loading of HGV traffic onto the strategic network over the whole day, minimising the impact of port traffic on peak traffic periods and reducing truck queuing at the port.

Condition 4 of the Board Order stated:-

Phase 3 of the proposed development (link-span bridge and berth to accommodate roll on/roll-off freight traffic) shall not become operational until such time as the N28 and Dunkettle road upgrade schemes are completed.

Reason: In the interests of orderly development and to minimise traffic congestion on the road network, prior to the coming into operation

Condition 5 required the operation of the RMMP, which must be agreed in writing with the P.A. at least 6 months prior to operation.

Conditions 6 and 7, respectively, also related to road/traffic matters. Condition 6 required the submission and approval of the final details of the junction of the R613 with the N28 and Condition 7 prohibited the use of the existing port entrance (adjacent to the junction of L2545 and Loughbeg Road) by port-related HGV traffic in the interests of residential amenity.

4.4 PM0010 – Revisions to Port of Cork permission PA0035 -

- 4.4.1 The Board decided on the 2nd of June 2017 to make an alteration to the permission granted for the redevelopment of the Port of Cork facility at Ringaskiddy (PA0035) under Section 146B of the P & D Acts 2000-2011. This involved alterations to (lengthening) of the permitted main berth, the relocation of mooring dolphins, changes to the landside handling of containers and changes to the design and layout of ancillary buildings. The Inspector's report indicates that one of the reasons for the proposed changes included the fact that the permission restricts the operation of the RoRo element of the development until after the upgrades to N28 and Dunkettle Road have been completed. It was noted that the effect of this was that the permitted link-span bridge (for Ro-Ro traffic) would not be required until a later date, and it was requested that this element be omitted.

- 4.4.2 It was stated that there would be no increase in the volume of goods which is to be catered for and that the number of TEU's which would pass through the port would not increase on foot of the development. Thus it was pointed out that the volume of traffic on the local road network would not increase and that the alterations were needed to enable the requirements of the RMMP to be met.
- 4.4.3 Seven conditions were attached to the decision. Condition 3 restricted the throughput at the permitted Ringaskiddy port facility to 322,846 TEU pending the completion of the N28 and Dunkettle road schemes (details of monitoring of compliance to be submitted for agreement). Condition 4 prohibited the operation of Phase 3 (link span bridge and use of berth to accommodate ro-ro freight traffic) until the completion of the N28 and Dunkettle road schemes. Pending completion of the road schemes, the container berth was required to be modified to handle general cargo (in accordance with submitted plans and particulars), and this condition was stated to supersede Condition 4 of PA0035 permission.
- 4.5 PA0045 – Waste to Energy Facility at Ringaskiddy** – this proposed development for a Resource Recovery Centre (waste incinerator with energy recovery) for the treatment of hazardous and non-hazardous waste was granted by the Board on 31st May 2018. The proposal includes an upgrade to a section of the L2545 and coastal protection measures on Gobby Beach (Eastern foreshore of Cork Harbour)

5 Policy Context

5.1 Transport policy

5.1.1 European Union – TEN-T Core Network and North Sea Mediterranean Corridor

- 5.1.1.1 The European Union adopted a transport infrastructure policy in December 2013 – “Infrastructure TEN-T – Connecting Europe”. The main legislative basis for this policy is the EU Regulation No. 1315/2013 (enacted in Jan 2014). The TEN-T network is a Trans-European network that connects the continent between east and west, north and south. The policy is to “close the gaps” between member states’ transport networks by removing bottlenecks and building missing links etc. It seeks to upgrade infrastructure and streamline crossborder transport operations for passengers and

business throughout the EU. It is also an objective to improve connections between different modes of transport and to contribute to the EU's climate change objectives.

- 5.1.1.2 There are nine core network corridors across Europe. Funding for core network corridors is provided by means of CEF (Connecting Europe Facility) in conjunction with member states. Ireland has one core network corridor crossing the country, the North Sea-Mediterranean Corridor, which stretches from the North of UK and of Ireland through the Netherlands, Belgium, Luxemburg to the South of France. It is a multimodal corridor which connects the North Sea ports with the large river basins such as the Rhine, the Seine, the Rhone etc. and onwards to the Mediterranean Sea. It extends eastwards through Belgium and the Netherlands and westwards through Dublin and Cork.
- 5.1.1.3 Ireland was successful in winning funding for the Port of Cork Ringaskiddy Redevelopment as part of the North Sea Mediterranean Core Network Corridor. Cork is an identified "core port" within this corridor. The 'Work Plan' for the corridor requires that core links are either motorways or express roads, and recognises the need to upgrade the current access route to Ringaskiddy, as the road standard is not adequate for the level of traffic. In addition, the Work Plan has identified a need for secure parking for HGVs.

5.1.2 National Ports Policy DTTAS 2013

- 5.1.2.1 Cork port is identified in the NPP as part of the core network which could receive funding from the EU's CEF as part of the TEN-T network. For inclusion in the core network, the TEN-T programme requires that ports must enjoy significant volumes of freight and/or passenger traffic, have a high level of international interconnectivity and, by 2030, be connected to the core European rail and road network. Cork is one of three Tier 1 ports – 'Ports of National Significance', (which are broadly similar to TEN-T ports), the other two being Dublin and Shannon/Foynes. The continued commercial development of these Tier 1 ports is a key objective of the NPP. This policy also states that "efficient hinterland connections are critically important to any port's ability to facilitate large volumes of traffic"(4.4).

5.1.3 Department of Transport Statement of Strategy 2016-2019

- 5.1.3.1 The strategy sets out objectives and actions to support continued economic recovery and social development and recognises the maritime sector as playing a critical role

in the movement of goods with Ireland's trading partners. It includes a high level goal to ensure the safety and competitiveness of maritime transport services.

5.1.4 Strategic Framework Investment in Land Transport, 2015

5.1.4.1 The SFILT assessed demand for transport based on population and the economy and included a consideration of modal choice. It established that investment in land transport is a high-level priority as it is recognised as playing an important role in supporting government economic objectives. One of the specific policies is to maximise the value of the road network through targeted investment, including improving connections to key seaports and airports, providing access to large-scale employment zones and to complete missing links. Other priorities include the reduction in urban congestion by providing viable alternatives to car travel.

5.1.5 Spatial Planning and National Roads: Guidelines for Planning Authorities, DoECLG 2012.

5.1.5.1 These guidelines state that the primary purpose of the national road network is to provide strategic transport links between the main centres of population and employment, including key international gateways such as the main ports and airports, and to provide access between all regions. It is pointed out that considerable investment has been made in the national road network to date and the importance of maintaining the efficiency, capacity and safety of the network is emphasised.

5.1.5.2 'Strategic Traffic' is defined as "major inter-urban and inter-regional traffic which contributes to socio-economic development and to the transportation of goods and products, especially traffic to/from the major ports and airports." The Guidelines state that the planning system must ensure that the strategic traffic function of national roads is maintained and that Development Plans must protect the capacity, efficiency and safety of these roads. Guidance is also provided in terms of the location of motorway service areas, including advice that such facilities should be designed so as to avoid attracting local custom/traffic.

5.1.6 Smarter Travel a Sustainable Transport future, a New Transport Policy for Ireland 2009-2020

5.1.6.1 High Level Targets/Key aims include the need to ensure good transport connections with our trading partners and efficient transport on the island and a more energy

efficient road freight sector. There is a broad range of Actions designed to achieve more sustainable transport by 2020. Action 10 relates to freight traffic and seeks to reduce environmental impact of freight whilst improving the efficiency in the movement of goods and promoting economic competitiveness. Action 29 relates to ports policy and seeks its review to maximise efficiency in the movement of goods, particularly in respect of freight traffic. There are many other Actions which relate to improving the effectiveness of public transport and seeking to encourage modal shift to more sustainable forms of transport than motorised vehicles.

5.1.7 National Roads Authority Service Area Policy, TII 2014

5.1.7.1 The policy sets out the basis on which the on-line service areas will be provided to meet the needs of road users on the national road network. The policy for the M28 Cork to Ringaskiddy project is as follows:

“A Type 1 Service Area is proposed for the N28 from Cork to Ringaskiddy. Cork County Council in consultation with the Authority, will include consideration of the appropriate location of this service area as part of the scheme planning, currently underway.”

5.2 National and Regional Planning Policy

5.2.1 National Planning Framework – Project Ireland 2040 – Building Ireland’s Future

5.2.1.1 The **National Planning Framework** was published on 16th February 2018, in tandem with the new ten-year **National Development Plan 2018-2028** which are jointly named “**Project Ireland 2040 – Building Ireland’s Future**”. This replaces both the National Spatial Strategy 2002 and the National Development Plan 2007-2015. The publication date was subsequent to the closing of the oral hearing on the M28. Although the NPF Issues and Choices Paper had been referenced by the applicant and third parties, the publication of the NPF as part of an overarching policy initiative, linked to the NDP was not envisaged. Circular FPS02/2018 stated that the linkage between the NPF and the NDP for capital investment is a major innovation whereby policies and priorities set out in both will be supported by wider public capital and state owned enterprise investment, including a €3 billion commitment to investment in regional and development funding for vibrant rural areas over ten years.

5.2.1.2 Project Ireland 2040 seeks to achieve ten Strategic Outcomes, which represent the ten priorities of the National Planning Framework. The most relevant to the M28 project are S.O.2 - Enhanced Regional accessibility; S.O.4 - Sustainable Mobility; S.O.6 – High Quality International Connectivity; and S.O.8 – Transition to a Low Carbon and Climate Resilient Society. These will be discussed further in Section 10.4.1.4 Assessment of Need and Planning Policy.

5.2.2 Regional Planning Guidelines for the South West Region 2010-2022

The RPG identifies the upgrading of the N28 as a major piece of road infrastructure that is required to be delivered (1.3.26 and 5.4.11). The importance of the Port of Cork and the Ringaskiddy area are recognised as key employment and economic drivers of the regional economy. It is stated that critical to the success of Cork Gateway and the docklands is the relocation of the Port of Cork facilities and the industries that currently occupy this area (3.3.12 and 5.5.9). Objective RTS-06 is to support the sustainable expansion of the Port of Cork in line with the targeted economic growth of the region. Ringaskiddy is seen as a principal location for new industrial employment and will continue as a strategic employment location.

5.2.3 Cork Area Strategic Plan (CASP) (Update 2008)

5.2.3.1 The key concepts include the revitalisation of the city and docklands areas and in particular, the delivery of the Docklands as a mixed-use sustainable community. Critical to the achievement of this is the relocation of the port-related facilities from Tivoli to Ringaskiddy, which will continue as a strategic employment location. The spatial development strategy includes proposals for high quality public transport serving Ringaskiddy as well as a green route. CASP and the Port of Cork's Strategic Development Plan are considered to be mutually reinforcing. The efficient operation of the port at a strategic level is seen as being dependent on accessibility and connectivity with the wider region, which is principally by road.

5.2.3.2 Major Transport Infrastructure proposals include the construction of the N28 Ringaskiddy Port Access Route to improve access to the proposed new port facilities including a container terminal at Ringaskiddy. It is acknowledged that the Port of Cork is heavily reliant on HGVs and thus on the provision of a high quality national road network. The N28 Ringaskiddy Port Access Route is considered to be "critical

and essential to the growth and development of the CASP region and the achievement of the CASP goals”.

5.3 Local Planning Policy

5.3.1 Cork County Development Plan 2014-2020

5.3.1.1 The current CDP identifies Ringaskiddy peninsula as one of four ‘strategic employment centres’ in the county and Cork Harbour as the most significant port in the state outside of Dublin. CDP objective EE 6-2 supports the upgrade of the N28 to accommodate the expansion of Ringaskiddy Port. The M28 road project is identified as critical infrastructure for the following reasons:

- Relocation of Port of Cork – upgrade of N28 required to be in place to facilitate the development of the Port’s primary location for future port development and port related uses displaced from Cork City
- Shannonpark Masterplan – provides for significant residential development to the north of Carrigaline (Table 15.1)

5.3.1.2 Relevant objectives include TM-3-1 which supports the NRA in the implementation of the N28 Cork-Ringaskiddy as a major project and in the identification of Service Areas for motorway traffic. TM-5-2 supports road transport capacity to facilitate strategic port facilities at Ringaskiddy and supports the M28 road Project in particular. This objective also supports the role of Ringaskiddy in terms of industry, defence, trade, marine leisure and tourism. Objective TM-6-1 seeks to ensure appropriate access, by road and rail, to Cork Port.

5.3.1.3 The Preferred Route Selected – N28 is identified in Figure 10.2 of the CDP but is based on the 2008 route. This route has since changed and is now reflected in the Ballincollig-Carrigaline Municipal District Local Area Plan 2017.

5.3.1.4 It should be noted that Variation 1 to the Cork CDP 2014 was adopted in February 2018. This is discussed in the Assessment Section below at 10.4.1.4.

5.3.2 Cork City Development Plan 2015-2021

5.3.2.1 The revitalisation of the City Centre as a place of employment, and the social and cultural heart of the region is a key concept. One of the main ways of achieving this is to create sustainable neighbourhoods in the form of a major mixed use quarter in

the Docklands, which in turn, requires the relocation of the industrial and commercial freight activities to Ringaskiddy. This is identified as a “critical step” in 13.94 to facilitate the redevelopment of the Docklands. Objective 5.18 identifies the N28 Cork Ringaskiddy route upgrading as a strategic road infrastructure objective and as a key priority for the city. The delivery of the Docklands development is also stated as being “critical to the city achieving its population and employment targets and to the implementation of the CASP update strategy as a whole” (2.2.3).

5.3.3 Carrigaline Electoral Area Local Area Plan 2011 (As Amended in 2015)

5.3.3.1 This LAP was effective at the time that the applications were lodged with the Board. However, it has since been superseded by the Ballincollig to Carrigaline Municipal District Local Area Plan 2017, which was adopted on 24/7/17 and became effective on 21/08/17.

5.3.4 Ballincollig to Carrigaline Municipal District Local Area Plan 2017

5.3.4.1 The Municipal District LAP supports the M28 Road Project as an important catalyst for the economic development of Cork and the South West Region (1.7.31/32). It is further stated that the upgrade needs to be implemented as quickly as possible in order to bring certainty and assurance on the commitment to investment in Ringaskiddy. It is noted that the route passes through industrial and open space zoned lands, RY-I 03/04/10/14/15 and RY-O-03/04/06/07/08. It is stated that the route will result in severance of strategic land banks and that the County Council will work with all relevant parties to future optimise and maximise the large amount of land zoned for industry at this location.

5.3.4.2 There is a general objective for the finalisation of the M28 route and development of the road (IN-02) which is repeated as a Specific Objective for each of the relevant areas under RY-U-02, i.e. for the Carrigaline area, the South City Environs and the Ringaskiddy area. This objective states –

M28 Cork to Ringaskiddy Motorway Scheme. Finalisation of this route and development of the road will be subject to environmental Impact Assessment and where necessary a Habitats Directive Assessment. Regard will be had in the design of the route to avoiding and mitigating impacts on sensitive environmental and heritage resources, as well as impacts on communities.

The LAP proposes to facilitate the proposed road development and to protect the route corridor from inappropriate development (Objective CL-GO-04). It provides an indicative alignment of the roadway within the South City Environs area, the Carrigaline area and the Ringaskiddy area.

- 5.3.4.3 The LAP includes a number of 'Urban Expansion Areas' and 'Strategic Land Reserves'. The most relevant Strategic Land Reserves to the route of the proposed M28 are SLR2 – Carrigaline East (47ha), SLR3 - Castletreasure (21ha), SLR4 – Frankfield Grange (44.9ha) and SLR 12 – Oldcourt (78.7ha). A Masterplan for the Shannonpark Urban Expansion Area (North of Carrigaline) was adopted in 2015 and provides for the development of up to 1000 residential units as well as community and retail/employment facilities. It has been divided into three main phases, but the first phase has been further subdivided into 200 houses (1a) and 100 houses (1b), with specific transport infrastructural deficiencies required before Phase 1b can be progressed. Objective CL-GO-05 seeks to secure public transport improvements including the examination of the possibility of introducing a localised bus service within the town. A further objective of note is CL-U-05 which seeks to provide a Greenway along the old railway line from the river north to Ballyhemiken.
- 5.3.4.4 The South City Environs includes Douglas, Rochestown, Grange and Frankfield. New growth will generally be provided within the existing zoned lands. This area is stated to be heavily dependent on a road network which suffers from heavy peak hour congestion, particularly at Douglas. A number of studies and plans have been drawn up including the Douglas LUTS, the main elements of which have been incorporated into the LAP, and the N40 Demand Management Study which seeks to ensure that the capacity of the N40 South Ring Road is protected. A key aim for this area is to improve the transport network for all users including the calming of the pedestrian and cycle environment and the public realm, (Objectives SE-GO-06 and SE-GO-07). It is also proposed to provide improvements to public transport, cycle facilities, pedestrian walkways, (Objectives SE-U-01 to 07).
- 5.3.4.5 Ringaskiddy is a strategic employment zone and RY-GO-01 seeks to maintain this designation, which is described as being suitable for large scale industrial development. It is also proposed to facilitate the relocation of the Port of Cork to the deepwater facilities (RY-GO-03) subject to implementation measures which are designed to avoid adverse effects on the environment. The village is not expected to

see a significant increase in residential population, but it is a key aim to maintain the current population and ensure that the amenity and quality of life experienced by the residents will not be compromised by the development of Ringaskiddy as a Strategic Employment Area. Objective RY-GO-06 seeks to maintain, protect and enhance the residential amenities of the villages of Ringaskiddy and Shanbally and RY-C-01 designates a site for a new primary school adjacent to the graveyard at Barnahely to serve both villages. The objectives RY-O-03/04/06/07/08 state that where open space acts as a buffer between industry and established uses and where the industrial land is developed, consideration will be given to landscaping, including strategic tree planting. RY-GO-05 seeks to upgrade the N28 upon completion of the M28, including improved public transport, walking and cycling facilities.

6 Submissions and Observations

6.1 Submissions from Prescribed Bodies

6.1.1 Transport Infrastructure Ireland

No specific comments to make

6.1.2 Dept. Arts, Heritage, Regional, Rural and the Gaeltacht

6.1.2.1 Archaeology

No objection subject to the following -

- All mitigation measures in 15.5 of the EIS to be carried out in full in advance of commencement of any construction works.
- The archaeological component of the development to be overseen by the Project Archaeologist.

6.1.2.2 Nature conservation

Species affected by the M28 project include breeding Peregrine Falcon and Pennyroyal Mint. Further information is required with respect to these species as follows:

- Peregrine falcon – specify where alternative nesting sites are available in the area for displaced PF. Confirmation required regarding whether artificial nest boxes and nest overhangs will be required for breeding PF.
- Pennyroyal – confirmation is required as to whether the species that is present in Raffeen Quarry and Shanbally has ‘Native Status’ by either an expert botanist or by genetic markers. A detailed translocation plan will be required including an assessment of the suitability of the receiving site for the long-term survival and identification of plants for translocation. It should be noted that a licence for translocation will be required and should be available before the determination of the application is made, and ideally before the conclusion of the oral hearing.
- Noise from piling and blasting – the impact on Cork Harbour SPA has been addressed in the EIS but also needs to be fully addressed in the NIS with respect to the potential impact on wintering waterfowl. This will inform whether it will be necessary to require a restriction on these activities during the winter period at certain sections of the proposed route.
- Barn Owls – this red listed species is susceptible to vehicle mortality. Notwithstanding the results of the surveys that there is no evidence of this species in the area, it should be noted that barn owls are elusive. Thus more information regarding mitigation is required in order to reduce the risk of collision mortality.
- Curlew feeding fields – monitoring is required during the winter for 2 years after and during the construction period. Roost areas in Lough Beg should be included.
- Raffeen Quarry – further information is sought regarding the extant permission for the quarry and the conditions regarding restorative works following excavation.

6.1.3 Inland Fisheries Ireland

The applicant has engaged in consultations with the IFI and the following matters are outstanding:-

- Culvert lengths must be minimised and diverted/realigned channels must mirror existing widths.
- Rock armour should be used instead of gabions/concrete to construct the banks of the realigned channels. Meanders must be incorporated into realigned channels.
- The design of all structures must ensure free passage of fish. The design of all replacement and new culvert crossings must be agreed with the IFI;
- Instream works should be limited to the period May to September;
- Flexibility should be allowed for in all contract documents to allow for minor design changes to mitigate against damage to fisheries.

6.1.4 Geological Survey of Ireland

There are two County Geological Sites identified in the EIS, 'Golden Rock' Ringaskiddy and Lough Beg Section. The GSI requests copies of reports detailing any site investigations to enable a national database to be compiled.

6.1.5 Southern Regional Assembly

The proposed M28 is consistent with the objectives and policies of the SWRPGs 2010-2022. The Assembly supports the proposed development for the following reasons:

- It would enhance connectivity to the strategic national and regional economic assets in Cork Harbour including the Port of Cork, Pharmaceuticals, the Tourism and Recreation assets, and internationally renowned research and innovation centres (e.g. MERC).
- Competitiveness in the region would be enhanced and the role of the Metropolitan Cork/Gateway would be strengthened as a key regional and national economic driver.
- The road project would improve access to the Port of Cork as part of the TEN-T route, thereby supporting the economic role of the port as a strategic gateway. It would also facilitate the relocation of existing port activities from Cork Docklands, which supports the city's role as 'core' of the 'gateway'.

- The proposed M28 strengthens the strategic transport infrastructure and supports sustainable transport infrastructure. It would contribute to life enhancement for the communities of Carrigaline, Ringaskiddy and the South City Environs.

6.1.6 Dept. Agriculture, Food and the Marine

Reference is made to planning permission granted to Minister for Agriculture, Food and the Marine, in respect of ISPAT/Irish Steel site at Haulbowline (16/6219) for the extraction of 134,000m³ of materials, comprising topsoil and subsoil from an area of 9.3ha (within a site of 12.1ha); on-site screening and crushing of some excavated materials; and the transport of 114,000m³ off-site to East Tip Haulbowline. It is noted that the permission arises from a Government approval of a project to enable the clean-up of waste material at East Tip, and that Ireland is required to do so by law (ECJ case regarding Waste Framework Directive). It is stated that Cork County Council is acting as agent for the Minister with regard to remediation of the site.

The minister has no objection to the proposed M28 road scheme project. However, should there be any potential issues between the two projects, the Minister would like to ensure that matters could be easily resolved. To this end, the Minister would be happy to provide any necessary advice or details prior to determination of the M28 case.

6.1.7 National Transport Authority

The NTA supports the proposed road project on the basis that it is intended to meet the requirements of the strategic traffic movements on the national road network and the requirements under TEN-T policy of the maritime port facility at Ringaskiddy. It is requested that the final details regarding the provision of public transport, cycling and pedestrian modes at the junction locations would be refined, in consultation with the NTA at detailed design stage.

6.1.8 An Taisce

EU TEN-T Route Policy – the sustainability objectives have not been met as it is a road proposal, which is unrelated to and specifically disregards any parallel rail access proposal. It is therefore contrary to Art. 4(c) of the European Guidelines on

Trans European Transport Network. This requires achievement of sustainability through –

- Development of all transport modes in a manner consistent with ensuring transport that is sustainable and economically efficient in the long term.
- Contribute to objectives of low GHG emissions, low carbon and clean transport, fuel security, reduction in external costs and environmental protection.
- Promotion of low carbon transport with the aim of achieving by 2050, a significant reduction in CO₂ emissions in line with relevant targets.

PA003 – refusal by Board for Port of Cork expansion – this was refused on the grounds of the lack of a rail connection to Ringaskiddy, and the exacerbation of traffic congestion at the strategic interchanges of Bloomfield, Dunkettle, Kinsale Road and Jack Lynch Tunnel, and that it would be unable to make use of rail freight in the future. Thus, it would have been a retrograde step.

PA0035 – recent permission by Board for Port expansion – this was granted on the basis of the proposed improvements to the N28. The Board must therefore address the following-

- Increasing road freight impact in the Cork area and nationally;
- Undermining alternative development proposals for Marino Point, which is rail connected;
- Cumulative traffic impact on the Jack Lynch Tunnel and the Dunkettle Interchange.

Climate change – it is queried whether the proposed development mitigates the effects of climate change and how the project will avoid the increase in the use of and the levels of polluting vehicles in the N28 catchment area, and the national/transboundary consumption/emissions with consequent increase in climate impact. Ireland must implement the Paris Agreement of 2015. Section 15 of the Climate Action and Low Carbon Development Act 2015 places an obligation on the Board (as a public body) on climate action. Transport emissions in Ireland represent 20% of all emissions and is one of the highest in Europe. The EPA is likely to

overshoot the 2020 target. It is considered that Section 13.5.2 of the EIS fails to provide for any route-specific climate mitigation or monitoring.

Smarter travel – it is queried how the project complies with any S.T. policies which seek to curtail growth in car use and to mitigate climate emissions, health impacts, air/noise pollution, congestion and inefficient land use resource consumption. There are no measures to ensure that there would be no increase in car commuting and car traffic in the catchment area. It is queried what measures are there to ensure investment in enhanced cycling and public transport and demand management. It is noted that it is proposed to provide for a Greenway, but there is no parallel design for this.

Air and Noise Pollution – How will the M28 achieve a reduction in air and noise pollution? The EIS states that there will be a net reduction in properties exposed to air and noise but section 13.3.1 indicates that there are 186 properties within 50m of the M28. Section 13.5.2 fails to provide any route-specific air pollution monitoring and mitigation after the project becomes operational.

New EIA Directive 2014 – this directive places a new emphasis on human health and climate. There is an enhanced obligation to mitigate direct, indirect and cumulative impacts on climate and human health, including air and noise. The EIAR failed to provide any mitigation measures regarding traffic generation and climate emissions.

6.1.9 Health Service Executive

Health Study - Reference is made to the Health Study in Appendix 1 of the EIS. The following criteria are noted-

- Transitional period for Directive 2014/52/EU – the EIS has been prepared during the transitional period. However, the applicants have engaged in a consultation/scoping exercise with EHS in compiling a Health Study to accompany the EIS. The EHS responded with a scoping submission on 24/3/17.
- EHS has reviewed the and is satisfied with the public consultation process and that it was meaningful and comprehensive.
- EHS considers that the Non-Technical Summary is an accurate summary of the EIS and is satisfied with its contents.

- Health Study was submitted to inform the decision-making process but is not currently required. The Scoping Study had determined that wider determinants of health should be included in the assessment and based on source-Pathway-Receptor model.

The EHS is satisfied that the Health Study satisfies the above criteria.

Traffic and Transportation – the Health Study and EIS identifies proposals for sustainable transport and increased facilities for physical activity. The Health Study also identified higher car ownership and usage in the area than the national average.

Socio-economic and community – there are no specific existing health inequalities that would be increased through the proposed road project with respect to socio-economic matters. The proposal to facilitate a green route connection between Crosshaven and Cork city is welcomed.

Agricultural land use – it is considered that the Health Study and EIS address impacts on agricultural land use satisfactorily and the residual impacts are satisfactory from a public health perspective.

Hydrology – proposed mitigation measures regarding accidental spillage, run off and foul waste water from construction compound, if implemented, will provide for protection of ground water and surface water and any residual impacts will be at a level that will protect public health. Any drinking water source for construction compounds must be potable and meet the requirements of the Drinking Water Regulations.

Emissions to Air – additional mitigation measures for dust levels during construction may be required, particularly in terms of sensitive receptors (e.g. food and restaurants). It is noted that the conclusions of the Health Study and EIS are that the predicted levels would be below the Air Quality Standard thresholds for human Health. The EHS has no further comments to make in this respect.

Noise and Vibration – it is noted that the current National Roads Design Standard for Day-Evening-Night is 60 dBLden for both opening year and design year. The EHS has no further comment to make with regard to the operational noise phase. In terms of the construction phase, there is a need for restricted hours together with a complaints procedure, and permission for outside of these hours should only be

allowed after full benefit impact assessment. The construction noise condition on the quarry should not be exceeded.

Overall conclusions – EHS welcomes the Health Study which is considered to be very comprehensive, when taken together with the EIS. Mitigation measures have been identified that are considered important for the protection of public health and these should be implemented in full.

6.1.10 Cork City Council

Policy – the M28 is necessary to maximise the redevelopment of Ringaskiddy Port. It is a strategic road objective in the City Development Plan 5.18(a), para 5.30. The National Planning Framework identified it as a strategic road of national importance.

Vision for Cork City – the project supports the vision for a successful, sustainable regional capital city. The port has a strategic role in the development of the wider region but is currently constrained. Excellent infrastructure and connectivity is needed.

Reduced traffic impact – the transfer of port operations from Tivoli/City Quays will benefit the city environment by reducing the number of heavy goods vehicles passing through the city centre road network, will ease congestion, and will allow the city to become more pedestrian and cycle friendly.

Development Potential for Cork City Docklands – this is the largest development opportunity for Cork involving 8,227 residential units and employment opportunities of up to 7,500 jobs. The relocation of the port activities is critical to this redevelopment. Thus, the proposed M28 is critical to the implementation of the core strategy.

Development potential for Tivoli – the proposed road project would facilitate the relocation of the container terminal at Tivoli, freeing up 150ha for potential development. This is critical to the implementation of the core strategy for the city. It would provide for 5,000 residential units and significant employment potential. The Tivoli site will offer a considerable development opportunity to contribute to the city's residential and employment growth targets.

6.1.11 Port of Cork

Tier 1 port - The Port of Cork is a Tier 1 port of national significance. The National Ports Policy places an onus on T1 ports to deliver port capacity. The Port of Cork Strategic Development Plan Review confirmed the intention to relocate port activities from Tivoli/City Quays to Ringaskiddy. The N28 is part of the TEN-T core network and is identified as a critical part of the road network supporting the core maritime port at Ringaskiddy.

PA0035 – Board granted permission for expansion of port at Ringaskiddy including a container terminal. Condition 3 of this permission specified that Phase 3, (which will facilitate the relocation of port activities from the City Quays/Tivoli) cannot become operational until the N28 upgrade and Dunkettle road scheme have been completed.

Critical piece of infrastructure – the proposal to connect Ringaskiddy to the N40 via the M28 is of national importance as it is essential for the planned expansion of Cork Gateway. The proposed road would –

- Facilitate the strategic development of the Port of Cork by improving access for port traffic on the N28 corridor;
- Support National Ports Policy 2013 and the Trans European Network (TEN-T) by creating a high-quality route from Ringaskiddy to N40;
- Facilitate the general economic development within Cork Gateway and Ringaskiddy Strategic Employment Area and the wider South West region.

In conclusion, the Port of Cork confirms its support for the proposed development.

6.1.12 Health & Safety Authority

The Health and Safety Authority referred to its official policy and approach to Land-Use Planning and to Regulation 24(c) of the COMAH Regulations, which states that “transport route” is one of the circumstances where the HSA could provide technical advice. The proposed route falls at various points within the notification consultation distances of 4 COMAH establishments, namely:

- Pfizer Ireland Pharmaceuticals (Ringaskiddy)
- Novartis Ringaskiddy Ltd.
- Carbon Chemicals Group Ltd.

- Hovione Ltd.

The biggest overlaps occur in relation to the Pfizer and Novartis establishments.

The HSA notes that there is a busy road (R613) which links Carrigaline and Ringaskiddy, which is adjacent to the Novartis site and is nearer to this site than the proposed M28 route. It is also noted that the proposed M28 route is further from the Pfizer site. However, it is stated that relevant consequence endpoints (as specified in LUP) are not reached at any point along the route. Thus, in terms of Regulation 24, the HSA would not advise against development. Notwithstanding this, it is advised that the local authority emergency services should be consulted in respect of local access/egress arrangements in the event of an emergency and related matters.

6.2 Observers on proposed M28 Motorway Scheme, Protected Road Scheme and Service Area

6.2.1 Submissions were received from approx. 80 observers (listed in Appendix 1 of this report) in response to the application for the proposed motorway scheme, protected road scheme and the proposed service area. These comprise submissions from individuals and families, interest groups and umbrella groups as well as several submissions from public representatives. The issues raised by observers are summaries in Appendix 1. They generally fall under the following headings: -

- The need for the development.
- Legal and procedural matters.
- Public consultation.
- Alternatives considered, particularly alternative routes.
- Strategic traffic matters and impact on local road network.
- Traffic modelling.
- Junction strategy and design.
- Impacts on health and quality of life and general amenity.
- Noise and vibration impacts.

- Air and climate impacts.
- Landscape and visual impacts.
- Impacts on flora and fauna.
- Water Quality impacts.
- Material assets including socio-economic impacts.
- Cultural heritage impacts.

6.3 Compulsory Purchase Order

The CPO was submitted to the Board on the 2nd June 2017. It is accompanied by: -

- Manager's Order signed on 31st May 2017 and was accompanied by a report from the Director of Services (Roads and Transportation), to the County Manager, which is accompanied by supporting documentation. This included a Report by Bob O'Shea, Senior Engineer (30th May 2017), and a certificate of compliance with planning policy from Michael Lynch, Senior Planner (9th May 2017). It was also accompanied by a letter from TII conveying its approval to publish the EIS, Motorway Order, Protected Road Order and Service Area Order in relation to the M28 Cork to Ringaskiddy project.
- Copies of the newspaper notices dated 1st June 2017
- There are three Schemes, the Motorway Scheme from Bloomfield to Barnahely; the Protected Road Scheme from Barnahely to Ringaskiddy East; and the Service Area Scheme at Ringaskiddy. Each Scheme has various Schedules and parts detailing the lands being permanently acquired, the lands being temporarily acquired and the public and private rights of way proposed to be extinguished. Other Schedules relate to matters such as stopping up of access, revocation of planning permissions etc.
- 7 no. officially sealed maps have been submitted in respect of the Motorway Scheme, and one sealed map in respect of each of the Protected road and Service Area Schemes.

The full extent of the lands required for the schemes as described, including the public and private rights of way, are shown outlined in red and coloured

grey, blue, yellow and green on the deposited maps Drawing Nos. M28-MO 01-07; M28-PR-01; and M28-SA-01. The Drawings were received by the Board on 2nd June 2017, with the exception of M28-MO-02, which was re-submitted with corrections on 22nd June 2017. The submission of the revised drawing necessitated the republication and re-notification of all notices, which was undertaken by the applicant.

- Certificate of postage regarding service of notices on landowners, occupiers and lessees.

A proposed Erratum to Schedule Part 1 and evidence of postage was submitted on 22nd June 2017. An Erratum to the Schedule was presented to the oral hearing (held between 7th November and 1st December 2017).

The report of the Director of Services (Roads and Transport) notes that the proposed road development will involve permanent acquisition of 141.5ha of land. It will include the extinguishment of public and private rights of way.

It is stated that the Compulsory Purchase of lands for the development will have the following effects:

- It will secure the acquisition of all land required for the development.
- It will facilitate the acquisition of all rights in the lands within a reasonable timescale.
- It will permit Cork County Council to implement the road construction programme for the road development in the knowledge that the lands and all rights in the lands required will be available.
- It will permit Cork County Council to acquire title to all the lands and all rights in the lands as appropriate.
- It will give effect to and facilitate the implementation of the Cork County Development Plan 2014-2019.

6.4 Objections to the Compulsory Purchase Order

A total of 59 written submissions to the Compulsory Purchase Order were received, which included a number of submissions from the same landowners, in addition to the observations received in respect of the proposed project. At the time of writing this report, 29 objections to the CPO remain. One landowner, who is subject to a temporary acquisition, but was not listed as a Notice Party, Mrs. Elizabeth O'Connell, Piper's Croft, Maryborough Hill, made a presentation to the oral hearing on Day 5 (14/11/17). The full list of the submissions and their status is attached at Part 2 of Appendix 1. The outstanding objections to the CPO are summarised below in respect of each CPO plot reference.

i. O'Flynn Construction Plot Ref. 101 – Rowan Hill

- Proximity of Mount Oval Diverge to Rowan Hill has undermined property values and sales in the area and hence, the viability of undeveloped lands and on existing residential land values.
- Objection to removal of heavily wooded area on slopes as it provides valuable screening. Retaining walls are requested to reduce the amount of cut slope, which encroach on land behind duplexes, and to retain as many trees as possible.
- Noise levels will be significantly above 60dB. Type of barrier at top of slope is queried and there is a need for noise reducing asphalt.
- Need for traffic calming/deceleration lane on approach to Mount Oval.

Diamond Developments Represented by Martin & Rea Plot Ref. 102 -Bloomfield

- Land acquisition is excessive
- Proposed access to retained lands is not of an acceptable design standard.
- Measures to mitigate the impact of the scheme on the retained lands are not adequately specified.

**ii. Margaret Fitzgerald, Mary McGrath, Lucy McGrath and Others Plot Ref. 103,104
- Bloomfield**

- Construction phase – access is inadequately specified and utility services will be damaged, with no information regarding who is responsible for repair. Bloomfield must not be used as a construction compound. Access to family landholding is via a single lane. Access must not be prevented during construction and traffic management will be required.
- Noise levels – noise levels unacceptably high. Inadequate information regarding noise barriers in terms of visual appearance.
- Mitigation measures inadequately specified re noise, vibration, illumination and other forms of pollution during construction.
- Loss of trees – currently a visual barrier and mitigates against noise and air pollution. Reinstatement proposals unclear.
- Mitigation in form of fencing insufficiently detailed and concern re ongoing maintenance of same.
- Property values – it is inevitable that their properties will be devalued.

iii. Nicholas Douglas Plot Ref. 108 - Mount Oval Lawn, Corner Clarke's Hill/Rochestown Road

- Extent of land acquisition is excessive - need for right hand turn onto Clarke's Hill is questioned on basis of improvement of traffic flow, which is disputed.
- Residential amenity impacts – loss of mature trees, need for retaining wall due to differences in levels not addressed; need for adequate noise barriers.
- Mulcon Valley woodland should be preserved and air quality monitoring carried out.
- Want professional fees/advisory costs paid for by applicant.

iv. Robin & Adeline Douglas Plot Ref. 109 – 'The Croft', Rochestown Road

- Land acquisition excessive.
- Need for retaining walls – steep gradient existing will be exacerbated as driveway will be foreshortened. Request safe driveway gradient and entrance

apron with adequate sight lines and appropriate materials for retaining walls. Gates, postbox and lights also need to be reinstated.

- Temporary acquisition should be for minimum period with advance notice, and access should not be impeded during construction. Impact from heavy machinery should be minimised and the Council should be responsible for repair of any damage.
- Noise levels will be exacerbated by M28 and adequate mitigation is essential. Noise barriers inadequate at 3m.
- Professional fees/advisory costs should be paid by applicant.

v. Barbara and Paul Kelleher Plot Ref. 111 – ‘San Martino’ Maryborough Hill

- Previous construction works for overbridge were extremely disruptive (noise, dust, traffic) and these works will endure for longer and will affect their residential amenity and Mr. Kelleher’s business as a mechanical engineer.
- Proposed motorway will result in loss of amenity and environmental impacts in Mulcon Valley, as well as additional noise and pollution.
- The loss of the Maryborough Hill slip road will add 1.2km to journey times.

vi. Douglas Golf Club Plot Ref. 112 – Carr’s Hill, Maryborough Hill

- Land take - The proposed link road from Carr’s Hill to Maryborough Hill results in a land take of 1,568ha and adjoins the existing south-eastern boundary of the long-established golf course (1909). The Golf Club does not oppose the land take but is concerned regarding a number of issues. This will result in the loss of a substantial number of mature trees and a significant impact on the future operation of the golf course in terms of visual impact, safety, security, noise, access and environmental issues. An A4 drawing was submitted with the objection which depicts the areas of potential conflict and labels them as follows A-B, C-D, D-E, F, G-H and I
- Boundary treatment Maryborough Hill (A-B) – this should be replaced with a stone-faced block work wall (2m) as existing.
- Boundary Treatment SW of junction of slip road with Maryborough Hill (C-D) – existing dwelling to be demolished is surrounded by mature trees in the form

of dense vegetative screening. Boundary treatment requested in form of stone wall on slip-road side of trees, not golf course side to ensure maximum screening and security. If these trees are removed, will also require noise barrier and ball netting in the interests of road safety.

- Boundary adjacent to 4th Hole immediately west of slip road (D-E) – the current 4th hole is severely impacted by the proposed road development. The removal of a wide band of trees necessitates the relocation of the fourth hole tee complex, fairway and green for safety reasons. A substantial sound and visual barrier will be required in the form of a stone wall with a mix of mature and semi-mature trees and hedgerows, as well as ball netting for safety reasons.
- Maintenance access (F) – it is proposed to extinguish the existing r.o.w. which provides maintenance access from the R609 to the golf course. It is requested that an alternative maintenance access is provided in this general location.
- Noise barrier (G-H) – A noise barrier is required at this location due to the proximity of the slip road and Carr’s Hill Interchange to the golf course.
- Mature tree planting (E-F-G-H) – It is requested that mature tree planting be provided inside the new boundary at this location, as it is proposed to extend the golf course in the vicinity of E-F-G-H. In addition, ball netting, noise and visual barriers are requested at this location.
- Boundary treatment adjacent to 16th Tee – if trees are removed at this location, it will be necessary to provide sound and visual barriers here as well as ball netting. It is requested that a retaining wall be provided together with a mix of mature and semi-mature trees and ball safety netting in the interests of road safety.

vii. Ted Neville Plot Ref. 112 – ‘Turnberry’, Carrigaline Road, Carr’s Hill

- CPO is unnecessary, overly intrusive and too costly. Purpose is to realign road and accommodation of new access road to serve 3 dwellings. This could be achieved by a small adjustment to the realignment of R609 which would avoid the CPO of Mr. Neville’s driveway and party boundary wall.

- The proposed alignment will materially affect the boundaries and exposure of his property to the realigned R609. It is proposed to remove part of the boundary wall/hedgerow, which is shared with Douglas Golf Course. There is no possibility of mitigation by screening.
- Proposal will remove a visually attractive road frontage of dry stone walling and hedges which is contrary to good conservation practice.

viii. Ann O’Dea Plot Ref. 113 – ‘Massabielle’ Maryborough Hill

- Residential amenity – loss of quality of life and devaluation of property due to proximity of new junction in respect of noise, air pollution and traffic congestion. Impacts will be most severe during construction phase, which was intolerable when the original overbridge was being constructed. During the operational phase, the noise levels from the increased proximity of the motorway and slip roads will be excessive. The increase in air pollution will have serious consequences for human health.
- Traffic congestion and access – there will be increased traffic congestion on Maryborough Hill and it will not be possible to access/egress from her property due to proximity of priority junction (40m) and right turn lane, where there will be queuing right past her property entrance. This will result in inconvenience and road safety issues.
- Pedestrian safety – priority junction inappropriate in an urban setting. Pedestrian safety will be adversely affected due to lack of a continuous footpath and lack of traffic controls on priority junction. The footpath from Douglas Village stops at the Golf Course, but needs to be continued outside her property and across the new junction to link up with proposed new footpath south of junction to serve Maryborough ridge development.
- Permanent and temporary land take – The setting back of the boundary wall is of concern as there is no guarantee that the applicant will reconstruct a wall of the same quality as that which currently exists. Previously, the observer had to rebuild the boundary wall at her own expense.
- Loss of vegetative screening on adjoining property to south (to be demolished) – this will reduce privacy and amenity and will increase

illumination from motorway. She wants as many trees to be retained as possible.

ix. RSM - Maryborough Ridge Plot Ref. 119 – Maryborough Hill South

- Residentially zoned lands not identified as NSL - Lands at Maryborough Ridge zoned for residential development fall into three categories as follows;
Section A - partially developed 13ha (at northern end)
Section B – undeveloped 9ha - Zoned Medium A density (middle section) – live planning permission
Section C – undeveloped 8ha - Zoned Medium A density (southern section)
However, applicant does not propose to provide noise mitigation for undeveloped lands, despite the fact that 16/7271 is likely to be completed before M28 is commenced.
- Extent of proposed noise mitigation measures inadequate – should extend to full extent of eastern boundary of proposed M28 adjoining these lands. Reduction at point of generation is far more effective than mitigation closer to the receptor and Good Practice Design Guide advises that noise mitigation should form an integral part of the design.
- Need for continuous length of barrier – 2.5m high barriers proposed to north of these lands and 3.0m barrier proposed to south of R-08 lands. Need continuous, uninterrupted barriers of same height with landscaping to visually screen them.
- Extent of CPO inadequate – CPO limited to 1ha but effectively impacts the development potential of 2ha of land in ownership. This is due to impact on the design/layout, inclusion of POS and screening on the western boundary, which necessitates greater separation distances as mitigation. The development potential of these zoned lands is 60-70 units (based on 30-35dw/ha).
- Future development of Section C – it is proposed to advance planning application for Section C and need TII to engage constructively. Any superfluous lands should be given back and where rock is encountered in cut

slopes, the slopes should be reduced by increasing the gradient or providing retaining walls.

x. Murnane & O'Shea Plot Ref. 124 – Castletreasure (R609)

- Proposed new access to lands to the west of R609 unsuitable for residential development.
- Lands are designated as SLR3 in Draft LAP, but in adopted Ballincollig-Carrigaline Municipal District LAP, this land is stated as being required to meet the housing need. On this basis, want revised access to reflect status of lands. Revised access should be further to the north, opposite the northernmost of the three houses on R609.

xi. Samuel & Rosie Vickery Plot Ref. 127 – Ballinimlagh/Ballinrea – represented by Martin & Rea

- Land acquisition is excessive
- Proposed access to retained lands, farmyard and dwelling is inadequate
- Proposed access to lands severed to the north-east is not acceptable
- Proposed underpass location and dimensions are unsuitable and inadequate.
- The proposed M28 route severs a large section of the farm on a route designed to mitigate the impact on other land owners at his expense.

xii. Teresa Leahy, Plot Ref. 132 Shannonpark

The grant of a CPO will give rise to the following unacceptable reasons:

- Shannonpark is situated centrally to Cork city and Carrigaline. It is a strategically positioned hub for commercial and residential development in the future.
- Shannonpark is highly sought after by developers. Over the past decade, I have refused to sell the land, therefore, providing an inheritance and financial security for my children.
- We will continue to apply for the land to be zoned residential after previous applications have been declined.

xiii. Estate of Mary Cogan Plot Ref. 144, 145

- Objection recorded – note did not appear at oral hearing. No specific details of objection to CPO.

xiv. Estate of Bartholomew Cooney Plot Ref. 146 Ballyhemiken/Shannonpark

- Severance - Lands zoned for medium density housing and identified as Strategic Land Reserve and two zonings apply C-R-16 and C-R-17. Lands will be severed by CPO which will severely compromise development potential and access is to be compromised. Although a large underpass is to be constructed, agreement needs to be reached in terms of design and detail. Cattle handling facilities are required for both sides of the M28.
- Design of underbridge on Rock Road – tie-ins not extensive enough – should be extended to connect with Heron’s Wood/Fernhill Road to south and to Shannonpark roundabout to west. There should be no impediment to the future development of the lands for residential purposes.
- Noise mitigation – the northern and southern boundary of M28 adjoins the landholding. Noise mitigation inadequate as adjoins southern boundary only.
- Landscape and visual impact – an uphill gradient is provided to an embankment where the M28 crosses Rock Road, and road will be higher than landholding. More details are required with respect to the embankment as well as sections, walls and railings, landscaping and screening.
- Drainage and water supply – any damage to the drainage system must be resolved to prevent flooding. Water supply must be restored. The septic tank seems to be very close to the road works and steps must be taken to ensure it is not affected.
- Conduit ducts will be required for the reconnection of services.
- Shannonpark Masterplan – need confirmation that TII will take a constructive approach to future development in the area.

xv. Janssen Laboratories Plot Ref. 151 – submission at oral hearing

- Janssen is wholly supportive of the proposed road project and of the Shanbally interchange but has a number of issues with the design and layout.

- Shanbally Interchange – concern that public ownership of part of IDA road will give rise to security issues for Janssen site. It is requested that a gate be provided at either end, one near the roundabout and one near the western boundary.
- Boundary treatment – seek clarification on boundary treatment and finishes of same along boundary with IDA road in terms of visual impact.
- Barnahely Junction – concern regarding ad hoc parking on R613 near the graveyard and whether this will continue and will encroach onto entrance to Janssen site.
- CEMP – clarification sought that mitigation will ensure no impacts arise for continued operation of the facility.
- L6472 Shanbally – Raffeen Road – clarification sought on purpose of this road.
- Mobility management – clarification sought on sustainable transport modes.

xvi. Carrigaline A.F.C. Plot Ref. 155 - Shanbally

- The CPO land take will totally destroy the club's only ground for playing football by members and for providing facilities for competitive games with other clubs.
- There is no land available in the locality for a replacement facility.
- It will have a significant impact on the local population, particularly the youth.

xvii. John Joseph Twomey Plot Ref. 157 – Twomey's Lane, Upper Shanbally

- Objects to CPO on the basis of impact on residential amenity and road safety
- Scheme will result in an elevated structure in front of his house which will have a significant impact on daylight, noise, vibration, illumination and other forms of pollution.
- Scheme will require relocation of powerlines which is likely to seriously impact his property. Does not want them closer to his property.
- Objects to L6472 linking Shanbally to Raffeen Road and considers this to be wholly unnecessary as there are already three routes linking Shanbally to

Raffeen Road. Approach from Lower Shanbally will be very dangerous due to the high number of entrances (7 no.) on a dangerous bend. This realignment should be omitted.

- There has been a history of serious accidents on the local road which will be exacerbated by the proposed development (realignment of L6472).

xviii. Patrick Twomey Plot Ref. 158 – Twomey’s Lane, Upper Shanbally

- Objects to CPO on the basis of impact on residential amenity and road safety
- Scheme will result in an elevated structure in front of his house which will have a significant impact on daylight, noise, vibration, illumination and other forms of pollution.
- Scheme will require relocation of powerlines which is likely to seriously impact his property.
- There has been a history of serious accidents on the local road which will be exacerbated by the proposed realignment of the L6472.

xix. Daniel Brady Plot Ref. 159 – Marian Terrace, Shanbally (LH077)

- Objects to CPO on the basis that he has lived here, alongside his extended family, for many years and does not wish to move.
- LH077 will have a profound impact on his property as the proposal is for 99.92% land take and the residential amenity and value of his property will be destroyed.
- Residential amenity – close proximity will result in adverse impact in terms of overshadowing, visual amenity, noise impact and private open space. The proposal will be potentially 7-8m higher than the FFL of his house with a potential noise barrier on top. Noise levels will have a profound impact.
- Inconsistency in EIS – some drawings do not show the proposed access road which runs to the south of his house in a westerly direction, designed to serve agricultural lands.
- Overall impact will be seriously adverse. He would reluctantly accept CPO provided that he is adequately compensated, but reiterates his desire to stay in the community.

xx. Aine O'Mahony Plot Ref. 161 - Upper Shanbally

- There would be an elevated structure in front of her house which could significantly reduce daylight.
- The close proximity of the proposed road infrastructure is likely to result in impacts in respect of noise, vibration, illumination and other forms of pollution. It is unclear how these would be mitigated.
- There is a history of serious accidents on the adjoining road which will be exacerbated by the proposed development – realignment of L6472.

xxi. Daniel O'Connell Plot Ref. 162 – Marian Terrace, Shanbally

- Land acquisition excessive – renders landholding a liability with severe economic impact.
- Access to retained lands inadequate – access near Grotto is being removed and is not being replaced with an access that is suitable in terms of road safety or practical use. Thus, no suitable alternative access is being proposed.
- Objects to proposed route – should be through IDA lands, substation and Shanbally quarry instead. Small additional cost to realign and relocate infrastructure and services.
- Shanbally interchange – will be elevated 6.5m with an additional noise barrier on top. The 8.5m structure will have a negative visual impact on his lands and on the nearby Grotto and will result in overshadowing of his lands. The retaining wall behind the barrier will be 5.7m tall and 65m long, which is totally inappropriate for this sensitive location.
- Absence of mitigation on lands – inadequate detail regarding 6.4m embankment in terms of future maintenance or how it will be stock proofed.
- Air quality – Shanbally has one of the highest increases in air pollution. The modelling is too highly dependent on diffusion tube bias adjustment factor and the EPA monitoring indicates wide variations on an annual, seasonal and weekly basis.

- Road safety/Health and Safety – there will be a large number of trucks and vans with a high proportion carrying cargo subject to COMAH and ADR regulations, which represents a significant hazard to the community.
- Relocation of pylons – this should form part of a separate planning application once the road layout, height, junctions and slip roads have been finalised.
- Road signage – more detail should be provided regarding the proposed road signage.
- Shanbally Quarry – only a small portion of this adjoining brownfield site is to be utilised for the road project with the remainder to be used for environmental purposes. The long-term maintenance of these lands is questioned on the basis of potential impact on his lands in terms of invasive species etc.

xxii. Sharon Rogers Plot Ref. 163

- There would be an elevated structure in front of her house which could significantly reduce daylight.
- The close proximity of the proposed road infrastructure is likely to result in impacts in respect of noise, vibration, illumination and other forms of pollution. It is unclear how these would be mitigated.
- There is a history of serious accidents on the adjoining road which will be exacerbated by the proposed development – realignment of L6472.

xxiii. Paul & Victoria O’Sullivan Plot Ref. 165

- Objects to CPO on basis of residential amenity and road safety.
- There will be an elevated structure behind their house which will reduce daylight.
- Close proximity of proposed development would lead to issues of noise, vibration, illumination and other forms of pollution and it is not clear how these impacts would be mitigated.
- There is a history of serious road traffic accidents on the adjacent road and this problem will be exacerbated by realignment of L6472.

- Scheme will require relocation of powerlines which is likely to seriously impact their property.

xxiv. Eugene O'Brien Plot Ref. 168 – owner Shanbally Quarry (located between Health Centre/Grotto and ESB Substation at Shanbally Upper)

- Shanbally Quarry has ceased operations and there is a current planning proposal for an anaerobic digester on the site (feasibility study enclosed with objection). It currently generates a commercial return from telecoms infrastructure and is ideally suited to brownfield redevelopment.
- Pennyroyal – a portion of the site is identified as being required for CPO but not for the proposed road infrastructure, rather as a site for translocation of Pennyroyal from Raffeen Quarry. There is no scientific evidence to support translocation to this particular location or of any other alternatives considered. A detailed plan for translocation, together with full justification for proposal is and an ecological assessment would be required.
- Peregrine Falcon – precise location for alternative artificial nest box not identified. Concern raised that PF would be relocated to his lands and/or that the nest boxes would be located on his lands. This would potentially reduce the value of his lands for redevelopment.

xxv. Kathleen Bowen Plot Ref. 202 Old Post Office Road – western side – Two separate submissions - Represented by FBA & by Risteard O'Lionaird

- Access to retained lands is inadequate and any proposals must comply with Health and Safety requirements. Landholding adjoins public road which is to be closed and requests road to remain open with unrestricted access as at present. Accessibility could be addressed by upgrading Tower Road between Old Post Office Road and Warren Cross Roads (R613).
- Development potential - Isolation of lands from Ringaskiddy Village curtails future development potential of lands, zoned industrial and would devalue her landholding. An underbridge should be provided.
- Utilisation of greenbelt lands – incongruous that greenbelt is used for a road scheme and there is concern that remaining lands may be at risk of similar

redevelopment with the consequent erosion of the greenbelt. This would devalue her landholding.

- Conflict with utility services – unclear how OHL will be addressed where they cross the proposed road and whether new pylons will be required. Clarity needed on how the gas transmission lines will be protected. Conduit ducts will be required for reconnection of services.
- Noise, dust and traffic during construction needs further clarification, including CPO fences.
- Cattle handling facilities required on both sides of the road.

xxvi. Brendan Roynane Plot Ref. 203 - Old Post Office Road

- Objects to M28 project on the basis of impact on Ringaskiddy Village and on his lands.
- Access to retained lands is unacceptable and wants continued access
- Clarification required regarding access to main services to the retained lands
- Clarification of surface water drainage arrangements following completion of scheme.
- Clarification required regarding boundary treatment and accommodation works along the new boundary to the acquired lands.

xxvii. Elizabeth & Kevin O’Grady Plot Ref. 204 Old Post Office Road – Represented by Coakley Moloney Solicitors

- Acquisition interferes with lands in their ownership
- Reserve the right to set out grounds of objection at oral hearing

xxviii. Fastnet Recycling Plot Ref. 209 – Owners of Ringport Business Park & adj. Residential Estate, Loughbeg Road. Represented by MHL, Martin & Rea

- Objects to CPO on basis of the design of the road scheme in the vicinity of the business park which will have serious implications for the attractiveness and operation of the business park. Although it is currently vacant, the Business Park previously employed over 700 people. The owners also own the 16 residential units to the north of the existing access to the business park.

- Relocated access to business park – it is proposed to provide a new access from Loughbeg road to the south of existing. Object to location of this and would prefer an entrance directly off the proposed Loughbeg roundabout. The likely future traffic demand, combined with the high volume of HGV traffic, would render the proposed access inappropriate. There would be a requirement for a security building and it also affect the amount of parking remaining on the site.
- Protected Road Status – TII rejection of proposed access directly from roundabout on the basis of a protected road scheme is not accepted, as Loughbeg Roundabout lies outside of the lands designated as Protected Road (Schedule 1, Part 1, Section 1). It is claimed that it lies within lands which fall under Schedule 1, Part 2, Section 1, which are not part of the Protected Road Scheme. Thus, it is asserted that the roundabout does not have Protected Road Status and direct access may be considered.
- Capacity of entrance to business park inadequate – the proposed new entrance is only 50m from the Loughbeg roundabout and the Right Turn lane is too short (30m). there has been no analysis and this will result in excessive queuing and will limit the development of the business park.
- Residential Access Road – this is too close to the buildings and should be moved further south. The access junction shows a solid white line which means there will be no right turn in/out.
- Parking – the proposed access road traverses the existing car park which renders a substantial part of site unusable and also results in loss of parking. This would be detrimental to the value and attractiveness of the site, and would undermine efforts to let it as three separate sites.
- Construction phase – details needed to ensure no disruption to operation of business park and that existing WWTP will not be affected.
- Utility services conflicts – confirmation required that there will be no interruption of services due to conflicts with gas and electricity transmission networks.

- Site security – Bonded warehouse on site means that maintenance of a secure boundary treatment is essential. Requests high level wall if new boundary required.
- Tower Road upgrade – request inclusion of access to business park as part of this upgrade.
- Land take excessive – when the residential site is included, the land take represents 40% of the landholding. This is a profound effect not moderate as stated in the EIS.
- Visual impact – office building FFL is 16.3m below the proposed road. The visual impact, including noise barriers on top will be severe.
- Noise impact – noise contour maps indicate that noise levels will be higher as road will be closer to property.

7 Oral Hearing

- 7.1 An oral hearing was held in relation to the proposed development over a period of 3 weeks between 7th November 2017 and 1st December 2017. The Oral Hearing Schedule, which was held on a modular basis, is contained in Appendix 3. The documents presented during the course of the hearing are included in Appendix 4. Issues discussed during the oral hearing are considered in the planning assessment below. Reference is made to observers who made substantial submissions and to the individuals representing the applicant.
- 7.2 The Board retained the services of Mr. Pierce Regan, Artane Recording Studio, to record the proceedings. This constitutes the official record of the proceedings.

8 Planning Assessment

- 8.1 Under the proposed scheme, consent is being sought for the motorway development, the protected road and the services area, as well as for the compulsory purchase of the lands required for the construction of each of these elements of the proposed development. I have examined the file and the planning history, considered national and local policies and guidance and inspected the site.

8.2 A Traffic and Transport consultant, Mr. Paul Bergin, was appointed by the Board to assist with the application, including carrying out a review of the submissions made in response to the proposed development and an assessment of the issues relating to traffic and transport including alternatives considered. Mr. Bergin was also in attendance at the oral hearing and inspected the site. A report was prepared by Mr. Bergin on these topics following the conclusion of the oral hearing and is attached as Appendix 2 to this report.

8.3 I have assessed the proposed development including the various submissions from the applicant, the prescribed bodies and the third party observers, as well as the report from the Traffic and Transport Consultant. The first sections of the report address the assessment issues arising from the proposed road scheme and services area development, including the policy context and need for the development, an environmental impact assessment and an appropriate assessment, and the second part of the report assesses the CPO. I consider that the key issues arising in this case are as follows: -

1. Legal and procedural issues.
2. The need for the development and policy context.
3. Evaluation of Alternatives.
4. Traffic and transportation impacts.
5. Noise and Vibration.
6. Air and Climate.
7. Health and amenity.
8. Landscape and Visual Impact
9. Flora and Fauna.
10. Water Quality.
11. Cultural heritage.

8.4 Each section of the report is structured to guide the Board to the relevant section of the EIS relating to a particular topic, the policies and objectives of the development plan, the substantive issues raised in the submissions, the applicant's responses to those issues and the oral hearing proceedings. The Environmental Impact

Assessment and the Appropriate Assessment will be addressed in subsequent sections, but reference will be made to the Planning Assessment in the interests of avoiding unnecessary repetition.

9 Legal and procedural issues

9.1 Environmental Impact Statement

The requirement for EIA in respect of a proposed road scheme development, such as that proposed, is set out in Part IV of the Roads Act 1993 (as amended) and in Part V of the Roads Regulations 1994, (as amended), primarily under Sections 50 and 51. As the proposed road project involves a Motorway Scheme, a Protected Road Scheme and a Service Area Scheme, approval is required under Section 51 of the Roads Act 1993 (as amended) and the submission of an EIS is mandatory. Section 49 of the Roads Act 1993 (as amended) requires the submission by the Roads Authority of a scheme made by it under Section 47 of the Act, such as a Motorway Scheme or a Protected Road Scheme. The applicant is seeking consent from the Board, concurrently, for the proposed development pursuant to Part XAB of the Planning and Development Acts 2000-2016, for which a Natura Impact Statement has been prepared, for the purposes of Article 6 of the Habitats Directive.

The relevant volumes of the EIS are as follows:

Volume 1 Non-Technical Summary

Volume 2 Chapter 1 – Need for development; EIA requirements; EIS Structure & Scope; and Appendices 1A, (Seveso Report), 1B (EIA Scoping Report, Health Scoping Report) and 1C (Health Study)

Chapter 6 – Non-Statutory Consultation and Appendices 6A, 6B and 6C

Chapter 4 – Outline of Alternatives

Chapters 10 and 12 (Aquatic Ecology, Terrestrial Ecology), and Appendices 10 (A-C) and 12 (A-F)

Chapter 18 – Interaction and Inter-relationships on Impacts

Volume 3 Natura Impact Statement

Volume 4 Appendices and Health Study

Volume 5 Drawings and Figures

9.2 Issues raised by observers during the course of the application and the oral hearing regarding legal and procedural issues

1. SEA Directive – failure to comply with the SEA requirements, and lack of alignment with other policies on health, climate change, transport and River Basin Management.
2. New EIA Directive – failure to demonstrate compliance with new EIA Directive, (EIA/2014/52/EU - effective on 16/05/17), as there is no Health Impact Assessment and given the deficit in any prior determination made under the Roads Act. Evidence must be provided that it was submitted before the deadline.
3. Public participation and consultation - There has been a complete failure to meet the public consultation requirements of EIA 2014/52/EU. Insufficient and meaningful consultation regarding the revised route, which has been presented as a 'Fait Accompli'.
4. Failure to comply with EU conventions - Inadequate access to public participation in the EIA screening process following the CJEU case C-243/15, (Charter of Fundamental Rights and Aarhus Convention precludes the application of national procedural rules allowing for swift decision making at the expense of rights granted to environmental NGOs).
5. Hotel venue wholly inappropriate – oral hearing being held at Ambassador Hotel in St. Luke's which is very remote from the site of the development and the location of most residents affected by the scheme. Attendance at hearing has been limited due to the inappropriate location of the venue and the lack of available parking. Hindering public participation.
6. Project splitting – cumulative impacts inadequately considered as the road is part of the port project, Board's decision (PA0035) tied the port expansion into the upgrade of the N28 without requiring the necessary links to the airport and the rail network. Cumulative impacts with permitted quarry at Raffeen also needs to be considered.

7. Deficiencies in the EIS – The EIS is deficient in respect of
 - Inadequate assessment of alternatives.
 - Failure to comply with S.15 of Climate Change and Low Carbon Development Act 2015.
 - Failure to address species protected under Annex IV of the Habitats Directive, e.g. Otters.
 - Inadequate surveys - not carried out in advance of consent.
 - No mention of invasive species
8. Deficiencies in NIS – the conclusions are irrational and fail to acknowledge the importance of and intermittent usage of over-wintering sites for wild birds. The conclusion “no adverse impacts on site’s integrity” is unsound and unjustified and does not meet the requirement of scientific certainty. Art. 4 of the Bird’s Directive – importance of over-wintering provisions is fundamental to the ecological requirements of migrating birds.
9. Deficiencies in planning drawings and documents

9.3 Oral hearing

Legal and procedural issues were principally discussed during Module 1 but were also addressed on Day 7 (16th November) and on Day 12 (1st December) of the oral hearing. Submissions were made by the following observers :-

- An Taisce
- An Cláíomh Glas - Bernie Connolly
- M28 Steering Group – Solicitor Joe Noonan; Wessel Vosolloo; Gerard Harrington
- Cork Environmental Forum
- Rochestown Rise Residents Association - Domhnaill Mac Domhnaill
- Ringaskiddy Residents Association - Peter Walker & Vivian Prout
- Maryborough Estate - George Ryan
- Lissadell Residents Association - John Higgins & Tommy Kelly
- Jo Goodyear & Others

- Rodney Daunt
- Daniel O'Connell - Shanbally
- Sylvester Cotter – Rochestown
- 'Martello', Ringaskiddy - Jim Roynane & Representatives
- Kevin Hanley – Raheen Bridge
- Gertie O'Driscoll – Ringaskiddy
- Pdraig O'Drisceoil - Wainsfort
- Minister Simon Coveney T.D.
- Micheál Martin T.D.
- Michael McGrath T.D.
- Senator Jerry Buttimer
- Senator Dan Boyle
- Councillor Seamus McGrath
- Councillor Marcia D'Alton
- Councillor Mary Rose Desmond
- Councillor Deirdre Ford

In attendance for Prescribed Bodies:

- Dr Jervis Good Dept. Arts, Heritage, Regional, Rural and Gaeltacht Affairs

In attendance for applicant :-

- Mr Delaney
- Dr. Bernadette White
- Mr Dermot Flanagan, Senior Counsel

9.4 Assessment of legal and procedural issues

9.4.1 SEA Directive

Some observers considered that the application fails to adequately demonstrate that the proposed scheme is based on a land use strategy which has been through the SEA process. The requirement for SEA derives from the SEA Directive (2001/42/EC) which came into force in 2001. The Directive is entitled 'The Assessment of the effects of certain plans and programmes on the environment' and it relates to plans and programmes, not to individual projects, such as that proposed. The policy framework upon which it is based (as stated in the EIS), is quite extensive and ranges from National plans (e.g. NDP, National Ports Policy), the South West Regional Planning Guidelines, to the County and City Development Plans and the Ballincollig-Carrigaline LAP. The degree to which the proposed development complies with the various land use plans will be discussed in the following section, under the heading 'Justification and Need for the Development'. However, it is noted that all such plans and programmes would have been required to carry out SEA as part of the process prior to adoption.

9.4.2 New EIA Directive 2014/52/EU

The EIA Directive 2014/52/EU came into force on 15/05/14 with a requirement to be transposed into national legislation by 16/05/17. The Directive has not been transposed into Irish Legislation, but the Dept. of Housing, Planning, Community and Local Government has issued a Circular Letter PL1/2017, which sets out the transitional arrangements. This states that where an application for planning permission or other development consent with an Environmental Impact Statement has been submitted before the 16th May 2017, the relevant provisions of Directive 2011/92/EU must be applied.

The assessment by the Board of the proposed development under the 2011 EIA Directive, rather than the 2014 Directive, was questioned by observers at the oral hearing. An Cláíomh Glas believed that although the Section 51 application for the proposed road scheme was submitted before the 16th May 2017, given that the application under Section 49 of the Roads Act, 1993 (as amended), Ref. No. MA0014, was submitted on 2nd June 2017, the project falls within the Transition

Arrangements. This would mean that the provisions of the 2014 Directive would apply. A legal submission was made on behalf of the M28 Steering Group on Day 7 of the Oral Hearing (16/11/17) by Solicitor Joe Noonan. Similar points were made to that made by An Cláíomh Glas in respect of the timing of the lodgement of each of the applications under S49 and S51, and also in respect of what was believed to be the sequence of such lodgements required by the legislation.

Mr. Noonan claimed that the Roads Act 1993 (as amended) requires that the scheme approval is to be sought (S. 49) together with the road development proposal (S.51) and that they should both travel in tandem, and stated that “there is no basis in law or practice for putting the Section 51 cart before the Section 49 horse” (page 13 of submission No. 61). He further submitted that Scheme approval is a prerequisite to show that the Council will have the legal right to carry out the proposed road development on the lands in question, and that the two applications should be considered, assessed and decided upon as a unitary project. It is stated that the two approvals should be treated as a single application to be governed by the law enforced when the later of the two was lodged. Thus, the proposed development should be considered under the provisions of the 2014 Directive.

I note that S. 49 of the Roads Act 1993 (as amended) requires the submission by the roads authority of a scheme made by it under S. 47 (i.e. a motorway, bus way or Protected Road Scheme); S. 50 requires the preparation of an EIS and specifies the contents of the EIS; and S. 51 requires the road authority to apply for approval and to submit the EIS to the Board, and states that the proposed development shall not be carried out unless it has been approved. S. 51(7)(b) requires that where an application under S. 51 and a scheme for approval under S. 49 relate wholly or partly to the same road development, a decision must be made on the two applications at the same time. However, I can find no reference to any provisions in the Roads Act 1993 (as amended) to a requirement for the sequencing of the lodgement of the applications. As the application for the proposed road development was submitted to the Board, together with an EIS for the proposed development, on 15th May 2017, it

is considered that the relevant provisions of Directive 2011/92/EU apply, as set out in Circular PL1/2017.

Mr. Noonan (for M28 Steering Group) also made the point that, even if it was accepted that the S. 51 application was properly before the Board, it cannot benefit from the transitional arrangements because the EIS submitted on 15/05/17 does not meet the mandatory requirements of Art 5(1) the 2011 Directive. He outlined these requirements (as set out in Articles 5(1) and 5(3), and in ANNEX IV), and further submitted that “Nothing can be added to the EIS after that date (15/05/17) for the purpose of this audit by the Board.” Reference is made to Article 3 of the 2014 Directive which states that projects shall be subject to the provisions of the 2011 Directive where, before 16/05/17, the procedure regarding the opinion (Art. 5(2)) was initiated or the information referred to in Art. 5(1) was provided. It is submitted that as the Scheme plans were not before the Board until 2/06/17, and because of other inadequacies in the EIS, the information required by Art. 5(1) was not provided before 16th May 2017, and as such, the provisions of 2014 Directive apply.

An Cláíomh Glas also made a similar, related point regarding FI at the oral hearing. It was submitted that it is not open to the Board to accept further information at the oral hearing, as it is obliged to take into account the public's input in the development consent procedure. It was claimed that the Board is obliged to either disregard such new information by the applicant or to facilitate public consultation thereon – in a process which cannot be discharged simply by circulating copies to those at the hearing.

However, the amended Roads Act sets out that, where a roads authority has submitted either a scheme under S49 or sought approval under S51, the Board may seek further information regarding the effects on the environment or the consequences for proper planning and sustainable development. Section 51 (5) of the Roads Act 1993 (as amended) specifies that prior to approval of a proposed road development, consideration must be given to the EIS, any additional information

furnished and any submissions made in relation to the likely effects on the environment of the proposed development.

The DoECLG issued Guidelines on EIA in 2013, wherein it is stated that the PA or the Board must seek such further information as it considers necessary to remedy any defects in the EIS, which it considers necessary to enable it to carry out EIA. In Section 5.2 of the Guidelines, a distinction is drawn between the requirements on the Competent Authority to carry out EIA and those imposed on the developer to submit an EIS. The latter is focused on the provision of data, information on the proposed development and the likely significant effects on the environment, whereas the EIA focuses on the effects of the proposed development on various environmental factors, requiring evaluation and analysis. Section 3.8 sets out the items which the Competent Authority must consider, which includes FI submitted by the applicant and by observers in relation to environmental effects.

It is clear, therefore, that the EIS is just a part of the EIA process, which must be carried out by the Competent Authority and which includes consideration of submissions by the public, prescribed bodies and the applicant. It is considered that the submission of the EIS is the starting point and that the information gathered in written submissions and at the oral hearing form part of the EIA process which will ultimately inform the Board' decision. It is considered, therefore, that the relevant provisions applicable to the proposed road development before the Board are contained in the EU Directive of 2011/92/EU, as the application for the proposed development, together with an EIS, was submitted before the 16th of May 2017, and as such falls within "Applications on hands on or before 15th May 2017".

An Cláíomh Glas also raised a query as to whether any EIA screening had been undertaken prior to May 16th, 2017 and that this in turn raises questions as to which Directive the application should be assessed against. Reference was made in the written submission to the need for public participation in the screening for EIA process in light of the Slovak Bear Case (C-243/15). However, formal EIA screening was not requested or carried out by the Board in this instance. An informal scoping

exercise was carried out by the applicant, the details of which are included in the EIS (Chapter 6 and Appendix 1).

9.4.3 Public participation and EU Conventions

Issues have been raised by some observers regarding non-compliance with the principles of the Aarhus Convention and the Charter of Fundamental Rights in respect of public participation in the process. An *Claíomh Glas* stated that the Aarhus Convention, when read together with Article 47 of the Charter of Fundamental Rights, precludes swift decision making in accordance with national procedural rules, where it is at the expense of the rights of Environmental NGOs. One of the main requirements of the Aarhus Convention is to promote the involvement of the public in environmental matters. It makes provision for three basic rights to be exercised by the public, i.e. access to environmental information, the right to participate in decision making and access to justice. It is required that the public be given early and effective options to participate in environmental decision making procedures, i.e. when all options are still open.

The public consultation process carried out by the applicant, prior to submission of the scheme and application for approval, is set out in Chapter 6 and in Appendices 1 and 6 of the EIS. Chapter 6 of the EIS describes the consultation process since the inception of the project, which incorporated 3 separate phases, i.e. prior to 2014, after 2014 and the informal EIA scoping process. It is stated that prior to 2014, a number of public consultations and exhibitions were held which addressed matters such as constraints, route options and the preferred route at the time. These meetings were held in 2002, 2003, 2004 and 2008, when the “Amended Emerging Preferred Route Corridor 2008” was presented at the Carrigaline Court Hotel.

RPS was appointed in 2014 to reassess the previous studies and the proposed revised route corridor was presented on 15th December 2014 in the Carrigaline Court Hotel. A further consultation day was held in Nov. 2015 in Maryborough House Hotel, which is described as “a dedicated consultation day...to liaise with the public and in particular, those affected by changes to the proposed road project in the

vicinity of Bloomfield Interchange and Carr's Hill in comparison to earlier published options". Over 600 people attended this consultation day, which was preceded by a briefing at a full Council Meeting on 16/10/15. The Preferred Route Alignment and Revised Junction Strategy, together with the proposed Service Area, were put on public display in April 2016 at two separate venues, where a total of 700 people attended. The final route alignment was presented on 11th April 2017 at the Carrigaline Court Hotel, at which approx. 450 people attended.

It is stated that an informal non-statutory EIA Scoping Report was also prepared to avail of the opportunity for consultation prior to the publication of the EIS and that the scoping process commenced on 17th February 2015. A Health Study Scoping Report was also issued to key stakeholders (including HSE and EPA) in 2017. It is further stated that additional ongoing scoping has been applied proactively throughout the EIS compilation process by the design team and the various specialist sub-consultants. Three pre-application meetings were held with the Board, the records of which were included at Appendix 6 of the EIS.

A considerable number of observers have raised objections to the level and nature of public consultation, which was described as not being a meaningful engagement with the public. It is further claimed that the 2008 Proposed Route had the broad support of the community and it was not until 2014, (following the Board's decision to grant permission for the port expansion PA0035), that the revised route emerged, but that the residents of Rochestown and Douglas were not consulted until November 2015. At this stage, it is submitted, the current route corridor introducing a proposal for a motorway, (as opposed to a dual carriageway), was presented as a 'Fait Accompli'. It is claimed that the residents of Douglas and Rochestown were never adequately consulted. The residents of Ringaskiddy also believe that there was broad support for the 2008 Route and that any concerns regarding the revised route and junction strategy were not taken on board.

The consultation process undertaken by the applicant has clearly been comprehensive and carried out over an extended period of time. Thus there have

been many opportunities for early public engagement in the process. However, one of the key criticisms of the observers is that despite the opportunity for public participation and influence prior to 2008, there has been little or no opportunity to influence the type of road or route corridor as currently proposed, which it is considered was imposed on the communities as “The Project” in 2014. The applicant however disputes this and states that the proposed route alignment was evaluated against several other options and that the current proposal best met each of the objectives for the project. Section 6.6 of the EIS also sets out how the consultation process influenced the proposed road project.

The Alternatives studied will be discussed later in this report, but it is worth noting that the Board had sought further information on this issue from the applicant to be presented at the oral hearing. Mr. Michael Noonan (RPS) provided an account of how the current proposal compared to previously considered alternative options having regard to the project objectives. He also dismissed suggestions in the observations that the need to achieve ‘motorway status’ was the reason for upgrading the section between Bloomfield and Carr’s Hill and that there had been no plans to upgrade this section prior to 2013. He stated that the upgrade of the northern section to a Type 1 Dual Carriageway had always been an integral part of the plan and that there was little difference in terms of cross section required between this type of road and a motorway. Thus, whilst there remains considerable disagreement between the applicant and the observers at the hearing regarding the route corridor proposed, it is considered that the applicant has complied with the statutory obligations in respect of the need to provide for early and meaningful public participation in the process.

Since the applications were lodged, the Board has engaged in a comprehensive and detailed consultation process, including the holding of an oral hearing for a total of 12 days. An Cláíomh Glas, commented that although the holding of an oral hearing was very much welcomed, the short notice given, together with the published schedule and agenda made it difficult to arrange for a wider attendance during the course of the oral hearing due to the voluntary nature of the membership and volunteers of the

NGO. The agenda was designed on a modular basis which was publicised in advance and updated on the Board's website as the hearing progressed. The intention of the modular format was to facilitate the public so that observers could choose which modules to attend. A detailed agenda was also issued in advance of the hearing to facilitate a focused approach and to ask the applicant to expand further on specific topics. It is considered that this approach aided the efficient running of the hearing and provided for full participation by the public.

The venue chosen for the oral hearing was a contentious issue. Following the announcement that it was to be held in the Ambassador Hotel in St. Luke's, Cork City, the Board received a considerable number of complaints. The concerns related to the remoteness of the hotel from the site of the proposed development and the residential communities that would be impacted by the proposal, as well as the traffic congestion and lack of available parking issues which would hinder attendance at the hearing. Some observers believed that it constituted a deliberate attempt to discourage public participation in the process. The Board wrote to the observers in advance of the hearing setting out the difficulties encountered and the great lengths pursued by the Board to find a venue closer to the site, which proved impossible to achieve. It was the only suitable venue available in Cork for the period required. I also addressed the issue in my opening statement. As the hearing was nearing the end of the second week, it became clear that there would be a need to continue proceedings for a further week. The Board was able to secure the Carrigaline Court for the third week, which met with the satisfaction of the observers in attendance.

In conclusion, it is considered that public participation in the process, including the consultation process and informal scoping report carried out by the applicant, together with the provisions made for written and oral submissions to be made to the Board, whereby each individual/group who expressed an interest in making a submission was facilitated during the course of the hearing, is in accordance with the statutory obligations and with the requirements of the Aarhus Convention.

9.4.4 Project splitting and cumulative impacts

Some concerns were raised that the proposed port expansion and relocation to Ringaskiddy should have been considered at the same time as the proposed M28 project. It was further considered that the Board's decision to grant permission for the port expansion (PA0035) subject to a condition that Phase 3 of that project, the Ro-Ro element, could not proceed until such time as the M28 and the Dunkettle interchange upgrade were complete, amounted to project splitting. The term 'project splitting' is normally associated with the subdivision of a large project into a number of constituent parts to avoid the necessity for EIA. Although plans for the upgrade of the N28 have been under discussion and subject to public consultation for some time, which preceded the grant of permission for the port expansion at Ringaskiddy, the two developments are being driven by separate applicants, The Port of Cork and the TII/Cork County Council, with different, if overlapping objectives. Each project has been/is being subjected to EIA and the cumulative impacts of the port development has been included in the EIS.

9.4.5 Deficiencies in planning drawings and documents

There were some observers who criticised the lack of detail and/or inaccuracies in the drawings and photomontages submitted to the Board. These matters will be discussed in more detail in the following sections under the relevant topic headings. However, it is worth noting that the matters referred to were, in the main, relatively minor aspects, which were either clarified, amended or justified during the course of the hearing and would not in themselves significantly impact third parties and that the information provided in EIS, as clarified at OH, was generally adequate and sufficient for the Board to make an informed decision on the applications.

9.4.6 Deficiencies in the EIS and the NIS

Observations were raised by several parties regarding deficiencies in the Environmental Impact Statement and in the Natura Impact Statement. Issues regarding non-compliance with the EIA and Habitats Directives are discussed under the headings EIA and AA at a later stage in this report.

10 Justification and Need for Development and policy context

10.1 Environmental Impact Statement

The strategic need for the proposed development is set out in Chapter 1, Section 1.3 of the EIS. It is stated that the need for the proposed M28 Road project derives from the requirements of European and National Transportation and Port Access policies and is strongly underpinned in national, regional and local planning policy. The policy basis for the need for the proposed development is set out in more detail in Chapter 2 of the EIS and has already been summarised in Section 5.0 of this report.

In addition to the policy basis supporting the need for the proposed development, the EIS sets out the justification of the proposed development in respect of the benefits to the national, regional and local economy, the existing and predicted traffic demands, the inadequacies of the existing route, and the benefits of improving the road in terms of road safety, environmental improvements, and increased accessibility and social inclusion. The need for the proposed Service Area is set out in Section 1.4 of the EIS.

10.2 Issues raised by observers during the course of the application and during the oral hearing regarding need for the development

10.2.1 Issues raised in support of the proposal:-

1. The Existing N28 - The existing infrastructure deficit and daily traffic congestion on N28 are having a negative impact on the quality of life of residents and on the economy of the region, including tourism, maritime interests and the strategic employment area. The delivery of improved infrastructure in a timely manner is of critical importance given the uncertainty posed by Brexit and the US economy.

2. Industrial development - Cork Region is a key driver of the national economy. The upgrade of the N28 is crucial for the industrial development of the area. Ringaskiddy has a significant cluster of Pharma/life sciences industry, IDA strategic sites, deep water port facilities and maritime research facilities. The existing infrastructure linking Ringaskiddy with the city, region and the national road network is hampered by daily traffic congestion and delays and the upgrade is a catalyst for further investment and the maintenance of the existing level of investment.
3. Employment - Ringaskiddy is designated as a Strategic Employment Area, providing employment for 5,000 employees with an annual salary spend of €388 million. There is currently a significant skills shortage and difficulty is being encountered in attracting the most skilled and experienced personnel. Existing levels of traffic congestion are hindering the potential for future jobs growth and Foreign Direct Investment in Ringaskiddy
4. Planning policy - The proposed M28 is fully supported by the strategic objectives contained in the National policy framework as well as by the South West Regional Plan, the City and County Development Plans and the Local Area Plans.
5. TEN-T and National Ports policy - The provision of a motorway linking Ringaskiddy with Cork City and the national road network is supported by the EU's TEN-T transport policy and by the National Ports Policy. The Port of Cork is designated as a Tier 1 Port, which plays a significant role in the wider development of the region but is lacking in appropriate connectivity and infrastructure.
6. Redevelopment of City docks - The transfer of the port to Ringaskiddy will facilitate the redevelopment of the City Quays and the Tivoli docks for more appropriate and sustainable development, including residential development. It will result in a significant reduction in port related and HGV traffic travelling through the city centre, with associated environmental improvements for the city.
7. Expansion of the port - Planning permission for the expansion of Ringaskiddy port (PA0035) deferred the relocation of the Ro-Ro element, (Phase 3), until the upgrades of the N28 and the Dunkettle Interchange are

complete. The upgrade of the N28 will allow the transfer of port activities out of the city and to concentrate all port related activities in one location.

10.2.2 Issues raised against the proposal:-

1. The need for an upgrade of the N28 is acknowledged but proposed development is contrary to good planning practice and is not supported by planning policy. There is substantial objection to the route as currently proposed as it would be at the expense of the quality of life, health and amenity of the residential areas it would pass through. It will increase congestion, car dependence and urban sprawl.
2. Increasing road capacity will only encourage further growth in industry, employment and residential development, thereby increasing traffic congestion. The Port is also likely to continue to expand and there are substantial tracts of land zoned for residential development in Carrigaline and Shannonpark and for industry in Ringaskiddy.
3. Unsustainable development The M28 proposal will increase car dependence, which is already extremely high in the southern suburbs, as road traffic volumes expand to fill the available capacity and will reinforce the unsustainable pattern of development in the area. Ringaskiddy is at the end of a cul-de-sac. The planning authority has continued to fail to invest adequately in public transport, and traffic congestion and associated GHG emissions will continue to increase.
4. Cork needs an Outer Ring Road or orbital route to take all heavy traffic out of the suburbs and city centre and provide connectivity with the airport. The failure to provide a link to the west from Shannonpark fails to recognise the existing traffic flow from Ringaskiddy to the west including to the Airport, the Wild Atlantic Way, West Cork, Kerry (tourism) and the western suburbs.
5. TEN-T policy does not support the need for the development as proposed, as it does not include a rail or an airport connection. It does not cater for multi-modality as required by the TEN-T regulations. TEN-T requires a

high-quality link to a Tier 1 port in the form of a motorway/expressway, but this does not mean it has to be a motorway (instead of a dual carriageway) between Bloomfield and Carr's Hill. The M28 will not eliminate bottlenecks so will not achieve TEN-T objectives.

6. The relocation of the Port of Cork is not dependent on the upgrade of the N28 as the relocation can proceed without Phase 3. The Ro-Ro terminal is the only element that cannot be moved.
7. Strategic traffic – the M28 proposal is not 'strategic' as it only caters for port related traffic and fails to provide adequate links to the rail network or to the airport, or to other areas of significant development. For example, there is substantial development potential at the airport industrial park, which should be linked to the port.
8. Open space buffer zones – residents of Ringaskiddy objected to the erosion of the open space zones which were designed as buffer zones to protect the residential communities from industrial development to the south.

10.3 Oral hearing

Module 1 of the hearing, Strategic Transport issues, and Module 2, Traffic modelling and Design took place on Days 1, 2 and 3 which were held on the 7th, 8th and 9th of November. The need for the development was discussed principally during Module 1, but also during Module 2 and at various other points during the hearing. Questions on Module 1 and Module 2 were taken on Day 3 (9/11/17).

Submissions were made by the following observers :-

- Orla Casey – IBEC and the Biopharma Chemical Industry
- Pat Ledwidge – Cork City Council
- Henry Kingston – Port of Cork
- Michele O'Sullivan – Cork Chamber of Commerce
- Michael O'Donnell – Bio pharma/Life Sciences Group of 9 companies
- Mark Collins – Janssen

- Christy O’Sullivan (ILTP) - Shannon Foynes Port Company
- Gavin Lawlor (TPA) – IDA Ireland
- Gerard Harrington - M28 Steering Group
- John Higgins – Lissadell Residents Association
- George Ryan – Maryborough Estate
- Sylvester Cotter
- Jackie O’Donovan
- Donagh Long
- Peter Walter – Ringaskiddy Residents Association
- Minister Simon Coveney T.D.
- Micheal Martin T. D.
- Michael McGrath T.D.
- Senator Jerry Buttimer
- Senator Dan Boyle
- Councillor Mary Rose Desmond
- Councillor Seamus McGrath
- Councillor Marcia D’Alton

In attendance for Cork County Council were:

- Michael Noonan – RPS
- Michael Lynch - Senior Planner, Cork County Council
- Peter O’Donoghue – Senior Engineer, Cork County Council
- Mr. Dermot Flanagan, Senior Counsel

10.4 Assessment of Need for the Development

10.4.1 The need for a motorway link between Ringaskiddy and Cork City and the National road network has not been adequately established

The need for an upgrade of the N28 was generally accepted by most parties in both written submissions and at the oral hearing. Some parties vigorously supported the need for an upgrade of what was perceived to be critical infrastructure, such as the City Council, the Port of Cork, and various representatives of business and industry in Cork and Ringaskiddy. Some parties, such as many of the Residents Groups along the route, acknowledged the need but were strongly opposed to the chosen route alignment and to the nature and scale of the proposed upgrade. Other parties disputed the need for the upgrade at a strategic level, the policy basis for such a development and the overall impact on the sustainable development of the area.

10.4.1.1 European Transport policy

The strategic need for the development is identified at a European level in the form of the **Trans-European Network – Transport policy**. This established nine Core Network Corridors across Europe, the aim of which is to “close the gaps” between member states, remove bottlenecks, upgrade infrastructure, improve connections between modes of transport and to contribute to the EU’s climate change objectives. Each core network will be supported by a comprehensive network of routes, and it is an objective that most citizens and businesses will be no more than 30 minutes travel time from this network by 2050. There are supporting documents on the EU Commission website which provide further guidance and progress reports on the individual Work Plans for each of the core network corridors, and the EIS (Chap 2) includes extracts from some of these documents. The TEN-T policy is also summarised at 5.1.1 of this report.

There is one Core Network Corridor which crosses Ireland, the **North Sea Mediterranean Corridor**. It is described in the Work Plan as a maritime corridor connecting a large number of ports, of which Dublin and Cork are designated as Core Seaports. It is a requirement of the EU Regulations 1315/2013 that all core

ports must be connected by high quality road and rail by 2030, except where physical constraints prevent such a connection. Article 17 of the Regs. specifies that a high-quality road must be either a 'motorway' or an 'express road'. It is stated in the Work Plan (2.2 compliance with technical requirements) that most of the core links comply with the road standard, but there are certain "last mile connections to seaports", including Cork, where current road standards are not adequate for the level of traffic. There are 26 core airports along the corridor which include Dublin and Cork Airports. Dublin is identified in the Work Plan as one of the airports that requires a rail link by 2050.

The EIS (1.3.1) states that the N28 is part of the TEN-T core network and has been identified as a critical part of the road network supporting the core maritime port at Ringaskiddy. Michael Lynch, Senior Planner for Cork County, advised the oral hearing that Ireland has been successful in its bid to secure funding from CEF for the Port of Cork redevelopment at Ringaskiddy as part of the North Sea Core Network Corridor. It was stated that the TEN-T policy requires that the route to the core port must be a high-quality route and be constructed to the standards set out in the EU Regulations, i.e. as a motorway or express road, and that the current road does not meet the specified standards. It is also noted that the Work Plan for the Corridor identified the need to upgrade the current access to Ringaskiddy as the road standard is not adequate for the level of traffic and has also identified a need for secure parking for HGVs.

There was much discussion at the oral hearing on the issue of whether the proposed M28 appropriately qualified as a TEN-T route and the issue was also raised in several written submissions. Doubts were raised principally on the basis of the failure to embrace the multi-modality requirement of TEN-T (i.e. rail and airport connections) and the failure to consider alternative 'high quality road' solutions to a motorway, such as a dual carriageway. An Taisce in its written submission also stated its belief that the proposed development is contrary to TEN-T guidelines in that it fails to provide for multi-modality and the need to reduce GHG emissions.

I would agree that the TEN-T policy seeks to encourage a greater degree of interchange between different modes of transport, including contributing to the EU's climate change objectives, and that it seeks connections between nodes such as seaports and airports with road and rail networks by 2030 and 2050, respectively, where such connections are not physically constrained. However, this requirement does not exclude connection by road and, in fact, requires connection by "high quality road", as well as rail, to the urban node and to the wider network. My interpretation of the policy is that it does not require the core seaports to be connected to the core airports, although such connections, where possible, would be considered as desirable.

Article 17 of the EU Regulations 1315/2013 provides clarification on the requirements for a "high quality road" in that it defines "motorway" and "express road". Both require separate carriageways in both directions, access (primarily in the case of express roads) from interchanges or controlled junctions and a prohibition on stopping and parking on the carriageways. However, motorways cannot cross any road/rail etc. at grade and express roads cannot cross a railway/tramtrack at grade. Michael Noonan (RPS for the applicant) responded to this issue at the oral hearing (Module 1), in respect of the differences between the two types of road between Carr's Hill and Bloomfield interchanges as follows;

- The cross section/design requirements for a motorway and a Type 1 Dual Carriageway would be identical.
- Grade separated junctions would still be required in either case and, in any event, the sub-standard junctions at Maryborough Hill and Mount Oval would still be required to be omitted.
- The proposed speed limits on the M28 would be less than the normal speed limits for a motorway (120kph) in that it would be 60kph between Bloomfield and Rochestown Road and 100kph between Rochestown Road and Ringaskiddy.

It is considered, therefore, that the TEN-T requirements can be achieved by means of the proposed Motorway status from Bloomfield to Barnahely and by the proposed Protected Road status from Barnahely to Ringaskiddy East. In addition, the need for secure parking for HGVs can also be met by the proposed Service Area.

10.4.1.2 National Transport policy

The primary purpose of a national road network, according to the Spatial Planning and National Roads Guidelines for Planning Authorities (2012), is to provide strategic transport links between population and employment centres, and ports and airports. It is a requirement that the strategic traffic function and capacity of national roads is maintained. Given that the M28 would provide for an upgrade to the national road network linking the Strategic Employment Area of Ringaskiddy and a major population centre at Carrigaline with each other and with Cork City (a centre of both employment and residential population), it is considered that it is in compliance with this national roads policy.

The 'M28 Steering Group', in Module 1 of the oral hearing, stated its belief that the M28 could not be described as providing a 'strategic function' as it merely provides for port traffic and fails to connect the port/Ringaskiddy with the major new developments (such as the new industrial development park near the airport), or provide for rail and/or airport linkages. The SPNR Guidelines define 'Strategic Traffic' as "major inter-urban and inter-regional traffic which contributes to socio-economic development and to the transport of goods and products, especially to/from the major ports and airports." The proposed M28 would clearly contribute to the transport of goods to/from the port at Ringaskiddy and would also carry major inter-urban and inter-regional traffic between Ringaskiddy and Cork City, and would connect to the N40, the N25 and the N8 road networks. Thus, I could not agree that the route would have no strategic function, or that M28 would not contribute to the fulfilment of that function.

10.4.1.3 Smarter Travel

An Taisce in its written submission queried how the proposed development complies with the policies contained in the Smarter Travel: A New Transport Policy for Ireland. This policy, it is stated, seeks to curtail growth in car use and to mitigate climate emissions and health impacts. It is emphasised that there is a need to ensure that measures are included to reduce car commuting in the catchment area and to make provision for enhanced cycle and public transport facilities, as well as demand management measures. Several other parties, including the M28 Steering Group, also made similar points about the need for a rail freight solution for Cork, that the proposal does not attempt to reduce car dependency and is likely to increase traffic congestion and reinforce unsustainable development patterns in the area. An Taisce stated that the proposed development would undermine any alternative proposals for the future development of Marino Point, which has a rail connection. This sentiment was also echoed by other parties who believed that it was not too late to look at the development of Marino Point for expansion of port activities and noted that the Port of Cork had recently acquired an interest at this location.

I would agree that it is a desirable and worthwhile objective to seek the provision of a rail connection to the port which would enable freight to be carried by more sustainable transport means. However, this does not form part of the M28 development proposal, which is currently before the Board. I find it difficult to accept the argument that the proposed upgrade of the M28 would undermine any future development potential for port related development at Marino Point, as it is located on the northern side of the harbour on Great Island, and has poor quality road infrastructure linking it to the mainland and the national road network. Given that planning permission has already been granted for expansion of the port at Ringaskiddy and that there is a substantial established industrial and employment base there, which is currently served by a poor-quality road, it seems a reasonable objective to provide a high-quality road link, such as that proposed. It would be unrealistic to expect that all freight would be handled by rail and as such, a high-quality road linking the port activities to the national road network would still be required. However, that does not mean that Marino Point could not be developed in

the future to handle part of the overall port activities of the harbour, but that is beyond the scope of this application.

The Smarter Travel policy also seeks to reduce car dependency and facilitate sustainable development patterns in the area. I would agree that increasing road capacity can have the undesirable effect of attracting more cars to the network. It is, therefore, necessary to introduce measures to manage/reduce demand for car journeys, and at the same time facilitate and encourage the use of other modes of transport such as public transport, cycling and walking. The applicant has outlined in the EIS and at the oral hearing on 7th and 30th November, (Peter O'Donoghue, Senior Engineer, CCC), the proposed measures to improve and provide additional facilities for cyclists and pedestrians. Mr. O'Donoghue explained that one of the principal effects of the project is to divert considerable traffic volumes away from the N28 between Carr's Hill and Ringaskiddy and from the villages of Shanbally and Ringaskiddy, and the declassification of the N28 as a local or regional road. It is also proposed to construct a "Greenway Link" (cycling and walking off-road) from Ringaskiddy to the Cork Harbour Greenway at Raffeen, by facilitating sustainable commuting between Carrigaline and Ringaskiddy, which he said would be compatible with the development of a cycle network for the area.

Mr. O'Donoghue set out, in his brief of evidence (Doc. No. 9, 7/11/17), how sustainable transport is to be achieved in the N28 corridor generally and by means of this project. Reference is made to improvements to public transport, (such as the Express Cross-City Service 220X), the introduction of a Cycle Network Plan for Metropolitan Cork, (including the N28 corridor which has the support of the LAP, 1.7.30) and various other cycle initiatives, and Work Place Travel Planning measures by employers that have been the subject of recent planning permissions in the area. Reference is also made to the possible introduction of Park and Ride as part of CMATS and to the provision of "Green Routes" in CASP. Mr. O'Donoghue (30/11/17) advised the hearing that a "Green route" is similar to a Quality Bus Corridor and that 8 of them radiate out from the city centre (funded by the Dept. of Transport), and that the section provided on Maryborough Hill forms part of the Carrigaline Green Route

Phase 1. The removal of large volumes of traffic from the N28 will allow for pedestrian and cycle facility enhancement, thereby encouraging more sustainable travel patterns. Mr. O'Donoghue also pointed out that the relocation of the port to Ringaskiddy, (including the Ro-Ro terminal), would be facilitated by the M28 project and that there are further sustainable transport initiatives that will be enabled as a result of this move, such as the potential for an east-west public transport corridor.

I would agree that one of the primary objectives of the proposed development is to reduce traffic congestion and improving capacity on part of the national road network. However, I would also accept that the proposed scheme includes many elements that would help to achieve more sustainable forms of travel. The provision of a high-quality link between the port and the national road network, will, facilitate more efficient movement of freight than at present. It is considered that the two most significant elements that would contribute to more sustainable development and travel are firstly, the reduction in traffic volumes and speeds on the existing N28, which would provide for significant opportunities for reducing the need for car dependent trips, and secondly, the facilitation of the relocation of the port from Tivoli and City Docks. This will free up large tracts of land in the city centre for residential and employment uses, which will help to address the unsustainable travel patterns that have developed in the area. The reduction in volumes of traffic using the N28 would provide opportunities for non-motorway users to utilise the route for more sustainable trips, which together with the other measures outlined by the applicant for improvements to pedestrian and cycle facilities, would be likely to contribute to more sustainable travel patterns in the area.

I would also refer the Board to the following section, (10.4.1.4), in which the planning policy initiatives contained in Project Ireland 2040 are outlined. In particular, Strategic Outcomes 4 and 8, respectively set out the investment priorities for the next ten years including the development of more sustainable travel measures including the Cork BusConnects and measures to reduce carbon emissions in the transport sector.

10.4.1.4 Planning policy

The EIS (Chap. 2) contains a comprehensive review of an extensive range of national, regional and local public policy that is applicable to the proposed scheme. I have also provided a summary of the main planning policy provisions applicable to the scheme at 5.2 to 5.6 above. At the oral hearing, (Michael Lynch, Senior Planner for CCC) outlined the main policy provisions at a national, regional and local level. Peter O'Donoghue (CCC) also provided evidence and answered questions on Sustainable Transport policy and on other policies/draft policies such as Douglas LUTS and Cork Metropolitan Area Transportation Study. The Southern Regional Assembly and the National Transport Authority also made written submissions to the Board, the main points of which are summarised at 6.1.5 and 6.1.7, respectively, above. Cork City Council also made a written and oral submission, which is summarised at 6.1.10 above. The IDA, (represented by Gavin Lawlor of Tom Phillips Associates), made a presentation to the oral hearing on 29th November 2017 (Day 10) which included observations on the effects of the proposal on IDA lands (zoned industrial) in Ringaskiddy. Other presentations were made at the hearing in support of the proposed development by the Port of Cork, Cork Chamber of Commerce, IBEC, the Biopharma Chemical Industry, 9 companies representing the Biopharma and Life Sciences Group and the Shannon Foynes Port Company.

On Day 3 of the hearing (9/11/17), Councillor Marcia D'Alton made a written and oral submission on Module 1 (Strategic Transport) which included policy related matters, and also submitted a written response to Mr. Lynch's evidence on the policy support for the proposed development. In this latter document, Ms. D'Alton notes that some of the policy documents referred to by Mr. Lynch have been superseded (e.g. CDP 2009-2014 and Carrigaline Electoral Area LAP 2011) or are out of date (NDP). It is also pointed out that several of the policy documents referenced don't make specific reference to the M28 and/or assign equal importance to airports and seaports, and that the need for multi-modality and integrated transport is clearly stated in many of the said policy documents. Evidence was also given by several other observers, including a number of people representing the M28 Steering Group and other residents' associations, regarding specific land use zonings and policy objectives at various points along the route. In particular, objection was raised to the

abandonment of the “2008 route alignment” which was set out in previous County and Local Area Plans. Residents of Ringaskiddy and Shanbally were strongly opposed to the erosion of the open space green belt, which it was stated was designed specifically to form a buffer between the residential communities and the industrial areas to the south.

National and Regional Planning Policy

I would agree with the applicant that the proposed development is generally compatible with the relevant national and regional policies and strategies against which it would be tested. I am satisfied that the nature and extent of the proposed development is compatible with the goals, policies and objectives set out in the **Project Ireland 2040** encompassing the **National Planning Framework** and **National Development Plan**, (which replace the National Spatial Strategy and the National Development Plan, and as summarised at 5.2.1 above); the **Smarter Travel** policy, (as set out 10.4.1.3 above); and the **South West Regional Planning Guidelines** (set out at 5.2.3 above).

Project Ireland 2040 seeks to achieve ten **Strategic Outcomes**, which represent the ten priorities of the National Planning Framework. The most relevant to the M28 project are :-

2. Enhanced Regional Accessibility – includes enhancement of roads networks. The upgrade of the N28 is included in the National Roads Programme 2018-2027 (Fig 5.2) and is also listed as an Inter-Urban Road priority
4. Sustainable Mobility – investment in environmentally sustainable public transport system including Bus Connects Programme, which seeks to overhaul the current bus system in Ireland’s cities and in the provision of safe alternative travel options. A revised bus network forms part of the Cork Transport Strategy which is currently being developed in partnership with the NTA, with an estimated cost of €200 million. Cork BusConnects comprises the delivery of bus corridors, enhanced services, cashless fares and account-based ticketing. It also includes the provision of Park and Ride facilities in conjunction with the new bus network.

6. High Quality International Connectivity – continued investment in ports (including Port of Cork) is recognised as crucial to an island economy, particularly post-Brexit, in terms of safeguarding and enhancing Ireland’s international connectivity and competitiveness. The Investment actions include reference to strengthening access routes to Ireland’s ports through investment to upgrade and enhance the road transport network to improve journey times, which is a Government Priority. The planned N28 cork to Ringaskiddy Road is cited as one requiring improved access to the Port of Cork. The relocation of port facilities from the city to Ringaskiddy is also cited as an important investment both for the port and in terms of freeing up the City Quays and Tivoli for development.

8. Transition to a Low Carbon and Climate Resilient Society – this national objective will influence public capital investment choices, including in the transport sector. The investment objectives for this sector include providing for 500,000 electric vehicles by 2030, no new non-zero emission vehicles to be sold post 2030, and continued investment in sustainable transport measures and comprehensive integrated public transport networks.

It is considered that the M28 project, as a strategic transport route connecting the city region and the Tier 1 port, is fully supported in the new national planning policy initiatives as outlined above. The facilitation of the relocation of the port to Ringaskiddy is also consistent with national objectives in respect of prioritising investment in Tier 1 ports. In addition, given that the proposed development includes provisions to improve sustainable travel options, in terms of freeing up the N28 for these purposes and providing for enhanced cycle and pedestrian facilities, it is considered that the M28 project is also consistent with the Strategic Outcomes relating to Sustainable mobility and reducing carbon emissions.

The **SERPG** strongly supports the relocation of the Port of Cork to Ringaskiddy and the planned redevelopment of the City Docklands. It also recognises the strategic employment role of Ringaskiddy and its potential for expansion, and the lack of capacity at present in both the road and the rail network serving the port. **CASP**

(2008) considers the upgrade of the N28 to be critical infrastructure to serve both the port and the strategic employment area of Ringaskiddy and essential to the growth and development of the CASP region.

Local Planning Policy

The current **County Development Plan (2014-2020)** and the **Cork City Development Plan (2015-2021)** each echoes support for the relocation of port activities as a strategically important step for the future development of the metropolitan area. Ringaskiddy is designated as one of four Strategic Employment Centres in the CDP (2014). The core Strategy is outlined in Chapter 2 and includes the approach to Active Land Management. It identifies areas for further development which may come forward during the lifetime of the plan as Strategic Land Reserves (Table 2.2). The County Development Plan identifies the upgrade of the N28 as critical infrastructure to the delivery of planned development, including the Shannonpark Masterplan, the zoned industrial development and employment potential of Ringaskiddy, as well as the expansion of the port. Chapter 10 Transport and Mobility contains the main Transport Strategy for Cork and the relevant policies and objectives. Objective EE 6-2 supports the N28 upgrade to accommodate the expansion of Ringaskiddy Port. Other relevant objectives are TM 3-1, TM 5-2 and TM 6-1. The 'Preferred Route' shown in Fig. 10.2 is based on the previously planned route (2008). However, the route as currently proposed, is contained in the more recently adopted Ballincollig-Carrigaline Municipal District LAP (2017), Objective RY-GO-04.

Variation No. 1 to the Cork County Development Plan 2014

This Variation was adopted on 12th February 2018 (following the closure of the oral hearing regarding the M28 project). Part A relates to changes to Chapter 2 (Core Strategy) as a result of revised housing supply figures, the approach to Active Land Management and the Metropolitan Cork Strategic Land Reserves arising from the adoption of the Municipal Districts LAPs in 2017. Part B relates to consequential changes to other chapters in volume 1, arising from the changes to the Core Strategy. The relevant changes are to Chapter 10.

It is stated that “Active Land Management” includes the delivery of zoned lands to ensure that they come into active use. A total of 17 SLRs were considered. These included the 12 SLRs originally set out in the CDP 2014 plus 5 others which emerged during the consultation process for the Municipal District LAPs. It is stated that the SLRs have been subject to High Level Appraisal based on the Sequential approach, Infrastructural Investment considerations and the opportunity to introduce multimodal transport opportunities. A total of 6 SLRs have “emerged” as likely to come forward, but it has been decided to retain all 12 of the original SLRs subject to further detailed assessment. Two SLRs close to the M28 corridor are included in the 6-no. selected SLRs, these are SLR 3, Castletreasure (21.4ha) and SLR 12, Oldcourt (78.7ha). A further area, SLR2 (Carrigaline East, 47ha) is included in the 12 originals.

The changes to Chapter 10 Transport and Mobility relate principally to reference to the Transport Strategy for Cork which is currently being prepared by the NTA on a collaborative basis with Cork Co. Co. and Cork City Co., and TII. It will address all transport modes and will inform transport investment levels and prioritisation over the next 20 years. Mr. O’Donoghue referred to this strategy in his brief of evidence at the oral hearing (Day 1).

The **Ballincollig-Carrigaline Municipal District LAP 2017**, which replaces the Carrigaline Electoral Area LAP 2011, contains a specific objective IN-02 for the finalisation of the M28 Cork-Ringaskiddy Motorway route, subject to EIA and where necessary, AA. It is further stated in this objective that regard will be had in the design of the route to avoiding and mitigating impacts on sensitive environmental and heritage resources and on communities. The timely finalisation of the planned N28 upgrade is described as “critical.... in order to bring certainty and assurance of commitment to existing and future investment in the Ringaskiddy area.” The LAP identifies Shannonpark in Carrigaline as an ‘Urban Expansion Area’ and a number of sites as possible ‘Strategic Land Reserve’ options at Carrigaline East (SLR2), Castletreasure (SLR3) and Oldcourt (SLR12). As stated above, SLR3 and SLR12

have “emerged” in Variation No. 1 to the CDP as likely to go ahead, and that the original 12 SLRs will also be retained for further detailed assessment.

The general objectives for Ringaskiddy/Shanbally include

RY-GO-01 - to reaffirm the focus on industrial and port related roles of Ringaskiddy associated with its status as Strategic Employment Area;

RY-GO-03 - to facilitate the relocation of the Port of Cork to Ringaskiddy;

RY-GO-05 - to facilitate the implementation of bus priority and designated walking and cycling routes upon completion of M28; and

RY-GO-06 - to protect/enhance residential amenities of existing communities.

Within the Ringaskiddy area, the proposed route passes through Open Space lands (Specific Objectives RY-O-03/04/06/07/08) and Industrial zoned land (Specific Objectives RY-I-03/04/10/14/15).

Open space zones

RY-O-03/04 relates to a football pitch/club grounds and an agricultural field adjoining Shanbally village to the south and south-east, respectively. The playing pitches form part of soccer grounds occupied/shared by two separate football clubs (Hibernian and AFC). It is noted that the northern one (of two football pitches) will be lost, but that RY-O-05 seeks to provide playing pitches as part of the development of RY-O-03. The other field (RY-O-04) is an agricultural field behind the grotto in private ownership. The landowner, Mr. Daniel O’Connell, made a number of presentations and participated in questions at various modules during the oral hearing and also participated in the CPO module, where he is an objector to the CPO. The impact on Mr. O’Connell’s lands will be discussed under the relevant topics later in this report. In terms of compliance with planning policy, it is noted that the RY-O-03 abuts the lands zoned RY-I-04 and that, apart from the area of the route alignment, the remainder of the open space zone would be retained as a buffer. In respect of RY-O-04, the lands to the north and south of the proposed route alignment would also be retained as open space, which would continue to form a buffer between the village and the IDA lands to the east/ north-east, (Site 02 in Mr. Lawlor’s brief of evidence).

RY-O-06 provides for a buffer immediately to the south of Ringaskiddy village (stretching from St. Carthage Place/Warren's Court to Old P.O. Road), and to the south of this OS zone, there is an expansive tract of industrially zoned land, bounded by the R613 to the Northwest and Lough Beg to the south-east. This land corresponds to Site 03 (Loughbeg North site) in Mr. Lawlor's brief of evidence. RY-O-07 continues as open space to the east of Old P.O. Road and RY-O-08 on the eastern side of Loughbeg Road, to the south of Martello Park.

It is clear that these open space buffers will largely be eroded by the introduction of the route alignment to the south of Ringaskiddy village. The applicant, in its justification for the proposed route, has pointed out that these open space buffers double as utility corridors with power lines and underground cables and gas mains travelling through these zones. I note that the proposed corridor between Shanbally village and the R613 passes between lands owned by IDA Ireland and Janssen to the north and Novartis and the ESB (large substation) to the south, with no housing or residential lands in the vicinity. To the east of the R613, there is residential development to the north but the industrial lands to the south are currently undeveloped and are in agricultural use. The only exceptions are the Ringport Business Park and where one-off housing development has occurred along Old Post Office Road and Tower Road to the south of the proposed route. Thus, should these industrial zoned lands come forward for development, it is likely that mitigation in the form of landscape screening will be necessary. The proposed M28 project has also included mitigation proposals for landscape screening and tree planting to screen the road from the residential lands to the north.

The LAP states that the passive open space objectives "seek to apply an appropriate degree of protection on those visually important open areas that contribute to the setting of Ringaskiddy and amenity afforded by the upper harbour generally". It is further stated that "during the lifetime of this Plan, if required, the P.A. will undertake to identify new areas of Open Space to compensate for loss of any Open Space which may occur as a result of the construction of the M28 Cork to Ringaskiddy

Motorway Scheme”. It is also noted for each of the specific OS objectives, that should adjoining industry make proposals in the future for development, consideration will be given to landscaping including strategic tree planting on the land. Thus, it is considered that whilst some of the areas designated as buffers will be somewhat eroded, there is scope for additional mitigation measures to be put in place, if and when the industrial land bank is developed in the future. In addition, the embankments on either side of the proposed road are to be planted with mixed woodland which will compensate to some degree for the erosion of the visual buffer. The role of the open space buffer zones is discussed further in Section 16.4.1 in terms of impact on landscape character.

Industrial zones

RY-I-03/04 are large agricultural fields located in Shanbally, to the east of the quarry and to the southwest of the village. The lands with the industrial zoning (44.5ha) at this location are severed by the proposed motorway. The northern portion of the zoned lands (as far as the N28) is owned by the IDA. At the oral hearing, Gavin Lawlor (TPA), for the IDA, pointed out that the proposed motorway runs along the southern boundary of this landholding (referred to in his brief of evidence – 29/11/17 - as the Raffeen Site, 01). However, the industrial zoning extends further south towards the substation. The LAP notes that the proposed M28 will result in severance of a strategic industrial land bank, but it is committed to working with landholders and communities to optimise and maximise the large amount of land zoned for industry at this location.

RY-I-10 is a large expanse of industrially zoned land south of Ringaskiddy village and to the west of Old P.O. Road. It forms part of a larger parcel of land owned by the IDA (Site 03 in Gavin Lawlor’s brief of evidence). This zone (18ha) and the larger IDA parcel, would be severely impacted by the proposed motorway in terms of severance. Gavin Lawlor stated that the IDA landholding would be divided into three unconnected small parcels. RY-I-14 is located to the east of Martello Park and is designated as a transitional site in the LAP, suitable for offices. The proposed route would skirt through the south-eastern corner of the zone (1.9ha). RY-I-15 is a

substantial industrial site (28ha) which encloses the Martello Tower (Protected Structure). The LAP states that it is “suitable for large stand-alone industry with suitable provision for appropriate landscaping and protection of the access points and provision for open space buffer to the Martello Tower and its associated pedestrian accesses. The proposed route runs along the north-western boundary of this site and does not significantly impact on the landholding (04 in Mr. Lawlor’s evidence).

Although the proposed development would result in severance of industrial land banks, which is acknowledged in the LAP, it is also accepted that the proposed development is a critical piece of infrastructure which is seen as of great strategic economic importance to the area. The IDA pointed out that it has 12 IDA client companies within the area and the LAP states that there are over 8,000 people employed in the Ringaskiddy Strategic Employment Area. Thus, notwithstanding the adverse impact on some of the large industrial landholdings, it is considered that the benefits of improved access and connectivity outweigh such disadvantages.

Cork City Development Plan (2015) supports the expansion of the city eastwards through the creation of sustainable neighbourhoods at Tivoli and the City Docklands, which are currently occupied by the Port of Cork, including several SEVESO sites. Objective 5.18 identifies the N28 Cork Ringaskiddy route upgrading as a strategic road infrastructure objective.

Douglas Land Use and Transportation Study was the subject of much discussion during the course of the oral hearing. The DLUTS was adopted by the County Council in 2013 which identifies a number of land use and public realm improvements along with transport proposals for the area. It is referenced in Section 3 of the Ballincollig Carrigaline Municipal District LAP wherein it is stated that it aims to improve pedestrian, cycle and public transport movements, reduce local traffic congestion and improve permeability through the area. It contains several transport recommendations including improvements to approx. 23 key junctions and a new East-West Link bridge linking Donnybrook Hill to Carrigaline. Concerns were raised

by many of the third parties regarding some of the proposed measures and how they related to the proposed M28 project. These matters will be discussed in the Transport Section later in this report and in the Transport Consultant's report. However, it was established by Mr. O'Donoghue (CCC) that whilst it has a statutory footing, the recommendations in the Study are subject to individual funding programmes over the next 10-15 years and would be implemented on an incremental basis by means of the Part 8 process for each individual element.

10.4.2 Relocation and expansion of port

As a Tier 1 port, it is a requirement of the NPP that Cork port would be connected to TEN-T core road and rail networks. Mr. Kingston of The Port of Cork Company advised the hearing that the proposed M28 project supports the NPP and TEN-T by creating a high quality route from the port to the N40. Concern was expressed by Mr. Kingston that increased employment traffic, in the absence of the M28, may add to the operational constraints of import and export related traffic which would lead to higher transportation costs and would undermine competitiveness of the Irish economy and the Cork region. The POCC is of the view that the M28 would facilitate the relocation of the port to Ringaskiddy and the development potential of lands in the city.

I would agree that the provision of a high-quality road along the proposed route would be in accordance with the objectives of the National Ports Policy and would also be consistent with the Dept. of Transport Statement of Strategy (2016) and the Strategic Framework Investment in Land Transport (2015). The grant of permission for the relocation of the port to Ringaskiddy (PA0035) includes a condition (No.4) which means that the final phase (the Ro-Ro terminal) is dependent on the upgrade of the N28 and the Dunkettle Interchange, which was the subject of a grant of permission in April 2013. The port redevelopment was subsequently the subject of an alteration to the original planning permission (PA0035) under S146B of the P&D Act, in June 2017, which included the omission of the link span bridge (facilitating the ro-ro element). This decision included a revised condition, (which superseded

Condition 4 of PA0035), but also prohibited the operation of Phase 3 (Ro-Ro) until the said road schemes were upgraded.

The proposed M28 development would, therefore, facilitate the full implementation of the relocation of the port to Ringaskiddy. The POCC states that this will provide an alternative to the 'land bridge' through the UK, as a route to market for Irish goods, and the M28 is therefore a critical hinterland connection to Europe.

10.4.3 Current Limitations of Existing N28

It is broadly accepted that the existing N28 plays a very important role in the transport network and that it is in need of a significant upgrade. The existing road network is described in Section 2 of the Board's Transport Consultant's Report (Mr. Bergin). The deficiencies of the N28 are also referred to in the EIS (1.3.5.2) and in Mr. Lynch's brief of evidence (Day 1, 7/11/17). They include considerable capacity limitations which result in significant delays and substantial safety issues arising from an inadequate cross section and substandard alignment and junction design. The economic and social costs of failure to address these deficiencies, and/or substantial delay in doing so, have been well documented by the representatives of commerce, industry and employment in the area. The development is seen as a catalyst for the future economic development, investment, employment growth and long term competitiveness of the metropolitan area and the region.

Notwithstanding the broad acceptance of the need to address the deficiencies in the interests of safety and efficiency, many observers questioned the approach contained in the proposed project in terms of its effectiveness and the balance between the nature and scale of the project relative to the impact on the human and natural environment. Some observers queried why the same efficiency and safety gains could not be achieved by increasing the capacity of the existing roundabout at Shannonpark together with increasing capacity at other pinch points. Many observers questioned the efficacy of undertaking any upgrade of the N28 without widening the Bloomfield Interchange, which represents a major bottleneck, whereby its lack of capacity causes tailbacks on both sides of the interchange. Other

observers claimed that the real issue is the lack of capacity on the N40 (South Ring Road), particularly between Kinsale Road interchange and the Jack Lynch tunnel and at Dunkettle roundabout. The N40 Demand Management Study, which was commissioned to seek solutions to the capacity issues has not yet been published.

The various options referred to above are addressed in the EIS (Alternatives) and were also responded to by Michael Noonan (RPS) in his brief of evidence at the oral hearing (Module 1, 7/11/17) and again during the question phase for Modules 1 and 2 (9/11/17). The Transport Consultant's report included a detailed analysis of the traffic and transport impacts and the alternatives considered. Mr. Bergin pointed out that the 'Do Minimum' baseline alternative was not feasible due to the increase in traffic flows and volumes, with associated increases in congestion, delays, environmental nuisance and development potential for the regional. This issue is discussed in Section 11.4 below. However, in terms of the need for the development, it is accepted that, in general terms, the proposed project best meets all of the criteria in terms of achieving the necessary efficiency in terms of capacity whilst also achieving the required road safety improvements, with increased accessibility and facilitation of more sustainable travel patterns.

10.4.4 Why not an orbital route or western route through airport?

The adequacy of alternatives considered will be discussed below, but it is worth noting, in terms of need for the development, that there was a great deal of discussion during the oral hearing about the need for an orbital route around Cork City and/or at least a route leading west from Shannonpark roundabout to provide a high quality link to the airport. Mr. Bergin addresses the strategic alternatives considered (Section 4 of his report) and I have also addressed the adequacy of the evaluation of alternatives in section 11.4 below. Michael Noonan also addressed this matter in his brief of evidence (7/11/17) and at the question phase (9/11/17) in considerable detail. The main reasons for rejecting such a proposal, according to Mr. Noonan, were based firstly, on the impact of the introduction of a new motorway route through the open countryside, previously not exposed; secondly, on the need for significant infrastructural improvements; and thirdly, on the results of the traffic

modelling which indicated that such an option would divert only 50% of the traffic (particularly port traffic) from the N28, which would not be upgraded and which would continue to have significant capacity and safety issues.

10.4.5 Need for Service Area

The proposed Service Area has been provided in accordance with the 'Location and Layout of On-Line Service Areas', (TII Design Manual for Roads and Bridges DN-GEO-03028). The site (1.77ha) is located on Port of Cork lands at Ringaskiddy, on the northern side of the L2545. The stated purpose of the facility is to provide services for long-distance inter-urban, inter-regional traffic to and from the Port of Cork and is designed to cater for HGVs and coaches only, with 45 HGV spaces and a facility for refuelling. It is therefore designed to be unattractive to short-term local trips.

It is noted that the Work Plan for the North Sea Mediterranean Corridor (TEN-T Network) has identified a need for secure parking for HGVs. Guidance is also provided in the Spatial Planning for National Roads Guidelines that the location of motorway service areas should be designed so as to avoid attracting local custom/traffic. It is considered that the proposed development is consistent with this guidance and with the NRA Service Area Policy, (TII 2014) policy, which sets out the basis on which the on-line service areas will be provided to meet the needs of road users on the national road network. The policy for the M28 Cork to Ringaskiddy project is as follows:

“A Type 1 Service Area is proposed for the N28 from Cork to Ringaskiddy. Cork County Council in consultation with the Authority, will include consideration of the appropriate location of this service area as part of the scheme planning, currently underway.”

Councillor Marcia D'Alton raised concerns during Module 1 questioning at the oral hearing regarding the location of the Service Area on waterside lands, which she

considered to be scenic lands and queried whether it was consistent with the Cork Harbour Study. Mr Flanagan S.C. (for the applicant) noted that the Study referred to was in draft form and that the need and justification for the location of the Service Area in this location was set out in considerable detail in Chapter 4 of the EIS. Mr Noonan (RPS) also pointed out that one of the factors which affected the location of the MSA was that there is an agreement with the Port of Cork, on whose lands the proposed Motorway Service Area is located.

It is noted that seven alternative sites were considered in the EIS and that the port option (SA3) was chosen, as it was considered that it best met the engineering and environmental criteria. I would agree that the site appears to comply with the requirements of the NRA policy and other guidance for the provision of such Service Areas, including vehicles travelling long distances on inter-regional routes and the need to avoid short local trips. It is also noted that the site is currently used as a holding area for imported vehicles and is adjacent to the ferryport. It is located on lands zoned industrial (RY-I-18), which has a specific objective for port facilities and port related activities. Thus, it is consistent with European, National and local policy objectives. Notwithstanding that the site is located on the seaward side of the road, it is not zoned for recreational use and is within the port lands. Thus, it is likely that, in the event that the Service Area proposal was not permitted or implemented, these lands would continue to be used for port related activities. The proposed development is therefore considered to be appropriate.

10.4.6 Conclusion on need/justification

It is considered that the strategic need for the proposed motorway, protected road and service area development has been established at European, National and local levels. It supports the core objectives of the TEN-T policy, which in turn are reflected in the national, regional and local policies for the provision of a high-quality route connecting a Tier 1 port with its urban hinterland and with the national road and TEN-T networks. It has been established that the proposed road would perform a strategic function as it would not only provide a vital connection between the Tier 1 port and this network, but would also provide enhanced connectivity between a

designated Strategic Employment Area, (employing over 8,000 people), and an industrial/commercial area of significant importance with centres of population and other commercial importance. It has been established that the proposed development complies with the national roads and planning policies for the area. It is further noted that there is no policy basis for an outer orbital route as suggested by many observers during the course of the application.

It is considered that it has been demonstrated that there is a clear and pressing need for an upgrade of the existing N28 road, which suffers from undue traffic congestion, delays and a poor-quality alignment that presents significant safety hazards, and that a motorway scheme is an appropriate and suitable means of meeting the stated objectives of the project. Furthermore, the congestion and delay are forecast to continue and to worsen without any major intervention. It has also been clearly demonstrated that the proposed development would facilitate the expansion of the Port of Cork at Ringaskiddy and the relocation of the port activities from Tivoli and the City Docks, thereby freeing up city centre lands for more sustainable development. It is considered, therefore, that the need and justification for the proposed development has been adequately established.

11 Alternatives Considered

11.1 Environmental Impact Statement

Chapter 4 of the EIS provides an outline of the alternatives considered and the main reasons for selecting the preferred alternative, having regard to environmental considerations and policy objectives. The alternatives ranged from strategic to local and included 'Do Nothing' and 'Do Minimum' alternatives. Each alternative was evaluated against the Scheme Objectives which were set out in Chapter 1 (Need for Development) and were restated in Chapter 4. These can be summarised as follows:-

Environment Objective – to reduce traffic impact and minimise impact of improvement works on environmentally sensitive sites.

Safety Objective – to reduce the number of road collisions/injuries/deaths.

Economy Objective – to facilitate the development of the Port of Cork at Ringaskiddy; to reduce peak hour traffic congestion/delay; and to facilitate economic development within the Cork Gateway and the Ringaskiddy Strategic Employment Area.

Accessibility and Social Inclusion Objective – to facilitate improved access to employment opportunities for cyclists and other vulnerable road users; and to return to the communities along the route, easier and safer access to local facilities by removal of strategic traffic.

Integration Objective – to support the National Ports Policy and the European TEN-T policy by creating a High-Quality Route from the port at Ringaskiddy to the N40.

Mr. Bergin, the Board’s Traffic and Transport consultant, in his report (Appendix 1), has provided a summary and evaluation of each of the alternatives considered for the route corridor options, the route options within the corridor and the junction strategies and layouts. This will be discussed further below in section 11.4.

11.2 Issues raised by observers during the application and during the oral hearing regarding alternatives considered

1. EIS inadequate - The alternatives examined in the EIS is totally inadequate. A robust case for the chosen route has not been adequately demonstrated. The best alternative would be to upgrade the existing road with much less harm to the human and physical environments.
2. TEN-T requirements – The TEN-T policy requires a high-quality link to a Tier 1 Port but does not specify that it must be a motorway. The objectives to relocate the port and reduce congestion could be achieved by means of a dual carriageway and a N28 upgrade between Bloomfield and Carr’s Hill, together with the Dunkettle upgrade. The TEN-T requirements of an airport or a rail link are not met. The cost of linking Ringaskiddy by rail would be prohibitive, but Marino Point has a rail link. These alternatives were never properly explored.
3. Orbital route - The EIS ignores the opportunity for an Airport Orbital route linking the N40, the northern parts of the city, the N20 Cork-Limerick road,

and the M28 at Upper Glanmire. This option is now more realistic in light of Government funding for the M20 upgrade and the current review of the Northern Ring Road.

4. The EIS is not future-proofed – only one lane through Bloomfield interchange; no provision for Park and Ride for Ringaskiddy Strategic Employment Area, cycling etc.; and health impacts of the chosen route have been disregarded. Increased traffic in the ‘Do Minimum’ Scenario does not justify choice of route, as the N28 could still serve Carrigaline and the HGVs could be re-routed elsewhere.
5. Motorway through dense residential area - The alternatives do not take into account the disproportionate effect on the Rochestown/Douglas area and Mulcon Valley, which is a densely populated area. The AADT in this area will increase by 60% by 2035 (Table 5.29 of EIS). It is therefore clear that the ‘Do Minimum’ in this case is better than the ‘Do Something’.
6. Alternative modes of transport – EIS deficient as insufficient attention paid to alternative modes of transport. Given the high car dependency in the area this is unacceptable. There is a need for a comprehensive strategy which is costed, with a committed budget, to address the high levels of car dependency. If the modal choice is provided, then an effective alternative would exist.
7. Bloomfield Interchange – The alternative of widening Bloomfield Bridge, and thus, its capacity, was not considered. It is wide enough to accommodate 2 lanes of traffic in each direction, (20.17m). A further alternative would be to widen the Southbound lane for a short distance and the additional space gained could be used to avoid the need to provide the additional N-bound lane at the back of Newlyn Vale.
8. Downstream Bridge crossing – this alternative has not been considered. This crossing (near Jacob’s Island) would facilitate port traffic accessing the national road network without the need to traverse the road network in the vicinity of the city or residential areas.
9. Raffeen Quarry – the 2008 Route which brought the road through the Fernhill golf course instead of Raffeen Quarry is a much better option as it created a buffer and landscaped berm for the residents in the vicinity. The current route is approx. 75m from the closest residential property and

necessitates a massive void to be filled, which would be very expensive. It would also result in a significant loss of biodiversity. A Cost Benefit Analysis should be carried out of other less damaging options.

10. Loss of amenity lands at Fernhill golf course - The recent rezoning of the golf course and offer for sale surely warrants reconsideration of this alternative route, as the justification of loss of amenity lands is undermined. The loss of a football pitch at Carrigaline AFC is equally inconsistent with the objective to preserve amenity lands.
11. Ringaskiddy – the Loughbeg option (2008 Route) is the only appropriate solution for the village and this was abandoned without sufficient justification. The proposed route from Barnahely to Ringaskiddy East further isolates the village from the port and cuts the community in half. It would result in environmental damage due to the significant increase in the number of trucks which would encircle the village and would use the R613 with its steep gradient. The current route also results in the loss of a designated school site and the replacement proposal is unacceptable. Furthermore, the proposed route would erode the green belt which is designed to act as a buffer zone between the village and the industrial lands to the south.

11.3 Oral hearing

The issue of alternatives and transport strategy were considered in Module 1 of the Oral Hearing. This module was held principally on Days 1 and 2 of the hearing with questions on Day 3. However, due to the submission of further information on Transport matters by the applicant on a number of occasions in response to queries from the Board's Inspector and Transport consultant, as well as from members of the public, the alternative options and further justification for options chosen were discussed on Days 7, Day 8, Day 9 and Day 11. Presentations were made by the following Third Party Observers

- M28 Steering Group - Wessel Vosoloo, Gerard Harrington, John Higgins
- Rochestown Rise - Domhnaill Mac Domhnaill, Miriam Collins

- Peter Walter, Ringaskiddy
- George Ryan, Maryborough Estate
- Donagh Long, Douglas
- Kevin Hanley, Raffeen Bridge
- Minister Simon Coveney T.D.
- Micheál Martin T.D.
- Michael McGrath T.D
- Senator Jerry Buttimer
- Senator Dan Boyle
- Councillor Seamus McGrath
- Councillor Marcia D'Alton
- Councillor Mary Desmond

In attendance for the applicant were:

- Michael Noonan RPS
- Micheal Lynch Cork Co. Co.
- Peter O'Donoghue Cork Co. Co.
- Dermot Flanagan S.C.

11.4 Evaluation of alternatives

Mr. Bergin carried out an evaluation of the alternatives considered by the applicant, which is set out principally in Sections 4 and 5 of his report. However, further alternatives are considered in Sections 6-9 inclusive. In Section 4, he evaluates the Do Nothing/Do Minimum options and the Do-Something options and describes and assesses the evaluation of alternative corridors. In Section 5, Mr. Bergin describes and assesses the evaluation of alternatives considered in the EIS within the M28 corridor. This includes an evaluation of the cross section of the M28 and the route alignments between Bloomfield and Ringaskiddy in three segments. The EIS has

also considered a range of alternatives relating to the junction strategy and layouts for each of the interchanges. Mr. Bergin has evaluated the assessment of these alternatives in Sections 6 (Junction Strategy – Northern Section), 7 (Junction Strategy - Southern Section), 8 (Junction Strategy - Shanbally Interchange and 9 (Junction Strategy – Barnahely to Loughbeg).

An evaluation of the alternative route corridors was also considered by me in respect of the policy context and Need for the Development (Section 10.4 above). Further alternatives were also explored during the Oral Hearing at the request of Mr Bergin, which included justification for junction designs and sections of route alignment, alternative junction designs, revisions to junction layouts and an alternative means of tying the new northbound diverge lane into existing road on either side of Rochestown Road. These will be discussed in Section 12.0 below.

11.4.1 ‘Do Nothing’/‘Do Minimum’ Alternatives

The ‘Do Nothing’ scenario assumes there will be no other investment in the network during the study period, apart from maintenance. The ‘Do Minimum’ assumes that transport improvements that are either planned or committed will be implemented, and is the baseline alternative. The EIS found that in this scenario, traffic flows will continue to increase over the study period leading to increased congestion in the N28 corridor and increased travel times, environmental nuisance will increase and constraints will be imposed on economic development in the region, with particular implications for the future of the port at Ringaskiddy.

Mr. Bergin agreed that the inadequacies within the existing N28 corridor are such that the provision of a modern road network to a standard consistent with that of a strategic route is justified and that the ‘Do Minimum’ scenario would not meet this standard. He also agreed that the problems associated with the existing corridor would become more acute as traffic flows increase over the study period. He therefore agreed that it was reasonable not to include it in a further evaluation of alternatives.

11.4.2 'Do Something' Alternatives - Alternative Route Corridor Options

I would refer the Board to Section 4 of Mr. Bergin's Traffic and Transport Report. He advised that there is no scope for alternative corridors through the Ringaskiddy peninsula, only route options within the selected corridor. Mr. Bergin provides an evaluation of the alternative corridors considered in the EIS. Five options were considered, of which two were discarded at an early stage. These were firstly, Mahon Interchange, (involving a tunnel under Douglas Estuary, part of SAC), which was rejected on the basis of cost and environmental impact on SAC and residential area at Jacob's Island, and secondly, a variation of another option (Bandon Road 2), which was considered to be too similar to Bandon Road 1. It was also considered that the Mahon option would not deliver the required improvements to either the N40 or the N28. Mr. Bergin agreed with the reasoning.

The remaining western options were considered further, Kinsale Road and Bandon Road, but both were discarded on the grounds that they would not attract a sufficient level of traffic away from the N28. The modelling indicated that the majority of strategic (and HCV) traffic would continue to use the N28 between Ringaskiddy Strategic Employment Area and Dunkettle. If either of the western options were adopted, the existing N28 would remain unimproved. Mr. Bergin considered the prediction that strategic traffic between Ringaskiddy and Dunkettle would continue to use the N28 to be reasonable, and that the modelling may have even underestimated the volume of traffic that would assign to the N28.

Mr. Bergin agreed with the conclusions of the EIS that the alternative western corridor options did not meet the Scheme Objectives and accepted the rationale provided by the applicant. He concluded that the consideration of alternatives in respect of the strategic route corridors represented a robust assessment of alternatives having regard to environmental considerations, which justifies the selection of the M28 Route Option as that which best meets the Scheme Objectives.

I would agree with this conclusion and would also draw the Board's attention to the conclusions of the assessment of Need for the Development and compliance with Policy objectives at Section 10.4.7 above. In addition, the issue of alternative route corridors, particularly the need for an orbital route and linkages to the rail network and the airport, were rigorously debated during the oral hearing, and are discussed in Section 10.4 above. It is considered, therefore, that the consideration and evaluation of strategic alternatives for the route corridor is adequate and robust and that the justification for the selection of the preferred corridor has been adequately set out and considered during the course of the application and the oral hearing.

11.4.3 Alternative Route Options considered within the preferred corridor

Section 4.5 of the EIS addressed the consideration of alternatives within the route corridor. It is noted that this process commenced in 2004-2006, when a study was carried out to identify an improvement scheme to upgrade the N28 to a high quality dual-carriageway. This study led to the emergence of different route options labelled A-M, which were analysed against different constraints. It is stated that the analysis, together with multiple consultation periods, culminated in the emergence of a preferred route corridor, which was Option L, E2 and M (Fig. 4.4 and 4.5). Subsequently, Halcrow Barry was appointed to review the route selection process, and a further Preferred Route Corridor emerged (2008). This was identified as Option C, E2 and J.

A further review of the route selection process was carried out in 2014, when RPS was appointed by Cork Co. Co., following the publication of the National Ports Policy. This led to the identification of 8 route options. These are listed in Table 4.3 and shown in Fig. 4.7 of the EIS and comprise Options 1, 2, 3, 4a, 4b, 5, 6a and 6b. The EIS contains a detailed description of each option is provided at 4.5.3 and an assessment of each of the options against the 5 core criteria (Scheme Objectives) at 4.5.4. A summary is provided in Table 4.4. Further analysis is provided in 4.5.5 of the localised alternatives of the various options. The outcome of the route selection process was a combination of Option 2 (the core route), with the localised options of Option 5 (quarry alternative at Ballyhemiken) and Option 6b (Loughbeg to

Ringaskiddy port). This combination emerged as the preferred option as it was considered to best meet the Scheme Objectives. It is shown on Fig. 4.9.

Section 5 of Mr. Bergin's report addresses the alternative routes considered within the selected corridor. These included alternative route options for the cross section, (motorway or dual carriageway west of Barnahely and single or dual carriageway east of Barnahely), options between Carr's Hill and Shannonpark, between Shannonpark and Shanbally and Ringaskiddy port. Mr. Bergin discussed the various alternative options and was in general agreement with the rationale used in the selection of the preferred route. However, he requested further justification of the alternatives considered for the route between Shanbally and Ringaskiddy port during the oral hearing. The applicant provided this further information and the matter was the subject of considerable debate and questioning during the hearing. This will be discussed further in Section 12.0 below.

It is considered that a robust and rigorous assessment of alternative route options within the preferred route corridor was carried out as part of the EIS and that this assessment was further refined and clarified during the course of the oral hearing.

11.4.4 Alternative junction strategy and layout options

An assessment of the alternatives considered in the junction strategy and the layout of junctions was provided in Section 4.5.7 of the EIS. A junction strategy was developed for the northern section of the route and for the southern section of the route. The Northern strategy included proposals such as the closure of the Maryborough Hill Slip road; the Mount Oval diverge; the design of the Carr's Hill interchange and two-way slip road; the north-bound N40 diverge; and changes to local roads such as the introduction of the Right-turn to Clarke's Hill and signalisation of Rochestown Road. The Southern Strategy considered various alternative options for the Shannonpark interchange, the Shanbally interchange and Old Post Office Road. Prior to the adoption of the preferred strategy, various alternative options were considered and were subject to public consultation. Certain options attracted considerable objection (e.g. the original proposal to close the Mount Oval diverge)

and further alternatives were developed and the proposed development was amended.

Sections 6, 7 and 8 of Mr. Bergin's report addresses the alternatives considered in the EIS in respect of Alternative Junction Strategies and Layout Options. In Section 6 he assesses the northern strategy and the evidence presented by the applicant in respect of Bloomfield Interchange, Rochestown Road, the N40 Diverge, Maryborough slip road, Mount Oval slip road and Carr's Hill interchange.

Mr. Bergin discussed the various alternative options and was in general agreement with the rationale used in the selection of the preferred junction strategies and layouts. However, during the course of the oral hearing, further justification/information was requested in respect of Shanbally Interchange, the signalisation of Rochestown Road, and the layouts of Carr's Hill and Maryborough Hill junctions and Old Post Office Road. He also requested a revision to the design of the North-bound N40 diverge to reduce the amount of lane weaving. These matters were the subject of much debate and questioning during the course of the hearing. It is considered that a robust and rigorous assessment of alternative options for junction strategies and layouts was carried out as part of the EIS and that this assessment was further refined and clarified during the course of the oral hearing.

11.4.5 Alternative options for Service Area

The Alternative options considered for the location of the Motorway Service Area is addressed in Section 4.6 of the EIS. This initially involved the identification of a study area in accordance with TII policy for such facilities. TA 90, TII's policy advice note on the location and layout of such facilities identifies a number of criteria which must be considered when siting on-line Service Areas. These include broad factors such as category of road, projected AADT and percentage of HGVs and potential for environmental impacts. Thereafter, suitable stretches within the study area were identified.

Environmental constraints were considered for each site and an assessment of the alternative sites was carried out. The alternatives included an assessment of the Do Nothing/Do Minimum approach by using the Hilltown Maxol Service Station. On-line options were considered as well as sites to the west of the preferred route and sites to the east, close to Ringaskiddy village and to the port. However, the on-line options failed to comply with the requirements of Spatial Planning and National Road Guidelines, which require that Service Areas are located and designed such that they do not attract local customers. Further assessment of seven sites resulted in four potential sites. These were

SA1 – Off-line option at Shanbally junction (directly to north)

SA2 – On-line option at Loughbeg (directly south of M28 Barnahely-Loughbeg road).

SA3 – Port option at Ringaskiddy (east of village, holding area for imported vehicles)

SA4 – Barnahely option at Barnahely (east of Janssen and west of Castle Warren).

The four options were assessed against three categories of criteria, engineering, human environment and natural environment. It is stated that the Do nothing/Do minimum approach was also considered. However, no conclusions are given regarding this option. SA3 emerged as the preferred option as it met most of the criteria. It is stated that it complies with TII policy with respect to long journeys and short local trips. It was stated that

“As the M28 is part of the TEN-T network, which aims to improve accessibility and connectivity between the Port and the core road network, the SA3 site best serves the needs of those utilising these major European routes.”

11.4.6 Conclusion Evaluation of Alternatives

In conclusion, it is considered that the consideration of alternatives and the main reasons for choosing the preferred alternative in respect of the strategic route, the options within the selected corridor, the cross section, the junction strategy and

layout and the location of the service area, was a rigorous process which had regard to environmental considerations. This process is generally clearly set out in the EIS but was also pursued further during the oral hearing. I am satisfied that the consideration of alternatives for the proposed road scheme and service area was a robust assessment as required by the EIA Directive and has fulfilled a full consideration of the proposal in accordance with the proper planning and sustainable development of the area.

12 Traffic and Transport

12.1 Environmental Impact Statement

Chapter 5 of the EIS assesses the impact of the proposed M28 road project in terms of traffic flows and journey times along the preferred new alignment, the existing N28 corridor and key links and junctions on the adjacent local road network. It is stated that the assessment was undertaken having regard to the Traffic and Transport Impact Assessment Guidelines (NRA, 2014) and Guidelines for Traffic Impact Assessment (IHT, 1994). Traffic modelling was undertaken using the SATURN software, which is an equilibrium model and other software, such as PARAMICs modelling was used in addition. The Board appointed a Traffic and Transport Consultant, Paul Bergin, to advise on traffic and transportation issues including reviewing the EIS, carrying out site inspections, attending the oral hearing and to make a written report including recommendations to the board. Mr. Bergin's Report is attached at Appendix 1.

12.2 Issues raised by observers during the course of the application and during the oral hearing regarding traffic and transport

- A. Route corridor options – note most of the points relating to strategic traffic matters have been addressed under Need for the Development (10.0) and/or Alternatives (11.0). However, there are a number of matters relating to the route alignment within the route corridor which will be addressed here.**

1. Cross section of M28 – there is no justification for a motorway as distinct from a dual carriageway. The TEN-T policy requires a high-quality road, which can be an express way or a motorway. The single carriageway road from Barnahely to Ringaskiddy may not have adequate capacity in the future year, particularly with the planned port expansion.
2. Route from Bloomfield to Carr's Hill – there is no justification for driving a motorway through the most densely populated area along the route. The proposed development would have significant environmental and health impacts and it should be re-routed away from residential populations.
3. Route through Raffeen Quarry – the decision to route the motorway through the quarry instead of the Fernhill Golf Course is strongly opposed. It has not been properly costed and the amount of fill required to bring the road up to the level of the ground on either side of the quarry would be phenomenal. The proposed route would destroy the unique ecosystem of the quarry and would result in unacceptable levels of noise and dust for local residents during construction.
4. Route through northern end of Ringaskiddy – the 2008 route which would have brought the road through the southern part of Ringaskiddy peninsula is favoured by most residents of the area. The northern route would sever communities, destroy the amenity of the area and erode the open space buffer zones. It would also mean that the residents would be hemmed in and surrounded by major roads. The proposed route would also eliminate the site earmarked for a new school to serve the community. The people of Ringaskiddy have suffered enough and strongly object to the route proposed.

B. Modelling/Traffic Analysis

1. Modelling flawed - The traffic modelling is flawed because it fails to address the knock-on effects on the local road network and incorrect base statistics are used. AADT predictions have already been exceeded. The percentage of

port traffic has also been underestimated. Traffic counts for other schemes have been relied on, many of which were undertaken during the recession.

2. Existing traffic congestion not addressed - It is unacceptable that the proposed development will not address existing traffic congestion problems on the network. The findings of the model are not accepted in that the “As Is” is completely out of step with the existing as experienced by local residents.
3. HGV traffic - Port expansion will result in 4,000 extra HGVs per day. Over 18 hours a day there will be 6 HGVs per minute (based on 6,500 HGVs per day). It is essential to have speed cameras and live vehicle advisory signage to slow trucks down on approach to Bloomfield.
4. Rochestown Road signalising - The existing 3 sets of traffic lights would be replaced by 9 sets which would be ineffective and counter-productive. The westbound approach along Rochestown Road currently results in bottlenecks at the junction of the R610 and Clarke’s Hill, which would undoubtedly get worse with queuing all the way back to Coach Hill junction and beyond. The traffic modelling needs to be underpinned by micro modelling and data on queue length and degree of saturation statistics.
5. Douglas East Off ramp – Plans by CCC to close this off-ramp must be included in traffic modelling. Traffic will exit at Rochestown Road and double back to the Fingerpost to access Douglas Village, putting even more pressure on Rochestown Road. Credibility of model undermined.
6. Traffic counts – reliance on 12 hour counts is questioned in relation to TII guidance. Location and reliance on traffic counters queried. Both inputs and outputs from model are required to enable a proper assessment of the robustness of the modelling.
7. Assumptions re growth underpinning model – is it appropriate to apply Medium Term Growth Rates? Is it reasonable to apply Regional Growth rates to traffic which will involve a significant amount of strategic

development including the port redevelopment and its Tier 1 status?
Reliance on PAG factors to represent growth of a nationally strategic road is questionable.

8. Validation of model – As it is now 2017, has the model been validated against more recent data? Has model included developments in pipeline such as Castletreasure and Maryborough Ridge and the considerable growth forecast for Carrigaline?
9. Journeys times north of Rochestown Road – although the model shows a reduction in journey times south of Rochestown Road, the predictions are for flows to the north to increase. It is not clear whether cumulative journey times are provided in the EIS.

C. Junction Strategy and Layout

1. Strategic versus Local Traffic congestion - The M28 is designed to facilitate strategic traffic but fails to take account of commuter generated congestion. As all North-bound traffic will converge on Bloomfield, the only way to control the traffic volume is to ensure that freight traffic retains priority, which means tolling. However, toll avoidance will undermine the credibility of the traffic modelling, as commuter traffic will be effectively restricted from the M28.
2. Bloomfield Interchange is a major constraint but as the bridge traverses an SAC, it cannot be upgraded without significant adverse impacts on ecology. The Board decision on PA0035 (Port expansion) identifies it as a critical element in the network, yet there are no proposals to upgrade it. 85% of Port Traffic from Ringaskiddy will travel through Dunkettle and Bloomfield to access the N8, N25, N20 and N40, but there is no capacity at Bloomfield to accommodate this level of traffic.
3. Northbound Diverge lane – The existing pattern of weaving between lanes will not be resolved, yet the design of the proposed additional lane will result in such significantly adverse impacts on the residential amenities of the properties in the vicinity.

4. Rochestown Road junction – The non-standard layout of the junction with the existing N28 on-ramp and the new North-bound lane means that traffic entering the motorway at Rochestown will do so between two lanes of fast moving traffic. This will result in traffic travelling at variable speeds in addition to the need to weave across lanes. It is essential that the traffic is calmed and that speed is controlled at this location.
5. Signalising of off-ramp at Rochestown – this junction is hugely complicated as large volumes of traffic are coming from different directions at variable speeds and signalising would result in queues on the N28 itself. An alternative to signalising the off-ramp would be to slow traffic down as it approaches the junction from the west (Douglas) to allow traffic exiting the N28 to join the R610 more easily and safely.
6. Mount Oval diverge – the redesign of this discrete exit ramp from the N28 as an exit ramp to motorway standards will result in substantial adverse environmental impacts at Rowan Hill. The exit ramp would also attract heavy traffic flow through Mount Oval Village, to the detriment of the amenity and environment.
7. Closure of the Maryborough on-ramp to the N28 – this on-ramp is very convenient and provides access for residents of the area to the city, to the N40 (east and west) and to the N8, Dublin Road. It also serves as an alternative to the local road network, which will now experience even further congestion following its closure. It will result in significantly increased journey times.
8. Maryborough Hill Priority Junction – traffic and pedestrian safety inadequately addressed and a priority junction and ghost island are more suited to a rural location. Accidents and restricted sightlines will result for right-turning vehicles due to the design and location of the flyover, cycle lanes, pedestrian movements etc. A roundabout junction would be much safer. Proper provision for safe pedestrian movement must be made at this

location and along Maryborough Hill, where there is currently a lack of continuous footpaths, which will be exacerbated by the new development planned at Maryborough Ridge.

9. Carr's Hill junction and slip road justification – this junction and associated slip roads will require vehicles to travel in the opposite direction and the need to queue, (with a low priority), in order to get back onto Maryborough Hill. It is unrealistic that traffic would stay on the M28 to Carr's Hill instead of exiting at Rochestown Road.
10. Carr's Hill junction layout – the design of the junction would result in too great a land take from the planned development at Maryborough Ridge and the road would be too close to the existing houses at this location. The proposed sound barriers would be just 7.5m from some of the houses. The inner lane radius is too narrow (as shown on Drg. GA0105) and there is no guarantee that the HGVs would not use this slip road. Queuing and hesitant traffic at this junction could lead to an accident and is also likely to result in traffic diverting to the Rochestown road on/off ramp instead to avoid delays.
11. Emergency layby – the decision to include an emergency layby and retaining wall close to existing dwellings is of serious concern to the residents of Maryborough Hill. This would be 580m long and would have vertical retaining walls to a height of 3-8m. Given the hazardous nature of the freight coming from Ringaskiddy, this would result in an extreme hazard in the event of an accident. *Note this is addressed in Section 15.4 below.*
12. Shanbally interchange – this junction is designed to incorporate an existing private IDA road linking the N28 with Janssen premises. This will result in security issues for Janssen, who currently benefit from the presence of a security gate at the N28 entrance to the road. This needs to be addressed. Janssen is also concerned regarding the likelihood of overspill parking on the R613 near the entrance to Janssen as a result on the proposed development.

13. The proposed link from Shanbally to Cogans Road – there is much opposition to the proposed new link road from the L2492 at Shanbally westwards to meet the L6472 mainly on health and safety and road safety grounds. Could this proposed link road be omitted?
14. Geometric Design at junctions – it is disputed that the design of the slip roads, roundabouts and junctions are in accordance with the TII Geometric Design Guidance.

D. Local Road Network

1. Traffic congestion on Rochestown Road (R610) will be exacerbated – the R610 will become an orbital route, especially during construction. At present all commuter traffic from Monkstown, Passage West, Upper Rochestown, Coach Hill and Mount Oval use the R610 to access Douglas, the city centre and the N40. The queues from Rochestown Road onto the N28 will not be addressed because there is only one lane from the East, which means that HGVs will have to queue to merge with the N40. The signalisation of Rochestown Road will create traffic gridlock and absolute chaos.
2. Maryborough Hill – the serious congestion at peak times is likely to get significantly worse following the introduction of the proposed 2-way slip road, as the priority will be given to northbound traffic and traffic turning onto the proposed slip road. This will result in queues and delays in both directions along Maryborough Hill. Additional development will use Maryborough Hill due to the Carr's Hill junction design, the additional development in the pipeline at Maryborough Ridge and at Castletreasure, the proposals to signalise the Fingerpost and the proposed alterations to the Douglas East Exit (N40). The cumulative effect will be increased rat-running and traffic flow on Maryborough Hill.
3. Fingerpost roundabout – the proposals to replace this with a signalised junction would result in the loss of an iconic element of the character of Douglas, against which there is strong and widespread objection. Its removal

would be counterproductive resulting in longer queues and gridlock in Douglas.

4. Clarke's Hill – The junction of Clarke's Hill with Rochestown Road currently operates on a gentleman's agreement, with one car at a time. The introduction of traffic lights here will result in queues in all directions and will exacerbate existing congestion. When the N28 was permitted, constraints at Clarke's Hill were never addressed. Mount Oval is used as a distributor road for through traffic and this will be exacerbated by the changes.
5. Coach Hill – The L2472 (Coach Hill) links a number of large housing estates with Rochestown Road, yet it is only mentioned 3 times in the EIS. It is used as a rat run. The predicted increase in traffic volumes on this road is staggering, with an increase in AADT of 34.9%. Coach Hill cannot cope with this volume of traffic as it is narrow and steep and the bus route reduces it to one lane. There are no pedestrian facilities on this road and it needs a safety assessment. The proposed alterations to the Clarke's Hill junction will result in Coach Hill being used as a rat run even more so than at present.
6. Maryborough Estate – This estate is located between Rochestown Road and Maryborough Hill. Since the Kinsale Road Flyover and Mahon Point were completed, the estate has been experiencing significant rat running through the residential streets. The residents are concerned that the proposed M28 will result in an exacerbation of the existing situation due to the significant increase in congestion that is likely to be experienced on the local road network.

12.3 Oral hearing

Module 1 of the hearing, Strategic Transport issues, and Module 2, Traffic Modelling and Design took place on Days 1, 2 and 3 which were held on the 7th, 8th and 9th of November. Traffic and transport issues were discussed principally during Module 2, and during Module 1 (Strategic), but also on Days 8, 9 and 11 (17th, 28th and 30th

November 2018, respectively. Questions on Module 1 and Module 2 were taken on Day 3 (9/11/17) and follow up questions on Days 8, 9 and 11.

Submissions were made by the following observers :-

- Wessel Vosoloo Planning consultant – M28 Steering Group
- Gerard Harrington - M28 Steering Group
- John Higgins – Lissadell Residents Association
- George Ryan – Maryborough Estate
- Sylvester Cotter
- Jackie O'Donovan
- Donagh Long
- Peter Walter – Ringaskiddy Residents Association
- John Twomey, Coolmore Close, Shanbally
- Gavin Lawlor (TPA) – IDA Ireland
- Mark Collins - Janssen
- Minister Simon Coveney T.D.
- Micheal Martin T. D.
- Michael McGrath T.D.
- Senator Jerry Buttimer
- Senator Dan Boyle
- Councillor Mary Rose Desmond
- Councillor Seamus McGrath
- Councillor Marcia D'Alton

In attendance for Cork County Council were:

- Michael Noonan – RPS
- Harris - RPS
- Peter O'Donoghue – Senior Engineer, Cork County Council
- Mr. Dermot Flanagan, Senior Counsel

12.4 Assessment of Traffic and Transport issues

12.4.1 Strategic transport issues

Strategic transport matters have already been discussed under the headings of Need for the Development (10.4) and Alternatives (11.4) above. However, there are a number of matters which are specifically related to traffic and transport, which are addressed in the Transport Consultant's report. These relate to route alignments within the M28 route corridor.

12.4.1.1 Cross section for M28

Dual Carriageway west of Barnahely

Mr. Bergin noted the justification in the EIS for a motorway or Protected Road on the basis that it would form part of the TEN-T core road network and that it will carry a large volume of strategic traffic, including traffic to/from the port facilities at Ringaskiddy. He noted that the capacity of the proposed motorway is 52,000 AADT and that the highest AADT on this section of the route in the Design Year would be 38,260. He considered that the cross section provides a reasonable factor of safety between capacity and predicted flow and that, in terms of vehicle kilometres, would be safer. He concluded that the cross section is appropriate to the strategic nature of the route between Bloomfield and Barnahely. I would agree with this conclusion and would also draw the Board's attention to the fact that this matter was also discussed at the oral hearing and has been assessed under 10.4.1.1 above.

Single Carriageway Protected Road East of Barnahely

The factor of safety between the capacity (AADT 11,600) and the predicted flow in the Design Year (9,150) was considered to be quite low, particularly when compared to the capacity of a dual carriageway on the part of the route (20,000 AADT). Mr. Bergin said it would be desirable to have the flexibility to allow for a dual carriageway to be provided in the future if required, given the strategic nature of the route. However, he was satisfied that the EIS confirms that this flexibility is available and can be provided for within the CPO line if needed in the future. As such, the proposed cross section is considered to be appropriate.

12.4.1.2 Bloomfield to Shannonpark

Bloomfield to Carr's Hill

The on-line section of the route has been discussed at considerable length in previous sections, in Sections 10.4 and 11.4 above. This part of the route was considered as part of the strategic alternative route corridors.

Carr's Hill to Shannonpark

The EIS compares two alternatives for this section of the route, one of which is on-line and the other is off-line south of Carr's Hill. The potential adverse and beneficial impacts have been considered for a range of criteria. It was considered that the off-line option would have a slightly lesser impact on sensitive receptors in respect of noise and air quality and would be preferable in terms of water quality and archaeology. It would also be more beneficial in terms of non-motorway users. Mr. Bergin agreed that the off-line option is considered to be the superior of the options. This seems reasonable.

12.4.1.3 Shannonpark to Shanbally

It is noted that the route through Raffeen Quarry is the preferred route in the EIS as it avoids the need to acquire golf course lands and that it provides a better opportunity for use of the quarry as a source of high quality construction material. It is further noted that during the oral hearing, the applicant confirmed that it has entered into an agreement with the quarry owner to supply the quarry reserve for the Scheme. Mr. Bergin noted that in terms of geometry, the routes are similar and one could not be considered to be superior to the other. However, given that access to high quality materials would be made available, which would have benefits in terms of the construction costs and the ability to avoid the impact of haul routes on the surrounding network, he considered that the route through the quarry would be the better option.

I would agree with this conclusion and consider that the environmental benefits to be gained from the proximity of the source of materials to the alignment of the route

cannot be underestimated. I would draw the Board's attention to the fact that this matter was the subject of lengthy debates during various stages of the oral hearing, but most particularly during Day 4, Ecology Module. The matter is addressed in more detail under Section 17.0 below.

12.4.1.4 Shanbally to Ringaskiddy Port

The EIS presents two options for this section, one to the north (closer to Ringaskiddy – the Preferred Route) and one to the south through Loughbeg (the “2008 Route”). Mr. Bergin had requested further information on the justification for the choice of the northern section. This was submitted on 28/11/17 (Day 9) and was the subject of much discussion. Mr. Bergin considered that the Northern Route is the shortest and most direct route between Shanbally and Ringaskiddy Port and provides superior geometry, as it has a lower gradient and is more suitable for HGV traffic. He further considered that the Southern Route would be likely to encourage port traffic from the western access to travel through Ringaskiddy village in order to access the M28 at Barnahely roundabout, which strengthened the argument for the northern route.

I would agree with these conclusions and would also draw the Board's attention to the fact that the issues surrounding this element of the proposed route are addressed in more detail in Section 15.0 below, in respect of community severance, recreational amenity and the erosion of the open space buffer zones. It is further noted that the Ballincollig-Carrigaline Municipal LAP 2017 has identified a new site for the proposed new school, which is adjacent to the Barnahely graveyard. It was further stated at the oral hearing that the IDA had offered some additional land adjoining the new school site for the purposes of providing a more generous site for the development of the school.

12.4.1.5 Ferry Terminal Access

Mr. Bergin noted that the EIS envisages that ferry terminal traffic will access M28 via the Loughbeg roundabout (L6517), but considers that it would be more desirable to direct ferry traffic to the proposed roundabout at Ringaskiddy Port (east). This, he

believes, would increase the separation between the village and ferry traffic and would also ensure that HCV ferry traffic benefits from the proposed Motorway Services Area. He therefore recommends that traffic management measures be implemented at the ferry terminal access to the port in order to direct traffic to the eastern access to the port.

I would agree that ferry traffic should be diverted to the east and that this would also help to resolve a problem with the Loughbeg roundabout that was aired at the Oral Hearing by Fastnet Recycling (owners of the Ringport Business Park). This matter is addressed further in Section 9.2 of Mr. Bergin's report.

12.4.2 Junction Strategy and Design - Northern Section

12.4.2.1 Bloomfield Interchange

There are no proposals to amend this interchange other than to improve the configuration of the N40 westbound slip road, but no additional lanes will be added. The EIS notes that the interchange operates without significant problems outside of peak hours, and that the peak hour congestion is caused by the inadequate capacity of the N40 rather than at the interchange itself. Although AM peak congestion will continue northbound with the Scheme in place, it is predicted that this will dissipate quickly and will not interfere with traffic flows on Rochestown Road. It is also stated that 85% of the port-related traffic will be unaffected by the peak hour congestion.

Mr. Bergin agreed with the justification in the EIS for not upgrading this interchange. These reasons related principally to the disproportionate expense relative to the benefits that would accrue; the fact that the benefits would only occur in the morning peak; and the difficulty of constructing such an upgrade given the proximity of the bridge to the Douglas Estuary, which is part of an SAC. He stated that unless such an upgrade was carried out as part of an overall upgrade of the N40, it would be unlikely that it would deliver significant benefits for M28 traffic.

12.4.2.2 Rochestown Road Interchange

Mr. Bergin considers that the proposed intelligent, linked traffic management system for Rochestown Road will provide much superior management of the high traffic flows on Rochestown Road to that which currently exists there. He further believes that the system will provide greater flexibility in dealing with tidal traffic flows during the morning and evening peak hours. He noted that the roundabout to be removed is a potential constraint on the efficient operation of both the N40 and the M28, that it does not comply with modern standards and that pedestrian facilities are deficient here. He also noted that the performance of the proposed TMS was assessed using Paramics and Linsig. Mr. Bergin had probed this issue with the applicant during the Oral Hearing. He stated that the assessment had indicated that the significant improvement in traffic flows on the R610 would also have knock-on benefits for the operation of the N40 on-ramp and off-ramp.

12.4.2.3 Northbound Diverge Lane – N40

Mr. Bergin notes that the Scheme introduces a diverge lane on the northbound M28, about 200m south of Rochestown Road and crosses over Rochestown Road immediately west of the on-ramps. The objective is to separate out the traffic that intends to travel westbound on the N40 and to eliminate the need for this traffic to cross the on-ramp from (Rochestown Road). This necessitates the construction of a new (additional) overbridge over Rochestown Road, which brings the motorway alignment closer and at a more elevated level to the houses at Rochestown Rise, Newlyn Vale and Wainsfort.

Mr. Bergin considers that the elimination of the crossing manoeuvre described above is desirable on safety grounds and level of service, and that the proposed Diverge Lane is justified. However, he considered the layout as submitted to be hazardous. He refers to the original proposal to assign westbound M28 traffic to the northbound slow lane and eastbound M28 traffic to the northbound fast lane, and subsequently separating the lanes south of Rochestown Road. He therefore requested an alternative arrangement whereby the diverge is introduced as an 'auxiliary lane'. The applicant submitted a revised proposal, Drawing No. SK5067, at the OH, which

introduces the northbound diverge as 'a conventional auxiliary diverge lane' as requested. Mr. Bergin recommends that this alternative layout be incorporated into the Scheme. I would agree with this recommendation.

12.4.2.4 Mount Oval Diverge

Mr. Bergin agrees that the new slip road is justified as it would serve a substantial residential area which would otherwise use Rochestown Road and/or Carr's Hill interchange and the local road network, adding to existing congestion. However, the road safety hazards associated with such a slip road terminating in a residential area are acknowledged, notwithstanding the steep uphill gradient. He therefore suggests a traffic management system to lower speeds/warn of approach to residential area. I would agree with this recommendation. This would require an appropriate condition in the event of a grant of Approval.

12.4.2.5 Carr's Hill Interchange

Mr. Bergin considers that the scale of the Carr's Hill interchange is justified on the basis that it replaces partial connectivity with full connectivity between the existing N28, the proposed M28 and the existing R609, and also provides for a north-bound on-ramp and a south-bound off-ramp. It also replaces the Maryborough slip road by providing a 2-way link road between Carr's Hill and Maryborough Hill. He notes that the option of providing a 2-way link road between Carr's Hill and Maryborough Ridge instead was considered in the EIS and discarded on the grounds of increased cost and greater environmental impact. It is considered that the new interchange will significantly improve connectivity between the M28 and the surrounding road network, but it is acknowledged that the reassignment of trips will have an impact on the local road network. This is considered further at 6.7 of his report (see 12.4.2.7 below).

12.4.2.6 Maryborough Hill Slip Road and Two-Way Link Road

Mr. Bergin agrees that the existing slip road is substandard and cannot be replaced with a DMRB compliant one, given the topography. He agrees with the decision not

to replace it and that this generates the need for an alternative means to access the M28. It is noted that two options were considered, one to the east and one to the west of the M28, and that the western option was chosen on the grounds of lower cost and smaller environmental impact. It was acknowledged that there would be an additional 1200m for traffic accessing the north-bound M28 from Maryborough Hill, but noted that the modelling indicates that the Do-Something journey times are shorter, despite the increase in journey distance, between Bloomfield and Broadale Estate. It is further noted that southbound connectivity does not currently exist, and as such, both journey time and journey distance are shorter in this direction.

There was also much debate regarding the design and layout of the proposed priority junction of Maryborough Hill and the Carr's Hill Link Road and its capacity. It is proposed as a T-junction where the link road meets Maryborough Hill, with a separate lane for traffic turning right onto the link road. The EIS notes that the junction will operate within capacity, except for a thirty-minute period in the morning peak hour, between 8.15 and 8.45, when traffic turning right onto the link road will experience delay. The queue will not exceed the length of the right turn lane in the opening year, but will do so in the Design Year. However, it is noted that at present, there is no facility for a reserve lane for traffic queuing to get onto the N28 at Maryborough Hill, which means that traffic has to dwell in the through lane waiting for a gap in the on-coming traffic. Thus, it is considered that the proposed right-turn lane will prevent such a delay occurring, apart for the 30-minute delay referred to above.

It should be noted however, that Mr. Noonan (RPS) advised that a revised junction layout has been modelled involving traffic light signals at this junction incorporating pedestrian crossings and a clearway outside 'Massabielle', property owned by Mrs. O'Dea. It is considered that the installation of signals at the junction could address the issue of delay during the morning peak. A drawing showing this layout was submitted on 28th November 2017. I would agree with this revised proposal and note that a condition would be required in the event of a grant of Approval.

12.4.2.7 Impact on Local Road Network in Vicinity of Maryborough Hill/Carr's Hill

Mr. Bergin noted that the combination of the proposed interchange at Carr's Hill and the link road from there to Maryborough Hill will contribute significantly to changes in travel patterns on the local road network, particularly in the Douglas and Rochestown area. The EIS predicts that traffic will reassign from Douglas Village and from Rochestown Road to Carr's Hill interchange and link road. Table 5.26 of the EIS shows predicted journey times for a selection of routes in the area in 2035 for the Do Something and Do Minimum scenarios, and in general, most journey times are lower in the Do Something scenario, apart from the R609 from the Fingerpost to Carr's Hill. In terms of Maryborough Hill, there would be an increase in peak hour traffic north west of the M28, but a slight reduction to the southeast of the M28. It is predicted that there would be a noticeable reduction in traffic on Rochestown Road, both east and west of the M28 and on the northern section of Clarke's Hill.

Mr. Bergin has carried out an analysis of the predictions in the EIS and has set out his conclusions in Sections 6.7 and 6.8 of his report. He points out that the closure of the Maryborough Hill on-ramp necessitates the provision of an alternative access to the M28 from the residential areas on either side of the N28, as to fail to do so would result in increased congestion on Maryborough Hill, Garryduff Road, Clarke's Hill and Rochestown Road. He considers that the only alternative is to provide an on-ramp south of Maryborough Hill and that Carr's Hill is a suitable location. He further considers that a two-way link road is the best solution because it replaces the connectivity that would have been lost by the closure of the existing on-ramp, but also provides for far superior levels of connectivity southbound, which would relieve considerable pressure from Rochestown Road, Douglas Village and Mount Oval. It would also provide an alternative for Carrigaline and Ringaskiddy traffic accessing Douglas, instead of the R609 and the L6477. Although there will be some increase in traffic on Maryborough Hill, Mr. Bergin considers that the additional traffic will reassign to both this route and the R609, both of which terminate at the Fingerpost, and that a balance between the two will emerge in due course. However, these changes in travel patterns would not, in his opinion, justify omitting the Carr's Hill Interchange and Link Road due to the substantial benefits to the rest of the network.

It is also acknowledged that there will be some increases in traffic flows on some local roads such as the southern section of Clarke's Hill and on Garryduff Road. However, the predictions for 2035 are that the capacity of these roads, and all of the local roads in the network, will be sufficient to absorb the extra flows. In respect of Coach Hill, the increase in traffic flows here are notable because the traffic flows are currently very low and due to the pinch point in the cross section where opposing traffic cannot pass. Mr. Bergin recommends that consideration be given to traffic management measures, such as traffic signalling, to mitigate these impacts. However, no modelling or analysis of this was carried out as part of the EIS and the matter was not discussed at the oral hearing. It is considered, therefore, that there is insufficient justification at this point in time to attach a condition in this respect.

I would agree with the conclusions regarding the impact on local roads, and consider that the proposed Scheme would have an overall positive impact on journey times and traffic congestion on the local road network, although it is inevitable that there will be some links that will experience some additional congestion at peak times.

12.4.3 Junction Strategy and Design – Southern Section

12.4.3.1 Shannonpark Interchange

Mr. Bergin evaluated the two options presented in the EIS and agreed with the conclusions of the EIS. Option 2 was considered to be superior because it would be less expensive to construct, would require a smaller land take and would not require an upgrade of part of the N28. The use of a section of the N28 would create access difficulties for a number of properties. He also considered that the design of the proposed interchange would be compact which would maximise traffic time on the M28.

12.4.3.2 Shanbally Interchange

Justification for Shanbally Interchange

The preferred option in the EIS (Option 4) for this junction is a partial grade separated interchange, which involves a roundabout with four arms located to the north of the mainline. One links the roundabout to N28 to the North and one links it to an existing private IDA road (serving Janssen) to the East. The other two arms link the roundabout back to the motorway and the local road network to the south and west. The justification for the junction provided in the EIS is that firstly, it attracts traffic (including high volume of HGV) that would otherwise use the existing N28 through Shanbally Cross, and secondly, it provides access to the large pockets of undeveloped IDA lands (N/S/W) and to the Janssen facility (E).

The issue was discussed at some length at the Oral Hearing. Following a request by Mr Bergin to justify a junction at this location, a Briefing Note was submitted by the applicant on 28/11/17 (Day 9). This indicated that as part of the earlier deliberations, two 'No junction options' had also been considered along with a number of other options. A comparison was provided of the 'No junction with an underbridge mitigation measure' with the 'Preferred option'. The main disadvantages of the 'Underbridge option' (i.e. no Junction at Shanbally) were :-

- 0.5% reduction in network travel times
- 0.35% decrease in the Present Value Benefits of the Scheme
- An increase in peak hour flows of 20% through Shanbally Cross (Mr. Bergin notes this is equivalent to 1,120 PCUs). This reasoning was based on the presumption that HCV traffic would chose not to use the Barnahely junction (to East) as there is a 9% incline on the R613 from N28 (Western Port access). It was considered that the traffic would chose to use the N28 and access the M28 at Shannonpark instead.

Further to the above, consideration was given to an enhanced interchange at Barnahely in lieu of the Shanbally interchange. Thus, the proposed Barnahely at-

grade roundabout would be replaced with a partial grade-separated junction (as proposed in the 2008 route). However, this option would mean that traffic from Carrigaline on the R613 would not be able to access the M28 and would have to travel through Ringaskiddy Village instead. This was rejected on the basis of increased construction costs, reduced user benefits, greater traffic flow through Ringaskiddy village and increased adverse impacts on landscape and cultural heritage assets (Castle Warren and graveyard nearby). It was further noted that there was strong support from local industry and from the IDA for a high-quality junction at Shanbally.

Mr. Bergin's assessment of the issue notes that the predicted number of PCUs that would use the interchange daily in 2035 is 1,370, which is equivalent to 685 vehicles using the on-ramp and 685 using the off-ramp. He noted that this number is very similar to the no. of PCUs predicted to travel through Shanbally on the N28 in the 'No junction' option. He finds it difficult to justify a junction of the scale proposed with such low traffic flows, having regard to the cost, land acquisition and local impact. Furthermore, the time savings are almost negligible at 0.5%. The cost savings are also considered to be very small (0.35%) and based only on construction costs, not land acquisition. Mr. Bergin further considers that the 'No junction' option could be improved in terms of cost if an underpass similar to that proposed for the main road through Shanbally leading south (L2492) as part of the preferred option was to be included as mitigation.

Mr. Bergin accepts that in the absence of an enhanced junction at Barnahely, there would be increased flow through the latter junction, which would provide less network resilience than the preferred option. However, he considers that an enhanced junction at Barnahely would provide better network resilience than the current proposal for a roundabout junction.

Although not all traffic (that would have been expected to use Shanbally interchange) would be attracted to such an enhanced Barnahely junction, (eg Pfizer, IDA lands), he submits that this traffic could travel through N28-Shanbally Cross instead. He

further considers that public ownership of the 'Janssen Road' would provide a direct link to the enhanced Barnahely junction. He disputes the 9% incline and considers it to be more like 3.8%, which he believes would not be prohibitive to HCV traffic. Thus, with the introduction of demand management measures, he believes that Pfizer and Western port traffic would be likely to use an enhanced Barnahely junction and the remainder of the industrial lands (IDA and Janssen) would be linked directly via the 'Janssen road' to the Barnahely junction.

He therefore recommends the following

- Omission of the Shanbally Interchange.
- Enhancement of the Barnahely junction. All options ranging from a larger roundabout than that currently proposed to a grade-separated junction should be examined. This would also include an option for a partial grade separated junction as proposed in 2008.
- The private IDA road should be taken into public ownership. This could provide a direct link from the IDA lands to the Barnahely junction. *Note this option would necessitate amending the CPO line and hence the issuing of new notices.*
- Introduce Demand Management Measures on the N28 to encourage use of Barnahely junction.

Design of Shanbally Interchange

Notwithstanding the above recommendation, Mr. Bergin evaluated the 6 options considered in the EIS for this junction in terms of the design. He noted that Option 2, (at grade roundabout), would have poor network resilience as it would come close to capacity in the Design Year. However, this option did not include a vehicular underpass at the crossing of the L2492, and hence has the disadvantage of severance. Option 4 (the preferred) has greater resilience and does not result in severance, but has greater landscape and visual impact. The comparison in the Briefing Note (submitted on 28/11/17 at the OH) indicates that Option 4 has the advantages of greater time saving, economic benefits, environmental benefits, traffic

impact and capacity. However, Mr. Bergin considers that these advantages are fairly marginal and he is not persuaded by them.

Mr. Bergin recommends that an alternative design be considered based on Option 2, but with revisions which would firstly, maximise the capacity of the junction and secondly, incorporate a vehicular underpass at L2492 to ensure no severance and to obviate the need for realignment of local roads south of the M28.

12.4.3.3 Realignment of L6472 at Shanbally

The L6472 is a local road that runs between Ballyhemiken Road (also known as Rock Road) on the eastern side of Carrigaline and the existing N28, immediately northeast of Raffeen Quarry. The M28 would sever this local road, L6472, creating access difficulties for some properties. In order to mitigate the severance issues, it is proposed to realign the L6472 to link it (E-W) with Shanbally village to the SW of the proposed interchange there. It would run parallel to and south of M28, would be 1.3km long, would occupy 2.1ha of agricultural land. However, it would have a profound impact on Coolmore Close (also referred to as Twomey's Lane). There was considerable objection to this at the Oral Hearing, principally from the Twomey family and from Marcia D'Alton.

The stated purpose is to mitigate the severance of the L6472 and to provide access to agricultural lands and to existing development to the south of the M28 (accessed from L6472). An added complication is the presence of an ESB substation to the south which is currently accessed from the N28 via the L6472. Although access to the substation can also be gained via Ballyhemiken Road, the geometry of this road and its 3 tonne weight limit, render it unsuitable for deliveries of extra wide loads associated with the substation.

Following a detailed analysis of the issues involved, Mr. Bergin concluded that the proposed realignment of the L6472 requires a substantial area of land and will have a significant adverse impact on the residents of Coolmore Close. It is acknowledged

that the realignment would provide access to agricultural lands severed by the Scheme, but considers that an agricultural access road would be sufficient for this purpose. He notes that if the realignment did not go ahead, access to the N28, for properties south of the M28 by means of cars and light vehicles would be maintained, albeit via a longer route along the Ballyhemiken Road. Mr. Bergin considered that the geometry was not any more difficult than that of the proposed route for HCVs through Shanbally village and the acute turn into the L6472, and that the 3 tonne weight limit could be resolved by means of repairs to the bridge over the old railway line.

Mr. Bergin has, therefore, recommended the omission of this proposed realignment and instead, has proposed that the Ballyhemiken Road be upgraded to allow HCV deliveries to the substation and commercial properties on the road. I would agree that this would be a more sustainable and less detrimental option. The realignment is not required to replace a direct route between Shanbally and the L6472, as such a route does not currently exist, and is not required to link Carrigaline with Shanbally either, as alternative routes exist. I would also agree that an agricultural access road would be required to serve lands that would be severed by the M28. However, although this was discussed during the CPO module of the Oral Hearing, no agreement was reached with the applicant on the matter. This will be discussed further in the CPO section of this report. Notwithstanding this, a condition requiring the omission of the proposed realignment and the requirement to upgrade the Ballyhemiken Road should be attached to any Approval.

12.4.3.4 Barnahely Junction

Mr. Bergin explored alternative designs for Barnahely junction. The EIS did not address this, but a briefing note submitted by the applicant at the OH (28/11/17) provided some insight into the preferred junction, but this was based on consideration of an alternative to Shanbally Interchange. He considered that there are 3 choices, assuming that a link between R613 and M28 west of Barnahely is a prerequisite, given the objective to remove traffic from Ringaskiddy Main Street. The

3 choices are - the Preferred option (at-grade roundabout); a Partial Grade Separated junction (similar to 2008 proposal); and a Full Grade-separated junction.

The main differences are that the at-grade has lower capacity but provides for greater connectivity locally (in particular facilitating traffic from R613 (Carrigaline) to Haulbowline). However, the at-grade junction would oblige all traffic (including large volume of HCV) to yield at a roundabout, which would increase noise/air pollution and surface deterioration. The partial separated option would prevent access to the M28 at Barnahely for Carrigaline traffic travelling towards Ringaskiddy/Haulbowline etc. This would result in lower user benefit and greater levels of traffic through Ringaskiddy village. This option and the proposed full grade separated option would have much greater impacts on the landscape, visual amenity and cultural heritage of the area around Barnahely, which includes the Caste warren complex, which is of architectural significance.

Notwithstanding the above, Mr Bergin considers that unless the Board seeks the omission of the Shanbally interchange, the preferred option (as presented in the EIS) should stand. I would agree with this conclusion as the only reason to alter the Barnahely junction would be to compensate for the omission of the Shanbally junction.

12.4.3.5 Conclusions regarding Shanbally and Barnahely junctions

Essentially there are three possible options for Shanbally/Barnahely in terms of junction strategy, each of which has been explored during the course of the application and oral hearing. Each option has advantages and disadvantages which have been set out in the EIS, the RPS Briefing Note submitted to the oral hearing on 28/11/17 and in Mr. Bergin's Report (Section 9.1) and summarised above. The issues were debated at length at the oral hearing. These options are

Option A - to omit the Shanbally Interchange. This would include a revised proposal to enhance Barnahely junction, (partial grade separated or grade separated); the

acquisition of the IDA road (in order to provide direct access from IDA/Janssen lands to Barnahely); and the introduction of traffic management measures on the N28 to direct traffic to the enhanced Barnahely junction (and away from Shanbally/Ringaskiddy). An underpass along the L2492 (linking Shanbally Upper and Shanbally Lower) would also be required.

Option B – Redesign the Shanbally Interchange to a smaller at grade roundabout junction together with a revised proposal to provide for a vehicular underpass to enable connectivity to continue between the northern and southern sections of the village and to obviate the need for road realignments to the south. This would not require alterations of Barnahely junction or the acquisition of the IDA road.

Option C – retain the proposed Shanbally and Barnahely Junctions as proposed in the EIS.

Option A would result in a substantial reduction in adverse impacts on Upper Shanbally Village (i.e. south of the proposed mainline) particularly in terms of visual and landscape impacts, and also in noise and air emissions and land acquisition. It would also result in a greater degree of separation of motorway traffic from the local community. However, it would give rise to additional environmental impacts at Barnahely and additional land acquisition in terms of the IDA road (and possibly at Barnahely to facilitate an enhanced junction). The need to upgrade Barnahely to a partial grade separated junction could have the unintended consequence of increasing traffic through Ringaskiddy village (due to inability to provide M28 access here).

It is likely, therefore, that this option would necessitate a formal request for significant further Information. This is likely to require an exploration of the design options for enhancement of the Barnahely junction, including a reassessment of the cost benefits and a rerun of the traffic model, as well as a reassessment of the environmental issues in relation to several criteria including Cultural Heritage,

Landscape and Visual Impact, Noise and Air emissions, and Flora and Fauna. It would also require the issue of new CPO notices and the reopening of the oral hearing. It should be noted that the applicant remained fundamentally opposed to this option and that local industry, and the IDA, were also opposed to it.

Option B would be less problematic procedurally as it would not necessitate any further land acquisitions or a redesign of a major junction. However, it may have unforeseen consequences in terms of the efficiency of the network and trip distribution locally. For example, an at-grade roundabout here would slow down traffic on the M28 which could have knock-on effects elsewhere, and could also have implications for predictions in terms of journey times as well as noise and air emissions, and there would still be two at-grade junctions in close proximity to each other.

Option C, to retain the junctions as proposed, has the advantage of not requiring further information, re-running of the traffic model or any further land acquisition. It is further noted that it would allow for optimisation of the opportunities for the future development of the huge quantity of IDA owned lands (serviced and zoned for industry). The IDA has also made it clear that despite the disadvantages of severance of its land holdings, it is very much in favour of the development as proposed. It is considered that the scale of the overall impact of the proposed junction would be substantially reduced by the elimination of the proposed realignment of L6472, (Section 12.4.3.3 above), and by the additional landscape mitigation measures, proposed by the applicant at the oral hearing for the area between the Grotto/Forrester's Hall and the proposed mainline, (as set out in Section 16.4.2.4 below).

Notwithstanding the conclusions reached by Mr. Bergin, which have considerable merit, it is considered that given the uncertainty regarding modelled outputs and any significant environmental effects associated with these options, the accessibility that would be provided to zoned industrial lands, and the overwhelming support for the proposed development by local industry and the IDA, the Shanbally junction, as

proposed, should be retained provided that the realignment of L6472 is omitted and that the additional landscape mitigation measures at Shanbally Upper are implemented, as set out in 16.4.2.4/5 below.

12.4.3.6 Loughbeg Junction

The design of this junction is not addressed in the EIS but was the subject of some discussion at the Oral Hearing, as it encroaches on part of the Ringfort Business Park and cuts off the existing access to that site. It should be noted that although the park is currently vacant, the owner considers the business park to be a viable commercial entity (formerly employing 750 people) and sought independent access by means of a fifth arm directly onto/off the M28 at this junction. The applicant however, has proposed an alternative access further south on Loughbeg Road and refused to consider direct access to the M28. Mr. Bergin agreed with this on safety grounds and as it is contrary to TII guidance. The applicant had sought to convince the Board that the roundabout did not strictly come within the remit of the TII guidance. However, this was not accepted by either the applicant or Mr. Bergin.

There is a concern that the proposed new access will be just 50m from the outer edge of the proposed new roundabout. It includes a dedicated right-turn lane into the Ringfort Business Park (30m long), which is slightly short of the required 35m, but its capacity has not been modelled. Mr. Bergin and MHL, (for the owners of the Business Park), had raised concerns that should capacity be exceeded, traffic could back up onto the local road (L6517) and possibly impact the operation of the Loughbeg Roundabout. Mr. Bergin, therefore, requests that the capacity of this RT lane be modelled to ensure that there is sufficient capacity to prevent traffic backing up onto the roundabout.

I consider that the local road (L6517) has, however, a low level of traffic flow as it mainly serves the existing industrial establishments at Loughbeg to the south. Thus, it is unlikely that traffic waiting to turn right into the business park would back up onto the roundabout. As discussed in 12.4.1.5, it has been suggested that ferry terminal traffic should be required to access the M28 at the Ringaskiddy Roundabout, rather

than the Loughbeg Roundabout. This would further reduce the potential traffic flow on the L6517, as traffic entering and leaving the ferry terminal would have to use the L2545 instead. I consider, therefore, that should the Board be minded to grant Approval for the Scheme, a condition should be attached requiring road signs/traffic management measures to be put in place to direct all ferry traffic entering and leaving the terminal to use the L2545 and the Ringaskiddy roundabout to access the M28.

12.4.4 Traffic modelling and analysis

12.4.4.1 Modelling software, data input and outputs

Mr. Bergin carried out a comprehensive review of the traffic modelling undertaken for the proposed scheme. He noted that the model was based on a number of previous models in the region including the Dunkettle Interchange, the Port of Cork, the N40 Demand Management Study and the Douglas LUTS. He further noted that all of these models derive from or incorporate the traffic model used for CASP, which forms the basis of all strategic models in Cork City and suburbs. He pointed out that all of the models used SATURN software, which is an equilibrium model. Thus, he concluded that there is likely to be considerable consistency between the various models.

It was noted that the input data was based on 3 different types of surveys, namely Temporary Automatic Counters (Ringaskiddy 2012, N40 Demand Management 2013, DLUTS 2014); Junction Turning Count Surveys (dates and studies as per TACs); Permanent Automatic Counters (maintained by TII on N40 and N28); and Journey time surveys (on four routes in the area in 2014). The flows from the pre-2014 surveys had growth factors applied to make them equivalent to 2014 flows.

12.4.4.2 Validation, calibration of model

Mr Bergin considered that an excellent calibration of the model was achieved and that validation of the model proved that the outputs were a good fit with the survey data. In his assessment of the traffic analysis, he agrees that the type of model

prepared, the data sources used, the construction, calibration and validation of the model comply with the TII Project Appraisal Guidelines (PAG).

12.4.4.3 Assumptions re growth, HGV traffic, committed development

Mr. Bergin notes that the Do Minimum model included the implementation of certain improvements/changes, including committed changes to the local network; Dunkettle interchange upgrade; Phases 1 and 2 of the Port expansion at Ringaskiddy, including improvements at the western access point to the port. The Do Minimum model assumes a medium growth scenario and applies medium growth factors (PAG). It was noted that the Do Something Model assumed all changes in the Do Minimum Scenario plus completion of the Scheme and Phase 3 of the Port expansion.

12.4.4.4 Conclusions re findings

The findings and predictions are summarised on page 41/42 of the Traffic and Transport Consultant's Report. The existing constraints and bottlenecks in the system are highlighted. It is noted that under the Do Minimum scenario, traffic demand will continue to grow; congestion and delay will continue to increase; and the duration of the peaks will increase. Under the Do Something scenario there will be a significant improvement in the capacity of the M28, particularly at the southern end where the main impact will be to divert considerable traffic volumes to the M28, with significantly positive impacts for communities in Shanbally, Ringaskiddy and other north-south local routes. At the northern end, it is noted that the local road network will remain extremely busy but will experience an overall improvement in the network performance. The Scheme will reduce journey times between Bloomfield and Shannonpark, but the improvement is better at certain times of the day south of Rochestown Road than north of this junction. However, Mr. Harris confirmed at the oral hearing that the cumulative journey time saving would be 5,500 vehicle hours per day, and hence the overall impact is positive in terms of journey times.

While some local routes will experience increased flows, others will experience decreased flows, but the link capacity indicates that the local road network can cope with the predicted demand in the Design Year. Key local junctions will continue to be over capacity in peak periods, but the impact on Douglas Village is predicted to be negligible. The overall conclusion is that the proposed road increases transport efficiency through improved capacity and the removal of bottlenecks, benefits freight transport and facilitates the implementation of alternative transport modes.

Mr Bergin also evaluated the preparation of future traffic growth projections against the guidance provided in the TII PAG and considered that the model complies with this guidance. He therefore concluded that the transport model used to inform the design of the Scheme and inform the assessment of its environmental impact complies with best practice guidelines.

12.4.5 Conclusion Traffic and Transport

It is clear from the analysis and conclusions of the Traffic and Transport Consultant's Report that firstly, the traffic modelling has been validated and calibrated and complies with best practice guidance and secondly, that the Do Minimum Scenario will see a continuation in the growth of traffic demand, congestion and delay, particularly at peak periods. The Do Something Scenario, however, will see significant improvement in transport efficiency on the strategic route, in terms of both journey times and traffic congestion, due to increases in capacity and removal of bottlenecks. This will facilitate strategic traffic (freight and employment related), as well as commuter traffic, and will provide environmental and amenity benefits for the communities at the southern end which currently endure high levels of HCVs and congestion, whereby heavy traffic will be diverted onto the M28. This will allow for the development of alternative modes of transport and for improved safety for all road users, both on and off the proposed route.

The local road network at the northern end will continue to experience high levels of congestion, particularly at peak times, but the Scheme will provide for an overall improvement in network performance. It is inevitable that some links will experience

increased traffic flows, but others will experience reductions, and the link capacity modelling indicates that the local road network will cope with the predicted demand. The impact on Douglas village is predicted to be negligible. The overall impact on the local road network will be positive in terms of improved journey times and lower levels of congestion, particularly on routes to and from Douglas Village, including Rochestown Road.

The evaluation of alternatives for the cross section of the route and the route options within the corridor have been adequately considered with a robust process which clearly justifies the selection of the preferred options. It is particularly notable that the conclusion regarding Bloomfield Interchange is that any upgrades to this junction would not deliver any significant benefits to the M28 in the absence of a substantial upgrade to the N40, where the main capacity issues arise. The evaluation of the junction strategy and design of layouts is comprehensive and has concluded that the proposed development is generally satisfactory in terms of junctions proposed apart from the following matters, which would need to be addressed by way of conditions and/or a request for further information.

1. The Northbound Diverge – the revised proposal showing the diverge as an auxiliary lane submitted by the applicant on 28/11/17 (Drawing SK5067) should be implemented.
2. Maryborough Hill/Carr's Hill Link Road Junction – the revised proposal submitted by the applicant on 28/11/17 showing signalisation of this junction together with revised pedestrian crossings, footpaths and cycle facilities and revised road layout markings should be implemented.
3. Mount Oval Diverge – the design, nature and location of the Mount Oval Diverge is such that it will be necessary to introduce traffic management measures to slow and warn traffic on the approach to the residential area.
4. Traffic management at Port access points – consideration should be given to the introduction of traffic management measures at the ferry port terminal exit and the western port access, respectively, in order to direct ferry traffic to join

the M28 at Ringaskiddy Port and to direct port traffic from the western port access to join the M28 at Barnahely roundabout.

5. Realignment of L6472 between Shanbally and Ballyhemiken Road – this proposed realignment should be omitted and replaced by a proposal to upgrade the Ballyhemiken Road to allow for use by HCV traffic including extra wide and large loads visiting the substation.

I am satisfied that the proposed development, subject to resolution of the matters outlined above, would achieve the Scheme Objectives, set out at 11.1 above and in Section 1.0 of Mr. Bergin's Report, which are considered to be reasonable.

13 Noise and vibration

13.1 Environmental Impact Statement

Noise and vibration issues are addressed in Chapter 14 of the EIS. There are several drawings and figures pertaining to this issue in Volume 5 including maps of the Noise Monitoring Locations (Fig. 14.3) and Noise Sensitive Locations (Fig. 14.6, Pages 1-7), a series of Noise Contour Maps and a map of the locations of each of the proposed noise barriers - mitigation, (Fig. 14.9). The Contour Maps relate to Construction Day Noise (Fig. 14.5), Do Minimum Noise Day (Fig. 14.7) and Night (Fig. 14.8) and Do Something with Mitigation Day/Night (Figs. 14.10/14.11).

13.2 Issues raised by observers during the course of the application and during the oral hearing regarding noise and vibration

1. EIS inadequate - The noise impact did not feature in the constraints study which led to the final choice of route through the Mulcon Valley, where the greatest concentration of noise sensitive receptors is located.
2. Current noise levels Northern Section breach TII Design Goals of 60dBL_{DEN}. At present the noise levels exceed 70dBL_{DEN} and are predicted to rise in the 'Do Minimum' scenario. The EIS states that it is not practicable to mitigate noise levels to reduce them by 10dB, and is not subject to the TII guidance (as not new section of road). This is unacceptable as the proposed new

northern diverge and bridge to the N40 is a new section of road and it is exacerbated by the addition of thousands of additional HGVs daily.

3. EPA and WHO Guidelines – There is no attempt to meet the WHO or EPA Guidelines on noise limits for day (55dB) and night (40dB), or the European Commission's aims in the EU's 7th Environmental Action Program to 2020 for reducing exposure to environmental noise.

Noise modelling

4. Noise input data – reliance on data from CRTN (almost 30 years old) unacceptable and undermines reliability of model.
5. Validity of modelling questioned – it excludes the effects of traffic speeds, HGV traffic, topography, gradients and tree planting. The +/- 5dB tolerance levels between predicted and measured are too high and exclusion of other noise sources (present in measured levels) is unacceptable. Predicted levels are annual averages and are not directly comparable with short term measured levels.
6. Low frequency noise – modelling fails to take account of low frequency components of noise from diesel engines, which is more damaging to human health. A-weightings are inappropriate if prominent, low-frequency components are present, as they significantly underestimate loudness.
7. Topography of Mulcon Valley – The topography is so steep that the sound levels will be 80-85dBA, which will significantly breach the guidelines. The eastern side is solid rock, and sound will reverberate and will be exacerbated by the impact of the sound waves from retaining walls on the opposite side.
8. Noise levels and gradient of road – the increase in traffic/HGV traffic will increase noise and air pollution, with one HGV per minute and the effect of gear changes up and down the hill.
9. Noise levels Maryborough Heights (Lissadell) – measured noise levels here were calculated at 71.2dB_{L_{DEN}}, yet the TII believe there is no obligation to mitigate this, which is unacceptable.

Noise Monitoring

10. Noise monitoring general – insufficient detail regarding the dates and weather conditions of surveys; the make and model of the noise monitors;

and last date of calibration. Data was presented for only 20 of the 31 Noise Monitoring locations (Table 14.6), and of the 20 NMLs, 4 had a 5dB variance, 4 had a 4dB variance between predicted and measured levels. Thus 40% had significant differences. These flaws undermine confidence in the results.

11. Noise monitoring locations – no background monitoring was carried out in Kiltegan Park or Newlyn Vale, although identified as noise priority areas in the Noise Action Plans for Cork. Ringaskiddy School site is not shown as a Noise Sensitive Location in Fig. 14.6.
12. Noise Monitoring Rochestown – monitoring station north of Rochestown Road (N3) is 85m from the off-ramp, which is too far from residential properties. The short-term measuring points N3-4 is to the north-west of Wainsfort (No. 11), but is in the shadow of a noise barrier at present. The intervals and sequencing of the mobile measuring units N3-4/5/6 are questioned. The height at which the measurements are taken should be at 4m, rather than at 1.5m, in order to represent 2 storey dwellings.
13. Predicted results Rochestown not credible – the results are not credible due to proximity to M28 and slip road and higher volumes of traffic – e.g. only slight increases (1-5dB) on existing levels at Wainsfort (N3-4), Garryduff Road (N3-1), St. Patrick's Church grounds (N4-1), Rochestown Rise (N4-2) and Lissadell (N4-3); and a predicted decrease at Fairways housing estate (N4-4) and Broadale Downs area, (N4-5).
14. Noise monitoring Ringaskiddy – 'Martello' Old Post Office Road, Ringaskiddy – Monitoring location N2-2 stated that the primary source of noise is traffic on the L6518 and secondary noise is from school traffic, human voices, crows, chainsaw etc. However, the predicted impacts for all the NSLs on PO Road are grouped together. Thus, there is no individual noise assessment, which is inadequate.

Noise mitigation

15. Noise mitigation general – little meaningful mitigation proposed as proposed not to meet TII guidelines. Mitigation inadequate given projected increase in HGV volumes, the 24-hour nature of the port and by the higher speeds

facilitated by the widening of the road. Noise barriers provided on N40 need to be extended onto the M28.

16. Northbound diverge is a new road and requires mitigation to meet TII threshold – it is a new lane which is elevated through the woods and must therefore be subject to the threshold of 60dB_{L_{DEN}}, particularly as it will result in a significant increase in traffic, in HGV traffic and in an extra roadway in much closer proximity to existing houses.
17. Noise Action Plan targets subject to budget – the EIS refers to implementation of mitigation to achieve targets of NAPs but “subject to budgets and available resources (page 14-8)”. This is wholly unacceptable.
18. Retention of existing natural mitigation - Existing mitigation is inadequate and ineffective, but the removal of trees and woodland, which break up and absorb the sound waves, will make situation worse. Existing natural barriers should be supplemented by artificial ones.
19. Design of Noise Barriers – Design and materials are critical. There is inadequate specification provided in respect of the nature of the noise barriers such as concrete walls, fences, landscaped berms etc. EIS fails to examine international best practice and should consider insulation on a house by house basis. The design of the barriers needs to include “top edge profiles” and in particular, the use of a “T profile at the top of the barriers”. Multiple barriers on both sides of the road will result in reflective properties which can degrade the performance by up to 6dB. However, this could be overcome by use of absorptive properties.
20. Low noise surface – EIS states that low noise surface material would achieve a minimum of 2.5dB reduction in noise levels but it was previously stated that a 3dB difference in noise levels is imperceptible.
21. Residual impacts – the EIS states that the number of properties expected to experience L_{den} levels in excess of 70dB reduces from 23 to 7, and that they are all over 300m from the M28. It is not clear how this can be so if the projected levels were modelled for traffic noise only (i.e. not all noise sources).
22. Noise mitigation at Rochestown Rise – Proposed 3m high barriers are wholly inadequate to mitigate the noise associated with the nature and volume of traffic at this location. Request high quality absorptive barriers bordering

Rochestown Rise; low noise surfacing material; traffic calming on approach to Bloomfield interchange; and minimise impact on woodlands.

23. Noise mitigation Rowan Hill (Mount Oval) – significant cut and removal of woodland/green space associated with off-ramp and road will be much closer to houses on Rowan Hill. Mitigation involving a 3m high noise barrier within metres of these properties is unacceptable and inadequate.
24. Noise mitigation Rochestown – impact on properties close to road will be intolerable, (e.g. Newlyn Vale), and the height and proximity of the new northbound lane is likely to significantly worsen the impact. Request solid wall with perforated bricks rather than RW01 and AB01. The slope of the barriers is also questioned.
25. Noise barrier Shanbally AB25 – this proposed barrier is too short and will not adequately mitigate property at Marian Terrace (John Brady).
26. Noise barriers at Ringaskiddy – the proposed barriers on south side of proposed road are far shorter than those on the northern side of the road.

Construction noise

27. Construction noise levels too high – the noise levels proposed are more than double or treble what is acceptable by EU and EPA guidelines (Table 14.12). there is no faith in the additional screening of the piling machine at Maryborough Hill.
28. Vibration levels during construction – vibration levels will have to be monitored during construction to ensure that there will be no cosmetic or structural damage to properties adjacent to the route, as well as the structural integrity and comfort of properties.
29. Construction night-time working – TII do not provide guidance for night-time working during construction, this is unacceptable particularly regarding elements of the project such as Maryborough Hill overbridge reconstruction, which will involve weekend and night working. TII will therefore be at liberty to work with no controls over hours or noise levels in order to meet project deadlines.
30. Lack of consultation on construction impacts – as TII has not yet engaged with residents regarding noise control during construction, how can residents

have confidence that they will be consulted about the massive impact these noise levels will have on their quality of life? Residents of Maryborough Hill had to endure severe disruption during construction of the N28 in early 1990s with construction work day and night, disruption to access etc.

13.3 Oral hearing

Issues relating to noise and vibration were raised throughout the oral hearing, but particularly during Days 1, 2, 6 7, 8, 9, 10, 11 and 12. The Applicant presented its case on Day 7 (16/11/17), which included a summary of the key findings of the EIS, clarification of matters/errata, a list of observers who had raised issues relating to noise in the written submissions to the Board, and a response to the issues raised. Presentations were made by third party observers on Day 7 and Questions on the Noise Module were taken mainly on Day 8 but also on Days 10, 11 and 12.

Presentations were made by the following observers at the oral hearing:

- Dr. Mary O’Dea
- Mr. Domhnaill Mac Domhnaill
- Councillor Marcia D’Alton (Cork Co. Co.)

Issues relating to noise were also raised by a considerable number of observers, which ranged from the general to the specific. The observers were as follows:

Marie Cashman	Jackie O’Donovan
Sandra Higgins	Anne Mason
Miriam Collins	Cllr Mary Desmond
Dermot O’Donovan	Donagh Long
Kevin Hanley	Nicholas Douglas
Paul Kelleher	Fergal O’Dea
Ann O’Dea	Solr Joe Noonan
Trustees of Douglas Parish	Donagh McCarthy JC for Jim Roynane
Mr Galvin for Douglas Golf Club	Michael McGrath T.D.

There was no representative of any relevant prescribed body present.

In attendance for the applicant were:

- Mr. McKeown (RPS Noise and Vibration Chapter)
- Mr. Deering (Health Study) (Day 7)
- Mr Michael Noonan (RPS Road Project Design and Traffic and Transport)
- Mr Russell Harris (RPS Traffic Modelling)
- Mr. Dermot Flanagan S.C.

13.4 Assessment of noise and vibration

13.4.1 EIS findings

Chapter 14 of the EIS describes the noise modelling carried out (14.2) which was based on the CADNA Noise Model; sets out the baseline noise levels and the monitoring locations (14.4); identifies the potential impacts (14.5); specifies the proposed mitigation measures (14.6) and summarises the potential residual impacts (14.7). Limits for noise and vibration during the construction phase are set out in Tables 14.1 and 14.4 of the EIS. In general, the limits will be 70dBA L_{Aeq} Mon-Fri 0700-1900 hours and 60dBA L_{Aeq} for night time 1900-1000 hours. However, night time working will only be permitted in special circumstances which will be agreed and notified in advance. The Design criteria for the proposed M28 project were set by reference to the TII Guidelines for the Treatment of Noise and Vibration in National Road Schemes (2004, as updated by Good Practice Guide, 2014), and the Cork Noise Action Plans. The limits for operational noise correspond with the TII Design Goal for new national roads, (as set out in the TII Guidelines), 60dBA L_{den} , in respect of the off-line section of the proposed road project. However, the on-line section, between Bloomfield and Carr's Hill is subject to the noise limits set out in the Cork Noise Action Plan, which is 70dBA L_{den} .

Traffic noise levels at the northern end of the proposed project are currently in excess of 70dBA L_{den} and are forecast to increase in the 'Do Minimum' scenario. It is stated that scope to reduce noise levels by means of mitigation is finite and a reduction to achieve TII Design Goal is not practicable for all locations. It is stated that in order to meet the Design Goal for the northern end of the project, it would be necessary to introduce excessively high barriers, which would have structural, visual and safety issues, making their implementation unsustainable.

The findings of the EIS were that in the 'Do Something' Scenario, noise levels at all properties within 300m of the northern section (on-line) will reduce, but a small number of properties at the southern end of the route corridor will experience moderate or significant negative impacts, although still complying with the TII Design Goal. This is because noise levels at these properties will increase from a very low background level at present. Furthermore, it is stated that within the northern section, all properties identified as 'High Priority Areas' in the Cork Co. Co. Noise Action Plan 2013-2018 and Agglomeration of Cork Noise Action Plan 2013-2018 will achieve the 70dB(A) target. Noise and vibration during construction will be controlled in accordance with measures set out in BS 5228-1:2009+A1 and the London Good Practice Guide: Noise & Vibration Control for Demolition and Construction. It is stated that there will be no significant vibration impacts during construction or operation.

13.4.2 Design Criteria for noise impacts, including guidance and legislation

Concerns were raised by several parties at the oral hearing regarding the failure to comply with European and National guidance and legislation. Dr. Mary O'Dea (M28 Steering Group) referred, in particular, to the requirements of the European Noise Directive 2002, the objectives of the EU Environment Action Programme to 2020 and the World Health Organisation's guidance on thresholds for noise levels of 55dB(A) daytime and 40dB(A) night time, above which exposure can lead to serious health impacts. Much evidence was presented by Dr. O'Dea on the effects of long term exposure to noise on human health.

Councillor Marcia D'Alton questioned whether a Constraints Study had been carried out and the degree to which the consideration of the potential noise effect on residential areas formed part of the final route choice as advised in the NRA 2004 Guidelines (as updated in 2014). In her opinion, given that the Mulcon Valley has the highest number/density of noise sensitive receptors, had a Constraints Study been carried out to evaluate the noise impact, the current proposed route would have been the least favourable option. Several other observers reiterated that it is wholly unacceptable that the applicant proposes to adopt a higher threshold for the northern end of the project, where existing levels are already over 70dB(A) L_{den} , and that the proposed north-bound diverge lane should be considered as a new section of road where the new design goal should be applied.

Mr McKeown (16/11/17) stated that the Environmental Noise Directive is the main EU instrument to identify noise pollution levels and to trigger the necessary action at both EU and Member State Level, and that the EU had still not set any noise limits under the Directive. He also stated that the 7th Environmental Action Programme has the goal of 'moving closer to the WHO recommended levels', which he believes is a clear recognition by the EU that the WHO Guidelines cannot be achieved in the short term. Mr. Flanagan SC stated that as there are no statutory limits in force, the Design Goals contained in the TII (formerly NRA) guidance documents are the appropriate standards to be applied. Mr. McKeown advised that the design criteria for operational noise in the scheme are based on the guidance provided in TII guidelines (2004 as updated by Good Practice Note of 2014), which in turn are based on the requirements of the EU Noise Directive. It was accepted that the traffic noise levels at the northern end of the project are unacceptably high and that it should be addressed.

The 2004 Guidelines introduced the concept of Design Goals for new National Road Schemes. It is stated (2.3.2 of the Guidelines) that prior to this, best practice in Ireland had involved a design standard of 68dB(A) $L_{10(18hour)}$, which was based on UK guidance. However, the NRA sought to introduce a design standard based on the use of L_{den} as was becoming the norm in the EU. In the conversion process, it is

stated, that the 60dB L_{den} design criterion proved (in practice) to be much more onerous than the standard that had previously been in place, 68dB(A) $L_{10(18hour)}$, but was nevertheless adopted as the design goal for all new road schemes. Mr. McKeown pointed out (Day 9, 28/11/17) that the Guidelines specify that the design goal is applicable to new road schemes only and hence the on-line and off-line sections of the scheme have been treated separately. The design goal of 60dB L_{den} applies to the off-line section of the proposed M28 only.

The on-line section is subject to Cork County Council Noise Action Plan 2013-2018 and the Agglomeration of Cork Noise Action Plan 2013-2018. These Action Plans aim to minimise the population exposed to values greater than 70dB L_{den} through mitigation measures. The Action Plans are reviewed on a regular basis and the thresholds/aims are revised. At present, the onset levels for assessment of noise mitigation for major roads in Cork County are 70dB L_{den} and 57dB L_{night} . Within the study area for the proposed M28 scheme, five High Priority Areas have been identified, i.e. at Kiltegan Park, Newlyn Vale, Mount Oval, South of Carr's Hill and Hilltown. Mr. McKeown advised that all properties identified in these Action Plans as High Priority Areas will achieve the 70dBA target.

Notwithstanding Mr. McKeown's evidence, several observers, including Domhnaill Mac Domhnaill, Frances Murphy, Pdraig O'Drisceoil and Marcia D'Alton, questioned the applicant's failure to apply the Design Goal to the on-line section of the route during questions on noise on Day 9, Day 11 and Day 12. There was a rigorous debate on the matter on Day 9. The observers questioned the fairness of the application of the 70dBA L_{den} threshold in the northern section, particularly given the proximity of the new diverge lane, (which some considered to be a new road), to such a high number of sensitive receptors. Mr. McKeown, in his response, referred to the guidance on this issue (which is contained within the Guidelines and quoted in the EIS (14.2.3.1) and his brief of evidence (4.1.6)). He pointed out that in existing situations, (such as the on-line section), mitigation is not required where noise levels will be reducing.

The Guidelines state that mitigation is deemed necessary whenever all of the following 3 conditions are satisfied:

- (a) The combined expected maximum traffic noise level (i.e. the relevant noise levels from the proposed scheme, together with other traffic in the vicinity), is greater than the design goal;
- (b) The relevant noise level is at least 1dB more than the expected traffic noise level without the proposed road scheme in place;
- (c) The contribution to the increase in the relevant noise level from the proposed road scheme is at least 1dB.

Thus, it was pointed out that whilst the design goal target of 60dB L_{den} may not be achievable for the northern section, the existing noise levels will continue to increase without the proposed road scheme in place, but would be reduced with the proposed scheme in place. Mr. McKeown emphasised that in the 'Do Nothing' Scenario, noise levels will increase along the entirety of the existing N28. He stated that this will exacerbate existing conditions in both the northern section of the route and in Shanbally, which is expected to become a High Priority Area in the absence of mitigation, in the next Action Plan. However, he stated that the proposed M28 scheme would result in considerable noise reduction and would take all of the High Priority Areas out of that category. He, therefore, concluded that the proposed development would have a very positive impact on the existing noise exposure and that the mitigation measures proposed would achieve the best solution possible.

In response to the issues raised regarding the inclusion of noise issues in the Constraints Study, Mr. Mc Keown confirmed that he prepared the noise and vibration section of the Route Selection Report and that this issue is discussed in Section 4.5.3 of the EIS. I would agree that Noise and Vibration Impacts form part of the objectives against which each of the options considered under the alternative route options (Chapter 4 of the EIS). In addition, Chapter 14 and Volume 5 include an analysis based on noise contour mapping as recommended in the Best Practice Guidance. However, the issue of noise and vibration is just one of a number of factors to be considered in choosing a route and the TII Guidance acknowledges this

(2.15), as “it is often the case that certain route options are eliminated from further consideration for non-acoustic reasons”.

It is noted that Mr. Bergin, (the Board’s Traffic Consultant), in his evaluation of alternative routes, considered that the final route option that was selected was, in his opinion, the option that best met the scheme objectives. In light of this, and taken together with the discussion at the oral hearing recounted above, in which it was established that the ‘Do Something’ Scenario would result in a much more favourable outcome in terms of noise exposure along the northern section (as well as the remainder of the proposed route), than the ‘Do Minimum’ Scenario, it is considered that the applicant has given adequate consideration to the impact of noise and vibration in the choice of the route. It is further considered that the approach adopted by the applicant to setting the design criteria for the proposed scheme has been comprehensive and appears to be in accordance with best available practice and guidance on this matter.

13.4.3 Adequacy of noise modelling

Cadna noise modelling software was used to predict the impact of the operational phase on the noise sensitive receptors (as set out in 14.3 of the EIS). The software was based on CRTN (Calculation of Road Traffic Noise) and included updated advice contained in the Good Practice Guide (TII). Some criticism had been made by observers that this methodology is outdated. Mr. McKeown’s response was that it is a long-established methodology which has been subject to several reviews and found to be valid and internationally robust. It is further stated that Cadna has been independently validated in accordance with the guidance set out in 6.4.2 of the TII Guidelines 2004 and sections 4.9-4.13 of the Good Practice guidelines.

Mr. McKeown stated that, in his opinion, the noise modelling carried out is conservative and that it overestimates future noise levels. He pointed out that the assumptions built into the models included a ‘High’ growth scenario, did not include existing screening provided by walls and vegetation and the absorptive effects from barriers was minimised. He also stated that whilst the reductions in noise levels

achieved by the introduction of low noise surfaces can be quite considerable, the model conservatively estimated reductions of just 2.5dB(A).

Many objectors questioned the ability of the modelling used to take into account matters such as the unique topography of the Mulcon Valley, the speed and nature of traffic, the type of traffic (especially the volume of HGVs), the effect of topography such as gradients etc. I note that these matters are addressed in 14.3 of the EIS. This states that the 3D base map (which covers the proposed route and a buffer of 300m) is augmented by the addition of the position of various buildings, receptor locations and distances. Roads are then imported into the model and the traffic count for each section is inserted. It is further stated that distance losses, ground attenuation and barrier/berm effects are applied as a result of the ground contour data (already inserted) and this allows the noise levels to be computed for each sensitive receptor. The EIS explains how the model can show how the noise radiates out from the source and is affected by intervening structures and terrain and can also calculate the effect of mitigating structures such as barriers and different road surfaces. Mr. McKeown advised that the modelling used provides for a very accurate terrain model which ensures that particular geographic features (e.g. Mulcon Valley) can be accurately represented. In response to Dr. O'Dea, he stated that the Cadna software models contours at 1m high levels and that every time the ground level changes by one metre on the contour map, the model assimilates it in 3D. Thus he was very confident that the model very accurately reflects the shape of the valley to the nearest metre.

Mr. McKeown addressed the matters relating to traffic volumes, flows, speeds, types etc. in 4.1.8 to 4.1.11 of his brief of evidence (16/11/17). It was stated that all calculations were based on the predicted traffic flows set out in Chapter 5 of the EIS, including variables such as the speed of the various roads and the percentage of HGVs. He pointed out that for this project, traffic was modelled on an hourly basis so that the noise model is based on hourly flows and percentage HGV traffic in accordance with TII Good Practice guidance (4.31). He confirmed that the traffic data included the port traffic and its projected growth. He stated that in his experience, the

robustness and reliability of the traffic modelling data was of an extremely high standard. Mr. McKeown stated that increasing the percentage of HGVs will increase the noise level at lower frequencies, but that road traffic noise does not contain low frequency components to any significant degree.

Mr. Harrington (M28 Steering Group, Day 8) did not accept the accuracy of the baseline traffic noise levels given that unemployment rates have reduced from 14.5% in 2012 to 6% currently, and that the port traffic has already started to move down to Ringaskiddy. However, Mr. McKeown considered that the traffic would have to double in volume in order to produce a 3dB increase in road noise and that this would be the lowest increase that would represent a perceptible change to the human ear. Thus, he stated that the modelled traffic noise levels would still be well within the tolerance levels. Mr. Harrington also asked about the inclusion in the modelling of specific noise events such as the sound of a HGV coming down the hill at Bloomfield with the 'pit pit' noise of shifting down gear, or the empty transport carrier, or the top of the truck. Mr. McKeown replied that he was confident that all such events have been included in the modelling. He explained that the European Noise Directive and the WHO require that noise from road traffic is aggregated on an annual basis and that the data from the CCC monitor for 2016 included all such individual noise events, over the course of a year, in the metrics. He further stated that CRTN has been tested by both the UK Transport Research Laboratory and by the TII/NRA for Irish conditions, and in each case, it was found that there was good agreement between the tested and the predicted.

Mr. McKeown advised that, as part of the validation of the noise model, the baseline data was compared with the predicted data and that the difference between measured and predicted levels was within the 5dB tolerance levels recommended in the guidelines. Table 14.5 of the EIS refers. This difference was the source of objection by some observers, including Dr. O'Dea, who also queried the exclusion of background noise from the model. Mr. McKeown replied that it was important to compare like with like and given that measured noise includes background noise/other noise sources, this had to be excluded to provide an accurate

comparison with the predicted levels. He also pointed out that measured results are based on short term spot samples, whereas the model predictions (Lden) are annual criteria. However, when the long-term baseline prediction data was compared with long term measured data from the continuous monitoring station maintained by Cork Co. Co. at the northern end of the project, the difference was just c. 1dB, which he considered to be an excellent agreement.

13.4.4 Baseline monitoring

Some observers questioned the location of monitors and considered coverage of the baseline monitoring to be inadequate. Councillor D'Alton expressed disappointment that the baseline monitoring was not carried out at the Noise Action Plan priority areas N40-8 and N28-2, nor at either the current or proposed locations for the Ringaskiddy national school. Councillor D'Alton also criticised the lack of information regarding the recording of weather conditions at the time of monitoring, such as wind speed, wind direction, air temperature and whether surfaces are wet or dry. Mr. McKeown pointed out that background noise level monitoring was carried out using a combination of three 24-hour measurement stations and 27 other stations for short-term monitoring, and it was in accordance with the procedures set out in the TII guidelines. This involved 6 short-term monitors around each 24-hour station, comprising 18 stations. Additional short-term monitoring was undertaken in October 2016 involving a further 9 monitoring locations. The locations of the monitors are shown on Fig. 14.3 and described in 14.6. In addition to this monitoring, Cork County Council operates a permanent monitor at the entrance to Mount Oval (since 2014). The data from this was converted to Lden for the year 2016 and compared with the predicted modelling results for the baseline year, and found to have a good level of agreement. I would agree that the extent and coverage of the monitoring undertaken exceed the requirements of the TII Guidelines.

The TII Guidelines (2014) state that it is generally accepted that noise measurements should not be taken when there is precipitation, a significant wind or when road surfaces are wet. (3.46). It is stated at 3.53 that meteorological conditions should be recorded, in particular, wind speed and direction. Mr. McKeown gave

evidence at the hearing that the monitoring was conducted in compliance with the procedures set out in the Guidelines and that the equipment used and the weather conditions during the survey are reported in 14.4.2 of the EIS. However, precise information regarding the meteorological conditions during the surveys has not been provided. Notwithstanding this, it is considered that if the monitoring was carried out in accordance with the procedures as laid down in the guidance, (and as stated in evidence by Mr. McKeown), then it is unlikely that the noise measurements would have been carried out under inappropriate conditions. I also note that specific weather events (such as wind and a hailstone shower) were recorded in the righthand column of Table 14.8. Given that the predicted (modelled) data compares well with the observed data from the permanent monitor at Mount Oval, there is no reason to suggest that the recordings were carried out under inappropriate meteorological conditions or in circumstances which would have distorted the results.

In response to questions from Dr. O'Dea regarding further potential distortions such as school holidays, (Day 7), Mr. McKeown advised that his instructions from CCC were that background monitoring had to be carried out outside of any period which might have a distorting effect on the results such as school holidays or other events. He confirmed that this was the case.

13.4.5 Adequacy of mitigation

Observers questioned the adequacy of the mitigation measures proposed and, in particular, sought further details regarding the nature, height and appearance of the proposed noise barriers and the extent, nature and likely effectiveness of the low noise surface. Some of the discussion on these topics, particularly geographically specific elements of the noise mitigation, (e.g. along particular stretches of the road/particular properties), crossed into the discussions on the landscape module and the CPO module. In the interests of efficiency, the impacts in relation to particular properties/stretches of the road will be discussed under those modules, and will not be discussed here. Please refer to the relevant sections (Landscape, CPO etc) of the report in respect of these matters.

As a general point, several objectors referred to a public consultation meeting at which it was asserted that Cork County Council had stated that mitigation in the form of noise barriers would be carried out “subject to budget”. The applicant confirmed at the hearing that this would not be the case and that mitigation commitments would be implemented as proposed or as conditioned by the Board, in the event that permission is granted.

Low noise surfaces and safety issues

The principal noise mitigation measure proposed is the provision of a low noise surface along the entire length of the proposed road. It is also proposed to apply this road surface to a number of roads in the vicinity of the M28, (Table 14,14 of EIS). It is assumed that this will provide a reduction in noise levels of at least 2.5dB(A), which Mr. McKeown believes is quite conservative. During a discussion on this matter (Day 8) he referred to noise reductions achieved at various national road locations across the country, where such road surfaces had been introduced, which ranged from 2.7dB(A) to 7.8dB(A), with most achieving 5.5-6.5dB(A) reductions. He stated that in his opinion, the quality of such road surfaces is improving all the time and the reductions achievable are likely to result in considerable noise mitigation, far beyond what is assumed in the EIS.

Mr. O’Drisceoill, (Day 9), questioned the existence of a low noise surface (LNS) on a stretch of road at the northern end of the N28. Mr. McKeown confirmed that there is an existing low noise surface between Bloomfield interchange and just to the north of the Rochestown Road, which was put in place as part of a recent upgrade of the N40. However, he stated that the quality of this road surface would be of a much lower standard than that which is now proposed. Mr. O’Drisceoill asked whether the noise reduction achieved by this existing LNS was factored into the baseline and the predictions in terms of noise reductions that would be achieved on this stretch of road. Mr. McKeown replied that it was included in the ‘Do Minimum’ scenario as far as Rochestown Road and that a new LNS will be laid along the entirety of the proposed road scheme. However, he reiterated that the development in performance

levels of the LNS products is proceeding at a very rapid rate and he was confident that the performance than can be achieved from the proposed new road surface would be far superior to that which is currently achieved at this location. He stated that if a low aggregate size is used in the new surface, a reduction of 5dB could easily be achieved, but the TII guidelines limit the amount of reduction that can be assumed in the modelling to 2-3dB.

Mr Harrington, (M28 Steering Group, Day 8), questioned the road safety element of using low noise surfaces on motorways, particularly in respect of steep gradients such as at the Bloomfield Interchange and where large volumes of HGVs are involved, with added complications of weaving between lanes and variable weather conditions, which might adversely affect the safety of the road surface. Mr Michael Noonan (RPS) confirmed that the application of a thin wearing course for noise attenuation purposes can achieve noise level reductions of at least 2.5dB compared with hot rolled dash. He further confirmed that the road surface would be 100% in compliance with the TII road safety standards for pavement. However, Mr. Harrington stated that in his experience as a road haulier, if there was no hard asphalt surface, there would be no grip, particularly in frosty or wet conditions, and that there is no escape route for an articulated truck coming down the hill with a smooth surface. He said that he wanted this statement to be put on the record. Mr. Noonan insisted that all approved road surfacing must be produced to the standards required by the TII which must meet the required safety standards for all road conditions. The Board should note, however, that in the event that there is a conflict between objectives to meet road safety standards and achieving noise level reductions, it is considered likely that the former would take precedence.

Noise barriers – height and types

Mr. McKeown gave further information on the detail of noise barriers in general in his brief of evidence (16/11/17). The height, length and location is specified in the EIS (14.6) and the location of the barriers is shown on Fig 14.9. Table 14.15 sets out each type of barrier according to its reference number, (e.g. AB01, RW02 etc), and specifies its height and length. He stated that 'Urban' barriers will generally be grey

in colour and textured and 'Rural' ones are more likely to be green or brown, and all barriers will be screened with landscaping where access and maintenance requirements permit. The resultant noise levels to be achieved following mitigation in 14.2.3.3. Mr. O'Drisceoil asked if the existing walls and barriers that exist behind Newlyn Vale and Wainsfort were factored into the modelling, in that they already achieve a noise reduction. Mr. McKeown replied that the quality of the existing sound barriers was very poor and their extent was patchy, with the 1-8m-2.0m high barriers which are in a very poor state of repair. He stated that the proposed 3m high barriers over a continuous stretch of 3km would provide a significant improvement in noise reduction. As a result, it was stated that the existing barriers were not included in the calculations as they currently provide little or no mitigation.

Mr. O'Drisceoil asked why higher barriers and novel barriers, (e.g. Special profile barriers), were not included in the mitigation proposals despite the proximity of houses to the road. Mr. McKeown responded that he did not specify barriers higher than 3m in general for aesthetic and amenity reasons, as most of these barriers would be at the bottom of a residential garden. He further stated that, in general, the additional height above 3m did not provide the equivalent level of additional acoustic benefits that would warrant such high barriers. It was stated that raising a barrier by 1m (to 4m) would provide an average of 0.6m dB(A) additional attenuation. He also stated that the provision of high barriers in such locations was often problematic in terms of maintenance of landscape screening, which would be required on both sides of the barrier. He stated that the effectiveness of special profile barriers has not been demonstrated in practice, but that some novel barriers were included (RW03, RW04, RW05 and AB04), which are located in the median area.

Mr. O'Drisceoil also asked why absorptive barriers were not proposed for the section of road behind Newlyn Vale and Wainsfort. Mr. McKeown advised that a limited number of absorptive barriers were modelled for the northern section of the route, including Absorption Category A3 (8-11dB), which it is stated is specified as a 'minimum' in the TII Specifications. However, he stated that the noise models presented in the EIS are based on absorption category A1 (<4dB), but that should

barriers with a greater absorption capacity be specified in the final detailed design, he submitted that even greater noise reductions would be achieved than predicted in the EIS. Mr. McKeown confirmed that, should the Board be minded to grant permission and to attach a condition(s) specifying the provision of absorptive barriers along a particular stretch of road, the effect would be to reduce predicted noise levels below those currently forecast in the EIS. It should be noted that on Day 12 of the oral hearing, a revised table of noise barriers was submitted which indicates that absorptive barriers will be provided in all locations where there are two opposing barriers. This will be discussed further below.

Some observers objected to the removal of trees as they were seen as a natural form of mitigation from the impacts of noise. Mr. McKeown advised that CRTN does not consider trees as part of the noise calculations and that research had shown that there is a need for a minimum width of trees of tens of metres in order for any noise mitigation effect to be present. He accepted, however, that they do provide some masking effect (e.g. rustling). On this basis, the impact of trees has not been considered in the modelling, but agreed that the presence of trees could have the effect of reducing the road traffic noise impacts further than that predicted in the EIS.

13.4.6 Construction noise and vibration

Mr. McKeown referred to the noise and vibration limits set out in Tables 14.1 and 14.4 in the EIS, and to the lower limits for noise in respect of some construction noise activity in Table 14.2. He reiterated that the contractor will be required to implement Best Practicable Means to reduce noise levels during construction, (including BS5228-1:2009+A1 and the London Good Practice Guide: Noise & Vibration Control for Demolition and Construction). Reduced construction noise limits are based on the background levels existing in specific areas. A detailed list of specific mitigation measures is set out at 14.6.1.1 of the EIS and includes site specific noise control plans and a noise and vibration monitoring programme to be implemented during the construction phase, which will assess compliance with the limits set out in the EIS. Where works need to be completed outside normal working hours, or where the specified limits are to be exceeded, permission will be required

in advance from the planning authority and will require a detailed noise control plan and follow up report which must address any complaints received and the measures taken to address such complaints.

Temporary noise barriers will be erected in the locations shown on Fig. 14.5 and Drg No. TM0010 and the existing walls and fences shown on Drg. No. TM0001 will be maintained to provide an acoustic screen for construction prior to installation of AB01 and RW01 barriers. Mr. O'Drisceoil questioned the adequacy of these barriers given that the existing barriers were described by Mr. McKeown as ineffective. However, Mr. McKeown stated that the existing barriers would be made good to provide temporary noise mitigation during construction and that the permanent barriers would be installed as quickly as possible.

A vibration monitoring plan will be conducted around the Castle Warren site and should the specified limits be breached, vibration control measures will be implemented to protect the structure. Blasting will be limited to the hours between 0900 and 1800 Mon-Fri and will not be permitted on weekends or bank holidays, and occupants of dwellings within 500m will be informed in advance of any blasting.

13.4.7 Other matters relating to noise

Councillor D'Alton (Day 12) queried a number of modelled results comparing the 'Do Minimum' to the 'Do Something' levels and raised concerns regarding the high levels predicted with mitigation. For example, at the southern end of the route, the levels for the Oratory in Ringaskiddy, Shanbally School and the sites of both the existing and proposed Lower Harbour school in Ringaskiddy were raised and at the northern end, Rowan Hill (Mount Oval) was raised. Similar questions were made by Dr. Mary O'Dea and by Fergal O'Dea in respect of Maryborough Hill and their mother's property, 'Massabielle', with particular reference to Tables 14.13 and 14.16 in the EIS. One of the issues which caused confusion was the presentation of amalgamated results (e.g. 63-69dB(A) for a specific area/group of houses). This issue was also raised by Harry Walsh on behalf of Mr. Jim Roynane of 'Martello', Old

Post Office Road. He stated that it was impossible to assess the impact on Mr. Roynane's property and no justification had been given for this approach.

Mr. McKeown explained that the reason for this was to enable the contour maps to be compiled, so that the different scenarios and models can be compared more readily. He emphasised that the important thing to note is that all properties within the 300m band will experience reduced noise levels in the 'Do Something' with mitigation and that there are more properties within the noise band in the 'Do Minimum' Scenario. He also pointed out that each of the situations raised by Councillor D'Alton (except for the oratory) are predicted to have noise exposure within the threshold limits for the particular area, i.e. in the southern/off-line section - 60dBLden as set out in the Deign Goal and in the northern/on-line section - 70dBLden (onset limit for the Cork NAP). The predicted limit for the oratory is 62dB and he explained that the reason for this was that it would suffer from additional noise from the existing N28 and from port traffic. Mr McKeown confirmed that the predicted impact had included an assessment of the cumulative impact on the oratory.

With regard to the proposed site for the Ringaskiddy school and the cemetery directly adjacent to the site, Mr. McKeown advised that the cemetery is not classified as a noise sensitive location. The school site (Plot 212 in CPO schedule) is predicted to have a level of 60dBLden (Do Something with mitigation), which he considered to be appropriate as it is only relevant during the day. This will be achieved by means of the application of a proposed low noise surface (for 813m), and by screening from Barrier AB27. Mr Flanagan pointed out that the school site is likely to be larger than that shown on the zoning maps given that the IDA had offered additional land for these purposes during the course of the oral hearing. Mr. McKeown considered that given that the additional land would be further removed from the proposed alignment, it is likely that 55dB could be achieved on the site. However, he did not think that further mitigation would be necessary here as the levels predicted would be within the threshold limits.

St. Patrick's Church was the subject of some discussion regarding the impact of noise during both the construction and operation phases. In terms of operation, Mr. McKeown pointed out that the church is located at the northern end of the route and thus, the 70dB Lden threshold set out in the NAP is applied. He noted that the noise levels for this location would reduce from 65dB Lden (Do Minimum) to 61dB Lden (Do Something with mitigation). Thus, he considered that there would be a slight positive impact significance.

I note that the noise levels at Old Post Office Road are predicted to rise from 51-53dB Lden in the baseline year to 64-65dB Lden Day and 50-51 dB Lden Night in the absence of mitigation. However, with mitigation, these levels would rise to 52-58dB (Day) and 39-45dB (Night) respectively. Thus the noise levels at Mr. Roynane's property (Martello) would be 58dB Lden at worst, which would still meet the Design Goal, although there would be a significant increase in noise levels compared to existing conditions.

Tom Halley (McCutcheon Halley) representing RSM lands and the Estate of Bartholomew Cooney made a presentation on Day 8 of the hearing regarding adverse impacts on future development areas. These included lands owned by RSM (Maryborough Ridge) and lands owned by Bartholomew Cooney Estate, (lands at Shannonpark south of the mainline). The objections to the CPO will be discussed further under the CPO module. However, as a general point of principle, Mr McKeown advised that in preparing the EIS, he had applied the TII Guidelines and Noise Action objectives and did not consider mitigation that might be required for 'future development'. He said that the approach was to include planning permissions granted on the date that the EIS was published, as it is not possible to design mitigation for development that is not there. I note that the TII Guidelines (2004) at section 2.3.1, state "Following confirmation of the EIS, the issue of noise mitigation for new receptors is a matter for the Planning Authority within the planning legislation". Mr. Flanagan stated that where it is brought to the applicant's attention that there are extant permissions, his client would be happy to look at these in respect of any mitigation measures needed.

Noise Barrier AB12 extends from the Maryborough hill flyover to Chainage 2000 approx. but does not continue as far as the Carr's Hill interchange itself, or beyond it. Mr. Halley asserted that notwithstanding the fact that planning permission had been granted for three developments (with extensions) over the past 10 years for 21 units (07/11814), 57 units (PL04.234318) and 198 units (16/7271), respectively, noise mitigation had not been included for these developments. He also stated that the approach taken here regarding zoned lands for which permission had not yet been sought/obtained, differed from the approach taken at Shannonpark, where mitigation was included. He was of the opinion that the additional length of noise barrier required was only c.1000m for the entire landholding and that on the basis that the development of these lands is progressing, the mitigation measures should be put in place.

Mr. McKeown (RPS) advised that the permissions for the 21 units and the 57 units had been taken into account, and that as the 198 units had been granted after the publication of the EIS, this development could also be included. However, he remained of the opinion that the mitigation should not be provided for the zoned lands as it was not possible to determine the layout of the buildings.

Although I would concur with Mr. McKeown in terms of mitigation for undeveloped lands generally, I am of the opinion that the RSM lands at Maryborough Ridge in question are part of a phased development for housing on zoned and serviced lands within the built-up area, which will ultimately deliver up to 500 units. It is therefore reasonable to assume that the development of the RSM zoned lands for housing will proceed in due course, and may even precede the development of the M28, if granted. I note that if Noise Barrier AB12 is extended to mitigate the 198 unit development, there would be a short section of road without a noise barrier between this and the start of AB14. It is considered, therefore, that in the interests of minimising the impacts on the future residents of these lands and of the proper planning and sustainable development of the area, a condition requiring the extension of AB12 for a further 1000m to the south should be attached to any approval by the Board.

In respect of the lands forming part of the Estate of Bartholomew Cooney (Plot 146), the issue regarding the extent of noise mitigation here differs from Maryborough Ridge, as there is no extant planning permission and although it forms part of a Strategic Land Reserve, this is a rural area and the landholding is in agricultural use.

A written submission (John Brady, Marian Terrace, Shanbally) objected to the length of AB25. This barrier is located on the northern side of the proposed route through Shanbally, opposite AB24, and is shorter than AB24 by approx. 100m. It is noted that the houses at Marian Terrace extend further to the west than AB25 and the adequacy of mitigation here is, therefore, in question. It is considered, therefore that AB25 should be extended further to the west by c. 100m, to match the length of AB24 to the south.

13.4.8 Residual impacts

The residual impacts identified in the EIS (14.7) are that the vast majority of NSLs (of which 2,983 were considered in the noise modelling), will either have reduced noise levels or be in line with the TII Design Goal of 60dB Lden (off-line section) or the Cork Noise Plans target of 70dB Lden (on-line section). As can be seen from Table 14.17, in the Design Year, the vast majority of properties, 2,290, will experience Lden levels below the 60dB Lden threshold, a further 685 will be below the 70dB threshold and there will be just 7 properties above the 70dB Lden threshold. It is pointed out that the number of properties within the band 70-75dB Lden would reduce from 23 to 7 and that they are all located outside the 300m band, where it is stated that the noise level would not be attributable to the M28 traffic. Although the residual noise level will remain above the TII Design Goal at the northern end, it will meet the Cork NAP targets in the Design Year and 243 properties will experience a reduction in noise levels during the day and 300 will experience a reduction at night. However, a number of properties will experience an increase in noise levels, but these will remain within the relevant threshold designated for the area.

13.4.9 Conclusions noise and vibration

I consider that the information and analysis of the likely impact of noise contained in the EIS, including the baseline monitoring and noise modelling, is robust and that the stated conclusion that the operation of the road subject to the stated mitigation measures would generally result in the noise level being within the Design Goal for the off-line (southern section) of the proposed route and within the Cork Noise Action Plan target for the on-line (northern section) of the proposed route. I would also accept Mr. McKeown's submission that the predictions are likely to prove to be conservative and that the traffic model data on which the modelling was based is robust. It is clear from the analysis that should the road project not go ahead, the noise levels for most of the existing N28 route will continue to increase. Thus, whilst the noise levels at the northern end are unacceptably high, they will reduce for all properties within the 300m band and the number of properties within the higher band will also decrease. The increase in noise levels for a small number of properties is also inevitable given the rural nature of much of the off-line section of the route.

The predicted noise levels for the northern section of the project are higher than the 60dB Lden threshold and the applicant has stated that it would not be practicable to reduce these levels to achieve the TII Design Goal in a sustainable manner at all locations. I note, however, that both Mr. McKeown and Mr. Noonan were confident that the application of low noise surfaces would deliver significantly greater benefits than predicted in the EIS. I would accept that there may be the potential for some road safety issues with low noise surfaces in the vicinity of Bloomfield interchange, due to the tight curve and steep gradient at this location. However, Mr. McKeown indicated that it was likely that additional benefits could also be achieved by the specification of absorptive barriers in place of the reflective type of barriers.

On Day 12 of the Hearing (Questions on Landscaping Module), the applicant advised that it is now proposed to provide absorptive barriers in any location where there are noise barriers on both sides of the road. This is consistent with the TII Good Practice Guide (B52-B55), which states that a noise barrier which protects a

Noise Sensitive Receptor on one side of the road can also reflect noise back across the road and can result in a serious diminution of the noise reducing effects of the barrier. If two barriers face each other, they can result in a degradation of up to 6dB due to multiple reflections. This problem, it is stated, can be improved by covering the noise barriers with sound absorbent material. Mr. Mc Keown provided a revised schedule indicating the location and type of barriers proposed over the entire route. This is included in the Schedule of Commitments (Item 13 and Table 14.15). He advised that the revised specification of the barriers, together with additional measures for ongoing maintenance and avoidance of leaks/gaps in the structures, and the provision of low noise surfaces on the entire length of the mainline, the additional locations set out in Table 14.14 of the EIS and a further stretch of road near Shannonpark as set out in Item 8 (Table 14.14) of the Schedule of Commitments.

It is considered that the revised schedule, which provides for 23 absorptive type barriers, is likely to result in further reductions in noise levels, particularly in the vicinity of Bloomfield interchange and where existing houses are in very close proximity to the proposed upgrade. These measures, together with the additional measures set out in the Schedule of Commitments outlined above, would facilitate the reduction of noise levels during the operational stage (following mitigation) to below the thresholds set out in the Design Standards in place for both the northern and southern parts of the route. The proposed development would result in a temporary adverse impact on noise and vibration during the construction phase, which can be adequately mitigated as proposed. I would accept, therefore, that the proposed development can be constructed and operated without significant adverse impacts on noise and vibration.

14 Air and climate

14.1 Environmental Impact Statement

Chapter 13 of the EIS addresses the issue of air quality and climate. Site specific baseline monitoring was carried out along the routes (existing and proposed), which

was supplemented by air quality data from the EPA National Air Quality Monitoring Programme, (Air Quality Zone B : Greater Cork Area). Baseline climate data was taken from Met Eireann 30 year averages. Screening and air dispersion models were then prepared to predict the future air quality trends as a result of traffic variations. An estimation of the GHG emissions from construction and operational activities was also included.

Modelling was carried out for the 'Do Minimum' and 'Do Something' scenarios for the opening and design years, 2020 and 2035 respectively. The Air Quality Exposure index was calculated in accordance with NRA guidelines. This provides information on the overall change in exposure to the general public as a result of the proposed road project. The findings were that there would be an overall reduction in exposure to pollution at a regional level for both the on-line and the off-line sections of the proposed road (Table 13.19). Modelling of Local Impacts was also carried out for seven segments of the route. Section 1 related to the segment between Bloomfield and Carr's Hill and included analysis of 9 different locations within this segment. The results are set out in Table 13.20, which show that they are well within the statutory limits and WHO guidelines. The same findings were made for the other segments of the route including Shanbally and Ringaskiddy villages.

14.2 Issues raised by observers during the course of the application and during the oral hearing regarding air and climate

1. Air Quality general - EPA State of Ireland Environment 2016 states that Ireland is close to the EU limits and that although emissions have reduced since 1970s, the anticipated reductions in Nitrous oxide emissions due to improved car technology has not been realised. EPA says Nitrous Oxide emissions are well above the limit specified in the EU Directive on National Emissions Ceilings for the majority of the Transport sector.
2. Location of Background monitoring sites – Indaver site is at the end of a wind-swept peninsula and Heatherton Park is at the back of a housing estate. Neither are representative of the M28 between Bloomfield and Carr's Hill. The mobile monitoring unit was sited at Monkstown, as the N28 was

considered unsafe, but it still stated that PM₁₀ was at a safe level for human health in 2007/2008 and there has been no monitoring since.

3. Adequacy of Monitoring Inputs – no information regarding meteorological conditions, traffic speed, traffic flows as required by NRA guidelines. How can the model be verified?
4. Frequency of Baseline monitoring inadequate – Baseline ambient monitoring was carried out for just one month, but three months are recommended.
5. Parameters monitored inadequate – The only parameters monitored were NO₂, PM₁₀ and VOCs, and excluded rest of parameters. Baseline NO₂ is inadequate as insufficient readings (A9) and PM₁₀ was measured at only one location (A15). Baseline monitoring is not comprehensive enough and no 3D modelling undertaken.
6. Baseline monitoring of particulate matter inadequate – Particulate matter is one of the most serious pollutants as it penetrates the lungs, yet PM₁₀ was monitored at only one site and PM_{2.5} was not monitored at all. PM_{2.5} is more dangerous than PM₁₀ as the particles are smaller and are carried more easily into the lungs and cardiovascular system.
7. Kerbside monitoring location inappropriate – NO₂ levels at A10 (Newlyn Vale) are a higher level (25.6-31.6 µg/m³), similar to that at Shannonpark (A6), but EIS states not representative of the residential area, as the monitor was placed at a kerbside at the entrance to the estate. However, levels are likely to be even higher, closer to the M28, which is extremely concerning.
8. Ecological receptors – EPA readings at South Link Road are continuously above annual average limits for vegetation. As 'Do Something' will result in further increases in NO_x, this will further compromise vegetation in the sensitive ecological areas.
9. Air quality modelling inadequate – unclear if increase in HGVs from the Port of Cork, or proportion of HGVs in tailbacks in Mulcon Valley, was included in air quality modelling. The national averages for emissions are in no way comparable to port traffic emissions as there will be more trucks, more diesel and more particulates.
10. Topography of Mulcon Valley - The modelling does not take account of the topography of the Mulcon Valley which captures and distributes particulate matter. Increased exposure at this location is due to its close proximity to

dwellings, to the predicted decrease in speed associated with proposed traffic calming, and to the significant noxious emissions as trucks descend into the valley due to idling engines.

11. Predicted impacts operation not credible – The EIS predicts (Table 13.19) an overall reduction in nitrogen oxides and PM₁₀ if the proposed road is developed. This is perplexing as there will be a huge increase in traffic volumes, especially HGVs, which will result in increased emissions for PM₁₀ and NO_x. The overall reduction in exposure is due to a net reduction in the number of properties being exposed. However, this relates to just some areas, such as Shanbally and Ringaskiddy, and is not representative of other areas such as Rochestown and Maryborough Hill.
12. Predicted reduction in emissions unrealistic – the predicted reduction in emissions is based on a predicted reduction in congestion and a general increase in traffic speed. This is an extraordinary conclusion as 80% of traffic from the port will head east through a single lane over Bloomfield Interchange, which will have to give rise to increased congestion on both the M28 and on local access roads as commuters try to find alternative routes.
13. Air pollution predictions dependent on traffic modelling – there is no faith in the traffic modelling predictions as the NRA had previously predicted an increase in the traffic volumes on the N28 from AADT of 11,000 to 16,500 by 2019, yet the current AADT is between 25,000 and 28,000. This undermines credibility of air quality predictions.
14. Local impact assessment inadequate – Data for Rochestown and Maryborough Hill have been omitted from Table 13.20, (local impact data for days with >50µg/m³ NO₂, PM₁₀ and PM_{2.5}). There is no explanation and it could mean that the magnitude of change was far greater than indicated in the EIS. There is evidence that NO₂ levels are on the rise and that levels measured at Rochestown Road and Rochestown Rise have risen over four months (Oct 2016-Feb 2017) by 22% and 5% respectively. The predicted increase in traffic levels is likely to increase NO₂ to dangerous levels over a short time period. Rochestown Road has highest levels of NO₂ and Volatile Organic Compounds (A 9, A10, A11).
15. Increase in particulates – PM₁₀ and PM_{2.5} levels at Mount Oval (A15) indicate that with the increase in traffic levels predicted, these will soon

exceed WHO Guidelines. There is no safe level of particulates, especially PM_{2.5}.

16. Cumulative impacts - It is unclear if the cumulative effect of development has been taken into account, e.g. 297 houses planned for Shannonpark (which is zoned for 1200 units) and 600 houses planned at Castletreasure, which will result in significant traffic congestion on Maryborough Hill as cars queue to access Carr's Hill.
17. Mitigation and monitoring operational – mitigation is not proposed due to the predicted reduction in exposure. However, it is further noted that there is no planned monitoring of the operational phase in the EIS.
18. Air quality – construction – the scale of the construction works is such that the properties in Rochestown and Maryborough Hill will be affected by dust and will suffer adverse effects from dust nuisance. Dust monitoring will be reported on a monthly basis. However, individual incidences of unacceptably high concentrations could be masked and residents will have to tolerate unacceptable levels of dust.

14.3 Oral hearing

Issues relating to air and climate were raised during the oral hearing on Days 1, 2, 7, 8, 9 and 12. The Applicant presented its case on Day 7 (16/11/17), which included a summary of the key findings of the EIS, clarification of matters/errata, a list of observers who had raised issues relating to air and climate in the written submissions to the Board, and a response to the issues raised. Presentations were made by third party observers, as well as questions, on the Air and Climate Module on Days 7, 8, 9 and 12.

Presentations were made by the following observers at the oral hearing:

- Dr. Mary O'Dea, Maryborough Hill
- Kevin Hanley, Raffeen Bridge
- Marguerite Gleeson, Rowan Hill
- Frances Murphy, Lissadell

- Councillor Marcia D'Alton (Cork Co. Co.)

Issues relating to air and climate were also raised by the following observers:

Jackie O'Donovan	Maureen O'Byrne
Dermot O'Donovan	Anne Mason
Ms Roset	Paul Kelleher
Ann O'Dea	Patrick Brennan

There was no representative of any relevant prescribed body present.

In attendance for the applicant were:

- Mr. Paul Chadwick (RPS Air and Climate Chapter)
- Mr. Deering (Health Study) (Day 7)
- Mr Michael Noonan (RPS Road Project Design and Traffic and Transport)
- Mr. Dermot Flanagan S.C.

14.4 Assessment of air and climate

14.4.1 Baseline monitoring

Mr. Chadwick, in his brief of evidence (16/11/17), responded to the observations regarding the scope and duration of the baseline air quality surveys, by referring to the information set out in Section 13.3.2 of the EIS. Baseline monitoring was carried out at 14 different locations (Table 13.1 and Fig. 13.1) for Nitrogen dioxide and Volatile Organic Compounds. PM₁₀ was measured at a further location (A15, Mount Oval), on a continuous basis for one month (March-April). It is stated that the kerbside location of monitors gives the worst case scenario as the levels would be considerably better at distances of >50m from the edge of the road.

Data was also used from the EPA Monitoring Stations at South Link Road and Heatherton Park, as a representative background for NO_x, PM₁₀ and PM_{2.5}. In establishing the baseline, reference was also made to the Ringaskiddy Resource Recovery Centre facility (Aug 2014-July 2015). The baseline air quality results (observed) were found to be similar to those obtained from the EPA continuous

monitoring stations. All annual averages were found to be within the statutory limits for the protection of human health and the WHO guidelines for air quality. It is stated that the Air Quality Standards Regulations (SI 180 of 2011) are based on the EU Directive on ambient air quality, which specify limits for a number of different parameters for the protection of human health and ecologically sensitive receptors. These are set out in Table 13.2 of the EIS. It should be noted that the WHO Guidelines (Table 13.6) differ in respect of some of the limits from the EU statutory limits (Table 13.2), particularly in respect of the Annual Levels for both PM₁₀ (20µg/m³ compared with 40µg/m³) and PM_{2.5} (10µg/m³ compared with 20µg/m³), respectively.

However, the Board should note that baseline data for PM_{2.5} was not included in the EIS. This data was estimated and shown in Tables 13.20-13.26 inclusive. Mr. Chadwick explained the absence of PM_{2.5} data (Day 8) as follows:

“Monitoring for PM_{2.5} was undertaken on the proposed route in early 2017 but the results were unavailable for publication in the EIS. These results are now presented in the following table (Table 1) for location A15. Location A15 is located at a boundary wall adjacent to the southbound carriageway of the existing N28 within the Mulcon Valley.”

Mr Chadwick explained that the reason for the omission of the PM_{2.5} results from the EIS was due to the fact that the monitor for this parameter, when checked at the end of the monitoring period, was found to be faulty. It was, therefore, decided to carry out further monitoring for PM_{2.5} in May and June. The results indicate that 24-hour averages for the period of background PM_{2.5} levels were found to be within the WHO 24-hour guidelines for the protection of human health (25µg/m³). However, the Period Average was 11µg/m³, which is above the WHO annual guidance of 10µg/m³, but is within the Statutory Air Quality Limits for the Protection of Human Health of 20µg/m³.

Mr. Chadwick pointed out that the period average levels at A15 are higher than the levels measured at both Heatherton Park (suburban location in South Douglas) and

at Ringaskiddy, but were similar to those at South Link Road (adjacent to N40 and N27). He advised that the likely explanation for this was that A15, adjacent to the N28, would be a more similar location to the South Link Road than either a suburban or a rural location. He advised that as the results for March/April were estimated for the modelling exercise, he expected that now that they have more specific data for background PM_{2.5}, there would also be a revised output for PM_{2.5}. He acknowledged that for all receptors, the predicted levels for PM_{2.5} would increase from the estimated 7-8µg/m³ (as shown in Table 13.20) to 11-12µg/m³ for all scenarios, based on the updated monitoring information. Notwithstanding this, however, he was confident that the trends identified in the EIS would be unaltered, as the net change between the Do Minimum and Do Something Scenarios would not change and that the proposed scheme would have a negligible effect on air quality in the area.

When questioned by Dr. O'Dea (M28 Steering Group on Day 8), and by Marguerite Gleeson (Day 9), regarding the decision to rely on just a single location for the PM monitoring, (A15), Mr Chadwick advised that the monitoring process is more complex than for measuring other parameters due to the nature of the equipment, need for access to lands and a power supply etc. However, for this project, the applicant also had the benefit of EPA monitoring for 365 days of the year. It was pointed out, however, that the EPA does not carry out any monitoring for PM_{2.5} for a traffic based location in the Cork Area, (only for the suburban location at Heatherton Park), hence the need to obtain baseline data for the N28. The precise location of the monitor at A15 was also queried by a number of observers. Mr. Chadwick advised that it was sited immediately adjacent to the N28 at the Cork Co. Co. Marchland office and was placed above the stone wall so that it measured ambient air and was not blocked by the wall.

Ms. Gleeson stated that she had contacted the Met office and was informed that the rainfall during the period of the measurement was 172% of the mean average for the year and she believed that this contributed to the low readings. However, Mr. Chadwick advised that the observed results were compared with the annualised results and that there were no discrepancies. He was confident that the information

obtained from this monitor was representative of the conditions in the Mulcon Valley. In response to further questions on this issue, Mr. Chadwick advised that the annual average results for PM₁₀ from the South Link Road for the last 3 years ranged from 17-19µg/m³, which compares very well to the average of 19µg/m³ for the monitoring station at A15. Thus, the implication is that it is a good indicator and validates the results from the monitoring.

Councillor D'Alton criticised the duration of the short-term monitoring as the NRA Guidance is that it should be conducted for a minimum of 3 months, and at the very least, one month. She considered that the one-month duration was inadequate from which to extrapolate the results over a year, particularly as there would be seasonal variations. Mr Chadwick agreed that the duration equated to the recommended minimum and that there would be seasonal variations. However, he stated that the greatest source of PM_{2.5} was from the burning of domestic fuel and that given that the monitoring for this parameter was carried out in May/June, the results would be likely to be lower than for the winter months. On this basis, he accepted that if the results obtained at this location were annualised, the levels would probably be closer to 13µg/m³ than 11µg/m³. Notwithstanding this, however, he did not accept that this would undermine credibility in the model as the observed data compares well with the data obtained from the permanent EPA stations in Cork, and are consistent with the results obtained at other stations in the country such as the EPA station at the junction of the M3 and the M50. He also pointed out that the results are still well within the EU statutory limits for air quality.

It is considered that the geographical scope of the monitors, the parameters monitored and the duration of the monitoring is in accordance with the guidance contained in the NRA Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (2011). However, the guidance states that wherever possible, use should be made of existing air quality data such as that collected as part of a national or local government programme or in relation to other development proposals (Appendix 2, A2.2). The applicant has had the benefit of data from two permanent, continuous monitors operated by the EPA, which the guidance

refers to as providing assurance that adequate procedures have been applied. Reference has also been made to other data collected in respect of other projects in the area. It has been established that the observed data obtained from the short-term monitor (A15) is consistent with the data from the EPA continuous monitors and that the annualised results are within the EU statutory limits for the protection of human health, with no exceedances of the daily limit for PM₁₀, (there is no daily limit for PM_{2.5}). It is considered, therefore, that the baseline monitoring undertaken by the applicant is adequate and is generally in accordance with best practice as set out in the guidelines.

14.4.2 Air Quality modelling

The air quality modelling was based on the traffic model outcomes, which utilised traffic flow data, fractions of HGVs and traffic speed. It is stated in the EIS that the current fraction of HGVs and the predicted increase in HGV fraction were accounted for by the traffic predictions (13.2.4), and that it included the predicted increase in HGVs from the Port of Cork and committed development. It is further stated that the HGV emissions for the northern section of the route have been modified to account for the gradient at this location. Mr Chadwick also addressed this issue at 3.4 of his brief of evidence and, in particular, the query regarding a predicted increase in traffic volumes in the 'Do Something' Scenario without a corresponding increase in traffic emissions. He explained that the level of road traffic emissions depends on 3 main criteria, namely the volume of traffic, the fraction of HGVs and the average speed of those vehicles. He stated that for the section of road between Carr's Hill and Rochestown Road, the increase in the volume of traffic and in the HGV fraction would be largely offset by the increase in average speed as a result of the reduced congestion. This in turn, he stated, would result in a decrease in direct emissions and as a result, there would be a negligible net change in pollution levels in this area.

Mr Chadwick was questioned by Dr. O'Dea (Day 8) regarding the comprehensiveness of the modelling for the northern end of the route, which is the most densely populated area and to what extent the gradient had been factored into the analysis. Mr. Chadwick's brief of evidence stated that in order to simulate

particulate emissions from HGVs when operating in lower gears up an incline, all HGV traffic in the southbound lane of the existing and proposed M28 between Bloomfield and Carr's Hill has been corrected to account for the incline. He advised that the correction was carried out in accordance with LAQM Technical Guidance (2016). In response to a question from Dr. O'Dea, he stated that an incline of 4% was assumed in the modelling. He also advised the hearing that because of the density of development and the gradient of the road at this location, additional and more refined modelling was carried out for this section of the route, (using a CalCqhc model as opposed to a DMRB model for the rest of the route), and that the results are shown in Table 13.20 of the EIS. He explained that this was the reason that the information is presented in a different form for Section 1 and that it did not include days > 50µg/m³. However, he submitted that had the no. of days for which the limits were exceeded in this section (Bloomfield to Carr's Hill) been presented in the EIS, it would have indicated that the statutory limits would have been exceeded for no more than 1-2 days, which is well within the tolerance levels.

Councillor D'Alton (Day 12) raised the issue of the increase in traffic congestion in the morning peak hour north of Rochestown Road, as indicated in Mr. Noonan's evidence (Day 2). This evidence related to the increase in congestion at this location for one hour during the morning peak, 8.00-9.00, which Mr. Noonan had explained was due to the fact that traffic would get through the route quicker to arrive at this point in the network. She queried whether this would mean that the particulates emissions would average out to a higher average over the course of the day. Mr. Chadwick replied that the air modelling looked at daily averages and that whilst there is an hourly limit for Nitrogen Dioxide, there is no such limit specified for particulates. He advised that the hourly limit for NO₂ is 200µg/m³, but that the regulations state that provided that the annual average for NO₂ does not exceed 60µg/m³, then there is no requirement to measure the hourly average. He advised that this situation does not arise in this case. He also stated that the statutory limits for particulates are 24-hour limits and that there are no breaches of these limits.

14.4.3 Potential operational impacts air quality

The EIS states that the air quality assessment related to exposure of the population to concentrations of pollutants at properties within 50m of the centreline of each alignment (N28 and M28). There were 186 residential properties within the 50m zone. The EIS predicts that there will be a net reduction in the number of properties exposed to air pollution from road traffic. The EIS (13.4.2) explained this as being a direct result of the alignment moving away from villages such as Shanbally and Ringaskiddy for the off-line section and the reduction in congestion and general increase in traffic speeds in relation to the on-line section.

In response to questioning on the issue of the reliance of the Air Quality model on the predictions of the traffic model, Mr. Chadwick pointed out that in the Do Minimum Scenario, there will be an increase in congestion and hence a reduction in air quality. However, as the traffic modelling predicts a reduction in traffic congestion in the Do Something scenario, (i.e. increased speed of traffic, despite increase in volume), he was satisfied that there would be no net increase (or decrease) in air quality. Ms. D'Alton referred to some PM₁₀ readings from the EPA monitoring station for 2013, which she claimed showed an increase from 5.14µg/m³ to 17.61µg/m³ and that this corresponded with a 10% increase in traffic. However, Mr Chadwick questioned the veracity of this information on that basis that the annual averages from South Link Road, and across the country, have been very stable, ranging from 17 to 19 µg/m³.

Mr. Chadwick stated that the general trend is that NO₂ and Particulate emissions are coming down, despite the increase in car ownership, which is due to the newer technology used in the manufacture of vehicles. He also pointed to Table 13.8 of the EIS which shows the improvement in emissions from passenger cars manufactured between 1992 and 2014, (94% reduction) which is likely to continue, thereby further reducing emissions per vehicle going forward. He advised that there is a similar set of data available for HGVs. He stated that as manufacturers of cars and trucks are bound by the new regulations, emissions are likely to continue to reduce, but that this factor was not relied upon in the modelling.

Councillor D'Alton (Day 12) also raised questions regarding the impact on the local road network, such as Garryduff Road and Ballinrea Road, and regarding the predicted increase in the number of trucks travelling through Ringaskiddy and Shanbally villages in the Do Something Scenario. Mr. Chadwick replied that a number of local roads will experience an increase in traffic, but those which are likely to experience more than a 5% increase in AADT have been re-examined by him. It was clarified that this information was not presented in the EIS but was based on sensitivity analysis following publication of the EIS. He was satisfied that there would be a negligible impact. This seems reasonable.

Mr. Noonan responded to the question regarding the predicted increase in the number of trucks using the N28, (in the absence of Mr. Harris, who this fact had been attributed to). Ms. D'Alton had stated that there would be an increase in the no. of trucks from 365 to 429 daily, and queried how this would not result in a significant increase in air pollution in these villages. Mr. Noonan advised that the model assumed that in the long term, the port traffic would use the eastern entrance, but that in the short-medium term, the western access would continue to be used, as Phase 3 would not be implemented until after the road project was in place. Mr. Chadwick confirmed that the air quality model was based on the prediction that there would be a reduction in vehicles travelling through these villages in the design year. Mr. Noonan reaffirmed this view but pointed to the anomaly that the Port has two entrances available to it.

I note from a review of the permission granted by the Board, (PA0035 as amended by PM0010), that at the time the decision was made, it was unclear where the proposed M28 would terminate, either at the western port access or to the east (as now proposed). The permission for the port included a new entrance at the western access point, at the junction of the N28 and the R613, which would be signalised. Thus, port traffic is likely to enter/leave the M28 either at Barnahely, if using the western entrance, or at Ringaskiddy East (if using the eastern access point). Either way, the need for port traffic to travel through Ringaskiddy or Shanbally villages is minimised. On further analysis of the figures provided by Councillor D'Alton, it would

appear that the figure of 365 relates to a 2014 survey, whereas the figure of 429 is based on 2035 predictions, should the Scheme go ahead. In this regard, I would refer the Board to Mr. Bergin's Report (Section 5.4) where the evaluation of the options for the Shanbally Interchange looked at the differences in traffic flows between the Do Minimum and Do Something scenarios, for the Design Year (2035). It is noted that the analysis indicates a reduction in HCV traffic from 714 in the Do Minimum to 439 in the Do Something. These predictions would appear to be consistent with the traffic management proposals for the port area.

14.4.4 Potential construction impacts

During the construction phase, there is a risk of an adverse impact from dust on those properties within 50 metres of the construction site. The EIS has identified 186 properties that would be likely to experience a short term slight adverse impact and a series of best practice mitigation measures are presented in Section 13.5.1 and 19.1.9 of the EIS to mitigate this impact. In addition, greenhouse gas emissions generated as a result of the construction phase are estimated at 54,509 tonnes of CO₂. It is stated that this includes the use of materials, transport of materials/staff and plant emissions. This was presented by Mr. Chadwick as a permanent slight adverse impact and the benefit of using Raffeen Quarry was also pointed out in terms of reduction of transport distances, which would mitigate emissions.

Some observers (Day 9) questioned Mr. Noonan and Mr. Chadwick on the issue of the control of dust and emissions from plant/construction vehicles during the construction phase. Mr. Noonan advised that the applicant would have to enter into a binding contract with the main construction contractor, who in turn would appoint an Environmental Manager as well as a Liaison Officer, who would form part of a larger team that would supervise the construction works. He advised that both landowners and residents could utilise these personnel as 'go to people'. He also stated that the subcontractors would be obliged to comply with the terms of the contract. In response to a query from Patrick Brennan regarding stationary plant (e.g. diggers) being started up in the morning and being left to run all day, which have been attributed to a major contribution to air pollution in UK studies, Mr. Chadwick advised

that such machines are heavily controlled by EU Regulations on Emissions to Air. Mr. Barumi (author of Health Study for applicant) also confirmed that in his opinion, there would not be sufficient concentration of pollutants to result in a pollution problem, and that mitigation measures during construction would be employed to prevent any such nuisance from occurring.

14.4.5 Mitigation and monitoring

As the conclusions of the EIS are that the net change between the Do Minimum and Do Something Scenarios would not change and that the proposed scheme would have a negligible effect on air quality in the area, there are no proposed mitigation measures for air quality during the operation phase. However, mitigation measures are proposed for the construction phase in order to control the temporary slight adverse impact from dust and emissions from plant and machinery on site. These mitigation measures and good working practices are set out in Section 13.5.1 and 19.1.9 of the EIS, as amended by the Schedule of Commitments submitted by the applicant at the end of the oral hearing on 1st December 2017. In addition, transport related emissions associated with the importation of aggregates have been mitigated to some extent by the decision to utilise construction materials from Raffeen Quarry, which avoids the generation of emissions had the material been sourced elsewhere. This would result in the reduction of dust and traffic related emissions that would have been generated along potential haul routes and would also reduce the amount of greenhouse gas emissions that would have been generated by the transport of materials and staff.

14.4.6 Climate change and transport

The EIS points out (13.3.2, page 13-25) that transport is currently the second largest contributor of GHG emissions in Ireland and that although emissions in this sector had reduced during the recession, a year on year increase has become evident since 2014. It is further stated that the EPA projections indicate that transport emissions are predicted to increase by between 10% and 16% up to 2020. Hence the transport sector is described as the one facing the greatest challenge in achieving the emissions reductions targets set out in national policy.

As stated previously, the total estimated GHG emissions from the construction phase are calculated at 54,409 tonnes of CO₂, which is described as a permanent slight adverse impact. Mitigation measures are set out in 13.5.1 which include local sourcing of materials, energy saving practices and the implementation of a traffic management plan. It is predicted that the proposed development, once operational, will result in a total increase in annual GHG emissions of 4,026 tonnes of CO₂ and 9 tonnes of NO_x in 2020, compared with the do-nothing scenario. These figures represent an increase of approx. 20%, which is described as slight adverse in the long term. It is stated that these increases are largely as a direct result of the increased number of vehicle kilometres travelled in the area on the combined existing N28 and the proposed M28 road project.

Mr. Chadwick, in his brief of evidence, noted that since the publication of the EIS, the National Mitigation Plan has been published in July 2017, which sets out government policy for mitigating transport related GHG in the short to medium terms. It is stated that the overall target is that new cars sold in Ireland by 2030 will be zero emission cars with an aim to decarbonise the passenger car fleet by 2050. Mr. Chadwick pointed out that the Plan does not preclude development of road infrastructure, but instead places the focus of emissions reductions on the vehicles on these roads.

14.4.7 Conclusion Air and Climate

The conclusions of the EIS are that the proposed alignment will have an overall benefit for the area in relation to air quality as the current source of pollution will move further from residential and other properties at the southern end of the route and that the impact on properties that would move closer to the alignment, and for those properties near the on-line section, the impacts would be negligible. Thus, there will be an overall reduction in exposure in terms of the number of properties exposed to pollutants. However, it is predicted that there would be a negligible impact on air quality for all properties and that levels will remain well below the relevant limits for the protection of human health. These conclusions, together with the methodology used in both the establishment of the baseline and the predictions

of impacts on air quality, were augmented by further surveys and analysis and were rigorously tested during the oral hearing.

It is considered that these conclusions were based on a comprehensive range of baseline data comprising background monitoring taken from both short-term and permanent monitors and on data from other published sources, which was found to be consistent with EPA observed results both locally and nationally and that the recorded levels were within statutory limits for air quality. The air quality modelling was based on the outputs from the traffic model, which has already been found to be comprehensive and robust. It was also established that the modelling took account of the additional HGV traffic from the planned port expansion and the impact of the topography of the Mulcon Valley. The measured and modelled results indicate that air quality levels along the route are such that all annual averages are well within the statutory air quality limits for human health, as set out in the Air Quality Standards Regulations (S.I. 180 of 2011), and the WHO guidelines for the protection of human health (air quality). Any breaches of the daily limits as set down in the statutory limits are well within the tolerance levels for these limits. However, it is noted that the period average for PM_{2.5} breached slightly the WHO guideline limit for this parameter at one location.

The EPA Air Quality in Ireland Report 2016 states that all observed concentrations of both PM₁₀ and PM_{2.5} across the country were below the EU Annual limits and that there were no exceedances of the daily limit. However, it is also acknowledged (Section 5) that Ireland's air quality fails to meet the tighter WHO guideline values for a number of pollutants and that there should be movement towards adoption of these values across Europe. In this respect, it is stated that the continued promotion of the shift from solid fuel is a key issue regarding particulate matter to alternative fuels as well as giving priority to public transport and cleaner transport fuels.

In conclusion, the proposed development would result in a slight temporary adverse impact on air quality during the construction phase, which can be adequately mitigated (as proposed). The impact on air quality from the operational phase would

be negligible as there would be no net change in air quality impact due to a combination of the realignment away from residential properties and the increase in traffic volumes being offset by a reduction in congestion on the proposed alignment. There would be a permanent slight adverse impact on greenhouse gas emissions which can be partially mitigated by sourcing construction materials from Raffeen Quarry along the route and is also likely to be mitigated further by national transport policy, (The National Mitigation Plan 2017), which seeks to reduce carbon emissions from cars over the next 3 decades. I would accept, therefore, that the proposed development can be constructed and operated without significant adverse impacts on air quality or climate.

15 Health and general amenity

15.1 Environmental Impact Statement

Many of the issues raised by observers under this broad heading have been addressed under other headings such as Noise and Vibration, Air and Climate, Flora and Fauna and Landscape and Visual impact. However, some issues relate to other matters which can be described as those broadly relating to overall health, quality of life, general amenity and health and safety. Although the application was submitted prior to the coming into effect of the 2014 EIA Directive, the applicant decided to address this issue by means of a separate Health Study, which forms part of the EIS (Appendix 1C). It addresses most of the issues raised under this heading. Other relevant chapters in the EIS include Chapter 7 – Socio-Economic/Community; Chapter 8 – Agricultural Land Uses; Chapter 12 – Terrestrial Ecology; Chapter 13 – Air and Climate; Chapter 14 – Noise and Vibration; Chapter 16 – Landscape and Visual Impact.

The Health Study was carried out by Dr. Andrew Buroni. The approach and scope was defined in consultation with the HSE. This was stated in the submission from the HSE and confirmed by Mr. Dearing at the oral hearing. It is noted that the HSE had advised the board (section 6.1.9 above) that the Health Study had been submitted to inform the decision-making process. It was further advised that the Scoping Study (to

which the HSE had input), had indicated that the wider determinant of health should be included and be based on the Source-Pathway-Receptor model. The HSE was satisfied that the Health study satisfied these criteria.

15.2 Issues raised by observers

- 1) EIS inadequate no assessment of health and quality of life - EIS assesses socio- economic impacts, but not the quality of life impacts in a scientific and meaningful way. WHO guidance states that long term exposure to noise and air pollutants shorten life expectancy. Noise exposure over 55dB can trigger heart attacks and high blood pressure. For a good night's sleep, it is necessary to have continuous background noise levels of less than 30dB.
- 2) Health Impacts general - increased noise results in health impacts and sleep deprivation, as well as mental health problems, tinnitus and stress and an increased risk of dementia. The increase in HGV levels is likely to increase noise levels significantly, which will be exacerbated by the increase in elevational changes to the road. Higher speed, noise and air pollution will result from traffic calming at northern end. People are exhausted and stressed from having to put up with excessive noise levels all day and night.
- 3) Amenity value woodlands - The existing woodlands at Bloomfield and Mulcon Valley are highly valued both ecologically and recreationally, and are much used natural amenities with centuries old woodland. Destruction of these woodlands is unacceptable with the loss of amenity and recreational spaces combined with the increased exposure to noise, air pollution and visual impact.
- 4) Residential amenity adjoining the new Northbound lane – the proposed additional northbound lane would have an overwhelming impact and brooding presence on the properties at Newlyn Vale, Wainsfort, Rochestown Rise and Lissadell which directly adjoin the proposed new roadway. The existing buffer of trees of 50m plus would be lost which would have a detrimental impact on residential amenity on a 24-hour basis, 7 days a week.
- 5) Proximity of embankments – the proximity of embankments and noise barriers would result in a loss of light and outlook for many properties along the route.

- 6) Devaluation of properties – the proposed development will devalue properties along the route.
- 7) Construction impacts general – inadequate assurances regarding mitigation of noise and dust during construction, as well as risk of subsidence and to water quality of streams. Access to Bloomfield properties during construction must be maintained. Reassurance is also sought that Bloomfield will not be used as a construction compound.
- 8) Impact from construction of northbound diverge lane – the construction of this new lane will involve splitting the existing N28 into two roads and the building of a new flyover over Rochestown Road. It is questioned how this can be achieved without demolishing the houses backing onto the road at Newlyn Vale. The distance from the gable wall of the closest house to St. Patrick’s Church is 130m, yet it is proposed to accommodate 2 no. 2-lane slip roads, 4 no. motorway lanes, retaining walls and crash barriers. It does not make sense.
- 9) Risk Assessment and Road Safety – a risk assessment of a scenario whereby a truck loaded with hazardous or explosive material goes out of control has not been carried out. The lack of any escape lanes in close proximity to houses is of concern. A risk assessment of a potential spillage of hazardous material is also required, and should be part of a road safety audit.
- 10) Severance of communities – the proposed development will sever the communities of Shanbally and Ringaskiddy, respectively. The closure of Old Post Office Road, in particular, will cut the village off from the existing school and the residential properties that lie to the south of the proposed road. The provision of a pedestrian underpass will give rise to a serious loss of amenity as it will attract anti-social behaviour and if it was to be gated at night, it would remove pedestrian access along the route.

15.3 Oral hearing

These issues were principally addressed on Days 5 and 7 of the oral hearing (14th and 16th November). Tom Dearing (RPS) made a presentation on Community Health on Day 7, which addressed most of the issues under this heading. He advised that he was part of the Health and Social Impact Assessment team, which was led by Dr.

Andrew Buroni, who is the author of the Health Study. However, Dr. Buroni was not available to address the oral hearing (as previously advised to the Board prior to the commencement of the hearing). Dr. Buroni attended the hearing on Day 9 (28th November) and was available to answer questions. As previously stated, presentations were also made on this issue as part of the Noise/Vibration and Air/Climate modules. In addition, on Day 5 presentations were made by Kieran Kennedy (RPS) regarding Socio-Economic and Community matters, by Conrad Wilson (RPS) regarding Material Assets – Agriculture, and by Liam Barry (RPS) in respect of various matters principally related to the CPO module. Although these latter presentations are focussed mainly on the CPO module, they do address the issues of the impacts of severance and land take.

Presentations on community health and general amenity were made by the M28 Steering Group, principally by Dr. Mary O’Dea (Day 7). However, other members of this group and several other observers also made reference to general health and amenity issues during their presentations on other matters (such as noise, air, ecology and landscape) and during the CPO module. Solicitor Joe Noonan (representing the M28 Steering Group) also addressed the hearing on Day 7, when he made a legal submission, during which he questioned the veracity and substance of the Health Study. Observers also raised issues during the oral hearing regarding community severance, residential amenity, construction impacts (generally) and health and safety matters.

15.4 Assessment Health and general amenity

15.4.1 Health impacts

Some observers considered that the application should be considered under the new EIA directive, 2014/52/EU, which requires that human health is specifically addressed as part of the EIA for the project. This matter has been addressed previously, but it is reiterated here that the Board has accepted that the application was made before the deadline and that, as such, the transitional arrangements apply. Thus, there is no requirement to submit a health study, but the applicant, in

consultation with the HSE, decided to do so in order to better inform the decision making process.

The Health Study concluded that the proposed M28 project, with mitigation as proposed, would offer a net reduction in exposure of the public to noise and air pollutant emissions compared with the 'Do Minimum Scenario', and in addition, would address by way of mitigation, a number of existing environmental and safety issues along the route. This would result in a net benefit to community health. It was further concluded that environmental health issues arising from the construction stage would be mitigated, avoided or prevented by means of the committed mitigation measures and, as such, that there would be no risk to the community health from temporary construction activity.

Air quality

In terms of air quality, Mr. Dearing emphasised the following points which were highlighted in the Health Study and Chapter 13 of the EIS:

- Air pollution at all residential locations, whether experiencing increases or decreases, is predicted to remain within air quality standards set to be protective of health;
- The majority of residential locations would experience decreases in air pollution and this would deliver a net benefit to public health.
- At locations experiencing increases, the magnitude of increase, population exposure and resulting health risk is not sufficient to quantify any measurable adverse impact on public health.

The HSE was satisfied that the predicted levels of air pollutants would comply with the Air Quality Standards for human health, but considered that additional mitigation may be required to address potential dust emissions during construction, particularly in respect of food and restaurant establishments. This was incorporated into the revised Schedule of Commitments submitted by the local authority at the oral hearing on 1/12/17.

Mr. Dearing also commented on the specific concerns raised by some observers regarding the potential link between proximity to major roads and Dementia. He referred to a Canadian study (published in the Lancet) which noted an observed association, but did not demonstrate a causal link or specific health pathway. On this basis, he considered that the article did not materially affect the evidence base applied in the Health Study. Mr. Dearing concluded that given that there would be a reduction in the exposure of the public to air pollutants in the Do Something scenario compared with the Do Minimum scenario, it is considered that there would be an overall net benefit in terms of community health, with particular reference to respiratory, cardiovascular or neurodegenerative disease impacts, including cancer and dementia.

Noise

Mr. Dearing noted that following mitigation, the effect of the proposed development would be a reduction in noise and associated community exposure during the operational phase in the Do Something scenario compared to the Do Minimum scenario. He emphasised that the most significant change from a health perspective was the reduction in the number of residential properties with exposures of a higher magnitude, i.e. 60-75dB Lden and 50-65 dB Lden, as these levels of exposure are associated with higher risk ratios of hypertension, ischaemic heart disease, acute myocardial infarction and stroke. He noted that although the residential night exposure at some locations would increase, the levels would still be within the lower magnitudes i.e. <55-60 dB Lden and <45-50dB Lnight. The HSE was satisfied with these conclusions.

With regard to construction noise, Mr. Dearing noted that Best Practicable Means to reduce community noise exposure and associated disruption (including the recommendations of BS 5228) will be required, together with the specific conditions and restrictions of the CEMP, as part of the implementation of the mitigation measures. However, the HSE considered that in addition to this, it will be necessary to impose restricted hours together with a complaints procedure. Furthermore, it was

stated that out of hours works should be subject to permission following a full benefit impact assessment. These matters have been incorporated into the revised Schedule of Commitments submitted by the local authority at the oral hearing on 1/12/17.

15.4.2 Residential amenity

Residents of certain parts of the Mulcon Valley, which are in very close proximity to the proposed alignment, such as Newlyn Vale, Wainsfort, Rochestown Rise, Maryborough Hill, Rowan Hill and St. Patrick's Church in Rochestown, have raised particular concerns regarding the impact of the proposed development on their residential amenity. The proposal to construct the northbound diverge lane, which would bring the motorway alignment much closer to many of the existing houses along the route was the subject of particular concern regarding the implications for increased exposure to noise, air pollution and associated health impacts for these residents and the impact on the residential amenity of their back gardens, views/outlook from their properties and the general impact on the quality of life of these residents during both the construction and operational phases of the development.

I would agree that many of these residential properties would be likely to experience considerable disruption and loss of amenity during the construction phase in the absence of mitigation. I would also agree with the HSE that restricted hours, together with an appropriate complaints procedure, will be required to ensure that best working practices are employed throughout the construction period. Mr. Noonan (RPS) also advised that there would be a liaison officer appointed as part of the construction contract to liaise with the local residents. The mitigation measures proposed by the applicant as set out in Chapter 19 of the EIS (and other relevant chapters), together with the updated Schedule of Commitments provided at the oral hearing, will address these potential impacts.

As part of my site inspections of the route, I inspected properties that are in close proximity to the site of the proposed north-bound diverge lane, including an internal

inspection of a property adjoining the N28 at Newlyn Vale (as a sample). I observed the impact that the existing N28 has on the residential amenity of these properties, whereby the amenity of the rear gardens is severely impacted by the proximity and height of the existing road in terms of its presence and the associated noise and visual impact. I also noted that the continuous noise is abated to a considerable extent by keeping the rear windows closed, but is not eliminated. I further noted that the line of coniferous trees which had acted as a buffer along the boundary had recently been removed, (I understand by the TII for road safety reasons), and that the loss of the tree line is likely to have exacerbated the existing impact to a considerable extent.

It is acknowledged that the proposed development would result in the widening of this major road which would inevitably bring the alignment closer to these properties, with an associated potential for increased noise and air pollution and loss of visual and residential amenity, in the absence of mitigation. Given that the road, which would be upgraded to motorway standard, would also carry more traffic and a higher proportion of HGVs, there is a potential for a significant loss of residential amenity in the Do Something scenario, without mitigation. However, as previously outlined above and in other sections of this report, with the implementation of the proposed mitigation measures, it is predicted that these properties will experience a reduction in exposure to both noise and air pollution compared with the Do Minimum scenario.

As can be seen from Table 13.20 of the EIS, these properties (based on the worst-case receptors) would all experience a reduction in ambient air quality concentrations of traffic pollutants with the exception of Kiltegan Park and Delford Drive. These latter receptors would experience a slight increase due to the increased traffic and proximity to the new slip road. However, in all cases, there will be a negligible change in ambient air quality and the levels of pollutants will be well within the statutory limits. Although the noise levels will not meet the TII Design Goal, they will meet the Cork NAP targets and will result in reduced levels of exposure. Notwithstanding this, it is considered that absorbent noise barriers should be used along this stretch of the proposed route from Bloomfield to Carr's Hill, (as discussed

at 13.4 of this report), given the potential for reverberation and due to the close proximity of so many residential properties to the route alignment in this area. The applicant agreed to this during the oral hearing and it is included in the revised schedule of mitigation measures (1/12/17).

The issue of outlook and visual amenity will be addressed in detail in the Landscape and Visual Impact section of this report. However, there is clearly a need to provide appropriate screen planting and noise barriers at the interface between the proposed route alignment and sensitive residential receptors. It is considered that the amenity value of woodlands has been addressed in the Ecology section of the report. However, it is worth noting that the applicant has accepted that there is a need to retain as many trees as possible and that it is the intention to do so, and to plant replacement trees in the form of screen planting and woodland areas. This issue was discussed in detail during the Landscape module of the oral hearing, when Mr. Holbeach (RPS) proposed revised and additional landscaping measures along the proposed route. The effectiveness of the proposed mitigation measures is discussed under the Landscape and Visual Impact heading below.

15.4.3 Socio-economic considerations

At a strategic level, the proposed development will facilitate significant improvements in terms of journey times and road safety between the main centres of population and the main centres of employment in the metropolitan area. This will contribute towards planned economic development in the region, which in turn, will support employment and income opportunities. These factors are identified in the Health Study as being some of the most important determinants of long-term health, influencing factors such as the quality of housing, education, diet, lifestyle, coping skills, access to services and social networks. Thus, by creating opportunities for improved economic circumstances, the proposed infrastructure project will have direct and indirect impacts on communities in terms of health and wellbeing and quality of life.

Impacts will arise in terms of land take and severance, both temporary and permanent. Most of the impacts have been assessed in Chapters 7 (Socio-Economic) and 8 (Agriculture) of the EIS as Not significant. In terms of non-agricultural land, the impacts on four landowners is described (Chap. 7) as profound, five as significant/very significant and seven as moderate. Chapter 8 states that there will be a permanent removal of 91.517ha of agricultural land and that 33 landowners will be affected, of which two would be profound, three would be significant and thirteen would be moderate. Mitigation is set out in 8.5.1 and 8.5.2 of the EIS. However, it should be noted that where impacts of moderate or greater significance occur, these will be addressed in respect of individual property owners in the CPO section of the report.

Community severance

The proposed road project will result in both positive and negative impacts in terms of community severance. The communities living along the route of the existing N28 between Carr's Hill and Shannonpark and through the villages of Shanbally and Ringaskiddy currently experience considerable levels of community severance due to the volume, nature and speed of traffic. The proposal to realign the route from Carr's Hill to Ringaskiddy will result in a significant reduction in traffic volumes with associated benefits for these communities. However, there are some locations along the proposed route where existing roads are to be made into cul-de-sacs or provided with pedestrian/vehicular underpasses or overbridges, which will have an adverse impact on communities. These include the properties to the south of the proposed alignment at Shanbally, including Twomey's Lane, properties to the south of Old Post Office Road in Ringaskiddy and properties to the west of Shannonpark interchange.

In Shanbally, the heavy traffic would be removed from the northern end of the village, adjacent to the school, shops etc., and accessibility between northern and southern parts of the village is maintained by means of an underpass. However, the location and design of the proposed interchange will result in a major intrusion into the community in terms of the introduction of a number of slip roads and access

roads as well as the visual impact arising from the dominance of the elevated interchange. The justification and design of the proposed grade separated interchange, as well as the proposed mitigation measures involving the provision of a new access road linking the southern part of the village with Ballyhemiken Road, are discussed in detail in the Board's Traffic and Transport Consultant's report and in section 12.4 above.

In Ringaskiddy, the closure of Old Post Office Road except for pedestrian traffic was the subject of much objection and discussion at the oral hearing. It is noted that the existing entrance to Old Post Office Road from Ringaskiddy village is via a lay-by in front of a public house, from where it becomes a very narrow and steep lane which serves a number of small residential terraces. The character changes quite abruptly to one of a rural-residential nature with one-off houses on both sides. This character continues until the point at which the proposed M28 crosses the road and thereafter, it is more rural in character as far as Tower Road. The alignment and surface quality is quite poor and it is sub-standard in width. The observers generally sought the reinstatement of the previous proposed route (2008 option) as an alternative to severing Old Post Office Road. However, this option was stated by the applicant to be less desirable in terms of ecological impact and cost.

Following consultation with local residents, a number of options were explored regarding Old Post Office Road (see 4.5.7.8 EIS). The option included in the final design was chosen on the basis of the low vehicular demand along the existing route and the avoidance of the need to divert major infrastructure services such as the gas mains and high voltage electricity lines. It was further stated that the alternative route, via Tower road, would only be 1km longer and the section east of Old PO Rd would be upgraded and realigned to mitigate the additional journey distance. The design and height of the underpass was also stated to ensure clear lines of sight for vulnerable users and to optimise the extent to which the mainline has to be raised in the interests of visual amenity.

At Shannonpark, the layout of the proposed development would increase the extent of community severance already experienced as a result of the existing layout. However, mitigation measures have been proposed to minimise and/or to offset the impact, including new/additional access roads.

Access and accessibility

The proposed development will result in the diversion of significant volumes of traffic away from the existing N28 which will result in improved opportunities for walking and cycling, which will improve accessibility, particularly along southern sections of the route. The removal of large volumes of traffic from the villages of Shanbally and Ringaskiddy will also facilitate greater connectivity within the villages by means of sustainable transport modes. The proposed scheme also provides for improved connectivity at various locations along the route, where cycleways and footpaths are provided as well as new/improved links to cycle networks. These improvements will provide for additional benefits in terms of increased opportunities of physical activity, which will contribute to healthy lifestyles and general wellbeing.

15.4.4 Road Safety

An analysis of road accident data is provided in the EIS (5.5). The Health Study also includes an analysis of road safety (4.47). It is stated that the existing N28 has a poor record of collisions in recent years which is associated with heavy traffic volumes, high proportion of HGV traffic and an inconsistent quality of the route. However, it is noted that roads designed to motorway standards have the lowest accident rates per vehicle kilometre travelled. The proposed development will reduce the risk of collisions by reassigning traffic flow to the new motorway, by increasing the capacity of the route and by improving the quality of the road, as well as the introduction of improved junctions and road layouts on the local network. It will also improve the safety of the N28 for non-motorway users including cyclists and pedestrians. Thus, there would be a direct benefit in terms of road safety.

Road Safety on proposed Carr's Hill link road

There was a lengthy discussion on the issue of ball netting. Mr. Bergin, the Board's Consultant, queried whether the introduction of a road, where none exists at present, would give rise to road safety issues involving golf balls straying onto the road and asked whether a risk assessment had been carried out on this issue. In Mr. Bergin's view, the proposed development would remove a boundary which has to date provided safety and would also bring the road closer to the golf course. In such circumstances, he asked whether ball netting should be provided within the CPO line, and in this respect, queried whether adequate space exists to permit such netting to be provided. Mr. Bergin considered that the safety of the Scheme was a fundamental part of the Road Scheme and asked if it was satisfactory to allow it to be decided as part of an accommodation package, particularly in terms of ongoing maintenance of the netting.

Mr. Flanagan was insistent that this is a matter of private law nuisance which must be addressed as part of the CPO compensation package, as the nuisance does not arise from the acquired lands. However, he also acknowledged that the Board may wish to examine the need for mitigation as part of the Scheme, as opposed to the CPO. He pointed out that the matter had been integral to discussions that have been had with the Golf Club, and that are still ongoing, in relation to a compensation package for the retained lands and in respect of the Club's plans to redesign the layout of the course. Mr. Noonan confirmed that it would be possible to provide netting and other security/safety measures during construction but considered that there was inadequate space available within the CPO line to provide ball netting for the operational phase.

Mr. Galvin (Day 11) stated that the Golf Club would require adequate safety and security measures in the form of boarding and netting during the construction phase but that it was happy to provide any netting that would be required in due course, within the retained lands, as part of the redesign of the golf club, which would be maintained by the club in perpetuity. The applicant's adviser on golf course design, Mr. Brannigan (Day 11) stated that he had reviewed the mitigation measures with respect to the fourth hole realignment, and considered that the catch netting is a 'belt

and braces' approach. However, Mr Galvin disputed this stating that this was in the context of providing a high wall, mature tree planting along with the netting.

I would agree that in the context of the redesign of the golf course, the issue of netting should form part of any compensation package for the retained lands. However, where the proposed new road directly adjoins the existing golf course, it is considered that the issue of road safety is a material consideration and should be addressed by means of appropriate boundary treatment. The precise form of boundary treatment will be discussed in the CPO section of this report (22.7.7). However, it is not clear that any enforceable arrangements are included in the proposal to address the issue of stray balls, which is a health and safety matter for the proposed road scheme. I do not accept that ball netting would require such space that it could not be accommodated within the acquired lands. It is considered, therefore, that should the Board be minded to approve the Scheme, a condition should be attached requiring the provision of ball netting along the section of the eastern boundary between Maryborough Hill and Carr's Hill, where the proposed road directly adjoins the golf course.

15.4.5 Health and Safety

SEVESO matters

The EIS contains a SEVESO Report in Appendix 1A. It is stated that the purpose of the Seveso Directive 2012/18/EU and the COMAH Regulations 2015 is to prevent major accidents involving dangerous substances and to seek to limit as far as possible the consequences for human health and the environment of such accidents. The proposed M28 falls within the category 'Other development proposed near to existing establishments'. It is noted that Objective ZU5-3 of the Cork CDP 2014 requires that development within the distances established by the HSA complies with the requirements of the Seveso Directive and that it does not compromise the potential of existing establishments to expand. There are 5 no. COMAH establishments close to the M28 route, three of which are Upper Tier and two of which are Lower Tier. The HSA has established a 'Consultation Distance' of 1000m for each of the Upper Tier establishments, namely Novartis Ringaskiddy Ltd., Pfizer

Ireland Pharmaceuticals, and SmithKline- Beecham (Cork) Ltd., but there is no consultation distance for the lower tier. This means

“a distance or area relating to an establishment, within which there are potentially significant consequences for human health or the environment from a major accident at the establishment, including potentially significant consequences for developments such as residential areas, buildings and areas of public use, recreational areas and major transport routes”.

Appendix 1A includes a Risk Assessment in Section 5 of the Report. Table 5.1 indicates the current distances from the N28 and the proposed distances from the M28. It is noted that the distances relating to Novartis Ringaskiddy and Pfizer Ireland change from 600m and 0m respectively (N28) to 100m and 300m (M28), respectively. The distance from the SmithKline-Beecham establishment remains at 1,000m. Although there is no consultation requirement for the Lower Tier establishments, it is noted that the relevant distances decrease from 1000m and 850m to 500m and 600m, respectively, for Carbon Chemical Group and Hovione Ltd. Fires, explosions and release of dangerous substances are hazards posed by all three establishments. It is noted that the short term transient population using the proposed road network may potentially alter the societal risk posed by these establishments. The Novartis facility poses a potential slight increase in risk for the proposed development, whilst the Pfizer facility poses a slight decrease in risk. It is noted that overall there is a net negligible change in risk from the COMAH establishments on the road infrastructure. However, it is advised that the potential increased posed by Novartis needs to be taken into account in the Safety Report and MAPP prepared by this company.

The report considers the risks posed by both the construction and the operation of the proposed road project on the COMAH sites. The risks in relation to construction can be mitigated by means of traffic management plans in consultation with Garda and Emergency Services. In terms of the operational phase, it is concluded that the reduced travel times will facilitate a faster response time and hence would improve

the emergency response time. This is considered to be a net slight positive impact. However, it was concluded that the proposed new infrastructure would have no direct effect on the operation or risk profile of the COMAH sites and that the risk during the construction phase would be low.

The Health and Safety Authority has stated (5th June 2018) that it does not advise against the development.

Transport of dangerous goods

Several observers raised the issue of the risk of a chemical or toxic spill or of fire, explosion or emission of toxic emissions in the event that a truck carrying such chemicals/hazardous material goes out of control or is involved in a road traffic accident. Particular concern was raised in respect of the proximity of the M28 to densely populated areas and to individual residential properties, most notably at the northern end of the route, and with regard to the steep gradient (4.8%) on the approach to Bloomfield. These matters were raised by Sylvester Cotter and Gerard Harrington of the M28 Steering Group. Mr. Cotter (Day 9) advised that he is a DGSA (Dangerous Goods Advisor) and that he believed that as there is no facility for a run-off lane (escape lane) at this location, as provided for in other countries, the only solution was to re-route the M28 away from the Mulcon Valley. Mr. Harrington advised that he is a former truck driver and raised questions (Day 8) about the safety of the gradient for HGVs on the approach to Bloomfield.

Mr. Noonan for RPS (Day 9) responded to these issues. He advised that the surveys carried out indicate that the gradient of 4.8% is fairly constant at this point and that there is no evidence of any safety risk associated with gradients such as this. He also pointed out that roads constructed to motorway standards are the safest of all, that the N28 itself sets a precedent (as does the M8 at Glanmire) and that there is no evidence of any collisions/increased risk associated with this stretch of the existing road. He also responded to a question from Paul Bergin (Board's consultant) that the proposed road project had been subject to a Road Safety Audit and that the auditors did not consider the gradient to be a safety issue.

Mr. Noonan also advised the hearing that a Risk Assessment of a collision occurring, including an analysis of the risk associated with a chemical spillage and the consequences for the pollution of watercourses was carried out as part of the Scheme and is included in the Hydrology Chapter of the EIS. He stated that the risk on a yearly basis was found to be negligible. In terms of road safety, Mr. Noonan added that the speed limit north of Rochestown Road is 60kph which would also reduce the risk of collision. He stated that given that the applicant had agreed to revise the approach to the proposed Northbound Diverge lane (as suggested by Mr. Bergin), it might be prudent to extend the 60kph limit southwards to the start of the diverge, which would further improve safety and reduce the risk of a collision at this section of the route.

It is considered that the potential risk from such incidents would be increased as a result of the additional volume of HGVs that would be traversing the route. However, the northern section of the route is on-line and HGVs carrying hazardous materials have been traversing the route for many years. The relocation and expansion of the port facilities to Ringaskiddy could give rise to an increased number of trucks carrying such cargo on the route, but no specific evidence to this effect has been presented. It is noted that the port expansion development, (PA0035), which has already been permitted, was subject to EIA. Notwithstanding this, I would accept that the proposed development, which would upgrade the road to motorway standards, and would reduce congestion and dangerous weaving between lanes, would improve the road safety of the on-line section of the route, with an associated reduction in risk of collisions. Thus, any increase in the volume of such trucks would be offset by the increased safety measures of the proposed project. It is also accepted that no particular additional risks were identified in the Risk Assessment or Road Safety Audit as referred to by Mr. Noonan. In response to the issue of 'run-off areas', Mr. Noonan advised that Irish standards do not make provision for such facilities.

Notwithstanding the above, the transport of dangerous goods is regulated under the ADR Regulations – Carriage of Dangerous Goods by Road (2011). The H.S.A.

website includes a Guide for Businesses in relation to this topic and emergency action. It is stated that training is given to drivers and businesses must have procedures in place for dealing with chemical spills, fire, explosions and road traffic incidents involving dangerous goods. It is further stated that Health and Safety legislation puts the onus on employers to carry out a risk assessment and to put in place procedures to minimise and control hazards, including the appointment of a Dangerous Goods Safety Advisor. Thus, it is considered that the issue of the risk of an incident involving a HGV carrying dangerous cargo has been adequately addressed by the applicant and that the carriage of dangerous goods is also subject to strict regulation under other codes, outside of the planning code.

16 Landscape and visual impact

16.1 Environmental Impact Statement

Chapter 16 of the EIS addresses the issue of landscape and visual impact.

16.1.1 Landscape Impact Assessment

The project is located within the City Harbour and Estuary Landscape Character Type, and within 3 LCAs. The receiving environment is assessed and described with reference to the scale and character of the landscape, the Landscape Character Areas and designations within the Cork County Development Plan. The northern end is described as having an enclosed scale due to the proximity of the built form and trees and vegetation. The agricultural area between Carr's Hill and the harbour is described as an enclosed landscape at the lower levels with open views available from the hilltops. The scale of the landscape around Ringaskiddy and the harbour area is described as broad. The existing N28 follows the contours of the landscape and is not prominent in views from the wider landscape. Three Scenic Routes were assessed, S53 (Cobh-Belvelly); S54 (Passagewest-Ringaskiddy); and S59 (R612 Crosshaven – Fountainstown). The findings were that there would either be 'no change' or 'no views available' from these Scenic Routes. It was considered that there would be no direct or indirect impacts on the designated landscapes.

The project is located within three Landscape Character Areas and the potential landscape impacts (in the absence of mitigation), on these were identified and assessed as follows:

Undulating Agricultural Patchwork Landscape – Medium sensitivity to change. Potential impact Moderate-Major to Moderate adverse/Significant – within 1km, but Negligible-Minor/Not Significant – beyond 1km.

Harbour Edge town Centre and Undulating Residential Townscape – Medium Sensitivity to change. Potential impacts - Moderate adverse/Not Significant.

Estuarine Harbour Based Industrial and Maritime Landscape – low sensitivity to change. Potential impacts - Negligible to Minor adverse/Not Significant.

16.1.2 Visual Impact Assessment

The Visual Impact Assessment included an assessment of the extent of the potential visibility, the view and viewers affected, the degree of visual intrusion and impact on the character and quality of the views. A Zone of Theoretical Visibility was established and actual visual impacts from within the ZTV were predicted by means of site surveys and assessment. This included the use of an enhanced digital terrain model, photographs using a professional level SLR camera (with 50mm lens), and a series of photomontages. Mr. Holbeach (RPS) advised that 17 viewpoints were assessed and that 11 of these were predicted to have significant visual effects, in the absence of mitigation. In addition, a detailed visual impact assessment for the residential properties in proximity to the proposed route was completed. The impacts, as well as the magnitude and the significance of each of the impacts, were set out for each viewpoint. The findings were that prior to mitigation, 67 properties were predicted to have Major to Substantial impact; 193 properties were predicted to have a Moderate to Major impact; 364 properties were predicted to have a Minor-Moderate Impact; and 294 properties were predicted to have No Impact. The EIS states (16.2.12) that the first two categories were considered be significant, i.e. Moderate-Major and Major-Substantial. The potential impacts, before and after mitigation, are visually represented, for each of the properties assessed, in the EIS, Fig. 16.4 a-p (Volume 5).

16.1.3 Mitigation measures

Mitigation measures to address the landscape and visual effects for both the Construction and Operational phases are set out in the EIS in Section 16.5. The main mitigation measures are generally in the form of landscaping with small copses of woodland using local plant species, as well as hedgerows and small clumps of woodland to break up the visible mass of the road where appropriate. A total of 16 SLMs (Specific Landscaping Measures) are set out for each section of the route in Table 16.10 of the EIS. The terms used (e.g. 'Screening Woodland Mix', 'Tree, Hedge and Shrub Planting' and 'Individual Tree Planting') are defined and described in section 16.5.2 of the EIS. Details are also provided regarding the core species to be used and the standards of trees to be planted. The location of each SLM is shown on figure 16.5 (Volume 5).

16.1.4 Residual impacts

Residual visual impacts (after 10 years of growth) are set out in Table 16.11, which indicates that after mitigation, the number of properties that would experience the most significant impacts would be reduced to 0 (Major-Substantial) and 67 (Moderate to Major), respectively. The vast majority of properties are indicated as being in the Minor-None category and the Minor-Moderate category is halved. The Residual Viewpoint Impacts (After Mitigation) are listed in Table 16.12. It is noted that following implementation of the proposed Specific Landscape Measures, the predicted impacts will be reduced for all viewpoints, but four will remain as significant, largely due to the proximity of the proposed development to these locations. These are VP4, VP4b (both at Shanbally), VP5 (East of Shannonpark) and VP7 (near Carr's Hill).

16.2 Issues raised by observers during the course of the application and during the oral hearing regarding landscape and visual impact

1. EIS inadequate – The information contained in the EIS regarding landscape and visual impact is insufficient to enable an analysis of the likely impact on individual sensitive receptors along the proposed route.

2. Landscape character – The Landscape Character Assessment was not comprehensive enough and did not adequately address the impact on the landscape character of Ringaskiddy. The proposed road will transform the character of the rural landscape between Ringaskiddy and Shannonpark from agricultural to industrial. The loss of bands of mature trees and woodlands at various points along the route will destroy the landscape character and visual amenity of those areas, such as Bloomfield, the Mulcon Valley (Rochestown Rise and Mount Oval), Rowan Hill and Wainsfort.
3. GLVIA guidelines – these are inappropriate in an Irish context, and are publicly inaccessible. The applicant should have used NRA/TII Guidelines and the EPA Guidelines on information to be contained in an EIS (2002) and the associated Advice Note (2003) instead.
4. Selected viewpoints for Photomontages inadequate – The range of viewpoints is inadequate and not representative of the landscape or visual impact. Only 15 VPs included which are not representative of the visual impact. They are not taken from locations which depict the worst case scenario or the most sensitive receptors. No photomontages to demonstrate impact on Martello Tower, Castlewarren and views from National Maritime College and cluster of houses in Shanbally.
5. Drawings and visual representation inadequate – the inadequacy of information contained in photomontages and cross sections makes it impossible to assess the environmental effects of the development. It is not possible to carry out an accurate assessment of the impact of the proposed development on ‘Martello’ which is a house in close proximity to the road on Old Post Office Road in Ringaskiddy. Sectional drawings are required to illustrate the relationship between the house and the motorway, the pedestrian/cycleway underpass (Structure S10) and the proposed agricultural access road. Furthermore, the gradient of the embankment is unclear. The photomontages misrepresent the impact of the proposed development and some have omitted important information.
6. Magnitude of impact – the magnitude of the impact both before and after mitigation is disputed in many cases, particularly in relation to residential receptors.

7. Mitigation unrealistic - There is inadequate information about landscape mitigation. Mitigation measures are generally incapable of being delivered due to need for access and maintenance or are not achievable due to the inability to plant mature enough trees. The proposed mitigation shown in Viewpoint 2a is unrealistic as it would not be possible for the trees that are to be planted to achieve the level of maturity that would be required to provide the level of screening envisaged. VP10 and VP11 unclear how mitigated to minor.
8. Visual impact at Bloomfield – removal of trees and existing screen planting to the east of the N28 at Bloomfield would have a major impact and proposals to replace the trees with high concrete retaining walls and noise barriers is totally unacceptable. Clarification is sought on the height and finish of the infrastructure and on the retention/replacement of the landscape/vegetation.
9. Rochestown Rise, Maryborough Heights and Lissadell – visual impact stated to be “major to substantial”, but the Viewpoints are taken from very specific locations and are not representative of the full impact. The proposed route will come within 50m, 80m and 180m of existing houses. At present, a buffer of 50m provided by trees and woodland which serves as a natural visual barrier to the N28, but these will be felled. Widening and upgrading of road will endanger mature trees to rear of gardens and the large overpass will diminish the quality of the remaining green space.
10. Newlyn Vale and Wainsfort – devastating impact due to height, scale and proximity of road to existing houses. Dense band of mature trees recently cut down by TII without any justification. Properties will be overlooked by 3m wall, compounded by loss of trees. The proposed north-bound diverge lane would bring the motorway to within 28m of property, which is too close, and would necessitate an additional flyover bridge over Rochestown Road which would be visually obtrusive. The sheer earth retaining wall, faced with concrete, along the eastern and north-eastern boundary of Newlyn Vale would have significant impacts on visual and residential amenity as it would be elevated 6-7 metres above the level of the existing road. There has been no proper visual assessment of the impact of the retaining structure on Newlyn Vale.

11. New flyover at Rochestown Road – The overpass would be widened from 20 to 40m and the overall footprint to 90m (which is the size of a football pitch). It would sever the community, reduce walkability of the area and be a “Class A eyesore”. EIS recognises that the visual impact here would be “Major to Substantial” and ‘Moderate to Major”. Both of these are the highest categories of adverse impact.
12. Rowan Hill – removal of significant amount of woodland and green amenity space, and replacement with 3m high wall and noise barrier, just 4m from property, is unacceptable. The proposed wall and noise barriers are too close to existing properties, would be overbearing and ugly and would replace the natural landscape, which is much more pleasing. Views of open countryside would be obscured and disrupted.
13. Shanbally – the proposed interchange would result in a motorway to the south of nearest house with a flyover to the east and would impair the natural vistas available at present.

16.3 Oral hearing

Issues relating to landscape and visual impact were raised during the oral hearing on Days 2, 3, 5, 7, 9, 11 and 12. Mr. Holbeach (RPS), for the Applicant, presented his evidence on Day 5 (14/11/17), which included a summary of the key findings of the EIS, clarification of matters/errata, a list of observers who had raised issues relating to landscape and visual impact issues in the written submissions to the Board, and a response to the issues raised. Revised proposals were also included in Mr. Holbeach’s submission. These are set out at 4.1.3 of his brief of evidence (14/11/17) and in Appendices 1, 2 and 3. They relate to additional planting and screening measures at Newlyn Vale/Rochestown Road on-ramp, at Mount Oval off-ramp, at Maryborough Hill, and at Rowan Hill, including a revised cross section with additional landscaping at St. Patrick’s Church. Mr. Holbeach also made some clarifications regarding Viewpoint 2a, Old Post Office Road, Ringaskiddy. These revisions and clarifications will be discussed in the assessment section below.

Presentations were made by third party observers, as well as questions, on the Landscape and Visual Impact Module on Days 2, 3, 5, 7, 9, 11 and 12 of the Hearing. Presentations were made by the following observers:

- Mr. Gerard Harrington, M28 Steering Group
- Mr. McGrath, Mr. Waldvogel and Mr. Walshe on behalf of Mr. Jim Roynane, Old Post Office Road, Ringaskiddy
- Mr. Adrian Culligan, Newlyn Vale
- Mr. Domhnaill Mac Domhnaill, Rochestown Rise
- Fergal O' Dea, Maryborough Hill
- Daniel O'Connell, Shanbally
- Kevin Hanley, Raffeen Bridge
- Frances Gordon, Bloomfield
- Frances Murphy, Lissadell
- Councillor Marcia D'Alton (Cork Co. Co.)

There was no representative of any relevant prescribed body present.

In attendance for the applicant were:

- Mr. Raymond Holbeach (RPS Landscape and Visual Impact Chapter)
- Mr. Eugene McKeown (Noise Chapter)
- Mr Michael Noonan (RPS Road Project Design and Traffic and Transport)
- Mr. Liam Barry (RPS, land acquisition and utilities liaison)
- Mr. Dermot Flanagan S.C.

16.4 Assessment of landscape and visual impact

16.4.1 Impact on Landscape character

Some observers at the Oral Hearing considered that the Landscape Impact Assessment was inadequate and that the assessment of the Landscape Character was not comprehensive enough. Others considered that the reliance on the GLVIA guidelines was inappropriate. The proposed development was considered to contravene policy objectives of the Cork County Development Plan and in particular, the Open Space zoning objective in the Ballincollig-Carrigaline Municipal LAP for the area. Mr. Waldvogel (Landscape Architect representing Jim Roynane, Old PO Road) and Donagh McGrath (JC) claimed that the Landscape character had not been assessed in respect of their client's property (Martello, Old PO Road).

Planning policy objectives

I note that the Scottish Natural Heritage Guidelines state that 'Landscape' may be valued for many and varied reasons which may be discerned from the local policy framework, such as the County Development Plan Policies and the LCA objectives. As stated above (16.1.1), the Landscape Character Impact Assessment has referenced the LCAs in the CDP. In response to questions from Donagh McGrath JC (for Mr. Roynane) regarding the lack of reference in the LVIA to the fact that the proposed road goes through an area designated in the LAP as Open Space, Mr Holbeach responded that his understanding was that the designation was as a 'buffer' rather than as a recreational area of open space and that whilst there is an objective regarding the zone in the LAP, there are also objectives regarding the provision of the M28. He further stated that under Objective 3.7.34 of the LAP, the P.A. has undertaken to provide alternative areas of open space as compensation should part of this buffer zone be developed as part of the M28. He considered that the proposed development is consistent with this objective. This issue has also been discussed under section 10.4.1.4 above (Local Planning Policy).

The Ballincollig-Carrigaline MDLAP 2017 Zoning Map (page 153) indicates that the majority of lands in Ringaskiddy are zoned for industrial or enterprise purposes,

apart from the Town Centre and a strip of open space to the immediate south of the TC, (RY-O-06/07/08). The objective for these zones states that the open space is to act as a buffer between proposed industry and established uses. Each objective also states that if the land designated for industry is developed, consideration will be given to landscaping, including strategic tree planting on the land. However, as pointed out by Mr. Holbeach, 3.7.34 of the Plan states that

“the objectives for passive open space seek to apply an appropriate degree of protection on those visually important open areas that contribute to the setting of Ringaskiddy and amenity afforded by the upper harbour generally. During the lifetime of this plan, if required, the P.A. will undertake to identify new areas of open space to compensate for the loss of any open space which may occur as a result of the construction of the M28.....such open space is most appropriately located as close to the town centre as is practicable”

Section 3.7.8 of the LAP states that the N28 is a critical piece of infrastructure which needs to be upgraded and that failure to do so will have severe competitive and economic implications for the Metropolitan Cork Area and the region as a whole. Thus, it is clear that there is a conflict between policy objectives, but that in anticipation of this, the P.A. has given an undertaking that it will identify alternative areas of open space as a compensatory measure. I would agree that the open space zones in question currently function as a visual buffer and provide physical separation from the lands zoned for industry to the south, but which have largely not been developed as yet. The OS zones double as utility corridors and do not have any real recreational value. Thus, the value of these lands is quite limited. The proposed road project will replace part of the existing agricultural fields with a new single carriageway road, but a sizeable proportion of the OS lands will remain as green space with the existing utility services. Although the use of the buffer zone will change significantly, a landscape buffer will be maintained between the built up area and the road, beyond which will be the industrial areas. This green space will also be enhanced by tree and woodland planting. As the provision of the road has been identified as a critical piece of infrastructure which would have significant benefits

both within and well beyond Ringaskiddy, it is considered that the proposed development is in accordance with the overall objectives of the LAP.

Methodology

In response to Mr. Waldvogel on the issue of the GLVIA guidelines, Mr Holbeach (Day 5) advised that the GLVIA are not prescriptive, are derived from the EIA Directive and that he had developed his own methodology based on this guidance, which is clearly set out in the EIS. He also stated that there is no statutory LVIA guidance and that the important thing is the establishment of significant effects. I would agree that the methodology is clearly set out and that the EIS includes both a Landscape Impact Assessment and a Visual Impact Assessment (as outlined above at 16.1.1 and 16.1.2). The methodology used appears to comply with the guidance provided by the EPA in 'Guidelines on Information to be Provided in an EIS' (2002) and the associated Advice Note (2003). It is noted that the entire project sits within the City Harbour and Estuary Landscape Character Type, (as set out in Appendix E of the CDP). However, as this is one of 16 generic landscape types (encompassing 76 LCAs), the applicant has provided a detailed Landscape Character Assessment to further refine this LCT as part of the M28 LVIA. Three LCAs were defined and are shown on Fig. 16.3 of the EIS (Vol 5). A detailed description of each of these LCAs is provided at 16.3.2 of the EIS. This includes the key characteristics, as well as their significance and the sensitivity of the LCA to change. It is considered that the LCAs are clearly described and that the impact of the proposed development on each LCA is assessed by reference to the value, sensitivity and importance (16.4.1 and 16.4.2).

Landscape Impact Assessment

The EIS notes that there will be a permanent impact on the 'Undulating Agricultural Patchwork' LCA, (which is the LCA that the majority of the route traverses), by reason of the introduction of the new road with embankments and cuttings, which would form a new feature in the landscape. However, it was considered that it will not be a prominent feature in the wider landscape due to the undulating nature of the landscape and its capacity to absorb changes with distance, and to the fact that the proposed M28 largely follows the local contours, but would be more prominent

locally. Thus, it is predicted that the change in landscape resource would be 'large' in close proximity (1km) but 'Negligible' beyond this.

I would agree with this analysis and consider that the N28 currently forms a major feature within this LCA. Given the strategic employment and industrial significance of Ringaskiddy, together with the location of the port relative to the city and national road network, it is inevitable that major infrastructure will continue to be a major feature of this landscape. However, given that the proposed road generally follows the natural contours of this undulating topography, it will not be overly prominent, except when viewed from a close distance (such as from the N28). However, where the road will be elevated in steep embankments and set within deep cuttings, it will be more prominent. Such areas include the route alignment to the north of Castle Warren (Warren Crossroads), and to the north of the Martello Tower. The EIS states that there is no public access to the 'castle in ruins', and therefore no potential visitor amenity impacts and that remaining walls and vegetation provide a buffer from the proposed road project.

Councillor D'Alton (Day 5) criticised this assessment of the impact on Castlewarren on the basis that there is no public access to this historic Protected Structure. She quoted part of Objective HE4-1(f) – note initially misquoted as HE4-1(e) - which she interpreted as the need to be appropriate to the existing protected structure and not be detrimental to its special character and integrity. However, Mr Flanagan disagreed with this interpretation and stated that a reading of the full wording of the objective indicates that this relates to development proposals for development to be carried out to/within the grounds of a Protected Structure and that as such, it was inappropriate to rely on this objective here. Potential impacts on this structure are assessed in the Cultural Heritage section of this report. However, having visited the area around the castle, it is considered that the former demesne at this location, which included the graveyard, church and Tower House, has become somewhat fragmented over time, and that the castle sits within a green buffer of stone walls, trees and grazing lands. I also visited the Martello tower and noted that it would not be possible to view the proposed road from this historic site.

I would agree generally that the LCA has a medium sensitivity to change, that the predicted change to the landscape would be 'large' in close proximity and negligible in the wider landscape. Thus, the predicted impact in the EIS of Moderate to Major within 1km and Negligible to Minor adverse beyond 1km during the operational phase is considered to be reasonable.

The predicted change in landscape resource for the 'Harbour Edge Town Centre & Undulating Residential Townscape' LCA, is Medium. This LCA is located around the edges of the harbour at Douglas, Rochestown, (incorporating the built-up area adjoining the on-line section of the route, and includes Shanbally village and Ringaskiddy town centre. The EIS notes that the existing N28 is already a feature of this landscape and that it would be modified in appearance at the northern section of the route. However, it is acknowledged that the project will result in the loss of trees and woodlands in the Mulcon Valley which will have a significant landscape effect at a local level. It is also noted that it would introduce new roads to the townscapes of Shanbally and Ringaskiddy, which would be of a larger scale than the existing local roads. The EIS states that as roads are already a feature of the wider townscape, the proposed road is in part consistent with the townscape area and that this offsets the degree of resource change in this LCA. It is further noted that the proposed diversions to existing Electricity OHLs would not result in a significant change to this townscape, as they already exist and would just be relocated.

Although I would agree that substantial roads and large-scale utility services are an established feature of the townscape in both Shanbally and Ringaskiddy, the scale of the proposed road, including grade separated junctions with slip roads, additional access roads, underpasses etc. is much greater than that which currently exists, and as such, the impact on the landscape resource is likely to be significant at a local level. The impacts on Shanbally and Ringaskiddy villages will be discussed further under the visual impact assessment below. Notwithstanding the above, I would agree with the assessment in the EIS that the predicted landscape impacts would be Moderate adverse for the LCA.

The third and final LCA is the Estuarine Harbour Based Industrial & Maritime Landscape which is located at Ringaskiddy. It includes the port lands to the north of the N28, Haulbowline, industrial areas at Loughbeg and Barnahely and Marino Point. The LCA is described as robust and in a continual state of flux and change due to the location of large buildings, pharma industries, port traffic and other traffic. The value is therefore described as Economic, due to its industrial nature and is assessed as having a low sensitivity to change. It is noted that the existing N28 is already a feature of the landscape and that the proposed M28 crosses it. The proposed Services Area is noted as being a new feature, but would be similar in scale to existing buildings nearby, and that traffic accessing it would be similar to traffic currently accessing the port area. I would agree with the assessment in the EIS that the predicted change to the landscape resource would be small and that the landscape impacts would be Negligible to Minor adverse.

Councillor D'Alton disputed the description of Ringaskiddy as industrial and that the landscape had a low or medium sensitivity to change. She made reference to the Draft Cork County Landscape Strategy in the context that the landscape had been given a much higher value and sensitivity rating. The Draft Landscape Strategy was published in 2007, but does not appear to have been progressed further as a stand-alone document. This document had identified 76 Landscape Character Areas in Cork County, which were then grouped into 16 Landscape Character Types. The current CDP incorporates the LCTs into the planning policy framework (Appendix E). It also sets out the methodology (Chapter 13, Section 13.6) by which each of the landscape character types was evaluated in respect of Landscape Value, Landscape Sensitivity and Landscape Importance.

The site of the proposed road scheme and services area lies within LCT 1, Cork City and Harbour and Estuary. This is described in the CDP as having a 'Very High' Value and Sensitivity and is of 'National' Importance. The ratings are the highest available and in such circumstances, an LCT is categorised as a 'High Value Landscape'. However, this LCT encompasses a considerable area of land including

most of the metropolitan area and harbour area. Within this LCT there are areas of high scenic value as well as built up residential areas and industrial areas, to name a few, with variable degrees of value and sensitivity. The provision of a more refined breakdown of the areas of landscape, within which the proposed M28 would sit and be visible from, is considered to be a reasonable approach. As stated previously, I would be in general agreement with the descriptions and assessment of the impacts given in the EIS and as elaborated upon during the oral hearing. I note that the Ringaskiddy peninsula falls within all three of the LCAs and the areas described as industrial are confined to the port lands to the north of N28 and at Loughbeg. The LCAs with the higher value and sensitivity ratings include the town centre, Warren Cross roads and the site of the Martello Tower.

Observers, such as the M28 Steering Group, Rochestown Rise Residents Group, and residents of Rochestown and Bloomfield, considered that the proposed development would result in the loss of so many trees and woodlands, particularly at Bloomfield and the Mulcon Valley, that it would have a devastating and long lasting/permanent impact on the landscape character of these areas. The EIS acknowledges that the loss of trees and woodlands in the Mulcon Valley would have a significant landscape effect at a local level. However, Mr. Holbeach pointed out that the number of trees that would be felled would be kept to a minimum and that every effort would be made to save as many trees as possible. He further stated that where it was necessary for trees to be felled, they would be replaced with native species with trees of reasonable maturity and scale and would be interplanted with whips and smaller trees. He also clarified that much of the woodland areas referred to by observers included areas outside the CPO (red) line and that these trees would not be affected. In Mr. Holbeach's opinion, the proposed mitigation measures would reinstate the loss over time and would satisfactorily mitigate the significant changes to the landscape at this location.

Mr. Waldvogel, (14/11/17 for Mr. Roynane of 'Martello', Old P.O. Road), considered that the LIA did not address the landscape impact on his client's property. He submitted that the proposed development would have a profound and permanent

negative impact on the landscape character of this 'individual view receptor' by reason of the change to the landscape in the vicinity of this house, in combination with the changes to the land use (from rural-residential to major road with traffic, HGVs etc), and the associated impacts of increased noise, visual impact and shadowing. He was also critical generally of the impact assessment on receptors in that it focussed on visual impact to the exclusion of landscape impact. Mr. Holbeach strongly disagreed with this and stated that landscape impact assessment related to the broader landscape and should not break down into an analysis of the impact on individual fields or properties.

I note that the potential landscape impacts identified in 16.4.2 (EIS) were 'Disturbance from Traffic during operation' and 'Imposition of new features in the landscape', which included the level of new roads and associated structures, signs and lighting, traffic on the road including headlight glare and loss of trees. I would agree that the character of the landscape in the vicinity of this house would change substantially due to the introduction of a major road at an elevated level with the associated noise, traffic and visual impact. However, I would also agree that the assessment of change to landscape character needs to be at a broader level than the visual impact on individual receptors, as it is the character of the whole landscape character area that is being assessed. It is considered that the change of use would have an adverse impact on the residential amenity of the receptor, but that this has to be balanced against the wider community benefits that the proposed road would bring to the area and the region. The noise impacts have been addressed in Section 14.0 above, where it has been noted that although some individual receptors will experience an increase in noise levels, all receptors near the southern section of the route will experience noise levels which will meet the TII Design Goal of 60dB_{Lden}. Shadow impacts have not been addressed but given the distance between the proposed road and the side elevation of the house, it is considered that it is not warranted in this case. The Visual impact on 'Martello' will be addressed below.

In conclusion, it is considered that the landscape impact assessment contained in the EIS, and subsequently elaborated upon at the oral hearing, adequately addressed the policy issues arising, was in accordance with appropriate and established methodologies and adequately identified and assessed the likely impacts of the proposed development on the landscape character of the area, including measures to avoid, reduce and remedy the adverse effects. The remainder of this section will address the Visual Impact Assessment for the proposed development.

16.4.2 Visual Impact Assessment

Observers raised issues regarding the inadequacy of the photomontages including the geographical range and location, representativeness and how the existing environments and proposed impacts were depicted. The absence of sectional drawings or the quality/content of same was also questioned as well as the information/omitted from both the photomontages and cross sections. Several observers vigorously disputed the conclusions on the magnitude of the visual impact on receptors both in a general sense and in terms of specific locations along the route. Some observers included 'mock-ups' of what they considered to be a more realistic view of the impact by means of screenshots from Google Earth which have been altered to include elements of the proposed development. Observers also questioned the adequacy of mitigation and disputed the degree to which the proposed mitigation measures would be effective.

16.4.2.1 Adequacy of information to assess environmental effects

Mr. Harrington (Days 5 and 11) identified what he considered to be a range of inadequacies and misrepresentations in the photomontages, particularly those in and around Bloomfield, Newlyn Vale, Rochestown Rise, Rowan Hill and Maryborough Hill. He included several 'mock-ups' of his interpretation of the likely impact on the visual amenity of the area and individual receptors. He made the point that the Viewpoints are not representative of the most sensitive receptors nor of the worst-case scenarios. For example, he considered that VP9 did not represent the most severe view or impact from Rowan Hill and he questioned the justification for the VP taken from Newlyn Vale, when he believed that there would be a significantly greater

impact from other locations within this estate. Councillor D'Alton also raised several issues regarding the representativeness of the photomontages and referenced the VPs at Old P.O. Road, Carthage Place and Shanbally, in particular. She also considered that the most sensitive receptors were not included and that the VPs were taken from vantage points which did not represent the most severe impacts. She also stated that she would have liked to have seen cross sections and additional drawings representing the impact of the proposed road on the Martello Tower, Martello Park, Ring House (on the NIAH) and on Twomey's Lane. She considered that there was a need for a cross section and photomontage of the impact on Castle Warren. Ms D'Alton also believed that the photomontages were deficient in that they excluded information such as traffic, HGVs, gantries etc.

Mr. Waldvogel, (for Mr. Roynane of 'Martello', Old PO Road), criticised the level of detail contained in the photomontages and elements included or omitted from the VPs, and also objected to the lack of cross sections showing the relationship between the proposed road, embankment and underpass and his client's property. He also considered the lack of detail regarding matters such as the proposed turning head and entrance to the proposed agricultural access lane prevented a proper analysis of the impact on 'Martello'. Mr Waldvogel was particularly concerned about the fact that an existing electricity pylon had been airbrushed out of the 'As existing' VP and that the existing substantial utility services had not been adequately taken into account. He was concerned that the fact that the proposed road would have to traverse the high pressure gas pipeline for 85m (excluding embankments) would necessitate the relocation of the route further north (closer to 'Martello') as it would not be possible to move it further south due to the presence of a 110kV and a 38kV overhead line. Mr. Waldvogel also considered the level of detail regarding the proposed underpass (S10) to be inadequate to enable a proper assessment of the impacts to be carried out. He stated that as it was unclear whether there would be wing walls or not, and how the agricultural lane and turning head would be accessed. He believed that the likelihood was that the resolution of a combination of these issues would result in a 'visual gap' in screening/planting, (e.g. large hedge on western boundary of property), which currently exists and on which the applicant was relying in the visual impact assessment, as shown in the photomontage.

Mr. Flanagan considered that the issues raised fell broadly into two separate areas. Firstly, the question had been raised as to whether the proposed land acquisition would be adequate to enable the proposed development to be constructed, including whether adequate measures had been put in place to ensure that conflicts with, for example, utility providers would not arise or would be capable of being resolved. Secondly, the issue had been raised as to whether the information provided was adequate to enable a proper assessment of the environmental effects to be carried out. Mr Barry addressed the issue of the adequacy of the land acquisition and Mr Holbeach, sometimes assisted by Mr Noonan, responded to the matters regarding the environmental effects.

Mr. Barry advised that extensive liaison had taken place with the ESB and that it had been agreed that the electricity tower would be replaced by one which would be 2m taller. Mr. Holbeach stated that the airbrushing out of the pylon had been an error and that a revised photomontage was included with his brief of evidence. He emphasised that the tower in question had been taken into account in the LVIA and does not change the assessment of the impact, and that it would be on the far side of the proposed road and partially screened by the road and vegetation. Mr. Barry advised that extensive liaison had also taken place with Gas Networks Ireland and that it had been agreed that a slab would be placed over the gas main along the stretch of the road that would traverse it. He advised that there was no requirement to relocate/realign the route. He stated that these matters had been set out in section 17.5.1.1 and 17.5.1.2 of the EIS and are shown on Drawings UT0201 to UT0207. He concluded by stating that there would be no need to extend the CPO line closer to Mr. Roynane's property and that there was no requirement to purchase this property in order to construct the Scheme.

Mr. Holbeach responded to the criticisms of the adequacy of information by stating that photomontages are merely a tool to assist the Board, the receptors and the designers and do not in any way represent the LVIA. He added that a full and detailed assessment has been carried out to determine the magnitude of visual

impact on sensitive residential receptors. This is set out in Section 16.4.4 and shown in Drawings 16.4 a-p in Volume 5. Several observers insisted that the viewpoints should have been from the worst-case scenarios. He stated that it is very difficult on a linear project to represent every location and that the viewpoints chosen are considered to be representative of the views that would generally be available from a general location. He advised that the justification and description for each viewpoint is set out at 16.4.5 of the EIS. Mr Holbeach believed that the information provided in the cross sections and the photomontages was sufficient to enable a full assessment of the visual impact of the proposed project.

I would accept that the detailed visual impact assessment is comprehensive and thorough and sets out the visual impact before and after mitigation for each property/block of properties in close proximity to the route. In addition to this, the overall impact on communities is discussed in 16.4.4 with the predicted significance of the impacts on villages and centres of population. Notwithstanding this, it is considered that the representation of the information in the EIS was not as comprehensive or accessible as it might have been. I would agree that the range of photomontages is not comprehensive enough in certain sections of the route and that the locations of many of the viewpoints are not necessarily representative of the most sensitive/closest receptors and/or the most severe impact from such a location. Some examples include the single viewpoint from a walled entrance at Shanbally village, the lack of views of the Mulcon Valley on both sides and the single viewpoint of the impact of the north-bound diverge on Newlyn Vale.

It is considered that the range of cross sections provided in the EIS is generally adequate. Drawings CSO101-109 (Sheets 1-9) provide cross sections of various chainage points along the route. However, the way in which they have been presented is poor, as the scale is so small, it is difficult to read the annotations and dimensions. I would accept that the drawings are available digitally and that one can zoom in to the relevant area of interest. However, there are 2-3 sections per page and it is not immediately clear how the existing and proposed ground levels are depicted. Notwithstanding this, a thorough interrogation of each of the cross sections

was undertaken at the oral hearing (Day 12) to ensure that the information presented was adequate and sufficiently clear to enable a full assessment to be carried out.

Councillor D'Alton and John Twomey raised the issue of the lack of information regarding the visual impact on the southern side of Shanbally village and Twomey's Lane. I would agree that the most severe impact within the village is likely to be from the south, which comprises the greatest portion of residential development within the village and is along an E-W axis facing the proposed interchange and complex range of slip roads and access roads. The views from the south currently comprise of the grotto with a backdrop of agricultural fields and the landscape is dominated by stone walls and hedgerows. The proposed motorway would be located immediately behind the grotto and at an elevated level. Although the proposed development at the location of the Grotto/Forrester's Hall is represented in a Cross-section drawing (CS108), and further details are provided in BR0802 and BR0803, photomontages from the south looking towards the grotto and from Twomey's Lane further to the west would have been useful.

However, these matters were discussed at some length during the oral hearing and it is clear that a detailed assessment of the visual impact on the residential properties to the south of Coolmore Cross and Twomey's Lane has been carried out. The impact on each of the properties has been assessed as 'Major to Substantial' prior to mitigation, reducing to 'Moderate to Major' with mitigation. This assessment seems reasonable and although a visual representation in a photomontage would have been useful, it is considered that the impact has been adequately addressed. I would also draw the Board's attention to the Transport Consultant's Report which has recommended revisions to the proposed development in respect of the proposed realignment of the L6472 at Shanbally interchange and is also discussed at 12.4.3.3 above and at 16.4.2.4/5 below.

South of Rochestown Road, the paucity of viewpoints taken from within the Mulcon Valley is notable (Fig 16.2-3/4). I would acknowledge, however, that the existing wooded area between the residential areas and the existing N28 would make it

difficult to access suitable locations for the photomontages to be compiled, and there are few locations that would be publicly available as well as representative of the views from the most sensitive residential receptors. I would also agree that the location chosen for Viewpoint 9 does not depict the impact on the most sensitive receptors at Rowan Hill as well as an alternative location further to the north would have done. However, it is noted that a detailed analysis of the visual impact on the properties that would be closest and most severely impacted has been carried out, in addition to an assessment of the impact of properties further to the north and east within Mount Oval. Similarly, a detailed visual impact assessment has been carried out for an extensive range of properties on the western side of the Mulcon Valley in Rochestown Rise and Lissadell and other housing estates to the west and south. The impact before mitigation for the properties in closest proximity to the proposed road has been predicted as Moderate to Major (Rowan Hill, Lissadell, Delfern Grove and Maryborough Heights) and Major to Substantial for the closest properties at Rochestown Rise and Mount Ovel/Clark's Hill. With mitigation, the predicted impacts of Moderate to Major reduce to Minor to Moderate and the Major to Substantial reduce to Moderate to Major. These findings will be discussed in the following sections.

The number of viewpoints and range of locations around Rochestown Road and to the North of this road is more comprehensive. I would accept however, that the view from Newlyn Vale did not represent the worst-case scenario. Notwithstanding this, a detailed visual impact assessment of the residential properties at Newlyn Vale, Wainsfort, Kiltegan Lawn and Bloomfield has been carried out. The predicted impacts for each of the closest properties, (apart from those at Bloomfield), are Moderate to Major prior to mitigation, which reduce to Minor to Moderate after mitigation planting has established. A number of proximate properties at Bloomfield would reduce from Major-Substantial to Moderate to Major with mitigation. The magnitude of the impact was the subject of some dispute at the oral hearing and this will be discussed in the following section.

In response to the issues regarding insufficient detail contained in VP2a raised by Mr. Waldvogel, (for Mr. Jim Roynane 'Martello', Old P.O. Road), Mr. Holbeach agreed (Day 5) that the access road was not included in the photomontage but it is shown on the relevant planning drawings and that it would involve a timber post and rail fence. The issue of the turning head was also discussed on Day 3. Mr. McGrath (for Mr. J. Roynane) asked why provision for a turning head at this location had not been shown on the photomontage. Mr. Noonan referred to Fig. 4.18 in Chapter 4 of the EIS (page 4-53), which shows that a turning head and an agricultural access lane to severed lands can be accommodated within the field adjacent to Mr. Roynane's house. Mr. Waldvogel (Day 5) insisted that the lack of information about these details meant that the full effects of the proposed development could not be adequately assessed. He also considered that the overbridge itself could not incorporate any screen planting, and given its elevated level within the landscape and the fact that the noise barrier on top would be just 3m, it would not be able to screen traffic including trucks passing by.

The EIS (pages 16-26/27) notes that the predicted view includes embankments, noise barriers (3m) and the overbridge at close distance and that the views of the woodland beyond would be blocked. It is further noted that the parapets associated with the proposed overpass (S10) would be partially screened by intervening roadside vegetation. Mr. Waldvogel believed that this referred to the tall hedgerow/tree on the Old P.O. Road roadside boundary. Mr. Holbeach stated that there is no intention to remove trees unnecessarily and this tree/hedge could possibly be saved, but accepted that it could also be lost. However, he rejected the claim that this meant that the assessment of impacts had not been comprehensive enough as the predicted impact at this location was 'Large' in magnitude with a sensitivity of 'Major to Substantial', which is the most severe level of visual impact. With regard to the proposed underpass (S10), Mr. Noonan stated (Day 12) that the details of the proposed structure, including a cross section, are shown on Drg. BR1001a, which shows a standard box design with wing walls. Mr. Bergin asked if the wing walls could be flared, as the square wall design makes the underpass appear longer than it is. Mr. Noonan responded that he would take this into consideration.

I would agree with Mr. Holbeach that irrespective of whether all elements of the proposed road infrastructure had been included in the photomontage, it does not change the fact that the magnitude of the visual impact and its significance are predicted to be 'Large' and 'Major to Substantial', respectively. Thus, even if these elements were not originally included but included subsequently, the impact could not be assessed as being any greater. It is considered, therefore, that the environmental effects have been adequately identified and described and that where there were any shortcomings, these were discussed at some length during the oral hearing. It is considered that as the predicted impact is very high, it is of great importance that adequate mitigation measures are provided at this location in order to reduce the impact. This will be discussed in the following sections.

16.4.2.2 Magnitude and significance of visual impact disputed

Several observers strongly refuted the findings of the EIS in relation to the predicted magnitude and/or significance of the visual impact. Mr Harrington (Day 11) disputed the predictions in regard to Rowan Hill, Newlyn Vale, Lissadell, Rochestown Rise and Maryborough Hill and included several 'mock-ups' to demonstrate how he considered that the visual impact would be in reality. He asked how could a rating of 'Minor to Moderate' be assigned when all of the amenity is being removed? Mr. Adrian Culligan, in his address to the hearing (Day 7), also included a 'mock-up' of what he considered the visual impact would be from his property (Ref. 435), which is located adjacent to the pinch point of the interface between the new north-bound lane and these residential properties. He considered the impact on his dwelling (39 Newlyn Vale) to be horrendous and utterly devastating. Domhnaill Mac Domhnaill (Day 9) asked how the impact of the 'elimination of the woods' in the Mulcon Valley was quantified in the assessment of the visual impact, and why they were not included in the 'Recreation and Amenity' areas. He also refuted the Moderate to Major impact assigned to Rochestown Rise, which he considered to be outrageous.

Mr. Hanley queried the 'minor impact' prediction for his property to the north-east of Raffeen Quarry. Councillor Marcia D'Alton refuted the predictions for several

properties/groups of properties including Carthage Place, Twomey's Lane, and Martello Park as well as the Martello tower and Castle Warren. She also stated that the assessment of the impact did not include the traffic, HGVs, noise barriers or gantry signs. She queried how the impact could be assessed without having regard to the full impact of these elements. Mr Waldvogel also raised similar issues as discussed in the previous section.

Mr Holbeach explained that the process of conducting the visual impact assessment included assessing the sensitivity of the viewer, which in the case of residential receptors was high, and the magnitude of change is then applied. He responded to the mock-ups by stating that they were not a realistic interpretation of the visual impact, especially the inclusion of lorries, and did not include the mitigation measures proposed, which have been included in the proposed photomontages and cross sections. He reiterated that the LVIA does not rely on the photomontages and that the important issue is that the level of impact has been predicted for each of the properties in question. He advised that loss of trees and woodlands was taken into account in the assessment and that the recreational areas provided by the local authority were also included.

I would generally agree with the findings of the detailed assessment of visual impact on residential receptors in the EIS, apart from the assignment of magnitude and significance of 'Moderate to Major' impact prior to mitigation, of the following properties :-

EIS Property Ref./ Location

21, 26, 27, 28, 29, 30, 32 – Kiltegan Cres./Park and Delford Drive (Fig. 16.4a)

48, 51, 53, 61, 62, 63, 68 – Wainsfort and Newlyn Vale (Fig. 16.4b)

125, 130, 132, 133, 135 – Rowan Hill (Fig. 16.4c)

129 - Maryborough Heights, Lissadell (Fig. 16.4c)

Given the proximity of these properties to the proposed realigned motorway, it is considered that the introduction of new structures which will bring the motorway infrastructure closer to these established residences, combined with the loss of substantial and mature woodland/amenity areas which currently shield these properties from the N28, would be the highest level of impact, which is Major to Substantial. It follows that the predicted impact with mitigation (as proposed in the EIS) would be likely to give rise to a more substantial visual impact at these locations.

Kiltegan/Delford Drive – it is noted that there is a photomontage taken from Delford Drive (No.12) which is stated to be representative of views experienced by residential properties in the immediate vicinity. The viewpoint is from the edge of an unmanaged green space and it is stated that the “existing view is restricted by mature tree and shrub planting within the foreground and at middle distance where such planting is associated with the southern boundary of the N28.” The predicted impact is that the proposed road project will be fully screened in views and the removal of vegetation will be viewed as a minor alteration as it will be difficult to distinguish from the proposed vegetation. The magnitude was deemed to be ‘no change’ and the significance as ‘none’.

It is acknowledged that properties to the west/northwest of the viewpoint were also assessed and that the impact was deemed to be moderate to major. This is somewhat to be expected as these properties are much closer to the project than VP12. However, Property Ref. 21 and 26-30 face directly onto the elevated road and are directly adjacent to the proposed development (northbound diverge lane). From my inspections of the area, I observed that the visibility of the existing N28 is much greater from properties at the northern end of Kiltegan Crescent, Kiltegan Park and Delford Drive, as the screening effect of existing vegetation is not as robust further to the west. It is considered that the impact is likely to be much more substantial for these receptors, in the absence of mitigation.

Wainsfort/Newlyn Vale – The viewpoint from Newlyn Vale was taken from the west, from the cul-de-sac which runs parallel to Rochestown Road. It provides a reasonable vantage point for the proposed new bridge, but is not particularly representative of the impact on the residential receptors. The EIS does not claim that this view is representative of the views from the nearby residential receptors. It notes that the views of the overpass are currently, and would be, restricted by existing dwellings to the left and to the right, by existing street trees.

I would agree with the observations but note that the magnitude of the impact is stated to be 'Medium', and the significance as 'Moderate to Major'. This is the same assessment that is assigned to Property References 48, 51, 53, 61, 62, 63 and 68. However, the visual impact on these receptors is probably the most severe of the entire route. Their rear garden walls abut a narrow space beyond which is the existing on-ramp to the N28. Within this space, it is proposed to insert the proposed Northbound Diverge Lane, which will be at an elevated level. The existing and predicted impact is worsened by the fact that the mature band of evergreen trees that had been planted along the interface in the 1990s has been felled and these properties are currently more exposed than previously. The predicted view in VP11 shows the noise barrier on the proposed overpass, which carries the said N-bound diverge lane. This gives some indication of the likely impact on the properties at Newlyn Vale and Wainsfort further to the north-west. I would agree that the 'mock-up' presented at the hearing is unrealistic and exaggerates the effect. Cross Section Drawings CS0101, CS0102 depict the relationship between the dwellings and the proposed road project for these locations with greater accuracy. However, I agree with the observers that the impact on these properties would be at the highest level, i.e. 'Major to Substantial', in the absence of mitigation.

Rowan Hill – The Viewpoint closest to Rowan Hill is VP 9, which is taken approx. 100m to the south-east of the properties that would be most affected by the proposed new motorway off-ramp serving Mount Oval. The proposed development will cut deeply into the wooded hillside and remove a substantial amenity space comprising sloping, manicured lawns with shrubs and ornamental planting. It would

bring the motorway on-ramp, with the associated retaining wall and noise barrier at the top of the new embankment, to within metres of these properties. This is illustrated in cross section drawing CS0104 (Chainage 1055). The EIS states that the viewpoint is representative of views experienced by residential receptors in the vicinity. Although this is likely to be the case, it is not representative of the houses at the top of the new embankment at Rowan Hill. Despite the assessment that the magnitude at the location of this VP is stated to be 'no change' and the significance 'none', the properties in question have been assigned a significance of Moderate to Major. However, it is considered that the visual impact of the proposed development (in its entirety) would be more severe than that at this location. The loss of the dense woodland on the eastern side of the valley would also open up views of the motorway that are currently screened from Rowan Hill. I would, therefore, consider the significance of the impact to be 'Major to Substantial', in the absence of mitigation.

Lissadell/Maryborough Heights - Although it is acknowledged that it is not proposed to undertake a significant amount of work close to these properties, it is also true that these properties, (particularly those at the southern end) are very close to the existing N28 and are currently shielded by the dense stand of trees. However, road widening works here, including the diversion of a stream, could result in the loss of strategically located mature trees, which would potentially give rise to a severe visual impact, at least until such time as replacement trees become established. Mr. Holbeach was not able to confirm the extent to which trees would have to be felled, but did confirm that as few trees as possible would be removed and that it would only involve trees within the CPO line. However, as can be seen from CS0104 (Chainage 1055), the extent of the CPO line at this location is quite extensive. The proposed new alignment would result in the loss of trees and the row of houses (Property Ref 129) would be closer to the road project. Thus, in the absence of mitigation, it is considered that the significance of impact here would be 'Major to Substantial', rather than 'Moderate to Major'.

Notwithstanding the above comments, the magnitude and significance of the impacts on these and other receptors was discussed in depth at the oral hearing and the applicant has responded by proposing additional mitigation which will be discussed in the following sections. It should also be noted that whilst the magnitude and significance of impact was debated in respect of other properties at the hearing, such as Rochestown Rise, Old Post Office Road, and several others, I am in agreement with the assessment of the likely visual impact, in the absence of mitigation, on these properties, most of which have been assessed as having the highest level of impact.

16.4.2.3 Adequacy of mitigation measures

Many observers criticised the proposed mitigation measures as being unrealistic, ineffective, incapable of being delivered and that the planting would take such a long time to become established that it could never replace the existing level of screening, ecological benefits and amenity provided by the woodlands to be felled. Mr. Waldvogel disputed the predicted impact depicted in Viewpoint 2a following mitigation. He rejected Mr. Holbeach's claims that trees could be planted at a heavy standard and that they could reach the level of maturity shown in the photomontages within those timeframes. He stated that the impact after 5 years would take more like 10-12 years and the impact after 10 years would take more like 25 years. Other observers similarly disputed the ability to plant trees that would be mature enough to provide the level of screening required to mitigate the visual impact. Some observers considered that the space required to plant and adequately maintain such high-quality trees was simply not available and as such, it was not possible to mitigate the impact as suggested in the EIS.

Mr. Holbeach strongly refuted these claims and stated that he had extensive experience in providing landscaping as part of major road proposals and had taken all of these factors into account. He was absolutely confident that the proposed planting measures as set out in the EIS would be capable of being delivered and that they would provide the required level of mitigation. Notwithstanding this, he proposed a number of additional mitigation measures in his brief of evidence. These include:-

- Redundant road areas - Additional landscape planting strips at three sections of “redundant road”, shown on MCT0597SK2228, namely;
 - (1) Rochestown Road on-ramp (Ch550);
 - (2) Mount Oval off-ramp (Ch1150); and
 - (3) Maryborough Hill on-ramp (Ch1500).
- St. Patrick’s Church – additional 2m strip of planting in front of the retaining wall with trees to a height of 4.5m at time of planting and instant hedging and mature shrubs (Drg. MCT0597SK2227).
- Rowan Hill – 2m strip landscaping strip in front of retaining wall with noise barrier at the top of the slope MCT05975SK5062 and (CS0103).

In addition, Mr. Holbeach proposed a number of refinements and additional measures, in conjunction with Mr. McKeown and Mr. Noonan, for a range of locations along the route. Clarification was also provided in respect of the interface with residential properties. These matters were largely discussed during the end of Day 11 and the morning session on Day 12, when I sought clarification in respect of the proposed noise and visual impact mitigation measures along the route as shown on each of the cross-section drawings. Most of the revised measures were included in the Schedule of Commitments submitted to the hearing at the end of Day 12. Mr. Holbeach suggested improvements to the mitigation measures at other points during the hearing also and they have been included in the amended schedule. I have summarised the main clarification issues and amendments below.

16.4.2.4 Clarification of specific mitigation measures by Inspector

1. Absorptive and reflective barriers – Specification provided

Mr. McKeown submitted a revised table (14.15) showing the type of barriers to be provided along the route, (included in Schedule of Commitments submitted Day 12). A discussion followed where Mr. McKeown explained the difference between Reflective and Absorptive barriers. He stated that it is now proposed

to provide absorptive barriers at the northern end of the route, along the Mulcon Valley, at Shannonpark and at Ringaskiddy, principally where two barriers face each other and where there is a deep cutting (such as at Mulcon Valley). He advised that this would be likely to result in even further reductions in noise levels than had been predicted in the noise modelling, which had been based on reflective barriers. The schedule in Table 14.15 also provided additional information on the materials and colours of the barriers and reiterated the heights and lengths.

PWC barriers - Discussion re treatment of PWC barriers not fully resolved but it was agreed that the barriers directly facing and in close proximity to residential properties need to be textured or patterned to raise the aesthetic quality, subject to being able to undertake the planting that has been committed to and to achieving the design life (120 years) required by TII.

2. Bloomfield/Kiltegan/Wainsfort - Drawing CS0101 – Ch220, Ch325, Ch375

Ch220 – AB01 would be a reflective barrier because it is protecting properties to the south side of N40 and no houses on northern side. As there would not be two barriers opposite each other, a reflective barrier is the most appropriate one. The trees on the south-western side of the proposed road, at Wainsfort, would have to be retained, (Item 13, 14 of Schedule).

Ch325 Wainsfort – Note Revised Drawing SK2227 which shows trees to be planted adjacent to Wainsfort and the retention of existing trees. It was clarified that proposed trees would be planted on the slope and would be 4.5m at the top of slope adjacent to the proposed barrier. It is also proposed to plant an instant hedge (1.5m high) adjacent to the barrier.

Ch375 Wainsfort- St. Patrick's Church – clarification that revised planting proposals as shown on Drg SK2227 (as discussed at 16.4.2.3 above) will continue along the full length of the retaining wall adjacent to St. Patrick's Church. On the Wainsfort side, the band of trees that had been removed will be replaced as discussed previously (Items 17, 18 on Schedule).

3. Newlyn Vale/St. Patrick's Church CS0102 – Ch435, Ch495

Revision Ch435 - It is now proposed to retain the existing slope (dashed line on CS0102 drawing) to the rear of Newlyn Vale House (Ch435). This is the

existing soil wall and it will allow planting directly into the slope, which will be at a higher level than previously proposed. These trees will be planted at Extra Heavy Standard (4.5m high) and will grow to approx. 8m within 10 years, which will provide an instant screening effect. There will also be instant hedging immediately adjacent to the retaining wall. (Note not specified in Schedule).

Clarification re RW01– the construction of RW01 will comprise a reinforced concrete wall (on top of the soil wall), with a vehicle restraint system above and a 1.5m extension of parapet at the top. Together this will form a 3m high noise barrier at this location, which will be absorptive and concrete or powder-coated metal finish.

Clarification re interface between dwelling and road – CS0102 shows the existing road as a dashed line. The levels vary along the route, but at Ch435, it will be 1m higher than the existing road and will be 0.5m closer to the residential property than existing, (i.e. distance between reinforced soil wall and existing embankment). The applicant stressed that the height would not be as depicted in the ‘mock-up’ presented by Mr. Harrington.

Means to guard against loss of mitigation planting in the future – in response to the information that the existing dense band of trees that had previously been planted at mitigation along the interface between the N28 and Newlyn Vale/Wainsfort, had been felled by TII in the past year, Mr. Holbeach stated that he did not have any specific knowledge of this. However, he believed that they were principally Leylandii trees which tend to be broad, unstable and unruly, which is probably why they were removed. He pointed out, however, that it is proposed to plant fastigia trees at this location which would be upright and more easily maintained, especially in confined spaces, yet would provide the same level of screening. Such planting would be more enduring and it is now proposed that all planting is to be managed and monitored by the Contractor for 3 years, post construction, (Item 14, Landscaping, Schedule of Commitments).

Eastern side Ch435/495 – St. Patrick’s Church – All efforts will be made to retain as many trees as possible along the access road to the church. This is in addition to the revision contained in Mr. Holbeach’s brief of evidence (additional planting strip adjacent to retaining wall) as outlined above (16.4.2.3), (Items 17, 18 of Schedule).

Ch495 Newlyn Vale adjacent to Rochestown Road – confirmed road will be closer and higher adjacent to property at end of cul-de-sac, but additional planting to be provided in redundant strip between house and road, as outlined above (16.4.2.3). Clarification provided that RW01 will have a barrier on top and overall height above GL is approx. 7m. and EHS trees will grow to 7-8m in about 5 years (Item 17).

4. Rochestown Rise – CS0102/CS0103 – Ch600, Ch650, Ch705

Ch600 – on western side, vegetation will be retained as much as possible and embankment will be replanted with a hedge provided in front of a 3m high barrier. On eastern side, retaining wall will be kept and EHS trees planted at 4.5m height. Discussion regarding land to north and south of road (white on plan layout, within CPO line), which is currently planted with trees and agreed that this could be replanted with trees subject to sightline restrictions. The possibility of inserting a retaining wall was also discussed with a view to retaining as many trees as possible, but not agreed as it would result in a 10m high structure.

Ch650 and Ch705 – Confirmed new embankment over culverted stream would be replanted with woodland on western side. Agreed that there is an error on cross section Ch650 and extra traffic lane shown on “white land”, (between Northbound diverge and mainline), which it is now agreed to be replanted subject to sightlines.

5. Rowan Hill/ Lissadell – CS0104 – Ch900, Ch1055

Ch900 – as cutting is very high on eastern side, CS0104 does not extend as far as the houses on Rowan Hill – submitted three cross sections which do, A, B, C on Drawing SK5062 (submitted 1/12/17) – attached to Schedule. Confirmed that new slope would be planted in its entirety with woodland and that the lost trees would be replaced. Woodland would consist of semi-mature trees (EHS, 4.5m), underplanted with feathers and transplants. Confirmed trees will be lost here and it is unavoidable, but replanted semi-mature trees should grow to at least 8m within 10 years, (Item 16 on Schedule).

Ch1055 – Revision - confirmed that there will be a 2m wide planting strip between the footpath and the barrier at the top of the slope (Rowan Hill), and

an instant hedge will be planted in front of the barrier, together with semi-mature trees. Confirmed error on cross section in EIS as widening proposed here to facilitate median strip, but a car is shown on central reservation. (Item 16 on Schedule).

RW08 – will consist of a retaining wall at the base and above this, the wall will be faced with stone with a highly textured finish. Mr. McKeown explained that as two barriers are abutting each other (RW08 and AB08). This means that where the retaining wall is no longer required for structural reasons, the remainder of the barrier would be in the form of a green timber barrier. Inspector queried why masonry wall not continued for visual consistency. Applicant responded that acoustically there would be no difference and the issues were based on which treatment would be more appropriate aesthetically and from a cost point of view. In light of the proposed hedging and EHS tree planting, it was considered that the green timber would be less obtrusive and softer aesthetically. (Item 16).

6. Lissadell/Maryborough Heights/Maryborough Hill – CS0105 – Ch1250, Ch1545

Ch1250- Maryborough Heights – confirmed that there will be minimal construction works here, which will be confined to the insertion of the retaining wall on the road side of the stream. The road will be widened by cutting into the existing mound and the remainder of the mound will be retained by RW09, which will be a 3m high stone-faced retaining wall, and there will be a further noise barrier AB06 at the top of the retained mound. (Note clarification that AB06 will extend to the dark dash line which represents the new ground level). This will be a reflective barrier as no residential development on opposite side of road. Confirmed no need to carry out works or remove trees on southern side of stream valley.

Ch1545 Maryborough Hill – confirmed that “existing wall” at this location is the point at which Mrs. O’Connell’s boundary lies and that it is proposed to widen the mainline here, but the road works would be at the level of the N28, which is below Maryborough Hill. Clarification that a piled retaining wall will be provided here and a 3m noise barrier at the top of the slope (AB10, timber, green, absorptive). Mr. Noonan confirmed that there would be some activity in the area

between the retaining wall and the noise barrier, which currently has a lot of trees, and which may affect the vegetation here. These works include the creation of a platform to enable the construction of the piled wall and the provision of a temporary noise barrier (TM0010) during construction. In addition, the provision of AB10 may also affect some vegetation. Mr. Holbeach confirmed that as many trees as possible would be retained and that SLM05 is the relevant mitigation planting here. Mr. Noonan also confirmed that the proposed widening of Maryborough Hill would be on the opposite side of the road to this property. It was confirmed that the significant area of trees adjacent to the O'Dea property would be retained as far as possible and that the old merge lane would be dug out and planted and that the installation of TM0010 on Maryborough Hill will not result in the loss of any trees (Items 12, 13).

7. Douglas Golf Course/link road – CS0106 – Ch1640, Ch1710

Ch1640 and Ch1710 represent the interface between Douglas Golf Course and the M28 between Maryborough Hill and Carr's Hill, including the proposed two-way link road which cuts along the side of the golf course. This will be discussed in more detail in the CPO module. From a landscape/visual amenity point of view, the main impact here is the loss of a significant area of woodland adjoining the existing N28 and the proposed boundary treatment.

8. Shanbally Forrester's Hall/Grotto – CS0108 – Ch110, Ch180

It was pointed out that the retaining walls shown in the cross sections are confined to the areas immediately behind the Grotto and Forrester's Hall, with a continuation of the embankment on either side, and in between. Mr. Holbeach advised that although not shown on the CS0108 drawing, it is proposed to provide a 1.5m instant hedge and 4.5m EHS trees in front of the retaining walls (RW17 and RW18). He stated that at present these walls would be TII standard retaining walls (precast units) but that if the Board considered it necessary, consideration could be given to facing these with stone. The inspector queried whether it would be possible to insert a grassed slope in front of the retaining walls, but Mr. Noonan considered that there would not be sufficient room within the CPO line and that the proposed landscaping would fill the space.

9. Underpass – Shanbally – BR0802

The proposed underpass on the main road through the village (S8A) will be a precast concrete structure with wing walls and will travel underneath the mainline, the southbound slip road and the northbound slip road. The Inspector queried the finish on the precast units and any constraints on providing a more aesthetically pleasing finish than smooth concrete. Mr. Noonan stated that the principal constraints were to retain the material behind it and to provide sufficient space to function as designed. He confirmed that the wing walls would be flared.

10. Underpass – Ringaskiddy – BR1001a

S10 would also be constructed of precast units and would have similar constraints. It would be 6m wide and 22m deep. It was stated that the wing walls could be flared, if the Board requested this.

16.4.2.4 Outstanding mitigation matters

1. ‘Martello’ Old P.O. Road Ringaskiddy

Further to the discussions during the questions on the landscape module in respect of this property, it is considered that there is a need to consider additional mitigation measures beyond those proposed in the EIS and at the oral hearing. Mr. Holbeach had stated that he could not confirm whether the existing tree/hedge, which provides very effective visual screening at present along the roadside boundary of Old Post Office Road, would be retained once the design has been finalised in respect of the access road and the tuning head. It is considered, however, that this vegetative screen should be retained if possible, and if it is found to be necessary to fell it, that it be replaced with an EHS tree (4.5m). should the Board be minded to approve the proposed Scheme, a Condition to this effect should be attached.

2. Shanbally Grotto and Forrester’s Hall

The proposal to provide 1.5m instant hedging and EHS tree planting at 4.5m height in the space in front of the proposed retaining walls immediately to the north of the Grotto and Forrester’s Hall was not included in the Schedule of

Commitments. A condition to this effect should be attached to any approval. In addition, the finish on the precast units on the southern face of the retaining walls (Rw17/RW18) should be required to be textured or patterned.

3. Shanbally and Ringaskiddy underpasses

The wing walls to the Shanbally (S8A) and Ringaskiddy (S10) underpasses should be required to be flared and finished with a patterned or textured finish.

4. Newlyn Vale – boundary treatment

The proposal to retain the existing soil wall to the rear of the properties at Newlyn Vale and to plant the new trees at existing ground level was not included in the Schedule of commitments. A condition to this effect should be attached to any approval.

16.4.3 Conclusion Landscape and Visual Impact

It is considered that the assessment of the landscape and visual impact conducted by the applicant together, with the information provided during the course of the application, is adequate to enable a full and comprehensive assessment of the issues. I am also satisfied that the landscape and visual impacts identified in the EIS, including those noted above as being more severe than that found in the EIS, would be adequately addressed by the mitigation measures contained in the EIS, as amended and clarified in the further information and dialogue during the oral hearing. Should the Board be minded to approve the proposed road and service area scheme, it is considered that the mitigation measures set out in the Chapters 16 and 19 of the EIS, and as set out in the Schedule of Commitments submitted on 1st December 2017, and in any conditions outlined below, should be required to be implemented in full.

17 Flora and Fauna

17.1 Environmental Impact Statement

The potential direct and indirect impacts of the proposed development on the flora and fauna of the area, together with the proposed mitigation measures and the

residual impacts are set out principally in Chapter 10 (Aquatic Ecology) and Chapter 12 (Terrestrial Ecology), of the EIS. Matters relating to Hydrology are contained in Chapter 9, and matters relating to Soils, Geology and Groundwater are contained in Chapter 11. It should be noted that mitigation measures, management and monitoring plans and surveys of habitats and species are set out in more detail in Appendices 12A – 12F, (inclusive), of the EIS.

In addition to the Environmental Impact Statement in respect of flora and fauna, an Appropriate Assessment Screening was carried out in accordance with the requirements of the Habitats Directive, and a Natura Impact Assessment was submitted with the application, which is contained in Volume 3 of the EIS.

17.2 Issues Raised during the course of the application and oral hearing

17.2.1 Issues raised by observers regarding flora and fauna

1. Biodiversity value of Ballyhemiken Quarry must be protected – Unique habitats have developed including species-rich limestone grassland and wetland areas, a diverse collection of invertebrates, cliffs which support Peregrine Falcon nesting sites and scarce plants such as Pennyroyal and bee orchids. Route through quarry will destroy biodiversity and is contrary to CCC Biodiversity Action Plan 2009-14. Alternative routes are available.
2. Alternative route 2008 should be pursued instead – the 2008 route through Fernhill Golf Course would avoid the destruction of the biodiverse site, and would not necessitate the filling of a large void and would enable the preservation of the lake and the habitats within the quarry. The Golf Club is now seeking a re-zoning as the golf course is said to be unviable. This alternative route would still enable the use of the quarry for construction material as it is just “next door”.
3. Habitat classification within quarry disputed – A group of local naturalists (led by Dr. Jo Goodyear) has disputed the classification of habitats. It is claimed that the quarry lake should be classified as Mesotrophic Lake (FL3), which would correspond to Annex I Habitat (Oglio-mesotrophic waterbody with chara), rather than Other Artificial Lakes and Ponds (FL8), and as such, the

road must be re-routed away from the quarry. It is further claimed that the habitat Dry Calcareous Grassland (GS1) is present within the quarry and that it supports 3 species of orchid, which means that it corresponds to Annex I habitat "Festuco-Brometalia Calcareous Grassland 6210". Although the habitat is not directly impacted, the proposal to translocate some areas of GS1 is of concern.

4. Protected species within quarry - A group of local naturalists (led by Dr. Jo Goodyear) has pointed out that the following protected species are present within the quarry –

Smooth Newt – protected under the Wildlife Acts 1976 and 2000 and was recorded on 17th June 2017 at the lake. This is a protected amphibian (*Lissotriton vulgaris*) which needs damp meadows as an adult but a lake as a tadpole. The EIS does not record it but was recorded by this group. The road should be re-routed as translocation is an ecologically poor and costly solution and the wetland also supports common frog.

Pennyroyal – this is protected by a Floral Protection Order. Work is needed to encourage and protect this species on site as well as proposals for translocation.

Peregrine Falcon – this is an Annex I Bird of Prey which successfully breeds in the quarry. The proposed development will directly affect its breeding success and may drive it from this habitat. The proposed nest boxes are unlikely to be adequate to encourage the return of the bird to the quarry after the construction stage.

Yellowhammer – this Red species (BOCCI) has been recorded on site.

5. Other species present within the quarry include invertebrates such as 11 species of butterflies and moths, 17 species of dragon flies and damsel flies, 34 species of bird including Little Grebe, Kestrel and Buzzard and 80 plant species.
6. Translocation issues – concern expressed regarding translocation rather than retention in situ as well as the Post-translocation strategy. It is stated that the calcareous grassland within the quarry is currently maintained by rabbit grazing but it is proposed to replace this with hay-cut. This is likely to alter the species composition of the grassland. The translocation of grassland and wetland will not be successful unless stringent planning conditions are put in

place to maintain the ecological criteria. Receptor sites also need to be monitored and a long-term management plan is required to maintain the biodiversity of the receptor sites.

7. Cumulative impacts - EIS inadequate - The cumulative effects of the development of the road and the resumption of the extraction from the quarry have not been adequately addressed. There would be a phenomenal increase in the rate of extraction of stone from the quarry from 30 years (as granted under the planning permission) to 3 years, required for the road project.
8. Water quality survey dates and relevance questioned – it is claimed that many of the surveys are outdated (based on 11-year-old unpublished reports) and incomplete, which undermines the credibility of the habitats assessment in respect of invertebrate water quality, aquatic plants, fish and ecological importance.
9. Woodbrook Stream – there will be a massive structure (S2) alongside a steep incline adjacent to Woodbrook Stream. It is inevitable that there will be spillage and sedimentation, as there is no protection. Thus, pollution and realignment of culverts will kill off most fish in the stream. Given that there is a hydrological link to the SPA and the SAC, this should not be allowed.
10. Bats – Bloomfield Woods – Habitats for bats will be irreparably damaged in respect of foraging, roosting, feeding and commuting. The dates that the bat surveys were undertaken are questioned as it would seem that it was just during winter 2017. Bats have been observed at Bloomfield Woods north of the R610, but it is not recorded as a bat habitat in the EIS. 7 out of 10 bat species have been observed within 10km including “ubiquitous common pipistrelle and soprano pipistrelle”. There is ample evidence that the impact of this development will be to destroy bat life in Bloomfield Woods, which is in contravention of the law.
11. EIS inadequate re assessment of impact on bats - Although the EIS acknowledges the loss of habitats and potential roost sites for bats, there are three major weaknesses in the EIS –
 - Residual impacts – negligible yet acknowledged in EIS that certain species are likely to be displaced and lose habitats. There is no guarantee that they will survive the displacement.

Roost sites – there is a lack of evidence regarding confirmed roost sites, but this is not accepted as being adequate.

Breach of NRA Guidelines – bat surveys were not four-season surveys as required by guidelines.

17.2.2 Issues raised by Dept. Arts, Heritage and the Gaeltacht

These issues have been summarised above at 6.1.2.2. In brief, further information was sought in respect of :-

- Alternative nesting sites for Peregrine Falcon;
- Confirmation of native status for Pennyroyal, together with FI re translocation and Licence for same;
- Likely impacts on wintering waterfowl and need for restrictions on piling and blasting;
- Monitoring of Curlew feeding areas during and after construction;
- Mitigation for barn owls in respect of collision mortality as an elusive species;
- Extant permission for Raffeen Quarry and conditions re restorative works following excavation.

17.3 Oral hearing

The potential impacts and proposed mitigation measures in respect of flora and fauna and biodiversity were discussed principally during Day 4 of the oral hearing, 10th November 2017. However, these matters were also discussed during Day 2 (morning, 8th Nov. 2017, Frances Gordon, Bats at Bloomfield); Day 7 (morning, 16th Nov. 2017); and Day 9 (morning and noon 28th Nov. 2017).

Submissions and/or presentations were made by the following observers:

- Dr. Jo Goodyear
- Rodney Daunt
- Dr. Dara Fitzpatrick
- Gordon Reid

- Frances Murphy
- Domhnaill Mac Domhnaill
- Frances Gordon
- Daniel O'Connell
- Cork Environmental Forum

In attendance for Prescribed Bodies:

- Dr. Jervis Good – Dept. Arts, Heritage and the Gaeltacht (NPWS)

In attendance for the applicant were:

- Dr. Bernadette White – Aquatic Ecology (Chap 10 EIS)
- Eamonn Delaney – Terrestrial Ecology (Chap 12 EIS, NIS)
- Dr. Karen Banks (Bats)
- Mr. McGuinness – Hydrology (Chapter 9 EIS)

17.4 Assessment Flora and Fauna

17.4.1 Receiving environment as described in EIS

The proposed road development area is not located within any areas designated for nature conservation and, as such, there will be no direct impacts on any such sites as a result of construction or operation. However, the proposed development is located within close proximity of two designated sites, Cork Harbour SPA and Great Island cSAC, giving rise to the potential for indirect impacts. This will be addressed in further detail in the Appropriate Assessment Section of the report below. The proposed project is also located within close proximity of four pNHAs and the proposed route will intersect three local streams, namely the Woodbrook Stream, the Donnybrook Stream and the Glounatouig Stream. Assessments of aquatic ecology and terrestrial ecology were carried out including desktop and field assessments of aquatic and terrestrial habitats, faunal surveys including bats, badgers, otters and other fauna and avifaunal surveys.

Three aquatic habitat types were found within the Zone of Influence. Although the three streams within the Zol correspond to Eroding (Upland) Rivers (FW1), none were found to correspond to Annex I habitats. The quarry lake formed within the Raffeen Quarry was classified as FL8, Artificial Lakes and Ponds. This wetland habitat which is principally located at the southern and eastern end of the quarry, extends across a substantial part of the quarry floor in winter and recedes somewhat during the summer months. Although this wetland was found to support vegetation such as broadleaved pondweed, stonewort, water mint and yellow-wort, it was considered that it did not correspond to an Annex I habitat. A survey of the wetland area was carried out in April 2017 and the findings are included in Appendix 12D of the EIS. This matter is discussed in greater detail below.

No Annex I terrestrial habitats were found within the CPO line, although several habitats were of Local, County or National Importance. However, three terrestrial habitats within the Zone of Influence were found to correspond to Annex I habitats of international importance. These were Lower Saltmarsh/Upper Saltmarsh (CM1/CM2) which corresponds to Atlantic Salt Meadows; Shingle and Gravel Shores (LS1) which corresponds to Perennial Vegetation of Stony Banks; and Muddy Sand Shores (LS3) which corresponds to Mudflats and Sandflats not covered by sea water at low tide. These were located within the shoreline areas of Lough Beg and Douglas River Estuary, which are within the Zol but not within the CPO line. There is one habitat of National Importance, Marsh (GM1) which is a large area of marsh to the north of Lough Beg and is located within the pNHA, and Zol, but is outside of the CPO line.

The majority of the lands within the CPO line comprises Improved Agricultural Grassland (GA1), Amenity Grassland (GA2) or Arable Crops and Tilled Land (BC1/BC3). There are several habitats that were classified as being of either County or Local Importance with a Higher Ecological Value. These include Dry Calcareous and Neutral Grassland (GS1), Wet Grassland (GS4), Wet Willow Alder Ash Woodland (WN6), Mixed Broadleaf Woodland (WD1), Scrub (WS1), Hedgerows (WL1), Treelines (WL2) and Spoil and Bare Ground/Recolonising Bare Ground (ED2/ED3). The most significant areas of woodlands, hedgerows and treeline

habitats occur along the watercourses and at Bloomfield Woods and the woodlands alongside the N28 in the Mulcon Valley. Although GS1 and ED2 and ED3 occur in various places within the study area, the largest areas of each of these habitats occurs at Raffeen Quarry, Ringaskiddy and Lough Beg and at the margins of Shanbally Quarry. The central and southwestern areas of the quarry contain recolonising bare ground in mosaic with scrub which supports a number of plant species including Pennyroyal, a species protected under the Flora Protection Order 2015.

Bat surveys were completed on 5th and 6th August 2014 and were also informed by bat surveys completed during earlier alignments. The observations recorded are set out in Table 12.14 of the EIS. Five species were recorded, Common Pipistrelle, Soprano Pipistrelle, Leisler's Bat, Natterer's Bat and Daubenton's Bat. Long Brown Eared Bat had been recorded during an earlier survey. A potential bat roost survey of trees and structures was carried out during the winter of 2017. No trees were confirmed as roost sites but 36 trees/clusters of trees were found to be moderately suitable as roost sites. Two structures were found to be suitable, one building was located in Shanbally Quarry and the other on Maryborough Hill, which is to be demolished. Raffeen Quarry face was also considered to be of moderate suitability. A number of more detailed surveys were carried out in the Carr's Hill and Moneygourney area and Donnybrook Stream was confirmed as providing foraging and commuting opportunities. However, sites with the greatest potential for roosting were said to be outside the project footprint, but some areas of woodland within the project area which would be lost would provide potential for foraging and commuting grounds.

There is potential for Badger foraging corridors and active setts were discovered within the study area. Otter surveys were also carried out along the three streams and at Lough Beg. Donnybrook Stream was considered to be the most suitable between Ballinimlagh and Douglas, with the other streams being too heavily modified. Otter spraint was recorded at Lough Beg but no activity was recorded on any of the streams draining the study area.

Avifaunal surveys were carried out in 2014-2015 and included overwintering surveys (line transects and field feeding) and breeding bird surveys (barn owls and peregrine falcon). Further surveys were carried out in 2015-2016. None of the overwintering species recorded were listed under Annex I of the EU Birds Directive. A number of species were Red listed or Amber listed in BoCCI. Seven of the species recorded during each of the Line Transect surveys are SCI species for Cork Harbour SPA including Curlew, Black-headed Gull and Little Grebe. Monthly site visits with respect to Curlew field feeding areas were undertaken over wintering months Oct-March in 2014/15 and 2015/16, with particular reference to the field feeding areas to the north of and in the environs of Lough Beg. However, it was found that field feeding areas do not support significant numbers of regularly occurring SCI species for Cork Harbour SPA, but there were occasional and sporadic occurrences of some species (including Curlew) which was considered to be mainly opportunistic.

Barn owls are considered to be particularly susceptible to collision and mortality with respect to road projects. Although no records were available for this species locally, surveys were requested by the NPWS. Two structures had been identified in earlier surveys as being potentially suitable (Barnahely Castle and buildings near Barnahely National School). However, no barn owls were recorded during the surveys in July 2014.

Surveys of Raffeen Quarry in the summer of 2014 confirmed the presence of Peregrine Falcon but breeding activity was not confirmed. Notwithstanding this, the EIS notes that Peregrine Falcon breeding activity at Raffeen Quarry is likely to have benefitted from the breeding and wintering distribution gain arising from the considerable recovery which has occurred since the ban on organochlorine pesticide usage has taken effect (12.5.4.3). The generation of suitable nesting habitat through quarrying activities at Raffeen was also attributed to this gain. It was further noted that Peregrine Falcon is now Green listed under BoCCI indicating that it is no longer a species of conservation concern in Ireland.

Suitable habitat for the Smooth Newt and Common Frog were found to exist, particularly in the wetland area of Raffeen Quarry. No evidence of these species was found during the surveys conducted for the EIS.

17.4.2 Potential impacts on Key Ecological Receptors as set out in EIS

Potential impacts for each of 22 Key Ecological Receptors were identified and proposed mitigation measures developed for each KER, during both the construction and operation phases. A summary of the Key Ecological Receptors, their ecological value and location within the study area is presented in Table 12.18 and their distribution in Figure 12.5 of the EIS. In the following summary, I have highlighted the potential impacts for some of the most relevant KERs. However, I would direct the Board to Table 12.18 and Fig. 12.5 of the EIS for a more comprehensive summary of the potential impacts.

Designated sites - No direct impacts were predicted for Cork Harbour SPA (ER1), Lough Beg pNHA (ER2), Monkstown Creek pNHA (ER3) and Douglas River Estuary pNHA (ER4), but indirect impacts would be likely to arise on these receptors in terms of disturbance to avifauna and water quality deterioration, in the absence of mitigation, during the construction period.

Streams and woodlands - Direct and indirect impacts arising from both construction and operation phases are predicted for a number of stream and woodland habitats such as Bloomfield Woods (ER5), Mount Oval Mosaic (ER6), Donnybrook Wood/Stream (ER7), Glounatouig Stream (ER8-10) and Species Rich Scrub and Woodland at Ringaskiddy (ER15). The direct impacts would arise from land-take, loss/fragmentation of habitats and collision with machinery (for bats and badgers), while the indirect impacts would arise mainly from changes to drainage/run-off affecting water quality and availability of wetlands as well as from disturbance, disruption and displacement and from the barrier effect with loss of foraging areas etc. All of these potential impacts were predicted to be significantly negative at a local scale, with the exception of Lough Beg pNHA, which would not be significant.

Other Habitats - No Direct or indirect impacts are predicted for Dry Calcareous Grassland and Mixed Broadleaf Woodland north of Lough Beg, (ER14). Direct and indirect impacts are predicted for both the Abandoned Railway/Woodland Copse, Scrub and Pond (ER11) and the Barnahely and Castlewarren Ruins (ER13) during both phases. Direct impacts would be in the form of land take, fragmentation of habitats and foraging territory (including badger setts) and collision with machinery during construction and collision/mortality for badgers during operation. Indirect impacts for these receptors are predicted in respect of disturbance/barrier effects, collision and alterations to drainage regimes. The potential impacts would be significant at the local scale.

Raffeen Quarry (ER12) has been the subject of much survey and analysis in the EIS and was also the subject of considerable discussion and debate in both the written and oral submissions. As noted previously, this receptor is based around a limestone quarry which is bounded by vertical cliff faces to the south, east and west and supports a diverse wetland area and a substantial assemblage of semi-natural habitats, including dry calcareous and neutral grassland. The quarry supports Peregrine Falcon and Kestrel which use the cliff faces as a nesting area, and also Little Grebe. The EIS also identified the presence of a potential Protected Plant species, Pennyroyal mint, which became the focus of much debate during the oral hearing. This will be discussed later in this report. The route of the proposed road project traverses the southern end of the quarry, necessitating a substantial area of fill. The applicant intends to source the stone material for the overall road project from the quarry, which is in separate ownership.

Direct impacts on Raffeen Quarry, during the construction phase, would principally involve land-take leading to habitat removal, fragmentation and disturbance as well as collision of fauna and avifauna with machinery. Indirect construction impacts were identified as disturbance and disruption of semi-natural habitats located outside the footprint of the project, such as Pennyroyal. No direct operational impacts were predicted for this receptor. Potential indirect impacts include ongoing

disturbance/avoidance by fauna, vehicle collision, eutrophication and alteration of the drainage regime of proximal sensitive ecosystems due to Nitrogen Oxide deposition. The potential impacts on Raffeen Quarry were considered to be significantly negative at a County level, in the absence of mitigation. There would be direct and indirect impacts on Pennyroyal during construction due to disturbance and removal. Indirect impacts could also occur during the operation phase in terms of disturbance, disruption, air or water pollution (from run-off) or from the proliferation of grassland or scrub leading to loss of habitat.

Peregrine Falcon - There would be direct and indirect impacts during construction on the Annex I listed Peregrine Falcon due to the removal of part of the cliff face used for nesting purposes under the footprint of the proposed motorway as well as disturbance and consequent avoidance due to sustained construction activities. The impacts on this species of International Conservation Importance would include habitat loss, direct disturbance and loss of suitable nesting habitat within the quarry and possibly long-term avoidance of breeding, nesting and foraging sites. However, the proposed project is not expected to impact the breeding or over-wintering status of this species on an international or national scale and is considered to be significant at the local level, in the absence of mitigation.

Avifauna - Other Annex I species within the same hectad were noted as being primarily associated with coastal and intertidal habitats which will not be impacted by the proposed route. Potential impacts on these species will be considered in further detail in the Appropriate Assessment section of this report. Avifauna listed on BoCCI are likely to be displaced and be affected by direct loss of potential foraging and nesting habitats during both phases of the project. Potential direct and indirect impacts on a Buzzard nest within a mature treeline (ER17) will involve removal and disturbance of the treeline, which is a nesting and foraging habitat, which could result in buzzards abandoning the area. Thus the project could have a significant negative impact at the receptor level (buzzard population).

Bats - There would be direct and indirect impacts on bats during the construction phase as well as direct operational impacts. Direct construction impacts include removal or disturbance of roosting, foraging and commuting habitats with indirect impacts identified as potential light and water pollution. The operational phase could result in disturbance to foraging, commuting and breeding habitats as well as collision and mortality. Such impacts would be significantly negative at a local level and the species, as they occur within the study area, are considered to be of national importance.

Other fauna - Similar impacts would be likely to affect other fauna protected under the Irish Wildlife Acts such as badgers, hares, hedgehogs, pygmy shrews and Irish stoat, in the absence of mitigation. Otters, although not recorded within the footprint of the project, would also be likely to suffer from disturbance, loss of habitat, pollution from run-off during construction and collision with road traffic, fragmentation of habitat and run-off during the operational phase. These impacts were considered to be significantly negative at a local level.

Common Frog and Smooth Newt - Evidence of common frog and smooth newt was not found during surveys for the EIS but the species is considered to be of National Importance. It is stated that the loss of habitat and pollution of watercourses during construction and operation would have an impact on the population along the route. The removal/reduction of an area of wetland at Raffeen Quarry was identified as being likely to result in direct impacts for the common frog and smooth newt during construction and in greater road mortality and in changes in the hydrological regime during the operational phase. The impact was considered to be significant at a local level in the absence of mitigation.

17.4.3 Proposed mitigation measures in the EIS

General mitigation measures for construction in respect of flora and fauna are set out in Section 12.7.1 of the EIS with additional measures contained in Chapters 3, 9 and 10 (in respect of waterbodies) and Chapter 14 (in respect of noise and vibration). In addition, the Board should note that Chapter 19 of the EIS contains a full schedule of

mitigation measures proposed for the scheme and that a revised Schedule of Commitments was submitted at the end of the oral hearing.

Proposed mitigation measures are set out regarding invasive plant species (12.7.1.5), non-volant mammals (12.7.1.6), pre-construction mammal surveys (12.7.1.7) and monitoring and protection of mammals during site clearance and construction (12.7.1.8). These measures are generally in accordance with the guidance provided in the NRA Guidelines Prior to the Construction of National Road Schemes. The pre-construction surveys are designed to update the baseline surveys prior to commencement of works, given that at least 36 months may have elapsed. As part of the mitigation proposals, a **Habitat and Species Management Plan** (Appendix 12B) was provided in which detailed proposals for the implementation of the mitigation measures are outlined. An **Outline Invasive Species Management Plan** (Appendix 12C) was also developed to address the management, control and eradication of invasive species.

Specific mitigation measures (construction phase) have been designed (in accordance with NRA Guidelines) for badgers and otters (12.7.1.19-11) including exclusion zones around active setts/holts and monitoring of evacuation and destruction of setts by an ecologist under licence from the NPWS. It is also proposed to provide for mammal ledges and underpasses, mammal fencing and artificial setts to mitigate against operational impacts. The success of mitigation measures would be monitored for a period of at least one year after construction. No mitigation measures are proposed in the EIS for amphibians as it was considered that the project would not affect any specific breeding pools or wetland habitats for amphibians. However, as Smooth Newt was discovered during a survey of the wetland in Raffeen Quarry subsequent to publication of the EIS, mitigation measures have since been proposed to capture and translocate this species (subject to licence). This will be discussed further below.

Mitigation measures for bats are also in accordance with the NRA Guidelines and include pre-construction surveys of structures and trees by qualified bat ecologist,

limiting the season of disturbance to trees and vegetation in order to reduce impacts on breeding species and to provide like for like habitats, the retention of as many treelines and mature trees as possible and the introduction of bat boxes. It is intended to reconnect severed linear features such as hedgerows and treelines to the proposed landscape measures (Specific Landscape Measures and Ecological Landscape Measures) using semi-mature trees under-planted with hedgerow species to compensate for the loss of trees and hedgerows. Details of such planting are set out in the Habitat and Species Management Plan (Appendix 12B, Vol. 4) and Chapter 16 (Landscape and Visual Assessment). The proposed bat boxes are intended to compensate for the loss of potential roost sites. Artificial lighting will be avoided where possible and where necessary, directional lighting will be used.

Semi-natural habitats to be replaced, translocated and/or recreated are set out in Table 12.40 of the EIS. Portions of Dry Calcareous and Neutral Grassland (GS1) within the footprint of the project at Raffeen Quarry will be translocated to Shanbally Quarry. The wetland habitat at Raffeen Quarry (Other Artificial Lakes and Ponds FL8), which is under the footprint of the proposed road would be recreated to the north of the route, within the CPO line. Woodlands (WD/WN) and Scrub (WS1) and Linear Woodlands (WL1/WL2) will be replaced as part of the proposed landscape management plan and the screen and ecological landscape planting schemes.

Site clearance during the bird nesting season will generally be avoided, and a derogation licence will be sought for any works during this season and any vegetation clearance will be surveyed in advance and monitored by an ecologist in order to avoid any nests. Landscaping mitigation along the route will provide nesting and foraging habitat for passerine birds and partially mitigate against the loss of trees and hedgerows. Specific Landscape Measure 04 proposes tree planting within the Mulcon Valley to compensate for loss of trees along the route. It is also proposed to establish landscape planting along both embankments as it passes through Raffeen Quarry, comprising Heavy Standard trees at the top with Screening Woodland Mix on the lower slopes. It is stated (12.7.2.8) that such planting will direct Peregrine Falcon over the road project, thereby avoiding vehicular collision.

Surface water drainage has been designed to limit the potential for contaminated surface water run-off, including suspended solids and hydrocarbons to reach the receiving waters at Cork Harbour.

17.4.4 Residual impacts as set out in the EIS

Avoidance and mitigation measures, together with the residual impacts, are set out in Tables 12.42 – 12.61 for each of the Key Ecological Receptors. It is stated that through avoidance and mitigation measures, the residual impacts for most receptors will be either 'No Impact' or 'Not significant'. Donnybrook Wood and Stream would, however, have a 'Significant Negative Residual Impact at a local scale' over the short to medium term. Although replacement woodland planting will compensate in part, it is considered that the fragmentation of the woodland will present a significant residual impact. The residual impact on the treeline supporting a Buzzard nesting habitat will remain 'Significant Negative at the Receptor Level' over the short to medium term. This is stated to be in spite of proposed mitigation in the form of suitable replacement tree planting, as part of the existing treeline habitat will be lost. However, as the replacement treeline and woodland area becomes established and mature, the impacts will improve to 'Not Significant' over the medium to longer term.

The residual impacts on Raffeen Quarry would be reduced overall from 'Significant on a County Level' to 'Significant on a Local Level'. This would be achieved through various means. Approx. 0.75ha of Scrub/Dry Neutral and Calcareous Grassland lies within the footprint of the proposed road and a further 1.7ha of this receptor is located immediately south of the road project within the CPO line. Translocation of turves from this habitat will be carried out to suitable areas within the CPO line, and the details are set out in the HSMP (Habitat and Species Management Plan, Appendix 12B of EIS). The EIS states that the abundance and distribution of Pennyroyal will be established so that populations outside of the footprint can be avoided and populations within the footprint will be translocated to an area of recolonising bare ground at Shanbally. It is also proposed to create compensatory wetland habitats within the roadway CPO line similar to those that would be

displaced, and details are contained in the HSMP. Further information came to light during the course of the oral hearing which has altered these mitigation proposals and these matters will be discussed further below.

Mitigation measures are proposed to facilitate continued Peregrine Falcon nesting activity to the south of the road project. It is proposed to maintain this site as a viable nesting site and also to establish artificial nesting habitats (trays/ledges/nest boxes) in the local area to provide alternative nesting sites. However, the construction phase will result in a Significant Residual Impact on a local scale over the short term as there will be a direct loss of suitable nesting and breeding habitat. It is stated that the proposals to provide alternative nesting habitats will enable continued breeding activities of this species and that the maintenance of part of the cliff face habitat together with proposals for screen planting to direct the birds to fly over the road and away to the south, would reduce the impact to 'Negligible to Not Significant'.

17.4.5 Assessment of issues raised by NPWS and by third party observers in submissions and during the course of the oral hearing

17.4.5.1 Raffeen Quarry – route through quarry

The impact of the proposed development on the biodiversity of the quarry in terms of the diverse range of habitats and species within the quarry and the potential impacts in terms of loss and fragmentation of habitats and disturbance to species was the subject of considerable discussion during the oral hearing. The debate commenced on Day 4 (10th Nov) and continued on Day 7 (16th Nov. between 10.00 and 12.00) and on Day 9 (28th Nov. 10.30-11.00, 12.00-13.00).

Concerns raised by a number of individual ecologists, Dr. Jo Goodyear, Rodney Daunt, Gordon Reid and Dara Fitzpatrick, included a strong objection to the route of the proposed road through the quarry when an alternative route exists, (i.e. 2008 route through golf course to south). The proposed vertical alignment, with the related need for a substantial amount of fill and the associated engineering costs, compared with the former proposed route through the golf course, was also questioned and

several observers sought a breakdown of costs on this basis. There was considerable concern about the loss, fragmentation and disturbance of habitats which some believed were very rare and worthy of protection, such that the route should be diverted away from the quarry. Dr. Goodyear raised specific concerns about the habitats of dry calcareous grassland and the quarry lake, which she believed corresponded to Annex I habitat. Concerns were also raised regarding the potential impacts on protected species such as Peregrine Falcon, Pennyroyal and Smooth Newt and the adequacy of the mitigation measures proposed in the EIS, (Chap. 12 and Appendix 12A, HSMP).

Several observers, including Dr. Good from the NPWS, sought more information on the topographical layout of the quarry, once the road had been constructed. Dr. Goodyear considered that it was impossible to assess the impact on the habitats within the quarry without such a drawing and considered that the cumulative impact of the two projects has not been properly considered, which results in a failure to comply with the requirements of the EIA Directive. Reference was made to previous court decisions (such as a number of wind farm developments), wherein it had been established that all elements that are material to the project (e.g. grid connection) must be considered as part of the project. On this basis, it was asserted that the proposal to extract stone from the quarry to facilitate the construction of the road must be considered as part of the overall EIA of the M28 road project. She further considered that the EIS submitted with the application for the quarry did not adequately reflect the ecology of the quarry as it currently exists.

The applicant declined to provide a breakdown of the engineering costings (solely) of the two routes, (one through the quarry and one through the golf course), on the basis that this would be just one parameter and would not enable a proper comparison to be made between the two routes. It was stated that many other factors informed the cost of each route including land ownership, land values and hope values. It was confirmed, however, that the two routes have been compared against the scheme objectives and that the proposed route through the quarry was the preferred one, as it met most of the environmental and social objectives. Mr.

Noonan (RPS) also stated that one of the key elements of cost is the ability to provide certainty and access to materials for the construction of the road. A letter was handed in on Day 6 from Roadstone in which it was confirmed that an agreement had been reached with Cork County Council to supply the necessary stone for the construction of the proposed road project.

I would agree that a direct comparison between two options based on only one, of a number of parameters, would be of little use. Such a comparison would be further complicated by the fact that the materials for the proposed road are largely to be obtained from the quarry. The applicant has consistently stated that the 2008 route through the golf course is not favoured as it would result in a loss of amenity lands, rather than a brownfield site comprising a partially worked-out quarry. Although some observers were of the view that the golf course was up for sale and that the owners had sought rezoning of the lands for housing, it remains the fact that the site is an existing golf course which is a valued open space amenity at the edge of a large and growing town. Thus, in principle, I would agree that the route through the quarry would be preferable from a land use point of view. Some observers, including Councillor D'Alton, also queried whether the road could be diverted away from the quarry, yet the stone material could still be obtained from there. However, this would result in the loss of both the amenity lands and the majority of the habitats due to the continued working out of the quarry in accordance with the permitted development.

The applicant also declined to provide a topographical drawing of the quarry after the road had been constructed, as it was submitted that the quarry is in private ownership and has established use rights, as well as a current planning permission for the extraction of the stone required to construct the road. Mr. Flanagan S.C. (for the applicant) also pointed out that the quarry permission (ABP Ref PL04.225610), which granted permission for extraction over a period of 30 years in 2008, was subject to EIA. Thus, it was submitted that this element has already been subject to EIA, unlike the wind farm court judgements referenced by Dr. Goodyear.

The Board granted permission (225610), following an appeal, for continuation of the use of the quarry for a period of 30 years in July 2008. The application for registration under S261 of the P&D Act 2000 (as amended) had been granted by Cork County Council subject to 74 conditions. The appeal to the Board sought the omission of 22 of these conditions. The Board decided to deal with the appeal under S139 of the Act and to omit 14 no. conditions, to amend 4 no. conditions and to add two new conditions. The applicant had sought to continue extraction over a period of 150 years on a campaign basis, which would have involved five phases and extraction well below the water table. However, the Board decided to restrict the permission to the first phase (30 years) with a further restriction of no excavation below 16m OD. Other conditions attached included restrictions on noise, blasting, ground water monitoring and implementation of a restoration plan.

The EIS for the quarry development set out restoration/aftercare recommendations at 5.4.5, which were stated to be principally to maximise the benefits for flora and fauna. It is noted that a restoration plan drawing was submitted with the application (24/8/07) and a revised plan with the RFI requested by the P.A. (16/04/08). However, these proposed plans were based on extraction over several phases on a campaign basis and would have resulted in extraction to a level approx. 20m below the water table. It was proposed that once these phases were complete, the quarry floor would be flooded to "natural water level" to form a lake and that a diverse range of habitats would be created as part of the restoration plan. This would have necessitated substantial drawdown of water and the topography and environment of the quarry would have been dramatically different to that which received planning permission, i.e. no extraction below the water table. Thus, the restoration plans on file are considered to be indicative only. In addition, as the proposed road project occupies much of the southern part of the quarry and would be constructed on an embankment with an elevation of approx. 20m, together with proposals to recreate wetland and other habitats on either side of the embankment, it is considered that the previously proposed Restoration Plan cannot be implemented as originally envisaged. However, restoration of the areas of the quarry outside the CPO line are beyond the scope of this application and the remit of the Board.

I would agree that ideally, a revised topographical plan of the worked-out quarry, with the road in place, would be useful in terms of assessing the impacts of the two schemes. However, it is considered that the nature of the established use and the terms of the permission granted by the Board, together with the information submitted with both the application for the quarry in 2008, (which included an EIS, drawings and a Restoration Plan, including plans for the creation of a lake), and the current application for the road project, provide a sufficient level of information upon which the Board can make a decision on the application which is currently before it.

17.4.5.2 Peregrine Falcon

The NPWS had raised concerns regarding the availability of suitable alternative nesting habitats in the overall area as well as the likelihood of success of the proposed artificial alternative nest structures. Dara Fitzpatrick (local ecologist) also raised similar concerns and pointed out that the Raffeen Quarry cliff face is an important non-coastal breeding site. It was acknowledged that success at breeding there had not been great, (last success in 2012), and that this was largely due to disturbance by intruders. He was concerned that construction noise and disturbance would lead to nest failure and that the effects of the change in topography together with the introduction of heavy traffic travelling at high speed would lead to abandonment of the quarry. It was pointed out that Peregrine Falcon is an Annex I listed species in the Birds Directive and that the destruction of a known nest site was contrary to European law and that there was no guarantee that the mitigation would be successful. Dr. Jervis Good (NPWS) also made reference to the EU Habitats Directive (Art 10) which requires features of the landscape important for wild flora and fauna, over and above those listed in the Directive, to be protected, and to the EU Birds Directive (Art 3, 4) which requires the prevention of deterioration or pollution of the habitats upon which bird species outside of the SPAs are dependent. However, Dr. Good acknowledged that Peregrine Falcon is no longer a species of conservation concern in this area.

Mr. Delaney (for the applicant), in his brief of evidence (10th Nov. 2017), outlined the alternative sites identified in the wider area as Coolmore Quarry (2.6km to SE),

Ballygarvan Quarry (4.3km to the West), and tall industrial buildings (15-20m high) located between Raffeen Quarry/Ringaskiddy and Cork Harbour. Furthermore, it was stated that it is now proposed to provide an artificial nest box north of chainage 7,350, in the form of a vertical steel-framed column (15m high). This site (shown on A3 drawing submitted on 10/11/17) is located to the south east of the former railway line, (now overgrown), and at the eastern edge of a large field through which the proposed M28 would travel. It is outside of the quarry but within the CPO line. He also pointed out that the HSMP details how the establishment of such structures would be monitored by an ecologist with the implementation of structural and/or positioning improvements as required. However, Dr. Good remained concerned that insufficient information had been provided regarding alternative sites in the district and that there did not appear to be any opportunities for re-creating habitats within the quarry itself for Peregrine Falcon. The applicant agreed to consider the matter further and to report back to the Oral Hearing on 16th November 2017.

Mr. Delaney proposed a further alternative artificial nesting site at Chainage 11350 (16/11/17). This site is located closer to Ringaskiddy, to the south of St. Carthage Place and the proposed M28 and to the east of the Barnahely junction. It would be sited within a large agricultural field approx. 200m to the north-west of the existing Lower Harbour National School and is likely to be a similar distance from the proposed new school site. Mr. Delaney acknowledged that the project will result in loss of suitable breeding habitat but pointed out that the existing quarry habitat had not produced good success rates, due mainly to disturbance of the cliff face from above. He submitted that the proposed artificial sites would not present such a problem as they would not be overlooked. He also reiterated that the main mitigation measures proposed are to direct to Peregrine Falcon away from the quarry during construction (by means of netting on the cliff face) and from the M28 by providing woodland screen planting on the embankments to encourage the birds to fly over the motorway towards alternative habitats in the district, which were previously outlined above.

There was much debate regarding the suitability of these artificial sites on Day 4, Day 7 and Day 9 of the hearing. Dr. Jervis Good (NPWS) remained concerned that the proposed Site 1 (Chainage 7350, north of Raffeen Quarry), would be too close to a proposed greenway (120m), given that the species usually requires a 400m disturbance free zone and a height of at least 18m. He also remained concerned that proposed Site 2 (South of St. Carthage Place) presented major difficulties in terms of potential impacts on bird species protected by the SPA. He stated that Peregrine Falcon regularly flying into/out of a nest in this location would be likely to disturb SPA birds such as Common Tern, which would have implications for Appropriate Assessment.

In his response, Mr. Delaney emphasised that these artificial sites were merely intended as additional proposals to augment the sites of natural potential already identified in the wider area. He also stated that the height of the proposed structures can easily be increased to 18m or 20m if required. The applicant also confirmed that although there is a specific objective (CL-U-05) in the Ballincollig-Carrigaline MDLAP to “Provide a Greenway along the old railway line from the river north towards Ballyhemiken where practicable”, the current proposal is for the Carrigaline-Monkstown Greenway Route to travel along the Rock Road to the N28 and from there to Monkstown via the R610. This is shown in Fig. 1.4-1 (Sustainable Travel Vol 5 EIS) and Section 5.9 of the EIS (page 5-49) also states that the proposed underbridge at Ballyhemiken (Rock Road) includes sufficient span to accommodate future cycle and pedestrian linkage on both sides of the road, which facilitates the development of the proposed Passage West to Carrigaline Greenway. The submitted road layout drawing (Sheet 13 of 22) shows the proposed M28 cutting through the site of the old railway line, with no provision for a tunnel. Mr. O’Donoghue (Senior Engineer CCC) stated in his evidence (7/11/17) that the Monkstown to Raffeen section of the Cork Harbour Greenway is scheduled to go to construction in 2018.

Further discussions took place regarding the possibility of accommodating an alternative cliff nest habitat within the quarry, post-construction. Dr. Goodyear

emphasised that should such a habitat be selected and be north-facing, it would be essential that adequate shelter and drainage would be available to encourage use as a nesting site. Dr. Jervis Good sought information on whether an alternative cliff face at the northern edge of the proposed wetland (Zone 1 Fig. 4.4 HSMP) could be used for these purposes, but raised concerns that the section of cliff had yet to be quarried. He considered that a ledge or overhang within a cliff would be the most suitable alternative habitat. It was not clear whether this could be achieved at the location referred to, as it may be susceptible to further quarrying in accordance with the permitted quarry. Other alternative cliff habitats outside of the CPO line were also discussed such as coastal cliffs from Ringaskiddy to Kinsale. Mr. Delaney considered that there were ample such habitats available along the coast. Dr. Good agreed in principle, but asked whether there would be any opportunities to insert ledges into the coastal cliff faces and queried whether these cliffs were already used by an existing pair of peregrine falcons. Mr. Delaney submitted that the pair in question could be the same pair previously recorded at Raffeen Quarry.

In conclusion, it is considered that the applicant has demonstrated that there are several locations within the Zol/ wider area which would be suitable as potential nest sites for breeding Peregrine Falcon. Although these alternative habitats have not been tested as such, it is known that this species is relatively flexible and can nest in the types of habitats identified by the applicant. Given that the existing quarry has proven to be less than ideal for breeding purposes in the recent past and that the quarry has permission to continue to extract material for up to 20 years, the value of the existing cliff face as a breeding habitat is questionable. Thus, the proposal to provide additional artificial nest sites would add to the range of habitats available to the Peregrine Falcon. I would agree that the Loughbeg location (Site 2) would not be suitable due to the proximity to the SPA. However, the site to the west of the quarry (Site 1) would be a suitable location given that the adjacent section of the former railway line is no longer part of the proposed greenway route.

It is considered, therefore, that the proposed suite of mitigation measures presented in the EIS, HSMP and at the oral hearing, apart from the proposed Loughbeg

artificial structure (16/11/17), together with the presence of suitable alternative habitat within the Zone of Influence would provide for adequate alternative nesting sites for breeding peregrine falcon, which is no longer a species of conservation concern. The proposed woodland screen planting will also serve to deter this species from nesting during the operational phase at the cliff faces in close proximity to the motorway. Provided that the mitigation measures and monitoring regime are implemented as proposed, I do not consider that there will be significant adverse impacts on the species or its habitats.

17.4.5.3 Pennyroyal mint

The NPWS had sought confirmation of the native status of the Pennyroyal mint protected plant species (*Mentha pulegium*), either by an expert botanist or by genetic markers, and a detailed translocation plan to a suitable receptor site. The applicant, in response to this request, had commissioned a report by an expert botanist, Paul Green, and had also applied to the NPWS for a licence under the Wildlife Act 1976 (as amended) and Flora Protection Order (2015) for the translocation of the plant. The report by Paul Green was presented by Mr. Delaney at the hearing on 10th November 2017. This included site based assessments of Pennyroyal populations where they occur within the proposed scheme ZoI, (i.e. Raffeen Quarry and an abandoned quarry at Shanbally), in order to determine whether the status of the populations are the native (*var. decumbens*) or non-native (*var. erecta*) varieties. The report concluded that the populations of Pennyroyal at Raffeen and Shanbally Quarries are consistent with the non-native variant of the species, i.e. *Mentha pulegium var. erecta*.

The Dr. Good (NPWS) advised that he would relay the information to the Department and that it would inform the application for the translocation licence. He offered to report back to the hearing on 16/11/17 on the outcome of the licence application. Dr. Good duly informed the hearing (16/11/17) that translocation of the plant species is not required because the variety identified as growing within the footprint of the proposed road is non-native and does not have biological conservation status. However, it was further advised that because S21 of the Wildlife Act 1976 and the

Flora Protection Order 2015 refer to pennyroyal mint as a species without distinguishing variety, an application for a licence to take, alter or interfere with the habitat and environment of pennyroyal mint is still required.

Notwithstanding the findings of Mr Green's report, discussions arising from third party questions continued during Day 4 and Day 7 of the oral hearing. One of the concerns raised related to whether the variety had been identified by means of genetic markers. However, Dr. Good confirmed that this was not considered necessary as the bone fides of Mr. Green's report was acceptable to the Department. Other concerns included queries as to whether the variety of pennyroyal occurring at the quarry constituted an invasive species and hence represented a threat to adjoining farmland. However, Mr. Delaney confirmed that although var. *erecta* is an introduced variety, it was not considered to be an invasive species and as it requires a very specific type of habitat, such as bare recolonising ground, or disturbed ground. Given that it has been established that the variety of the plant species occurring within the site is not of conservation importance, it is considered that the proposed mitigation measures to translocate the plant outlined in the HSMP are no longer relevant and are not therefore required. Thus, Zone 4 of Raffeen Quarry (Fig. 4.4 HSMP) and section of Shanbally Quarry identified for translocation, are no longer required for these purposes. No update on the licence to uproot Pennyroyal was available before the end of the oral hearing.

17.4.5.4 Semi-natural Grassland

There are some areas of Dry Calcareous and Neutral Grassland habitat (GS1) occurring within Raffeen Quarry. It is proposed to translocate this habitat to a receptor site to the south of the quarry comprising arable land with high soil nutrient. Once the receptor site has been prepared (regraded and infilled with limestone bedrock and overburden removed from the footprint of the M28), areas of GS1 will be identified (Zone 2 Fig. 4.4 HSMP) and translocated to Zone 5 (Fig. 4.4), receptor site. Dr. Goodyear (local ecologist) raised concerns that because the proposed road would necessitate the extraction of all remaining stone above 16m OD (as per condition of quarry permission), which would extend across the entire existing

footprint of the quarry, it would result in the removal of all of the existing habitats within the quarry including the dry calcareous grassland. She also submitted that as the road would require extraction of the remainder of the quarry that the cumulative impacts should be assessed.

However, as discussed at 17.4.5.1 above, the permitted quarry development allows for the extraction of all of the material currently above 16m OD across the entire footprint of the quarry, irrespective of whether the road project goes ahead or not. That permission did not specify that Dry Calcareous Grassland habitats should be translocated. Mr. Delaney pointed out, however, that as part of the M28 project, it is proposed to translocate this habitat as described above. Mr. Flanagan (S.C. for the applicant) also pointed out that (as discussed in 17.4.5.1) that the cumulative effects of the quarry and the road project have been considered in the EIS and that both projects are/have been subject to EIA. Provided that the mitigation measures and monitoring regime are implemented as proposed, I do not consider that there will be significant adverse impacts on this habitat.

17.4.5.5 Wetland Habitats /Smooth Newt

The residual impacts on wetland habitats identified in the EIS included the net loss of 0.63ha of wetland habitat under the footprint of the proposed road and the temporary disturbance of avifaunal and invertebrate species associated with the wetland habitat. The spatial coverage of the habitats and linear habitats located within the project footprint and associated ZOI were recalculated following the publication of the final CPO line 3 weeks after the application was submitted and have been updated and presented in 6.1.4 of Mr. Delaney's Brief of Evidence (10/11/17). It was emphasised that there was no change to the impact assessment, mitigation measures or residual impacts for these habitats.

The extent of the existing wetland as set out in the EIS and the degree to which it fluctuates with the seasons was disputed by several ecologists. Considerable debate took place on the issue of the existing wetland habitat and the adequacy of the proposals to provide for compensatory mitigation measures. Several submissions

had identified the wetland as an Annex I type habitat, 'Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. Lake'. Dr. Goodyear submitted that the existing wetland has the correct water and edaphic conditions for a marl lake and that the wetland corresponds to this Annex I habitat. Other submissions had identified the presence of Smooth Newt and queried the failure to record this in the EIS. However, Mr Delaney (for the applicant) advised that a subsequent survey carried out in July 2017 did in fact record this species and that an application had since been submitted to the Department for translocation.

Dr. Good (NPWS) read an opinion from the Dept. of Culture, Heritage and the Gaeltacht on the matter into the record on Day 4 (10/11/17). Reference was made in the statement to the report by Dr. Cillian Roden (EIS Appendix 12D) on the aquatic botany of the quarry lake, which had concluded that "despite the presence of cyanobacterial crust on the bare limestone floor of the pond, there is no other resemblance to marl lakes". It was stated that as Dr. Roden is a biological expert on this habitat type, there was no reason to disagree with the conclusion that the habitat 'hard water lakes' does not occur at the quarry site. Notwithstanding this, it was submitted that the aquatic habitat has biodiversity value as an example of biological colonisation and habitat succession. He also drew attention to the requirements of the Habitats and Bird Directives in terms of the importance of protecting and maintaining such habitats, notwithstanding their location outside of a designated site, particularly where they support protected species. Dr. Good also informed the hearing that a licence to capture and translocate Smooth Newt had been granted by the NPWS to the applicant, (expiry 31/12/19).

The proposed development includes mitigation proposals to create a compensatory wetland area within the quarry, as the existing wetland will be intersected by the proposed road. Details of the proposal are set out in Section 4.7 and in Fig. 4.4 of the HSMP. The recreated wetland will be located immediately to the north of the embankment at Zone 1 and it is also proposed to retain a smaller area of wetland to the south of the embankment (north of the cliff face). In response to questions from third parties it was confirmed that the wetland would be created prior to construction

works and that the new habitat would reflect the physical characteristics of the existing such as water depths, substrate composition, wetland vegetation abundance and composition. To assist with this process, wetland species, macrophytes and emergent species would be harvested and translocated. It is stated in the HSMP (and confirmed at the OH), that current water levels are at 14.7m OD with a variation in depth within the lake of 0.2-1.2m.

Considerable opposition was raised to the smaller size of the new wetland. Mr Daunt believed that the current wetland was 15 acres in area, extending to 30 acres in winter. However, Mr. Delaney stated that the surveys of the habitat had established that the existing lake is 1.79 ha (Zol) of which 1.63ha is within the CPO boundary. Mr Delaney acknowledged that whilst the new wetland may be smaller (c. 0.54ha), the key issue was that it would be a permanent central water body with an ephemeral outer area, to reflect the existing types of habitats. Dr. Goodyear asked Dr. Good if the road proposal was refused and the quarrying activity continued (as permitted), would it be possible to re-create the wetland as exiting and would it be capable of becoming a marl lake in due course. Dr. Good replied that in his opinion, it would depend on the hydrology of the quarry, the effects of residual quarrying activity north of the CPO line and whether the appropriate conditions would be recreated in terms of translocation of species and vegetation etc.

Dr. Good also queried whether there was any scope to extend the proposed wetland area into Zone 4 (previously proposed for Pennyroyal translocation). However, it was pointed out that this location is within the embankment and that it would not be suitable for a wetland habitat. Dr. Good, however, considered that the CPO line may be too restrictive and that this may amount to a lacuna in the EIS. He queried why the worked-out area to the NE of the CPO line could not have been included within the CPO for additional wetland recreation and that there were further cliffs outside the CPO line which could have been included as Peregrine Falcon habitat. Mr. Flanagan (S.C.) disputed this and said there were no lacunae in the EIS as the entire quarry area had been subject to EIA and that the existing permission is subject to a restriction of the depth of quarrying and to a restoration plan. However, he stated

that in the discussions between the applicant and the owner of the quarry (Roadstone), it had emerged that there may be scope for further mitigation in terms of additional habitat recreation as part of the agreement for the use of the material.

In response to questions regarding the hydrology of the quarry, Mr. McGuinness (hydrologist for the applicant) confirmed that the existing water regime of the wetland could be recreated and would be very similar to what is there now. It was also confirmed by Mr Delaney that the recreation process would be monitored by an ecologist including the success of translocating species and the outcome of the monitoring would inform the future maintenance of the wetland. In response to questions from Dr. Goodyear regarding water drawdown, Mr. Delaney confirmed that there were no proposals to excavate below the water table. He clarified that the depths within the existing wetland ranged from 14.5m-13.5m OD and that the restriction of the quarry permission of no excavation below 16m OD would be adhered to. Dr. Goodyear also raised concerns regarding the design and siting of the proposed wetland in terms of overshadowing from the proposed screen planting on the embankment, potential leaf drop (nutrient enrichment), placement of boulders within the waterbody (preventing birds from taking off) and prevention of newts from accessing adjacent terrestrial habitats. Mr. Delaney stated that these matters would be addressed as part of the monitoring and maintenance programme.

In light of the foregoing, it could be argued that the Restoration Plan for the permitted quarry could conceivably provide for a lake with a much larger footprint, covering almost the entire quarry area, and that the current proposal to route the M28 through the quarry would undermine the ability to achieve this. However, the details of the restoration plan are rather vague and it is not at all clear whether it can be implemented as originally envisaged, albeit at a much shallower depth. In order to arrive at the final restoration phase, it would be necessary to complete the working out of the quarry across the entire footprint, which would almost certainly result in considerable disruption to species and the loss of most existing habitats, including GS1 and the existing wetland. It is considered, however, that the current road proposal provides for the creation of a new permanent wetland area in advance of

construction works, which aims to replicate the existing conditions and to harvest and translocate species and vegetation to achieve this. It is also proposed to recreate an area of semi-natural grassland. Once the working out of the quarry is complete, it is likely that the final restoration plan will involve the creation of further wetland areas within the remainder of the quarry, outside the CPO line.

Thus, it is considered that there would be a potential cumulative impact on the biodiversity of the quarry which would be adverse in the short term in respect of the loss of wetland area underneath the road footprint and a temporary disturbance to avifaunal and invertebrate species and, in the longer term, the potential lost opportunity to create a much larger wetland across the entire footprint of the quarry. It is noted, however, that other habitats, such as GS1 would not necessarily be recreated in the final quarry restoration plan.

From the various debates during the hearing, it was evident that the scale and size of the wetland habitat was of less importance than the quality of the habitat recreated in terms of vegetation and range of species it can support. In this respect, the EIS and HSMP for the current project contains detailed methodologies, as well as monitoring and maintenance programmes, which are based on up-to-date baseline data compiled by acknowledged experts in this area. It is considered, therefore, that the compensatory mitigation measures contained in the current road proposal would be likely to provide for a much greater level of certainty in terms of facilitating the recreation and enrichment of habitats, which would allow for the continuity of the existing diverse biodiversity present in the extant habitats and species within the quarry. Provided that the mitigation measures and monitoring regime are implemented as proposed, I do not consider that there will be significant adverse impacts on this habitat or the species it supports.

17.4.5.6 Woodlands and stream habitats

Residual impacts for the identified Ecological Receptors comprising woodlands and streams include the net loss of 0.7ha and fragmentation of a semi-natural woodland habitat associated with Donnybrook Wood and Stream and the loss of a tree line

habitat for use as a nesting habitat by buzzards. The spatial coverage of the habitats and linear habitats located within the project footprint and associated ZOI were recalculated following the publication of the final CPO line 3 weeks after the application was submitted and have been updated and presented in 6.1.4 of Mr. Delaney's Brief of Evidence (10/11/17). It was emphasised that there was no change to the impact assessment, mitigation measures or residual impacts for these habitats.

Much of the discussion relating to this type of habitat centred around the potential impacts on Bloomfield Woods and the woodland habitat in the Mulcon Valley, and the adequacy of the proposed mitigation measures. Mr. Delaney noted that there would be a loss of mixed broadleaved woodland and scrub habitats on the eastern verge and the loss of mixed broadleaved woodland on the western verge of the Mulcon Valley, but that the mature woodland on the western slopes to the west of the CPO line would be retained. It was pointed out that all trees, shrubs and woodland removed from the Mulcon Valley would be replaced by means of compensatory woodland planting as set out in Specific Landscape Measures (SLM03 and SLM 04), (Landscape and Visual Impact mitigation, Chapter 16). Similarly, it was stated that trees and scrub removed from Bloomfield Woods will be replaced with woodland planting to reflect existing species (SLM 03/04) and that as many mature trees as possible will be retained. Mr. Holbeach (Landscape Consultant for the applicant) also presented evidence on Day 10, which included a revised landscape plan for the interface with the Bloomfield Woods, involving additional tree and hedgerow planting, which will be discussed under Landscape later in this report.

The proposed route from Bloomfield to Carr's Hill will undoubtedly result in a significant adverse impact at a local level due to the need to remove large linear tracts of woodland on either side of the Mulcon Valley. The reasons for the tree felling in this area are firstly to accommodate the additional new North-bound lane which travels through part of the woods on the western side of the road; secondly to allow for the widening of the carriageway on the eastern side of the Bloomfield

junction; and thirdly, to facilitate the provision of a new off-ramp to serve Mount Oval. This will result in loss and fragmentation of this woodland habitat, which is highly valued by the local community in terms of amenity, visual screening, providing a filter for noise and air emissions and its wildlife value. Furthermore, in the absence of mitigation, it could also lead to disturbance, disruption and displacement of wildlife.

The need for the road widening in this location and justification for the design of the additional lane and off-ramp are set out in the accompanying report of the Board's Traffic and Transport consultant, Mr. Paul Bergin. In his report, the justification for the design of this section of the route has largely been accepted, apart from some minor adjustments which would not materially alter the impact on the woodlands as outlined above. On Day 12 of the Oral Hearing, Mr. Holbeach also proposed a number of changes to the landscaping mitigation measures along the Mulcon Valley and adjacent to the Bloomfield Woods, which will be detailed in the Landscape section of this report. The mitigation measures for these receptors are set out in the EIS Tables 12.46 and 12.47 with further details presented in Section 4.8 of the HSMP. Provided that the mitigation measures and monitoring regime are implemented as proposed, I do not consider that there will be significant adverse impacts on these habitats.

17.4.5.7 Bats

Concerns were raised by observers in respect of the number and dates of bat surveys which informed the baseline, as well as the findings of such surveys, including the failure to establish the presence of bat roosts within Bloomfield Woods and the woodlands in the Mulcon Valley. Several observers informed the hearing of their personal knowledge of the presence of bats in these woodland areas and disputed the lack of any record of any roost sites. Dr. Good (NPWS) queried whether a sufficient resource for bats, in terms of the number and density of mature trees, would remain within these woodland areas, particularly Bloomfield Woods, after the project was constructed.

This issue was addressed initially by Mr. Delaney on Day 4 (10/11/17) and by Dr. Karen Banks on Day 7 (16/11/17) of the oral hearing. Mr. Delaney advised (10/11/17) that an initial autumn bat survey was undertaken in 2016 and further autumn and summer surveys had been undertaken in 2013 and 2014. These were followed by an activity survey of the Carr's Hill/Moneygourney area in 2015 and a winter bat survey, together with an assessment of the entire M28 project area by Dr. Karen Banks, in February 2017, respectively. Dr. Banks, who is an experienced ecologist specialising in bats, in her brief of evidence (10/11/17), provided an updated summer and autumn assessment of the potential value of the M28 Scheme area to bats, based on further surveys carried out during July, August and September 2017, i.e. following the publication of the EIS. The brief of evidence sets out in detail, the methodologies used and the findings of the various surveys carried out.

The surveys included a preliminary roost assessment survey of trees and buildings in Feb. 2017, (walking, recording droppings etc), during which potential roost sites were identified. Subsequently, more detailed roost surveys, (and dusk emergence surveys), of the identified sites were undertaken in July, Aug, Sept. 2017. Manual bat detector surveys for bat activity (four transects) were undertaken between July and Sept. 2017. This process included 8 dusk activity surveys to provide information on the number and species of bats present, areas used for foraging, commuting routes to/from any roosts and changes in mid to late summer activity levels. This was supplemented by a passive monitoring system which records ultrasonic calls, where the monitor was placed in 8 different locations, including south of the Bloomfield Woods. Dr. Banks stated that all surveys were carried out in accordance with Bat Mitigation Guidelines for Ireland (Kelleher & Marnell, 2006) and the survey methodology in Collins (2016).

The results of the tree surveys indicated that there are 36 trees or clusters of trees of moderate suitability as bat roost sites within the Zol. However, no trees within the study area were confirmed as roost sites. The bat activity surveys indicated that there was a low level of activity within the woodland to the west of the N28 (at the

northern end of the project), compared with other areas of the project, but a relatively high diversity of species. No bat activity was detected within the woodland to the east of the existing N28. However, other areas within the project area had high levels of bat activity including evidence of foraging and commuting such as Donnybrook Stream. Overall, at least 7 species of bat were recorded within the study area. The impacts during construction were identified as the barrier effect and loss/fragmentation of foraging and commuting habitats, loss of potential or actual roost sites and disturbance from lighting. The impacts during operation were identified as roadkill (collision), the barrier effect and habitat degradation (lighting, noise, pollution).

Mr. Delaney stated that while bat surveys completed for the scheme did not confirm bat roosts within the footprint or Zol, a precautionary derogation licence application was submitted to the NPWS to allow for the demolition of the dwelling at Maryborough Hill and for the felling of trees which may have potential as bat roosts. Mitigation measures are detailed in the HSMP and in the EIS, which include tying SLM features into the surrounding hedgerow and tree network as well as specific areas of woodland planting. In addition, Dr. Banks outlined some specific planting measures to mitigate the barrier effect including planting alongside the road alignment (to connect linear features) and planting a “hop-over” to guide bats over the road corridor (illustrated in Fig. 5.3 of her brief). In respect of potential roost sites, detailed mitigation measures are set out in Dr. Banks’ evidence (5.1.2) in respect of buildings and trees. The range of measures includes avoidance of hibernation and breeding seasons, pre-construction surveys of potential sites for presence of bats and careful removal of species if found, and the placement of at least 36 bat boxes in strategic locations in advance of construction works and tree felling. Other measures include the use of directional lighting and the use of accessories such as hoods, cowls, louvres and shields. Items 22 and 25 of the Schedule of commitments provides for the implementation of mitigation measures as set out in both the EIS and in the brief if evidence by Dr. Banks presented to the hearing, including the additional landscape planting measures.

Monitoring following construction, for a period of 3 years, is also proposed in order to assess the efficacy of the mitigation measures outlined above. It was pointed out that there is potential for short-term negative impacts at a local level while the landscape planting establishes and matures and the bat boxes become established. Dr. Banks stated, however, that with effective implementation of mitigation measures and monitoring, and given the existing widespread network of hedgerows and tree lines in the wider landscape, she considered that these impacts would not be significant.

Questions from Dr. Good on Day 4 related to the adequacy of the surveys, the age of the trees to be retained and the sufficiency of alternative sites (mature trees) remaining within the woodlands following construction. However, Dr. Banks had left the hearing at that stage and the matter was raised again on Day 7 (morning). Dr. Banks began by reading a short addendum to her brief of evidence into the record. This was essentially a clarification of the surveys conducted to date, an outline of the findings and a summary of the proposed mitigation measures. In response to Dr. Good's questions, Dr. Banks advised that surveys included three rounds in the Autumn and Summer, but not in the Spring. She also advised that monitoring of mitigation measures will include the replacement and/or repositioning of bat boxes, if and when required.

Questions were also posed by Frances Murphy, Domhnaill Mac Domhnaill, Frances Gordon, Wessel Vosoloo for the M28 Steering Group and Cork Environmental Forum. Dr. Banks clarified that whilst bat roost sites were not confirmed, the proposed mitigation measures are designed to address the potential for such roosts to exist, irrespective of the fact that they were not physically found to be present. Thus, the absence of roosts during the surveys has not been taken as the absence of potential roost sites. The proposed mitigation is intended to address the possibility of roost sites being uncovered during the detailed pre-construction surveys that will be undertaken immediately prior to site clearance/tree felling. This will involve climbing trees and pre-dawn and pre-dusk surveys. She also clarified that the purpose of the pre-construction surveys is to address the issue of the mobility of bats and the frequency with which they move roost locations. In response to questions

from Frances Murphy, it was explained that it would be pointless to carry out these detailed surveys too early in the process and the location of the roost sites could be missed. She also advised that mitigation would be implemented even if no roosts were found.

Frances Gordon asked if the area between St. Patrick's Church and the Douglas Estuary (SPA) had been surveyed, as she had already informed the hearing of evidence of the presence of bats there. Dr. Banks replied that the area in question had not been surveyed but that it could be included in a pre-construction survey, if there is evidence of the presence of bats at this location. In response to a question from Cork Environmental Forum regarding the impact on food supply, Dr. Banks advised that extensive landscape planting is proposed to ensure foraging and commuting will not be adversely affected and for invertebrates to feed on.

It is considered that the baseline surveys are adequate and in accordance with best practice, as set out in the guidelines referred to by Dr. Good and Dr. Banks. However, the area of Bloomfield Woods to the north of the proposed road alignment, (referred to by Frances Gordon), should be included in the pre-construction surveys and the proposed mitigation and monitoring measures should be extended to this area, should evidence of bat activity and/or roosts be confirmed. Notwithstanding this, it is considered that the absence of confirmed recordings of roosts in Bloomfield Woods seems to have been misinterpreted by some observers as a failure to record any bat activity there. However, the EIS had identified the woods as an Ecological Receptor that "provides valuable connectivity, cover and refuge for a range of mammal and avifaunal species in the locality". The surveys had also confirmed that foraging Soprano pipistrelle, Common pipistrelle, Leisler's bat and Myotis were identified at Bloomfield Woods and that a moderate amount of bat foraging/commuting activity was recorded along woodland edges.

It is considered that the mitigation measures for the protection of bats, as presented in the EIS and further clarified and augmented at the oral hearing, during the construction and operational phases, is both comprehensive and appropriate.

Provided that the mitigation measures and monitoring regime are implemented as proposed, I do not consider that there will be significant adverse impacts on bats.

17.4.5.8 Other mammals

The survey methodologies and mitigation/monitoring programmes in relation to other mammals, including badgers and otters, are considered, in general, to be adequate and appropriate. Provided that the mitigation measures and monitoring regimes are implemented as proposed, I do not consider that there will be significant adverse impacts on these species or their habitats.

17.4.5.9 Other Avifauna

17.4.5.9.1 Barn Owls

Dr. Good (NPWS) had raised concerns about the significant mortality rates for barn owls in relation to major road developments. The matter was discussed briefly on Day 4 of the Oral Hearing. He advised that as a result, it is recommended that new road developments would have mitigation measures to reduce amounts of rough grass margins, especially on embankments, alongside such roads. Reference was made to Mr. Delaney's brief of evidence in which it was advised that a survey in 2014 of suitable structures to support breeding Barn Owl had identified two suitable structures near Barnahely, and that follow-up visits to check for nests and activity did not reveal any Barn Owl activity. Notwithstanding this, mitigation measures in the EIS propose to provide for 16 no. Specific Landscape Measures (SLM) (Table 16.10 and Fig. 16.5), and a further set of measures is contained in the HSMP (Appendix 12B), which include woodland planting proposals.

Mr. Delaney noted that the factors which influence collision risk include route elevation, maintenance of roadside verges, width of roadside grass covered verges and embankments and traffic speed. He advised that much of the proposed road scheme would be adjoined by woodland planting, on sections of cut, sections at grade and embanked sections. He was of the opinion that these measures would

influence the flight paths of avifauna, including Barn Owl. He also advised that it is proposed to carry out frequent mowing regimes that maintain grass sward height at low levels, particularly those areas exceeding 5.0m in width, which will reduce foraging suitability of these habitats and hence, reduce the risk of collision during the operational phase.

Provided that the mitigation measures and monitoring regime are implemented as proposed, I do not consider that there will be significant adverse impacts on the species or its habitats.

17.4.5.9.2 Buzzard

A buzzard nesting tree habitat at Ballinimlagh will be affected by the proposed road project. The impacts on this species were discussed above at 17.4.4.

Notwithstanding the proposed replacement treeline and woodland planting, the impact on the buzzard nesting habitat will remain as 'Significant Negative' at the local level until such time as the tree planting becomes established and matures. The EIS states that the impact will become 'Not significant' over the medium to longer term. In addition to replacement planting, the general mitigation measures relating to potential bird nesting habitats involving protective barriers, avoidance of nesting season, surveying trees by an ecologist in advance of tree felling etc. will be employed. It is considered that adequate measures have been proposed to minimise the potential direct and indirect impacts on this nesting habitat. Provided that the mitigation measures are implemented as proposed, I do not consider that there will be significant adverse impacts on the species or its habitats beyond the local context and/or in the medium to longer term.

17.4.5.9.3 Avifauna associated with Cork Harbour SPA and Lough Beg pNHA

There will be no works within Cork Harbour SPA or Lough Beg pNHA. Table 12.42 of the EIS states that there will be no direct impacts to the habitats and species associated with the SPA and no proposals for avoidance or mitigation measures are included. However, issues have been raised by the NPWS in respect of the effects of

piling and blasting on bird species within the SPA and the use of fields to the north of Lough Beg by field feeding curlew. The applicant agreed to restrict the timing of blasting and piling activities during the winter period and to the recommendations of winter monitoring of curlew. These matters are addressed in more detail the Appropriate Assessment section of this report. However, Item 21 of the Schedule of Commitments (presented On 1/12/17) refers to the seasonal restrictions proposed.

17.4.5.10 Water quality matters

Issues raised in respect of aquatic ecology, as well as matters arising from potential water pollution and degradation of water quality in relation terrestrial ecology, will be addressed under Section 18.0, Water Quality.

17.4.6 Conclusions on Terrestrial Ecology

There are no designated sites within the proposed route corridor but it is in close proximity to Cork Harbour SPA and Great Island cSAC, as well as four pNHAs. Thus, the potential for indirect impacts arises. The route intersects 3 streams but none correspond to Annex I habitats. There are no Annex I habitats within the site. The majority of the lands are of low ecological value but certain habitats along the route are of County or Local importance, the largest occurrences of which are in or near the Mulcon Valley (woodlands and streams) and at Raffeen Quarry (including semi natural grasslands, wetlands and Pergrine Falcon nesting sites). It has also been established during the course of the application and oral hearing, and accepted by the NPWS, that the wetland habitat at Raffeen Quarry is not a Marl Lake (i.e. does not correspond to Annex I) and that the Pennyroyal mint plant species present at the quarry is the non-native variety, which is not protected and is no longer required to be translocated.

It is considered that the proposed route through the quarry is appropriate and justified on the basis that it avoids the loss of valuable amenity lands and would significantly reduce the environmental impacts during construction, by reason of the availability of the stone material required to construct the road, the extraction of

which is already permitted and has been subject to EIA. Although the 'Do Something Scenario' would be likely to result in significant impacts on the various habitats and species within the quarry in terms of loss, fragmentation and disturbance, it is considered that the compensatory mitigation measures and monitoring regimes, (as proposed in the EIS, the HSMP and as augmented/clarified at the oral hearing), provide greater certainty of the likely successful recreation and continuity of the existing rich biodiversity of these habitats, than the 'Do minimum' scenario, given that there is full planning permission for the entire quarry to be worked out with less certain outcomes for the restoration phase. In particular, the proposals to create compensatory semi-natural grassland and wetland habitats, including the translocation of smooth newt, none of which were requirements of the quarry permission, will guarantee the continued presence of these habitats and species. Furthermore, the methodology proposed together with the monitoring programmes will ensure that the habitats created will be of a high quality and will be permanent.

It is accepted that Peregrine Falcon, which are known to nest on the cliff faces of Raffeen Quarry, will be directly impacted by the removal of much of this habitat. However, the suitability of the quarry as a breeding site is questionable (due to lack of success and the extant permission to work out the quarry), and it is accepted that there are potentially suitable habitats in the wider district for breeding peregrine falcons, which are no longer a species of conservation concern. Notwithstanding this, it is considered that the proposed mitigation measures to direct the species away from the motorway and to provide for alternative artificial nest sites, together with monitoring, would help to avoid and offset the potential adverse impacts. However, the proposed artificial nest box at Chainage 11350 (item 23 of the Schedule of Commitments) should not be implemented on the grounds of proximity to the SPA and a possible conflict with the bird species for which the SPA has been designated.

There are no Annex I overwintering avifauna recorded, but some species for which the SPA is designated were recorded, and the field feeding curlew surveys indicated that this activity is likely to be mainly opportunistic. No barn owls were recorded but

mitigation measures have still been proposed to direct these birds away from the motorway to avoid risk of collision. There will however be a significant negative impact on the nesting buzzard habitat in a line of trees near Ballinimlagh, notwithstanding the proposed mitigation measures. However, it is noted that once the new tree planting becomes established, this impact is likely to reduce to 'not significant' over the medium to longer term.

There will be direct impacts on woodland and stream habitats due to land take, loss and fragmentation of habitats and the risk of collision with machinery, particularly in the Mulcon Valley and Bloomfield, as large sections of woodland are to be felled and sections of streams are to be diverted, culverted etc. This will also have an impact on bats, otters and badgers and other mammals that rely on these habitats for foraging and commuting. A total of 0.7ha of woodland will be lost and the semi-natural woodland associated with Donnybrook Stream will be fragmented. However, it is proposed to carry out extensive planting of mature trees and woodlands along the route which will compensate for the loss of trees and woodlands and minimise the potential impacts on these habitats and the species that rely on them.

It is considered that the baseline surveys for bats was adequate and carried out in accordance with best practice guidelines. Potential for foraging and commuting was established but it is accepted that no roost sites were recorded. However, the proposed mitigation measures are based on the potential for such roosts to exist and include provision for much more detailed pre-construction surveys of potential roost sites. These include approx. 36 trees/clusters of trees and 2 derelict buildings. However, it does not include Bloomfield Woods, but the applicant is agreeable to including these woods on the basis of local knowledge. This is not mentioned in the Schedule of Commitments and will therefore require a condition to be attached to any approval. Other mitigation measures proposed at the oral hearing include specific measures providing for continuity of tree lines to facilitate commuting and foraging habitats. The range of mitigation measures and monitoring programmes in the EIS and presented at the hearing are considered to be appropriate and

comprehensive and, if implemented, will ensure that there will be no significant impacts on bats.

Overall, it is considered that the baseline surveys of the various receptors, which were carried out prior to, and following, the publication of the EIS are generally comprehensive and are sufficiently adequate to enable the direct and indirect impacts on the flora and fauna of the area to be identified and assessed. It is further considered that the mitigation measures and monitoring programmes proposed as part of the EIS, together with those proposed during the oral hearing, (as clarified and amended above), if implemented as planned, would result in no significant residual impacts in respect of the flora and fauna of the area apart from the impact on the nesting buzzard habitat and the fragmentation of the woodland associated with Donnybrook Stream, as identified above. However, in the longer term, these impacts will also be reduced to not significant, as replanting becomes established.

18 Water quality

18.1 Environmental Impact Statement

The potential direct and indirect impacts of the proposed development on the water quality issues, together with the proposed mitigation measures and the residual impacts are set out principally in Chapter 9 (Hydrology), Chapter 10 (Aquatic Ecology) and Chapter 17 (Material Assets) of the EIS. Matters relating to Soils, Geology and Groundwater are contained in Chapter 11. In addition to the Environmental Impact Statement in respect of flora and fauna, an Appropriate Assessment Screening was carried out in accordance with the requirements of the Habitats Directive, and a Natura Impact Assessment was submitted with the application, which is contained in Volume 3 of the EIS.

18.2 Issues raised during the course of the application and oral hearing

18.2.1 Issues raised by third parties regarding water quality issues

1. EIS inadequate – The EIS does not provide a robust enough overview of the importance of each individual catchment for each fish species. Surveys

- conducted were inadequate and there should be electro fishing surveys with a minimum of 3 sample points over the longitude of each stream.
2. Water quality survey dates and relevance questioned – it is claimed that many of the surveys are outdated (based on 11 year old unpublished reports) and incomplete, which undermines the credibility of the habitats assessment in respect of invertebrate water quality, aquatic plants, fish and ecological importance.
 3. Woodbrook Stream – there will be a massive structure (S2) alongside a steep incline adjacent to Woodbrook Stream. It is inevitable that there will be spillage and sedimentation, as there is no protection. Thus pollution and realignment of culverts will kill off most fish in the stream. Given that there is a hydrological link to the SPA and the SAC, this should not be allowed.
 4. Donnybrook Stream – this stream contains Brown Trout and Lamprey. It is queried whether surveys of these fish were adequate. There are also Otters on this stream as well as the Glounatouig Stream.
 5. Impact on Cork Harbour SPA – diesel run-off into the local streams (Woodbrook, Donnybrook and Glounatouig) will eventually end up in Douglas Estuary, which is part of the SPA.
 6. Sedimentation and run-off – during construction there will be huge amounts of suspended solids generated which is likely to make its way into the local streams. There is insufficient information on the amount of sedimentation and hydrocarbons in the run-off and how it will be controlled.
 7. Water Framework Directive – requirements not complied with in respect of water quality (European Court of Justice C461/13).
 8. Excavations at Raffeen Quarry – proposals for water drawdown not adequately set out and hence impact on water quality of Glounatouig stream, which feeds Monkstown Creek, cannot be adequately assessed.
 9. Shanbally water supply – proposed route will cut through existing watermain.

18.2.2 Issues raised by Inland Fisheries

These have been summarised above at 6.1.2.3. It was pointed out that the applicant has engaged in consultations with the IFI and that a number of matters are yet to be finalised. These related to the length and width of culverts; details of the construction

of the realigned channels which should include meanders and rock armour; the design of all culvert crossings, which must ensure free passage of all fish; and the timing of instream works (limited to May-Sept.).

18.3 Oral hearing

The potential impacts and proposed mitigation measures in respect of water quality issues were discussed principally during Day 4 of the oral hearing, 10th November 2017; Day 7 (morning, 16th Nov. 2017); and Day 9 (morning and noon 28th Nov. 2017).

The following observers made submissions and/or presentations or participated in questions on this issue:

- Dr. Jo Goodyear
- Rodney Daunt
- Dr. Dara Fitzpatrick
- Frances Murphy
- Daniel O'Connell

In attendance for Prescribed Bodies:

- Dr. Jervis Good – Dept. Arts, Heritage and the Gaeltacht (NPWS)

In attendance for the applicant were:

- Dr. Bernadette White – Aquatic Ecology (Chap 10 EIS)
- Eamonn Delaney – Terrestrial Ecology (Chap 12 EIS, NIS)
- Mr. McGuinness – Hydrology and Groundwater (Chapters 9 and 11 EIS)
- Mr. Michael Noonan – Drainage design

18.4 Assessment Water Quality

18.4.1 Surface Water Hydrology

Within the study area, three river water bodies, one transitional water body and one coastal water body were identified in the EIS (Chapters 9 and 10). The Woodbrook Stream intersects the N28 between Bloomfield and Carr's Hill and discharges to the Douglas River Estuary (a proposed NHA). The Donnybrook Stream drains the northern side of Carr's Hill and also discharges to the Douglas River Estuary (pNHA). The Glounatouig Stream drains the southern section of the project area and discharges to the Monkstown Creek (part of the Cork Harbour SPA). The Douglas River Estuary is part of the Lough Mahon Transitional waterbody, which in turn forms the inner part of Cork Harbour Coastal Body.

The Hydrology chapter includes an assessment of flood risk from fluvial and coastal sources as being low. It is noted that most of the route crosses agricultural land and that the road scheme is outside of Zone A associated with the Glounatouig Stream. Although the proposed route crosses Flood Zone A associated with the Woodbrook Stream, it follows the footprint of the N28, which is not flooded due to the difference in levels. Although the route goes through an area at risk of coastal flooding, the road itself is not at risk. However, the proposed Motorway Service Area site and the L2545 would be at risk of flooding during construction. It is noted that the Indaver proposal incorporates measures to reduce flood risk by raising the levels of the local road. In the event that this proposal does not go ahead, the EIS proposes that road levels are raised at the entrance roundabout to the proposed Motorway Service Area to ensure emergency access is maintained.

The risk of pluvial flooding from overland flow is acknowledged, although there is no record of such flooding along the route. However, it is stated that the design of the proposed road has taken account of such risks. It is noted that most of the route is raised above ground level by embankments and where it is in cut, interceptor drains will be used. The Motorway Service Area will be designed to direct run-off away from buildings and to prevent ponding. The proposed surface water drainage will be managed through design and construction of an engineered drainage system, which

will address the risk of pluvial flooding. Ground water flood risk is also considered to be low due to the fact that most of the route is on embankments.

The existing surface water drainage system on the N28 is primarily by means of run-off over-the-edge to fields. Although the proposed scheme includes over the edge run-off with swales where appropriate, it is proposed to collect and attenuate run-off by means of tanks, ponds, grassed swales to reduce flood risk and improve water quality. There will be new outfalls to existing watercourses, to the existing surface water drainage system and to the foreshore. The proposed route crosses a number of watercourses which will require stream realignments, new culvert crossings and extensions to existing culverts. There are 5 stream diversions proposed, two on each of the Donnybrook and Woodbrook Streams and one on the Glounatouig stream. There are 17 no. culverts proposed, some of which are already in place but required alteration/extension. Table 9.7 outlines the proposed culvert works, which will comply with IFI requirements.

Construction impacts, in the absence of mitigation, were identified as flooding, accidental spillage of polluting material and sedimentation from sediment being transported to surface waters. Standard best practice mitigation measures are proposed to ensure that there will be no pollution or sedimentation of receiving waters during construction. The surface water drainage system for both construction and operational phases has been designed to limit the potential for contaminated water to reach the underlying soils and groundwater.

The issues of surface water drainage and flood risk were not discussed at any length at the oral hearing. No significant objections were raised to the proposed drainage system. Michael Noonan (RPS) clarified some matters relating to the proposed drainage during the discussion about the wetland at Raffeen Quarry (Ecology Module). He confirmed that surface water would be carried by pipe from the road embankment to discharge at the watercourse at the northern end of the quarry and would be kept away from the extraction works at the quarry.

It is considered that there would be no significant residual impacts from the proposed development in terms of surface water hydrology and the proposal is likely to result in a reduced risk of flooding and an improvement in the water quality of the receiving waters.

18.4.2 Groundwater hydrology

The proposed route is said to pass through two areas of Locally Important Karst Aquifer, one to the west of Shanbally and one to the north of the Martello Tower at Ringaskiddy, (Chapter 11 EIS). It is stated that there are many karst features between Shannonpark and Ringaskiddy and that aquifer vulnerability ranges from Extreme to High and as such, discharges will be controlled to prevent pollution of groundwater sources. The potential impacts during construction include accidental spillage, the risk of encountering karst features and dewatering which would affect private wells, if ground water is intercepted. During the operational phase, the potential impacts include accidental spillage, impacts on aquifer vulnerability, karst features and private wells.

Construction mitigation measures as set out in the EIS (Chapters 3, 9 and 11) are generally in accordance with standard best practice methods for CEMP. The potential for accidental spillage will be mitigated by means of containment methods and emergency procedures such as storage of fuels, chemicals etc. within bunds, the use of safe materials handling methodology and an emergency response plan. Avoidance of impacts on aquifer vulnerability and karst features will be informed by pre-construction site investigations, including geophysical surveys and the drainage system will be designed to reflect the groundwater protection response. Measures will include closed drainage systems, interceptor drains and hydrocarbon separators. Karst features will be protected from surface water run-off and will include specific mitigation measures (based on the results of the SI) in accordance with the NRA and TII guidance documents on sustainable drainage for road schemes.

As the proposed road is to be constructed mainly at grade or on fill, the impact on groundwater levels and the potential for dewatering is stated to be relevant only to areas in, or in close proximity to, proposed cutting. In such areas, it is proposed to

monitor ground water. It is stated that existing private wells that have been identified within 300m of a cut where the water table is to be intersected, which would be greater than 5m, will require monitoring and should a problem arise, a new well will be provided in agreement with the affected owner. Dewatering of the service area will require a suitably designed system and use of appropriate engineering methods such as cut-off walls.

The potential impact on sensitive receptors, including surface water and ground water receptors, are described in the EIS as being imperceptible with mitigation. The proposed surface water system has also been designed to allow for a 20% increase in flow rates to take account of the effects of climate change, as recommended in the TII and OPW guidelines. It is stated in the EIS (pg 11-46) that there will be no impact, therefore, in terms of climate change as a result of the proposed development.

18.4.3 Aquatic ecology

Dr. Bernadette White, in her brief of evidence (10/11/17) outlined the key findings of the EIS (Chapter 10) and responded to the issues raised by observers. Several surveys have been carried out including walkover surveys in 2016-2017; site specific aquatic surveys on 26th and 27th February 2015; and electro-fishing surveys. No Annex I habitats or Annex II species were found during the surveys. Neither Lamprey not Atlantic Salmon were present but each stream has salmonid habitat value and suitable lamprey habitat, and this was taken into account during the impact assessment and design of mitigation measures. It was noted that each of the three streams within the study area are of 'Poor Ecological Status' and each has been modified. The EPA has characterised the three streams as "Review" in terms of the risk of failing to meet objectives under the Water Framework Directive. The Q values vary from Q3 to Q4 (Moderate to Good).

A total of nine aquatic ecological receptors were identified in the ZoI. Table 10.12 of the EIS summarises the Aquatic Ecological Receptor Valuation for all river and water bodies. The Woodbrook, Donnybrook and Glounatouig Streams were each

categorised as Local Importance (Higher Value) due to the presence of species such as brown trout and eel. However, they are of poor water quality overall. Whilst each stream discharges into Cork Harbour SPA, the contribution of each to the water quality of the harbour is stated to be minimal.

Construction impacts are described in the EIS (10.4.1). They include pollution by suspended solids; pollution by other substances (eg. Concrete, fuels); construction of culverts and stream diversions; hydrological changes to streams; siting of compound areas; and environmental incidents and accidents. These impacts were discussed under surface water and groundwater hydrology above. The main impacts from stream modifications, in terms of aquatic ecology, is the potential to obstruct the passage of fish and alterations to the hydraulic characteristics of the stream, as well as the introduction of outfalls to watercourses. The impacts would be highest for the smaller streams and slightly negative for the larger waterbodies, in the absence of mitigation. Section 10.5.1 of the EIS sets out standard construction mitigation measures, which would result in residual impacts which would be Not Significant.

Operational phase impacts include pollution with contaminated surface water run-off; hydrocarbon run-off; hydrological changes; and environmental incidents and accidents. As discussed under 18.4.1 above, the current surface water drainage system on the N28 is quite limited with discharge over the embankments to fields and either infiltrates to ground or discharges to a local watercourse. Thus, the current level of pollutants contained in surface water run-off is largely unmitigated. The impacts of the proposed scheme would be significantly negative in the absence of mitigation for the smaller streams and moderately negative for the larger waterbodies. Mitigation by design is proposed, which includes a new surface water drainage system with measures to attenuate and treat carriageway run off. The likelihood of a serious pollution risk was calculated as low.

A schedule of monitoring is outlined in the EIS (10.7 and Table 10.17), which is proposed to ensure that baseline conditions are maintained and to ensure that the mitigation measures are effective.

Dr. Bernadette White's brief includes reference to minor errata (section 4) and to additional surveys carried out following the publication of the EIS (Section 5 and appendix to Brief). The errata relate to a discrepancy in Q values for two sites, between the Table (10.9) in the EIS, which was correct and the EIS Appendix (10C). The additional survey was carried out in August 2017, given that 2.5 years had elapsed since the previous surveys had been undertaken. This indicated that there had been an overall deterioration in water quality at 3 no. sites (Sites 1, 3 and 4 Woodbrook and Donnybrook Streams, near Bloomfield and Carr's Hill), and an improvement at Site 9, (Glountouig Stream near Shannonpark). Q values improved from Q2-3 to Q3. However, as the ecological status of all sites remained poor, there was no change in the assessment or in the proposed mitigation measures.

18.4.4 Other matters

18.4.4.1 Water quality surveys and hydrology issues

In response to specific concerns raised by observers, Dr. White advised that the issues raised by the IFI have been addressed in the EIS and that all of the requirements set out in their submission will be complied with. She reiterated that all streams, rivers and waterbodies will be protected during construction and operational phases and refers to the mitigation measures. The reliance on an 11-year-old survey was dismissed and reference was made to the various surveys carried out to date (as outlined above), as well as the baseline monitoring and electrofishing surveys conducted and the proposed monitoring regimes. It was emphasised that the EIS was prepared with full integration with the requirements of the WFD and compliance with same. It was acknowledged that the un-named stream at Maryborough Heights housing estate was not surveyed in Feb 2015 or in Aug. 2017, due to low water levels, which meant that it was impossible to conduct a biological water quality assessment. However, it was stated that alternative sites, above and below St. Patrick's Church, were surveyed instead.

I would agree that the baseline surveys in the EIS are adequate and have been supplemented by additional surveys carried out in August 2017, which have increased the robustness of the original surveys. It is considered that the potential

impacts have been appropriately identified for the various receptors and that the mitigation measures have been designed in accordance with the current guidance and best practice. The issues raised in respect of the potential for pollution of the Woodbrook Stream and other watercourses have been addressed by Dr. White in her brief of evidence and in response to questions at the hearing. She also outlined the proposed mitigation measures during construction, which are considered to be appropriate to prevent pollution of the watercourses within the ZoI. I would further agree that the current level of attenuation and treatment of run-off from the existing N28 is very poor and the proposed new surface water drainage system is likely to result in much improved water quality following its implementation and during the course of the operational phase.

In response to questions from Frances Murphy (M28 Steering Group), Dr. White and Mr. Noonan stated that monitoring of water quality in the watercourses will be carried out under the supervision of a qualified ecologist in conjunction with the NPWS and the IFI. Thus, it is considered that ongoing monitoring of water quality will also inform the effectiveness of the mitigation measures and allow for adjustments and fine tuning in due course.

The issue of water drawdown in Raffeen Quarry was discussed on Day 7 (16/11/17) and Day 9 (28/11/17) of the oral hearing, and at 17.4.5 above. In response to a question from Dr. Goodyear regarding whether it would be necessary to excavate below the water table to create the new wetland, Mr. Delaney and Mr. McGuinness (Hydrologist) confirmed that it is intended to excavate until the water table is reached and that there would be ingress. Mr McGuinness stated that the water regime for the wetland is expected to be very similar to the present regime. Dr. Good (NPWS) asked if excavation works would be likely to result in any fracture drainage due to subterranean fissures. Mr. McGuinness confirmed that the groundwater is expected to be consistent, even if there is a need for a large amount of excavation and he reiterated that there are no proposals to drawdown the water table.

18.4.4.2 Motorway Service Area

Dr. Jervis Good, representing the NPWS (10/11/17), referred to the Motorway Service Area and sought a condition to be attached to any permission granted by the Board, which would require supervision of all works with the potential to cause water pollution by an environmental clerk of works, who would have the power to stop works where there is a significant risk of water pollution and who would provide regular reports, with photographs, of the receiving waters. In addition, Dr. Good sought a condition requiring the monitoring of hydrocarbons, heavy metals and microplastics, in conjunction with appropriate state agencies at the receiving part of Cork Harbour SPA at the discharge point of the watercourse draining the Motorway Service Area, as part of the mitigation of aquatic ecology. There was some debate regarding the appropriate timeframe for such monitoring, the objective of which is to gather information and research. Dr. Good suggested a period of 20 years (16/11/17), but Mr. Flanagan S.C. (for the applicant) suggested that 15 years would be more appropriate. The decision on the most appropriate period of time was referred to the Board.

The case for this type of monitoring and the longer timeframe was put forward by Dr. Good (10/11/17) as the need to obtain better data on the pollutants contained in the run-off from uses such as the MSA, so as to better inform the effectiveness of the mitigation proposals, and with a view to amending the mitigation if necessary. Mr. Flanagan noted that this is a new type of monitoring which is currently being conducted by a number of state agencies with a view to gaining a better understanding of this type of material (microplastics). Dr. Good agreed that the monitoring of heavy metals and hydrocarbons is standard and that it is data regarding microplastics that is of interest over the longer time period. However, no particular case was presented in favour of 20 years, and as the applicant is agreeable to the 15 year monitoring commitment, it is considered that this would be the appropriate timeframe in this instance. Items 17 and 18 of the Schedule of Commitments refer.

18.4.4.3 Water supply matters

A number of conflicts arise with existing water mains along the proposed route (17.4.1.3 EIS). Details of the conflicts with the Cork Harbour and City Watermain are set out in Table 17.8 and with other watermains in Table 17.9. It is stated that each of the conflicts has been discussed with the relevant personnel in the local authority/Irish Water and further discussions will be held at detailed design stage. Mitigation measures are set out in 17.5.1.4. In general, the 1200m watermain will remain in situ and be protected. However, the northbound merge at the proposed Shanbally Interchange may require a diversion, although the preference is stated to leave the watermain in situ. It is stated that this decision will be made following further discussion with those responsible for the watermain at detailed design stage. A discussion took place regarding this watermain at Shanbally interchange on Day 5 of the Oral Hearing. The discussion was in relation to CPO Plot Ref 162, with the landowner, Mr Daniel O'Connell. However, the discussion did not have any bearing on the water supply issues relating to the project and will be addressed in the CPO section of this report.

The potential impact on private wells was also discussed on Day 7 and Day 9 in relation to groundwater. This matter was addressed previously at 17.4.5. Mr. McGuinness confirmed that monitoring of the water supply to private wells will continue before, during and after construction and should any problems be encountered, these will be addressed directly with the private landowner, including the provision of a new water supply if necessary.

18.4.5 Conclusions Water Quality

It is considered that the flood risk is either low or would be adequately mitigated apart from the local road serving the MSA (L2545). In the event that the Indaver proposal does not go ahead, it will be necessary to impose a condition on any approval requiring the road levels to be raised at the entrance to the proposed roundabout to the Motorway Service Area during construction. Potential impacts on ground water levels are only likely to occur where the road is in a cutting, but ground

water levels will be monitored before, during and after construction to ensure no impact on private wells. It is noted that should any problems arise, the applicant has agreed to provide a new water supply if necessary, (Item 9 of Schedule of Commitments, Soils, Geology and Hydrogeology).

The baseline surveys carried out in respect of aquatic ecology, both in the preparation of the EIS and as supplemented in presentations to the oral hearing, are considered to be adequate. It is noted that that no annex I habitats or Annex II species were recorded but that suitable salmonoid habitats value was factored into the assessment and the design of the mitigation measures. There were 9 aquatic ecological receptors identified. The 3 streams are of poor ecological status. It is considered that the proposed mitigation measures during construction are appropriate to prevent pollution of watercourses. It is further considered that as the current level of attenuation and treatment of run-off from the N28 is very poor, the proposed new surface water drainage system will result in much improved water quality in the operational phase.

The Schedule of commitments submitted to the board during the Oral Hearing on 1st December 2017 includes all of the mitigation measures discussed above and as outlined in the EIS, with two additional measures. Items 17 and 18, respectively, of the commitments under Surface Water, Groundwater and Aquatic Ecology, relate to the two mitigation measures requested by the NPWS. Item 17 requires monitoring of the construction of the MSA and adjacent M28 by a clerk of works with the power to stop works in the event of a significant risk of water pollution occurring. Item 18 requires annual monitoring of hydrocarbons, heavy metals and microplastics in conjunction with appropriate state agencies at the discharge point to the Cork Harbour SPA over a 15 year period. This is considered to be acceptable. Item 7 also addresses the flood risk to the Motorway Services Area.

19.0 Cultural Heritage

19.1 Environmental Impact Statement

Cultural Heritage issues are addressed in Chapter 15 of the EIS and in the associated appendices.

19.2 Issues raised during the course of the application regarding Cultural Heritage

1. Separates Castle Warren and the Martello Tower from the community in Ringaskiddy - The route of the proposed road would separate the historic sites of Castle Warren and the Martello tower, which are significant tourist attractions in the area, from the village community. This would be unacceptable but could be overcome by reverting to the 2008 route.
2. Castle warren separated from its associated graveyard by motorway – the driving of the proposed motorway through the historic site comprising the tower house, the church and its graveyard at Barnahely is unacceptable. The proposal would squeeze the motorway through with a distance of just 50m from Castlewarren and 25m from the graveyard, and would be elevated at 4-5m above ground. It would therefore dominate the landscape and overwhelm the ancient ambience of the site.
3. Curtilage of Protected Structure and character of Castlewarren would be materially affected – contrary to Architectural Protection and Heritage Guidelines and objective HE4-1 of the CDP.
4. Planning gain for Castlewarren – should commit to ensuring structure is secured and that public access is provided with interpretation.
5. Ring House – historical house of great local significance. It was built by ‘Guys’ in 1850 and has had various uses historically, e.g. as a detention centre and barracks in 1920s. Serious concern about the impact of the proposed development on the property.
6. Grotto at Shanbally – the embankment and grade separated interchange would have an adverse impact on the setting of the grotto, which is a place of cultural significance to the local community and a place of prayer.

19.3 Oral Hearing

This issue was discussed on Day 4 (10/11/17).

- Dr. Clare Crowley made a presentation on behalf of the applicant.

Third party observers present were:

- Mr. Daniel O'Connell
- Councillor Marcia D'Alton

Questions followed the presentation by Dr. Crowley.

19.4 Assessment of Cultural Heritage issues

19.4.1 Archaeological sites

The proposed road project has been designed to avoid known archaeological sites. Only 3 sites on the RMP/SMR will be directly impacted. These are a Fulacht Fia at Shannonpark, an Enclosure at Barnahely and a Gate Lodge at Barnahely. There are two additional RMP sites which will be affected indirectly, which are Barnahely Castle and Barnahely Church. The site known as Barnahely Castle is also referred to as Castle Warren, and comprises a medieval Tower House and Bawn, which is incorporated into the 18th Century Castle Warren House (a Protected Structure). The setting between the Castle site and the Church/graveyard will be altered.

There are many undesignated sites of archaeological potential which have mainly been identified during the assessment. There is also a newly discovered enclosure complex identified during geophysical survey and archaeological testing (AH48). Since the publication of the EIS, there has also been 23 sites of archaeological potential identified as a result of the analysis of the LiDAR survey. However, only two of these would be directly impacted, one of which is AH48 and the other has not yet been identified as being archaeological in nature.

19.4.2 Sites of Architectural Heritage

There are no Protected Structures within the CPO line but there are some structures on the RPS in the vicinity of the site. These are Castle Warren House and Martello Tower. The proposed route travels approx. 50m to the north of Castle Warren House and would affect its setting. It is proposed to mitigate this by means of screen planting. The proposed route is located to the north of Martello Tower, but is at a much lower level, in a cutting and is screened by vegetation. There is also one site which is not protected but is on the NIAH, Ring House

19.4.3 Castle Warren/Barnahely Castle

Dr. Crowley responded to the observations regarding the separation of Castle Warren from the church and graveyard by stating that the association between the Tower house and these elements were lost at the beginning of the 18th Century, and that the church was in ruin by 1700, with no upstanding remains of this structure. She further believed that the curtilage comprises the area containing the upstanding remains of the late 18th Century country house and of the medieval tower house and bawn only. This is based on what she considered to be a lack of evidence of any functional connection between the Castle and the church and graveyard, as the latter were not necessary in order for the house to function as a dwelling. Dr. Crowley did accept, however, that there is likely to have been a historical relationship between the two sites, although this is not documented. It is presumed that the sites would have been used contemporaneously during the medieval period, but there are insufficient grounds to conclude that the graveyard falls within the curtilage of Castle Warren.

Dr. Crowley considered that the former demesne landscape forms the attendant grounds of the protected structure, i.e. it is associated with the structure and forms an intrinsic part of its function, setting and/or appreciation. This former demesne landscape, which contains both Castle Warren House and the graveyard, will be traversed by the proposed road. However, Dr, Crowley pointed out that this former historic landscape is now “almost entirely degraded with virtually no recognisable features surviving (as noted in the National Inventory of Architectural Heritage

Historic Gardens Survey and described in Section 15.3.3.5 and 15.3.4.11 of the EIS)". She further pointed out that the design elements that would have provided the context for the Protected Structure have long since been removed, including the gate lodge, the walled garden, curved entrance walls and gates, carriageways and footpaths, parkland, and a belvedere tower.

The only elements that survive are the upstanding remains of Castle Warren House, one wall of the walled garden and some fragmented sections of a degraded demesne boundary wall along the southern boundary. None of these elements will be directly affected by the proposed development. However, a 30m section of boundary wall along the eastern boundary, which was re-built in the 20th Century, will be removed, but will be recorded prior to its removal.

Having inspected the site and surroundings of the castle, and having regard to the detailed description and analysis in Chapter 15 of the EIS, I would agree with this assessment. The Castle is an iconic feature in the landscape but is in ruins. It is fenced off by means of security mesh fencing and stands relatively isolated in a landscape that has evolved around it with large scale industrial uses, including pylons and wind turbines, intermingled with residential and agricultural land uses. The proposed road reduces to a single carriageway road with an at-grade roundabout at this location. I note that archaeological investigations of the agricultural field that separates the castle from the church/graveyard did not uncover any associated features and that the proposed mitigation includes an undertaking to carry out further archaeological investigations as well as proposals to provide appropriate screening to reduce the visual intrusion. Vibration monitoring will also be carried out during construction.

When questioned by Councillor D'Alton (Day 4), regarding the height of the road and the nature of the proposed screening, Dr. Crowley replied that the road would be 4m at its highest and 3-3.5m directly in front of the Castle. She advised that it is proposed to provide tree planting and vegetative screening on the embankment, together with noise barriers, which would effectively screen the visual and noise

intrusion on the castle site. Dr. Crowley also emphasised that the modern extension to the graveyard is quite an eyesore when viewed currently from the castle, and that the most important aspect is the view to the south towards Loughbeg, as evidenced by the siting of the Belvedere Tower. I would agree that strategically, the views southwards would have been the most significant in terms of defence and views towards Loughbeg, and that this aspect will be preserved. I would further agree that the impact on Castle Warren would not be significant, once mitigation is in place. It is further noted that there is no public access to the castle at present and, as such, it would not be separated in any meaningful sense from the community.

19.4.4 Martello Tower

Martello Tower stands on a hilltop to the south of the L2545 and Martello Park. It is currently accessed by means of an overgrown footpath which leads off the Loughbeg Road, just to the south of the existing entrance to Ringport Business Park. It is a formidable structure, surrounded by a moat, and as its name suggests, occupies a commanding position overlooking Cork Harbour and is visible from many vantage points around the harbour. However, due to the topography and vegetative screening to the north of the Protected Structure, as well as the design of the road at this location, it is not possible to see the proposed road from the tower itself, or from the vicinity of the tower. the proposed road will sit well below the promontory site of the tower and will not interfere with views to or from the Martello Tower. Access to the tower will not be affected by the proposed development.

19.4.5 Ring House

Although not a Protected Structure, it is accepted that Ring House is important in terms of local history and is on the NIAH. The EIS states that there will be an indirect moderate visual impact and that proposed mitigation includes appropriate screening, which will reduce the visual impact. The house looks quite neglected at present and is situated on large grounds. It is surrounded by industrial development. It is considered that the proposed road, which will run behind (south) of the structure with screen planting, will not have a significant impact on Ring House.

19.4.6 Grotto at Shanbally

Mr. O'Connell (Day 4) raised the issue of visual intrusion and interference with the character of the grotto, which he considered to be of local cultural heritage interest and a place of contemplation and prayer. Dr. Crowley agreed and stated that she had identified a potential indirect impact on the grotto and had proposed mitigation in the form of vegetative screening, which would reduce the visual intrusion, and fencing during construction to protect it. Councillor D'Alton (Day 4) sought clarification on the distance of the road and the height of the structure behind the grotto. Mr. Noonan replied that the closest element of the road project would be the slip road as it diverges from the mainline and that it would be 10m (approx.) behind the grotto and that the height of the slip road would be approx. 4.8m at this point. Ms. D'Alton queried whether there would be a noise barrier on top, which was confirmed as a 2.0m high barrier, bringing the total height to 6.8m.

Neither Mr. Noonan nor Dr. Crowley could confirm the nature of the barrier at this point, but Mr. Holbeach suggested, on Day 12, that it would be timber and he proposed that the planting could be upgraded to extra heavy standard and that an instant hedge would also be provided. This issue is discussed in greater detail in the Landscape and Visual impact assessment (16.4) above. Mr. O'Connell asked whether the applicant would be prepared to fund the relocation of the grotto, on the basis that he (Mr. O'Connell) would provide an alternative site on his land free of charge, and provided that there was community agreement to do so. However, he acknowledged that there was no agreement within the community at present. Given that there are no such proposals before the Board, and that there was no community agreement on the matter, it was considered not to pursue this suggestion any further.

19.4.7 Conclusions re cultural heritage issues

It is considered that the overall impact of the proposed development on the cultural heritage of the area would not be significant and that the mitigation proposed in the EIS, and augmented/revised at the oral hearing, would satisfactorily address any potential adverse impacts.

20.0 Environmental Impact Assessment

Introduction

This application for a proposed road project, to which the Motorway Scheme, Protected Road Scheme and Service Area Scheme relates, has been submitted for approval under Section 51 of the Roads Act 1993 (as amended), and is one which requires the submission of an EIS. The application was submitted prior to 16th May 2017, the date for transposition of Directive 2014/52/EU amending the 2011 EIA Directive. Under the transitional provisions of the 2014 directive, the 2011 Directive, as transposed into Irish legislation, will apply to the application.

I am satisfied that the information contained in the EIS complies with Article 94 of the Planning and Development Regulations 2000 (as amended).

I have carried out an examination of the information presented by the applicant, including the EIS, and the submissions made during the course of the application. A summary of the results of the submissions made by the prescribed bodies and observers, including submissions made at the oral hearing, has been set out at Sections 6.1 and 6.2 and the associated appendices, and also under each of the topic headings in the planning assessment above. The EIA has had regard to the planning assessment carried out by myself and the Traffic and Transport Assessment carried out by Mr. Paul Bergin, consultant appointed by the Board.

In accordance with Article 3 of the EIA Directive and Section 51 of the Roads Act 1993 (as amended), the environmental impact assessment has been carried out under the following headings:

- Human Beings and Flora and Fauna
- Soil, Water, Air, Climate and the Landscape
- Material Assets and Cultural Heritage

- Interactions between the foregoing.

20.1 Human Beings

20.1.1 Likely Significant Direct and Indirect Effects on human beings

Impacts on Human Beings are considered in the EIS under various headings, but principally in Chapters 7, 8, 13, 14 and 16, and in Appendices 1A, 1C, 7 and 8. Chapter 7 – Socio Economic and Community addresses the impacts in terms of Population, Employment, Community (Resident, Working and Visiting) and Land Use (including Land Take). Appendix 7 provides survey information on socio-economic factors and a non-agricultural impact assessment in terms of land take. Chapter 8 addresses the impact on agricultural land take. Health and amenity related impacts are addressed in Chapters 13 (Noise and Vibration), 14 (Air and Climate) and 16 (Landscape and Visual impact) and in Appendices 1A (Seveso Report) and 1C (Health Study).

Human Beings – Population, Employment and Community

Direct and Indirect impacts will arise as a consequence of the construction and operational phases of the development. The development will result in direct and indirect jobs on and off site during the construction period, and will contribute positively to the local economy with the purchase of materials and economic activity in shops, restaurants and local services during construction. During construction, negative impacts will arise in terms of the general amenity of the resident community as a result of road works, traffic diversions, noise, visual and dust impacts. Widening of the road will also affect entrances to homes which will require the temporary and/or permanent acquisition of parts of properties. One property will be demolished and four residential properties will be fully acquired as part of the CPO order. Similar impacts will arise for the working community. There is potential for short term disruption and delay particularly to commuters during construction. The visiting community will not experience any significant effects during the construction period as roads will still be in use for traffic.

During the operation phase, the development will contribute to improved journey times and road safety between the main centres of population and of employment in the metropolitan area. An increase in employment opportunities will support the role of Ringaskiddy as a Strategic Employment Area with significant long terms positive impacts on the economy of the region. This will contribute to planned economic development and potentially for increased residential development, as set out in the National and Regional plans for Cork City and Region, and in the County and City Development Plans and Local Area Plan for the area. This in turn will support employment and income opportunities which will contribute to improved standards in terms of housing, education, health etc. By creating opportunities for improved economic circumstances, the project will have direct and indirect impacts on the community in terms of health, wellbeing and quality of life. The potential for significant increases in population within the metropolitan area, such as Shannonpark Masterplan and the regeneration of the City Docks, are positive indirect impacts of the proposed project. The facilitation of the relocation of the port will also have positive long term impacts on employment and investment opportunities in the region.

Diversion of heavy traffic away from communities will provide for improved connectivity and greater opportunities for sustainable transport modes including walking and cycling and a cleaner, safer and quieter environment. This will give rise to direct benefits in terms of road safety, the environment and quality of life. There will be some loss of trade to businesses directly adjoining the N28 which will be bypassed. However, the road will remain open and there is potential for an increase in trade due to increased visitor numbers following the diversion of heavy traffic away from the road. This will result in direct and indirect benefits to the local economy. Other positive impacts include opportunities for greater social interaction and accessibility to local community facilities.

Cumulative impacts on population, economic and community are likely to occur in terms of employment and economic activity with expansion of the port facilities at Ringaskiddy and increased opportunities for investment in industry and housing.

However, these impacts are likely to be positive in the long term to the working, resident and visiting community due to reduced journey times and reduced congestion as well as increased employment opportunities. As the traffic model has already factored in future traffic scenarios, cumulative impacts in respect of traffic, noise and air are not likely to arise. It is assumed that Dunkettle Interchange will be developed in advance of the M28 which will result in positive cumulative impacts in terms of journey times and congestion.

In terms of construction, cumulative impacts could arise if any other planned/permitted development listed in Table 18.4 of the EIS, (pages 18-8 to 18.24), were to take place at the same time in terms of road works (disruption/delay), noise, dust and visual impacts. However, these impacts would be temporary and subject to traffic management plans and required to adhere to best practice methodology. The M28 project is subject to strict controls during construction and the mitigation for traffic, air and noise are set out in Chapters 5, 13 and 14, respectively. Thus, any cumulative impacts arising would either be positive or addressed by mitigation as proposed in the M28 and other projects.

Human Beings - Land use

The road project has been designed to minimise land take and associated impacts on land uses. At the northern section of the road project, where the proposed works are largely on-line, it is not anticipated that there will be a significant loss of land use types. Land uses along the length of the alignment, particularly south of Carr's Hill, are predominantly agricultural. Direct, indirect short and long term impacts will arise as a result of the construction and operation phases of the development. Two dwellings will be demolished, which will have a profound impact, and the route to the south, as well as the Service Area, will result in the loss and/or severance of some industrial zoned lands. However, the road will have a positive impact on investment potential for lands in terms of improved access and journey times.

Non-agricultural land take impacts are predominantly 'not significant' or 'slight'. These relate to slight encroachment on a property, (where no loss of amenity), land

required for accommodation works and lands to be compulsorily purchased. Douglas Golf Course and Fernhill Golf Course will be affected by land take but in peripheral areas of the facilities. There will be a significant impact on Raffeen Quarry and to a site owned by the IDA. Very significant impacts arise in respect of a three properties including Shanbally Hibernian AFC, which will lose one of its two pitches; a commercial site in Shanbally where over 65% of the site will be included in the CPO; and an industrial site in Ringaskiddy. Four properties will experience profound effects, which include the two houses to be demolished (one at Maryborough Hill and one in Shanbally), and two properties in Shannonpark where the loss of amenity would be too great, including the Bros. of Charity premises. Mitigation will mainly be addressed through the CPO and compensation processes.

Direct impacts on agricultural land use will arise by the permanent removal of 91.517ha. However, of the 33 landowners affected along the route, only two will be profoundly affected and three significantly affected. Having regard to the relatively modest land take, the continued use of land for agriculture in the vicinity of the proposed development, it is considered that there will be no significant impacts on the farming community in the long term and inconvenience during construction will be temporary. Mitigation measure include accommodation works, stock underpasses and relocated access points. It is considered that with mitigation and conditions outlined below residual impacts will not be significant.

There will be both positive and negative impacts in relation to community severance. The communities between Carr's Hill and Shannonpark, and at Shanbally and Ringaskiddy, currently experience significant levels of community severance, but the proposed road project will reduce the volumes of traffic leading to benefits for these communities. Proposals to close roads/create cul-de-sacs has been kept to a minimum, with just two such proposals, namely at Raffeen (L6472) and at Old Post Office Road in Ringaskiddy. However, the proposed mitigation measures to provide a pedestrian underpass on Old PO Road and the intention to provide a new school near Castle warren (which would replace the Lower Harbour School) would reduce these impacts to not significant. Community severance impacts would also be limited

on the L6472 due to the low number of properties and the pedestrian environment served by this road. It is considered that major intrusion will occur in Shanbally Upper due to the introduction of slip roads and access roads associated with the proposed Shanbally interchange, which will result in significant negative impacts. However, mitigation measures and conditions outline below will address these issues such that residual impacts will not be significant.

Cumulative impacts on land use from the proposed development in conjunction with existing, planned or proposed developments are not likely to arise.

Human Beings - Health

There will be direct and indirect impacts in respect of air and noise arising from the construction and operational phases. These issues have been addressed in detail in the planning assessment (Sections 13.0, 14.0 and 15.0 above) and it is not intended to repeat the assessment in any detail here. The main significant impacts will also be discussed below in terms of Likely Significant effects on Air and Climate. It is noted, however, that there will be a net reduction in exposure of the public to noise and air pollutant emissions following mitigation and that a number of environmental and safety issues will be addressed along the route. Thus, environmental health issues will be avoided or prevented by committed mitigation measures and by conditions outlined below, and there will be an overall net benefit to community health.

There will be an overall net negligible change in risk from COMAH establishments near the route alignment. Risks from the construction and operation of the proposed road project can be managed by means of traffic management plans in consultation with Garda and Emergency Services. However, once operational, the reduced travel times and reduced risk of collisions occurring will result in an overall net benefit to the community in terms of health and safety.

Cumulative impacts on health from the proposed development, in conjunction with existing, planned or proposed developments are not likely to arise.

20.1.2 Conclusions re Direct, Indirect and Cumulative Effects on Human Beings

I have considered all of the written and oral submissions made in relation to human beings, in addition to those specifically identified in this section of the report. The issues have been addressed in detail in Sections 13.0, 14.0, 15.0 and 16.0 above, including the assessment of contrary views on particular matters, where they arose. I am satisfied that the issues have been appropriately addressed in terms of the application and the information submitted by the applicant and that where adverse impacts are likely to arise, these would be avoided, managed and mitigated by the measures which form part of the proposed scheme, the proposed mitigation measures and through suitable conditions.

I am, therefore, satisfied that the proposed development would not have any unacceptable direct or indirect impacts in terms of human beings. I am also satisfied that while some cumulative effects may arise from the proposed development together with existing and permitted developments, these would either be positive impacts or would be avoided, managed and mitigated by the measures which form part of the proposed development and through suitable conditions.

20.2 Flora and Fauna

20.2.1 Likely Significant Direct and Indirect Effects on Flora and Fauna

Designated sites/undesigned sites of conservation interest – There will be no direct physical impact on any Natura 2000 site. No development will take place within the boundary of an SAC or any other designated site of ecological interest during the construction or operational stage of the development. During construction, the potential exists for indirect effects on both designated and non-designated sites. Potential exists for impacts on Cork Harbour SPA and on three pNHAs (Lough Beg, Monkstown Creek and Douglas River Estuary). Impacts on these designated sites include disturbance of species, (including avifauna in the SPA), and deterioration of water quality, which would be significantly negative at a local scale. Subject to the mitigation measures proposed to protect water quality, there will be no significant impacts on any of these designated sites.

Habitats - There are no Annex I habitats and no habitats that correspond with Annex I habitats. Direct and indirect impacts will arise in respect of several non-designated sites/habitats of high ecological interest. These include Bloomfield Woods, Mount Oval Mosaic, Donnybrook Wood and Stream, Glounatouig Stream, Abandoned Railway and Woodland Copse, Raffeen Quarry, Barnahely and Caste Warren Ruins, Species Rich Scrub and Woodland at Ringaskiddy, Badger Setts and Connecting Treelines at Ballinrea and Buzzard Nest within a Mature Treeline at Ballinimlagh. Within Raffeen Quarry, a rich biodiversity has developed during the past few years while the quarry remained idle. Habitats of importance within the quarry include a wetland, dry calcareous and semi-natural grassland and a nesting site for Peregrine Falcon.

The potential impacts for each of 22 key ecological receptors are set out in the EIS and are summarised at 17.4.2 above. The potential direct impacts include land take; loss/fragmentation/removal of habitats; disturbance of habitats/commuting/foraging routes; removal of (potential or existing) foraging territory; removal of badger setts, potential roost sites (bats); collision of species with machinery leading to mortality; and contaminated run-off during construction to streams. Potential indirect impacts include water quality deterioration; collision mortality; disturbance/disruption/avoidance of habitats; altered drainage regimes/drying out of wetlands; barrier effects; and loss of foraging territory.

I would accept that the proposed mitigation measures (as summarised at 17.4.3 above), will avoid collision mortality, the loss of potential roost sites, foraging and commuting territory and will minimise the potential impacts on these habitats. The impacts in terms of habitat loss, fragmentation and disturbance will be significant adverse, but with mitigation measures as proposed and augmented and amended during the course of the application, the impacts will be reduced to Not Significant. Residual impacts include a net loss of 0.7ha of woodland and fragmentation of semi-natural habitat at Donnybrook Wood and Stream and the loss of a treeline habitat used for nesting buzzards, which will be significantly negative at a local and receptor

level, respectively. However, mitigation in the form of extensive tree and woodland planting will reduce the impacts in the longer term, as new planting becomes established.

In Raffeen Quarry, there will direct and indirect impacts during construction and indirect impacts during the operational phase. The direct impacts include a net loss of 0.63ha of wetland habitat and the loss of semi-natural grassland, but compensatory wetland and grassland will offset these impacts (as detailed in the EIS and the HSMP and further clarified and augmented at the oral hearing) and summarised at 17.4.5 above. Mitigation measures will minimise the direct and indirect impacts on the habitats remaining within the quarry.

Cumulative impacts on habitats from the proposed development in conjunction with existing, planned or proposed development are unlikely to arise, except in relation to the habitats within Raffeen Quarry. This issue was discussed in detail at 17.4.5 above. It is considered that routing the proposed road through the quarry would result in the loss/fragmentation/disturbance of habitats, but as the quarry has planning permission to extract materials across the entire footprint of the quarry over the next 30 years, these habitats are likely to be lost permanently, even if the road does not go ahead. In particular, the proposal to carefully recreate high quality wetland areas in advance of the construction phase, including the harvesting and translocation of species and vegetation, would provide for permanent benefits with opportunities for continuity of the existing biodiversity. It is considered, therefore, that the cumulative impact of the proposed road and the permitted quarry on habitats within the quarry would be positive, given that the proposed development includes the provision of compensatory habitats which will be carefully recreated and monitored to ensure successful establishment of equivalent conditions.

Terrestrial species – it is acknowledged that there are a number of protected terrestrial faunal and floral species which would be significantly affected, either directly or indirectly, by the proposed development. These include Badger, Otter, Bats, Hare, Hedgehog, Pygmy Shrew, Irish Stoat, Common Frog and Smooth Newt.

In addition, a protected floral mint plant, Pennyroyal, is present within the quarry and would be directly affected. When the EIS was published, it had been thought that the plant species present was the native variety, but it was established during the course of the oral hearing that it was the non-native variety. Thus, there is no longer a requirement to translocate it. There are several areas of hedgerows and treelines that would also have significant negative impacts at a local level.

I accept that the location of the alignment on mainly improved pasture land and generally at a distance from the preferred habitat of these species, minimises the potential for significant effects on their breeding, foraging and commuting habitats by means of avoidance. However, there are several habitats supporting protected species that would be significantly affected in the absence of mitigation. It is considered that the mitigation measures proposed in the EIS, including the Habitats and Species Management Plan, and augmented and revised during the course of the oral hearing, and which includes pre-construction surveys, translocation of smooth newt (under licence), the inclusion of continuity in planting/treelines, and careful monitoring under the supervision of an Ecological Clerk of works, would ensure that direct and indirect impacts on the species will be minimised. However, Bloomfield Woods should be included in the pre-construction bat surveys.

Cumulative impacts on terrestrial species from the proposed development in conjunction with existing, planned or proposed development are unlikely to arise except for those species whose habitats are located within Raffeen Quarry, which is likely to be positive due to the proposed mitigation measures as discussed in respect of habitats above. Severance of wildlife corridors in conjunction with construction of the proposed Indaver Plant (if permitted) could also arise if construction periods coincide, but mitigation proposals would reduce this potential cumulative effect.

Fisheries and Aquatic Species – There are no Annex I habitats or Annex II species present. The 3 streams are of Poor Ecological status. Nine Aquatic Ecological Receptors were identified in the EIS. The potential impacts arising during construction and operational phases include pollution, contamination and

sedimentation of watercourse from run-off or discharges; obstruction of the passage of fish; hydrological changes to streams. I would accept that the existing surface water drainage scheme for the N28 is largely untreated. The proposed development incorporates mitigation by design with measures to treat and attenuate surface water run-off from the M28. The Inland fisheries has been engaged in extensive liaison with the applicant to ensure appropriate mitigation measures will be in place for the safe passage of fish. It is considered that subject to effective mitigation and monitoring, including the monitoring of discharges from the Service Area for microplastics and hydrocarbons, there will be no significant effects on fisheries or aquatic species.

Cumulative impacts on these aquatic species, from the proposed development in conjunction with existing, planned or proposed development, are not likely to arise, although overall impacts on water quality and the receiving aquatic environment are likely to be positive.

Avifauna – Significant direct and indirect impacts will arise during construction and indirect impacts during operation in respect of Peregrine Falcon, which is known to nest in the cliff faces of Raffeen Quarry. The impacts include loss of suitable nesting/breeding habitat by removal of the cliff face, direct and indirect disturbance of the species (particularly during breeding), and possible long-term avoidance of breeding, nesting and foraging habitats. Mitigation by design will direct the birds over the motorway, but will also maintain the quarry as a viable nesting site and will provide for alternative artificial nesting sites within the CPO line, which would be established before construction. However, the proposed nest box at Loughbeg could have a potential adverse impact on bird species for which the SPA is designated, and should not be put in place. The potential also exists in the wider area for alternative natural nesting sites. Although this species is Annex I listed, it is no longer a species of conservation concern. I would accept that the proposed mitigation measures and conditions below would reduce the potential impacts on this species to Not Significant.

Barn owl was not recorded but it is known that collision mortality risks arise in respect of motorways. Mitigation measures have been proposed to avoid such risks. Provided that the mitigation measures and monitoring regime are implemented as proposed, I do not consider that there will be significant adverse impacts on this species. The impacts on buzzards would be reduced with the establishment of woodland and tree line planting, as discussed above.

Cumulative impacts on avifaunal species from the proposed development in conjunction with existing, planned or proposed development are unlikely to arise except in respect of those species whose habitats lie within Raffeen Quarry. It is considered that the cumulative effect on Peregrine Falcon is likely to be positive as no compensatory measures were proposed as part of the permitted quarry development, but mitigation measures as part of the road project will minimise impacts on this species.

20.2.2 Conclusions re Direct, Indirect and Cumulative Effects on Flora and Fauna

I have considered all of the written and oral submissions made in relation to flora and fauna, in addition to those specifically identified in this section of the report. The issues have been addressed in detail in Sections 17.0 and 18.0 above, including the assessment of contrary views on particular matters, where they arose. I am satisfied that the issues have been appropriately addressed in terms of the application and the information submitted by the applicant and that where adverse impacts are likely to arise, these would be avoided, managed and mitigated by the measures which form part of the proposed scheme, the proposed mitigation measures and through suitable conditions.

I am, therefore, satisfied that the proposed development would not have any unacceptable direct or indirect impacts in terms of flora and fauna. I am also satisfied that while some cumulative effects may arise from the proposed development together with existing and permitted developments, these would either be positive impacts or would be avoided, managed and mitigated by the measures which form part of the proposed development and through suitable conditions.

20.3 Soil, Water, Air, Climate and the Landscape

20.3.1 Likely Significant Direct and Indirect Effects on Soil

Direct impacts are likely to arise during construction of the proposed development, particularly in terms of the excavation of overburden, with a risk of soil erosion, and the proposed earthworks, with a risk of slope instability and compaction of materials. The total fill required is 2.2 million m³, with a deficit of 1.05m³, the majority of which will come from the quarry. Other risks include exposure of geological features, which is a positive impact and the potential to encounter karst features and contaminated waste in the Motorway Services Area site. During the operational phase similar impacts arise such as accidental spillages and impacts on karst features and private wells, in addition to embankment settlement. Aquifer vulnerability is extreme-high and mitigation will therefore be required to ensure that discharge is controlled to prevent pollution of groundwater sources.

Having regard to the proposed means to mitigate impacts on soil, geology and the hydrological environment, it is considered that no significant impacts on soil will arise during the construction or operational phases of the development. Cumulative impacts on soil, from the proposed development in conjunction with existing, planned or proposed development, are not likely to arise.

20.3.2 Conclusions re Direct, Indirect and Cumulative Effects on Soil

I have considered all of the written and oral submissions made in relation to soil, in addition to those specifically identified in this section of the report. The issues have been addressed in more detail in Section 18.0 above, including the assessment of contrary views on particular matters, where they arose. I am satisfied that the issues have been appropriately addressed in terms of the application and the information submitted by the applicant and that where adverse impacts are likely to arise, these would be avoided, managed and mitigated by the measures which form part of the proposed scheme, the proposed mitigation measures and through suitable conditions.

I am, therefore, satisfied that the proposed development would not have any unacceptable direct or indirect impacts in terms of soil. I am also satisfied that while some cumulative effects may arise from the proposed development together with existing and permitted developments, these would either be positive impacts or would be avoided, managed and mitigated by the measures which form part of the proposed development and through suitable conditions.

20.3.3 Likely Significant Direct and Indirect Effects on Water

There will be no direct discharges of polluting matter to receiving waters within the study area. Construction activity has the potential to result in indirect effects. Construction impacts, in the absence of mitigation, include flooding, accidental spillage of polluting material and sedimentation from sediment being transported to surface waters. Standard best practice mitigation measures are proposed to ensure that there will be no pollution or sedimentation of receiving waters during construction. The surface water drainage system for both construction and operational phases has been designed to limit the potential for contaminated water to reach the underlying soils and groundwater. It is considered that there would be no significant residual impacts from the proposed development in terms of surface water hydrology and the proposal is likely to result in a reduced risk of flooding and an improvement in the water quality of the receiving waters.

The potential impacts on groundwater during construction include accidental spillage, the risk of encountering karst features and dewatering which would affect private wells, if ground water is intercepted. During the operational phase, the potential impacts on groundwater also include accidental spillage, impacts on aquifer vulnerability, karst features and private wells. Dewatering will only be permitted in areas of cutting and groundwater will be monitored before, during and post construction. It is considered that following mitigation and monitoring, including the provision of a replacement water supply if required, it is not considered that there will be significant impacts on groundwater and water supplies.

The risk of flooding is considered to be low. Although the route traverses a coastal flood zone, the proposed road itself is not at risk of flooding. The Motorway Services Area, however, which is served by the L2545, is at risk of flooding in terms of access, in the event that the Indaver proposal does not go ahead, (with mitigation measures proposed for that scheme). The surface water drainage system for the MSA is also designed to limit the potential for contaminated surface water run-off to reach groundwater. Provided that mitigation measures are implemented as proposed, there will be no contribution to flooding.

Cumulative impacts on water from the proposed development, in conjunction with existing, planned or proposed developments are not likely to arise.

20.3.4 Conclusions re Direct, Indirect and Cumulative Effects on Water

I have considered all of the written and oral submissions made in relation to water, in addition to those specifically identified in this section of the report. The issues have been addressed in detail in Section 18.0 above, including the assessment of contrary views on particular matters, where they arose. I am satisfied that the issues have been appropriately addressed in terms of the application and the information submitted by the applicant and that where adverse impacts are likely to arise, these would be avoided, managed and mitigated by the measures which form part of the proposed scheme, the proposed mitigation measures and through suitable conditions.

I am, therefore, satisfied that the proposed development would not have any unacceptable direct or indirect impacts in terms of water. I am also satisfied that while some cumulative effects may arise from the proposed development together with existing and permitted developments, these would be avoided, managed and mitigated by the measures which form part of the proposed development and through suitable conditions.

20.3.5 Likely Significant Direct and Indirect Effects on Air

Direct impacts are likely to arise from the construction phase in terms of dust emissions from road construction activities along the alignment of the proposed route and at the proposed Services Area site. There are 186 properties within the dust risk zone. Mitigation measures are proposed to ensure compliance with Air Quality Standards for Human Health but the HSE has requested that additional mitigation be provided in respect of dust emissions near food and restaurant establishments. With such mitigation measures in place, the impacts would be reduced to slight adverse and would be of a temporary nature.

There would be a negligible change in ambient air quality levels during the operational phase for the 186 properties within 50m of the centre line and the air quality levels would be well within the statutory limits. There would be a reduction in the overall exposure of the public to air pollutants in the Do Something scenario compared with the Do Minimum, which will result in a direct positive effect on community health. This is largely due to the predicted reduction in congestion and general increase in traffic speed. Thus, there is no need for mitigation measures for air quality during the operational phase.

Direct impacts in respect of noise during the construction and operational phases are inevitable. During construction, there will be a considerable amount of cutting and filling, but material will be reused inside the site boundary, which will reduce the quantum of material that would have to be hauled to the site. However, this will require crushing and screening on site. The sources of noise and vibration will include ground works, blasting, vehicle movements and the use of a variety of machinery and equipment. Noise and vibrational impacts will generally be slight and localised but will include profound impacts for a temporary or brief duration. Construction hours are proposed to be limited to 0700 to 1900 Mon-Fri and 0800 to 1630 Saturdays but there will be a requirement for works to be carried out outside of these hours from time to time. Such events will be subject to the approval of the local authority and stakeholder engagement. Temporary noise and vibration impacts will

be managed and maintained within acceptable levels for the duration of the construction and will not give rise to significant impacts on amenity.

During the operational phase, the vast majority of noise sensitive locations will either have reduced noise levels, or be in line with either the TII Design Goal (Southern Section) or the Cork Noise Action Plans (Northern Section) requirements, following mitigation. Thus, there will be an overall reduction in noise and community exposure in the Do Something Scenario compared with the Do Minimum Scenario. However, there will be a limited number of properties that will experience a residual impact. There will be a reduction in the number of properties with exposure to noise levels in the higher ranges of 60-75dB Lden and 50-65dB Lden and similarly, many properties will experience a reduction in night time noise. The additional mitigation measures proposed during the oral hearing will further reduce noise levels at sensitive receptors along the route. It is considered that the proposed development, subject to the implementation of mitigation measures as proposed, together with conditions outlined below, will not give rise to significant noise nuisance on sensitive receptors.

There is potential for cumulative impacts, from the proposed development in conjunction with existing, planned or proposed infrastructure, (as listed in Table 18.4) to arise, should construction periods coincide, particularly in terms of dust and noise. The proposed road project includes strict controls on dust and noise emissions during construction, as do other planned projects in the vicinity. In addition, short term operational dust events occur periodically at the Port (e.g. grain handling) and the construction phase has the potential to give rise to cumulative impacts in such instances. It is further considered that local temporary cumulative effects in respect of noise, vibration and dust during the construction period are likely to arise in the vicinity of Raffeen Quarry. However, the extraction of materials from the quarry has the benefit of planning permission and has been subject to EIA, with associated mitigation measures to restrict such emissions.

Cumulative impacts on air quality during the operational phase could arise in respect of the proposed Indaver facility. This issue is addressed in Table 18.4 of the EIS. It is

stated that the annual average background levels of NO₂ combined with levels from existing sources and proposed levels from Indaver, together with a further 2-4µg/m³ (worst case scenario) from the M28, would still result in combined levels which are still well below the statutory limits for human health.

Cumulative noise impacts during the operational phase have been examined in the EIS (pages 18-30/31). A noise model was generated for the M28 in combination with the port development and the DePuy development of a wind turbine, as these were considered to be the most relevant. The results are set out in Table 18.5. The findings were that there would be an increase of less than 1dB, which would be imperceptible.

20.3.6 Conclusions re Direct, Indirect and Cumulative Effects on Air

I have considered all of the written and oral submissions made in relation to air, in addition to those specifically identified in this section of the report. The issues have been addressed in detail in Sections 13.0, 14.0, 15.0 and 16.0 above, including the assessment of contrary views on particular matters, where they arose. I am satisfied that the issues have been appropriately addressed in terms of the application and the information submitted by the applicant and that where adverse impacts are likely to arise, these would be avoided, managed and mitigated by the measures which form part of the proposed scheme, the proposed mitigation measures and through suitable conditions.

I am, therefore, satisfied that the proposed development would not have any unacceptable direct or indirect impacts in terms of air. I am also satisfied that while some cumulative effects may arise from the proposed development together with existing and permitted developments, these would be avoided, managed and mitigated by the measures which form part of the proposed development and through suitable conditions.

20.3.7 Likely Significant Direct and Indirect Effects on Climate

Direct and indirect impacts will arise as a consequence of the proposed development during construction and operation. Temporary short-term impacts on air quality (including dust) may arise during construction of the proposed development from construction traffic and related equipment. However, having regard to the short duration of construction works, their relatively modest nature, the linear nature of the project and the proposed means to reduce emissions, impacts are not considered to be significant.

There would be a 20% increase in annual CO₂ emissions and a 19% increase in annual NO_x emissions, in 2020 compared with the N28 (Do nothing). This would represent a permanent slight adverse impact on greenhouse gas emissions which is largely from the increased number of vehicle kilometres travelled in the area combined with the N28 and the M28. However, it would be partially mitigated by sourcing materials from Raffeen Quarry and using recycled materials and other measures, and by the government's national transport policy contained in the National Mitigation Plan.

The proposed surface water drainage network is designed to allow for an increase of 20% in flow rate, in line with OPW and TII requirements. There is therefore no impact predicted in terms of climate change in respect of groundwater as a result of the proposed M28 project.

The cumulative impact of greenhouse gas emissions for various projects in the area are examined on page 18-29 of the EIS. It was concluded that the cumulative effect on greenhouse gases, for both the construction and operational phases, are considered a permanent slight adverse impact. This seems to be a reasonable conclusion, based on the information available.

20.3.8 Conclusions re Direct, Indirect and Cumulative Effects on Climate

I have considered all of the written and oral submissions made in relation to climate, in addition to those specifically identified in this section of the report. The issues have been addressed in detail in Section 14.0 and 15.0 above, including the assessment of contrary views on particular matters, where they arose. I am satisfied that the issues have been appropriately addressed in terms of the application and the information submitted by the applicant and that where adverse impacts are likely to arise, these would be avoided, managed and mitigated by the measures which form part of the proposed scheme, the proposed mitigation measures and through suitable conditions.

I am, therefore, satisfied that the proposed development would not have any unacceptable direct or indirect impacts in terms of climate. I am also satisfied that while some cumulative effects may arise from the proposed development together with existing and permitted developments, these would be avoided, managed and mitigated by the measures which form part of the proposed development and through suitable conditions.

20.3.9 Likely Significant Direct and Indirect Effects on Landscape

Direct, indirect and cumulative impacts will arise as a consequence of the proposed development. Extensive wider ground level views will be restricted by extensive built form at Douglas and Rochestown and intervening strong topography and vegetation in rural areas. However, having regard to the scale and form of the development, to the topographical characteristics of the undulating agricultural landscape and to the need to fell substantial areas of mature woodlands and lines of trees, it is considered that the proposed project will give rise to significant direct adverse landscape and visual effects including significant effects on

- Residential property in close proximity to the route;
- Landscape character of the three LCAs through which the route passes
- Identified landscape features.

During the construction stage, the main impacts will arise from activities associated with the increase in construction traffic (mainly HGVs) on local roads and the loss of screening vegetation. Properties at close proximity to the proposed route will have Moderate to Major visual impacts which will be temporary and of short duration. No significant landscape effects are predicted for the construction phase.

During operation, notwithstanding the 'Very High Value' and 'Sensitivity' and the 'National Importance' of the Cork City & Harbour Estuary Landscape Character Type, within which the site falls, it is considered that the impact on the individual LCAs within the LCT will range from Moderate to Major within 1km distance to Negligible-Minor Adverse beyond 1km. The proposal will form a new feature in the Undulating Agricultural Patchwork LCA due to the introduction of a new road with embankments and cuttings, but will only be prominent when viewed in close proximity or in embankments and deep cuttings, due to the fact that it will follow the natural contours of the landscape. Thus impacts would be significant within 1km only. The Harbour Edge and Town Centre LCA is characterised by major roads and large scale utilities and the Estuarine Harbour based Industrial and Maritime Landscape is robust with a low sensitivity to change. In these LCAs, the predicted impact is not likely to be significant.

A total of 11 Viewpoints were predicted to have significant visual effects. However, a number of viewpoints with predictions of lesser effects were considered to be likely to have more significant impacts than stated in the EIS. Notwithstanding this, it is considered that the mitigation measures as proposed in the EIS (SLMs), and as augmented and amended during the oral hearing, will reduce the landscape and visual effects during the operational phase. However, significant visual impacts will remain for some properties in close proximity. It is considered that this must be balanced against the wider community benefits that the proposed road would bring to the area and the region.

No long term cumulative effects as a result of the proposed development in conjunction with other existing, planned or proposed development are likely to arise.

However, during construction, should a number of planned developments undergo construction at the same time, there is likely to be a negative visual impact, which would be mitigated by screening.

20.3.10 Conclusions re Direct, Indirect and Cumulative Effects on Landscape

I have considered all of the written and oral submissions made in relation to landscape, in addition to those specifically identified in this section of the report. The issues have been addressed in detail in Section 16.0 above, including the assessment of contrary views on particular matters, where they arose. I am satisfied that the issues have been appropriately addressed in terms of the application and the information submitted by the applicant and that where adverse impacts are likely to arise, these would be avoided, managed and mitigated by the measures which form part of the proposed scheme, the proposed mitigation measures and through suitable conditions.

I am, therefore, satisfied that the proposed development would not have any unacceptable direct or indirect impacts in terms of landscape. I am also satisfied that while some cumulative effects may arise from the proposed development together with existing and permitted developments, these would be avoided, managed and mitigated by the measures which form part of the proposed development and through suitable conditions.

20.4 Material Assets and Cultural Heritage

20.4.1 Likely Direct and Indirect Significant Effects on Material Assets

Direct and indirect impacts are likely to arise as a consequence of the construction and operational phases of the development as a result of the project's interaction with existing utilities and from the generation of waste. Major utility services are present in the vicinity and the route traverses major infrastructure lines in a number of locations, including gas transmission mains and electricity underground and overhead lines which supply industrial and pharmaceutical facilities. The applicant has engaged in extensive liaison with the various utility providers with a view to

ensuring no conflicts or disruption of services during construction or operation of the project. Having regard to the mitigation measures proposed, impacts on existing utilities are unlikely to be significant.

The road project will generate a significant amount of waste due to the substantial areas of cutting and filling required for its construction. The majority of the waste generated will be from excavation and will also arise from demolition and piling. In the absence of appropriate waste management and mitigation, there is the potential for pollution of air, soil, groundwater and surface water. There is also potential for contaminated material to be excavated on site, particularly in respect of the proposed Services Area. This site has been used for the storage of vehicles with the potential for the presence of metals, hydrocarbons and polycyclic aromatic hydrocarbons contaminants. However, the removal of such substances is likely to have a positive impact on soils.

Although there will be a need to transfer some material off site for disposal, the majority of cut material will be re-used on site. By reusing excavation material from the cuttings and sourcing the remainder from Raffeen Quarry, it is considered that the impact from excavations will be slight negative in the absence of mitigation. Having regard to the proposed means to manage and dispose of waste, it is considered that these arrangements will not give rise to significant environmental effects.

Direct and indirect impacts are likely to arise, primarily during the construction phase of the development, notably from construction traffic, off-loading on the public road, temporary road closures and temporary access routes. Having regard to the linear nature of the proposed development, construction works at discrete and separate sites, the phased approach towards construction, the relatively short duration of works at the majority of individual site locations, and subject to the implementation of the proposed mitigation measures, it is considered that the proposed development can be accommodated within the public road network, without significant impact on road condition or traffic safety.

Cumulative impacts on material assets, from the proposed development in conjunction with existing, planned or proposed developments are not likely to arise.

20.4.2 Conclusions re Direct, Indirect and Cumulative Effects on Material Assets

I have considered all of the written and oral submissions made in relation to material assets, in addition to those specifically identified in this section of the report. The issues have been addressed in detail in Sections 12.0 and 15.0 above, including the assessment of contrary views on particular matters, where they arose. I am satisfied that the issues have been appropriately addressed in terms of the application and the information submitted by the applicant and that where adverse impacts are likely to arise, these would be avoided, managed and mitigated by the measures which form part of the proposed scheme, the proposed mitigation measures and through suitable conditions.

I am, therefore, satisfied that the proposed development would not have any unacceptable direct or indirect impacts in terms of material assets. I am also satisfied that while some cumulative effects may arise from the proposed development together with existing and permitted developments, these would either be positive impacts or would be avoided, managed and mitigated by the measures which form part of the proposed development and through suitable conditions.

20.4.3 Likely Significant Direct and Indirect Effects on Cultural Heritage

Archaeology – Direct and indirect impacts will arise in respect of a number of sites on the Sites and Monuments Record and/or Records of Monuments and Places during construction. Profound negative direct impacts are likely to arise in respect of AH9 (Fulacht Fia – Shannonpark) and AH33 (Enclosure – Barnahely), and significant effects on AH10 (Standing Stone – Ballyhemiken) and AH19 (Gatelodge associated with Prospect Villa – Barnahely). Indirect impacts will arise in respect of AH22 (Castle Warren Tower House and Bawn) and AH20 (Graveyard and Church associated with Castle Warren). There will also be significant negative indirect

effects on AH5 (Fulacht Fia – Ballinrea), AH7 (Ringfort - Hilltown) and AH26 (Enclosure at Barnahely).

It is also accepted that the potential exists for unknown subsurface archaeology to be uncovered during construction resulting in direct physical impacts. The LiDAR surveys revealed a number of anomalies, which if shown to be archaeological, could have direct negative impacts on subsurface archaeology. There are a number of riverine environments and townland boundaries which would also be potentially affected.

The mitigation measures proposed are fairly standard and include geophysical surveys and archaeological testing within the CPO line as well as monitoring of groundworks, archaeological excavation of any archaeological features revealed by the test trenching, and the demarcation of features under the supervision of a qualified archaeologist. Having regard to the proposed mitigation I accept that this impact will be minimised.

During the operational phase, the proposed road project has the potential to impact on the setting of monuments and structures. No monuments of international or national significance will be significantly impacted. It is considered that the setting of Castle Warren Tower House and Bawn will be affected. The proposed road passes through the middle of the historic complex, which would separate the Tower House and Bawn from the site of the original Church and Graveyard (all in ruins). However, it is considered that the impact on the archaeological setting of Castle Warren has to be considered in the context of a significantly altered environment, which is no longer recognisable as a cohesive archaeological landscape.

Architectural heritage – No direct impacts will arise in respect of protected structures but indirect effects will arise in respect of two protected structures. These are BH11 Castle Warren House and BH1 Martello Tower. The proposed development will pass quite close to Castle Warren (50m) and will be quite prominently visible. However, it

will not be visible from Martello Tower due to intervening topography and vegetative screening. The setting of Ring House, (BH3), which is on the NIAH, will be affected by the M28 which passes through a field within which the house is situated. There are several Demesne Landscapes which will not be significantly affected, apart from Castle Warren.

Other cultural heritage sites – Shanbally Grotto is located immediately to the south of the proposed Shanbally Interchange with its associated slip roads and access roads. The proposed development will have an indirect negative effect on the Grotto but mitigation measures in the form of hedging and tree planting will create a visual screen between the structures, which would reduce the impact.

It is considered that the route of the alignment has been designed to avoid direct impacts on the archaeological and architectural resource as much as possible. It has been demonstrated that the impacts on the cultural heritage resource has been mitigated to the greatest possible extent. I accept that where significant impacts arise, as for example in the case of Castle Warren, the level of impact must be balanced in terms of the wider public interest to provide a high quality strategic transport link between Cork City and Ringaskiddy.

Cumulative impacts on cultural heritage assets, from the proposed development in conjunction with existing, planned or proposed developments are not likely to arise. However, there is always the potential for such impacts to arise in respect of unknown archaeology, which would be mitigated by pre-construction testing and monitoring.

20.4.4 Conclusions re Direct, Indirect and Cumulative Effects on Cultural Heritage

I have considered all of the written and oral submissions made in relation to cultural heritage, in addition to those specifically identified in this section of the report. The issues have been addressed in detail in Section 19.0 above, including the assessment of contrary views on particular matters, where they arose. I am satisfied

that the issues have been appropriately addressed in terms of the application and the information submitted by the applicant and that where adverse impacts are likely to arise, these would be avoided, managed and mitigated by the measures which form part of the proposed scheme, the proposed mitigation measures and through suitable conditions.

I am, therefore, satisfied that the proposed development would not have any unacceptable direct or indirect impacts in terms of cultural heritage. I am also satisfied that while some cumulative effects may arise from the proposed development together with existing and permitted developments, these would either be positive impacts or would be avoided, managed and mitigated by the measures which form part of the proposed development and through suitable conditions.

20.5 Interactions between the foregoing

20.5.1 Significant effects

I have also considered the interrelationships between factors and whether these might, as a whole affect the environment, even though the effects may be acceptable when considered on an individual basis. In particular, the potential arises in respect of residential receptors during construction, for interactions between air quality, noise, visual effects and traffic effects. However, these effects are short term, with no significant adverse residual impact. Construction impacts on economic factors could be both positive and negative in terms of interactions between employment and traffic and transport. An increase in employment would be a positive impact. However, traffic diversions and delays would be a negative impact, but it would be short term and temporary in nature, and would be planned in consultation with employers and in accordance with a traffic management plan.

During the operational phase, there would be interactions for residential receptors in respect of air and climatic factors, noise effects, visual effects and traffic effects. This includes a slight permanent increase in greenhouse gas emissions, an overall reduction in the number of properties exposed to noise, minor to moderate visual

impacts and overall benefits on traffic flows and journey times. Thus, there would be both beneficial and adverse impacts of a minor-moderate nature after mitigation. There are also benefits in terms of the interaction between water and soils and employment and traffic and transport.

20.5.2 Conclusions re interrelationships between the factors

In conclusion, I am satisfied that such effects can be avoided, managed and mitigated by the measures which form part of the proposed development, mitigation measures and suitable conditions. There is, therefore, nothing to prevent the granting of approval on the grounds of cumulative effects.

20.6 Environmental Impact Assessment Conclusions

Having regard to the examination of environmental information contained above, and in particular to the EIS and supplementary information provided by the developer, and the submissions from the prescribed bodies and third party observers in the course of the application, including submissions made at the oral hearing, it is considered that the significant environmental effects arising as a consequence of the proposed development have been adequately identified, described and assessed. I am satisfied that these effects can largely be avoided, managed and mitigated by the proposed mitigation measures and by suitable conditions. Where any residual impacts remain without being fully mitigated, it is considered that the environmental effects would not justify a refusal of approval having regard to the overall benefits of the proposed development.

21 Appropriate Assessment

21.1 Introduction

The EU Habitats Directive 92/43/EEC provides legal protection for habitats and species of European Importance through the establishment of a network of designated conservation areas, or Natura 2000 (or 'European') sites. The network includes sites designated as Special Areas of Conservation (SAC) under the Habitats Directive and Special Protection Areas (SPA) under the EU Birds Directive.

Under Article 6(3) of the Habitats Directive, an Appropriate Assessment must be undertaken for any plan or project not directly connected with or necessary for the management of a European site, but is likely to have a significant effect, either individually or in combination with other plans or projects, on the European site(s) in view of the site's Conservation Objectives.

The proposed development is a project which is not directly connected with or necessary for the management of a European site. A Natura Impact Assessment has been submitted with the application to address the likely or possible significant effects, if any, arising from the proposed development. The NIS is contained in Volume 4 of the EIS. The Stage I Screening assessment is contained in Appendix A of the NIS. The findings of the Stage I Screening Assessment are set out at Section 1.4 of the NIS document. The location of the European Sites within the Zone of Influence of the project is set out in Fig. 3.1 of the NIS.

21.2 Screening for Appropriate Assessment

There are two European sites within the Zone of Influence of the proposed M28 road project, namely, Cork Harbour SPA and Great Island Channel SAC. The Study Area supports connectivity to Cork Harbour SPA through three watercourses, Woodbrook Stream, Donnybrook Stream and Glounatouig Stream. By extension, the study area supports remote connectivity to the Great Island Channel SAC through open waters and tidal regimes of the greater Cork Harbour area connected to the watercourses identified above. The Screening Assessment examined each site in the context of its proximity to and connectivity with the proposed development, its qualifying interests and Conservation Objectives. The potential significant effects arising from the development, either alone or in combination with other projects, were then examined and whether the potential for significant effects could be ruled out.

The main elements of the project that are likely to give rise to potential impacts on these European Sites are

1. Construction activities which could give rise to pollution of watercourses draining the proposed project area and consequently entering downstream areas of Cork Harbour SPA;
2. Construction and operational activities which could give rise to ongoing/continual disturbance of over-wintering waders and wildfowl associated with Cork Harbour SPA, north of Loughbeg.
3. Pollutants during the operational phase could enter watercourses draining the study area before entering nearby areas of Cork Harbour SPA, such as Monkstown Creek and Douglas River Estuary, in the absence of best practice and construction design.

Construction activities include earthworks, vegetation and soil stripping, blasting and excavations with high levels of noise and vibration, site drainage, demolition operations, air pollution and dust deposition, lighting, movement of machinery and environmental incidents. Operation activities include traffic use, operational drainage, lighting and maintenance operations.

21.2.1 Likely direct, indirect and in-combination impacts of project on European Sites

As the site of the proposed development is not situated within a European site, there will be no direct impacts arising. However, indirect impacts are possible due to the proximity and connectivity to these sites through 3 watercourses, as outlined above, and through disturbance to avifauna, during both the construction and operational phases of the development.

Bird surveys completed during the over-wintering season of 2014/15 highlighted that expansive pastoral fields located to the north of Lough Beg supported field feeding shore birds which constitute the Special Conservation Interests of Lough Beg and Cork Harbour SPA. It was decided that further over-wintering avifaunal surveys would be required, given the uncertainty regarding the suitability and importance of these habitats as viable and integral feeding sources for species associated with Cork Harbour SPA.

The **likely changes to the European sites** which could result in potential impacts can be summarised as follows:-

1. **Habitat reduction** – although no direct loss of habitat will occur, there may be partial loss to feeding grounds located outside the SPA, to the north of Lough Beg, that support bird populations associated with Cork Harbour SPA.
2. **Disturbance to key species** – the close proximity of the project to Cork Harbour SPA at Douglas River Estuary (100m) and Lough Beg (350m) and the fact that the route would adjoin lands used as winter feeding grounds by Curlew (an SCI species for the SPA), means that there is potential for disturbance to this species during the project's construction and operational phases. However, the Service Area is not in close proximity to the SPA and does not contain habitats that correspond with preferred habitats of the Qualifying Interests of the SPA.
3. **Habitats or species fragmentation** – although there will be no fragmentation of the European site network, there will be fragmentation of the non-designated landscape along the route which may, in turn, result in fragmentation of species populations associated with the European Site network.
4. **Reduction in species density** – a highly localised species reduction could occur as a result of the proposed project.
5. **Changes in key indicators of Conservation value** – key indicators include water resources, water quality and species population density. Works supporting connectivity to areas associated with Cork Harbour SPA may cause a reduction in the key indicators of conservation value, through reductions in receiving water quality or disturbance of key qualifying species, within the European sites.

The in-combination effects for the project were considered in conjunction with plans and projects in the area. The key objectives for each of these plans and projects together with the likely in-combination effects are set out in Table 4.1 of the

Screening Report. The anticipated in-combination effects are generally either positive or neutral, or in the case of certain projects, will have no cumulative or in-combination effects provided that best practice and mitigation measures are implemented as outlined in the EIS and NIS for that project.

The likely direct, indirect and in-combination impacts have been examined, but in the absence of further information regarding the importance of the expansive fields north of Lough Beg to field feeding shore birds, it is not possible to identify the scale or magnitude of the impact and its significance in terms of the conservation objectives of these European sites.

21.2.2 Conclusions on Stage I Screening

Given this uncertainty and the need for further over-wintering surveys and assessment, it was decided not to screen out Cork Harbour SPA. Furthermore, given that Great Island Channel SAC supports remote and tenuous connectivity with the proposed M28 road project through the waters of Cork Harbour, it was decided not to screen out the Great Island Channel SAC. These sites were, therefore, brought forward for Appropriate Assessment and the potential impacts of the development (direct, indirect and in-combination effects) on each of the sites concerned was examined in light of the site's conservation objectives.

I would agree that it is not possible to rule out significant effects on the conservation objectives on Cork Harbour SPA without the further information, which has been identified as being necessary to determine the importance of the fields which lie outside the SPA but adjacent to the road project to a Qualifying Interest of the SPA. I would also accept that given that Great Island Channel SAC is also connected to Cork Harbour SPA through the waters of Cork Harbour, it is not possible to rule this site out either. Thus, I agree with the decision to bring both sites forward for Appropriate Assessment.

21.3 Stage 2 Appropriate Assessment

It was concluded from Stage 1 Screening that it was not possible to rule out significant effects on the conservation objectives of two European Sites, either alone or in combination with other developments, without employing mitigation measures. The NIS examines the potential impacts (direct, indirect and in-combination effects) of the development on each of these sites in light of their conservation objectives. The Sites are Great Island Channel SAC and Cork Harbour SPA.

Cork Harbour SPA is 55m at its closest to the proposed M28 road project and there is indirect connectivity to the SPA via three watercourses. The M28 may also present potential disturbance impacts to avifaunal feeding grounds north of Lough Beg. Great Island Channel SAC supports remote and tenuous connectivity with the proposed M28. The objectives of the NIS were stated as follows:-

- Consider Impacts to Cork Harbour SPA – focus on avifaunal feeding areas to the North of Lough Beg, proximal to M28;
- Establish the suitability and importance of these areas to bird species and populations associated with Cork Harbour SPA;
- Identify and assess other potential impacts such as the release of air and water borne pollutants to sensitive habitats and watercourses draining the Study Area and providing connectivity to Cork Harbour SPA and Great Island Channel SAC.

21.3.1 Potential Direct and Indirect Impacts on Cork Harbour SPA and Mitigation

Cork Harbour SPA (Site Code 004030) is a large sheltered bay system with several river estuaries, River Lee, River Douglas, Owenaboy River and Owenacurra River. It comprises most of the intertidal areas of Cork Harbour including North Channel, Douglas River Estuary, Inner Lough Mahon, Monkstown Creek, Lough Beg, Owenaboy River Estuary, Whitegate Bay and Rostellin and Poul nabibe Inlets. The site is of major ornithological significance and international importance for the total number of wintering birds (>20,000) and for its population of Black-tailed Godwit and

Redshank. There are over 18 wintering species of national importance, including a nationally important colony of breeding Common Tern. There are many species which are listed on Annex I of the Birds Directive, including Whooper Swan, Golden Plover and Bar-tailed Godwit. The site provides many roosting and feeding sites. The Site-Specific Conservation Objectives were published in December 2014 and are set out in Table 3.4 of the NIS.

Water quality

The route of the proposed M28 does not intersect with Cork Harbour SPA and consequently, there will be no direct impacts on this European site as a result of the M28 project. However, there is potential for indirect impacts on Cork Harbour SPA and by extension, Great Island Channel SAC, by means of indirect connectivity maintained by three watercourses draining the site, Glounatouig Stream, Donnybrook Stream and Woodbrook Stream. Both Glounatouig Stream and Donnybrook Stream provide connectivity to Douglas River Estuary, which is designated as part of Cork Harbour SPA. Glounatouig Stream flows into Monkstown Creek, which is also designated as part of Cork Harbour SPA.

The potential impacts are from run-off which would enter Cork Harbour during both construction and operational phases via these watercourses, which could carry potentially deleterious substances such as suspended solids, particulate matter and hydrocarbons. However, the implementation of best practice design and robust, standardised mitigation measures in relation to surface water attenuation and regulation, will restrict the release of potential deleterious matter from reaching the watercourses which support connectivity to the European site. Furthermore, the applicant has agreed to requests from the NPWS to firstly, monitor all works for the Motorway Services Area with the potential to cause water pollution by an environmental clerk of works, who will have the power to stop works where there is a significant risk of pollution occurring, and secondly, to carry out annual monitoring of hydrocarbons, heavy metals and microplastics in conjunction with appropriate state agencies for a period of 15 years, at the discharge point of the watercourse draining the MSA and adjacent to the M28. It is considered that the implementation of the

proposed design and mitigation measures, in addition to the monitoring proposals, will ensure that significant impacts are not, therefore, likely to occur.

Disturbance to avifauna

The potential impacts in terms of disturbance of avifauna associated with cork Harbour SPA include habitat loss, disturbance/fragmentation of habitats, displacement impacts, fragmentation of field feeding areas, potential noise disturbance to both the designated SPA and to the adjacent field feeding areas and air pollution impacts on sensitive ecosystems.

Bird surveys carried out during the over-wintering season of 2014-15 highlighted that expansive pastoral fields located to the north of Lough Beg supported intermittent occurrences of overwintering field feeding shorebirds, which are Qualifying Interests for Cork Harbour SPA. Further over-wintering avifaunal surveys were carried out in order to ascertain the suitability and importance of these habitats as viable and integral feeding sources for these Qualifying Interests. The findings of these surveys are contained in Appendices A and B, respectively, of the NIS, and are summarised in Section 4.2 of the NIS. In addition, in response to a pre-application request by the NPWS regarding the potential for road schemes to fragment feeding habitat and deter Curlew from flying over roads to reach feeding areas, over-wintering avifaunal surveys carried out included surveys of field feeding waders in fields on the eastern side of Little Island adjacent to the N25 dual carriageway.

The findings of the over-wintering avifaunal surveys completed over two seasons, (2014/15 and 2015/16), were that the field feeding areas do not support significant numbers of regularly occurring SCI species for Cork Harbour SPA. However, it was found that there were occasional and sporadic occurrences of small flocks of SCI species Common Gull, Black-headed Gull, Curlew and Oystercatcher within these expansive fields, which was attributed to opportunistic feeding following heavy rainfall periods, that made prey more readily available. It was concluded that these grassland areas are not routinely used as a feeding habitat for the SCI species associated with Cork Harbour SPA and that there is an abundant supply of

potentially suitable grassland habitat in the vicinity of Lough Beg. North of Lough Beg, Curlew were noted to occur within the footprint and environs of the route sporadically and in numbers that were not of importance for the SPA. No other SCI were identified in significant numbers within the footprint or the immediate environs of the proposed M28 project. These findings were supported by desktop reviews of previous surveys completed in 2014 and 2016.

The field studies undertaken in the vicinity of the N25 at Little Island (2014/15) were inconclusive as the numbers of birds using the fields on the eastern side of Little Island were relatively low. However, it was recorded that wading birds, including Curlew, Oystercatcher, Lapwing, Redshank and Black-tailed Godwits use fields immediately adjacent to the N25 road flying over the road to access mudflats and roosting areas to the north of the road.

Habitat Loss – there will be grassland habitat loss in the vicinity of Barnahely/ Castle Warren, which is intermittently used by low numbers of over-wintering Curlew, but no loss of intertidal habitats, which are more critical to the integrity of the SPA. There will be grassland habitat loss for field feeding Curlews north of Loughbeg, but this will be offset by the abundance of such habitats in the vicinity. This impact is not considered to be significant.

Disturbance/Fragmentation of habitats – there is a possibility of a barrier effect for field feeding Curlew, and/or avoidance of these habitats. As noted above, this will largely be offset by the availability of an abundance of such habitats in the vicinity. Construction activities could also result in temporary disturbance, but this would be localised and intermittent. Evidence from elsewhere (including the studies carried out adjacent to the N25) indicate that disturbance/fragmentation impacts in relation to road developments do not result in complete avoidance. This impact is not considered to be significant.

Displacement impacts – as Curlew intermittently use these fields adjacent to the SPA, displacement is not considered to be significant in terms of the over-wintering population associated with the SPA.

Fragmentation of field feeding areas – any disturbance/fragmentation of these habitats from the M28 are likely to be limited in magnitude and not significant.

Potential Noise Disturbance to nearby Cork Harbour SPA – the noise modelling indicates that the maximum noise levels for the intertidal areas of Lough Beg is 50 decibels. Furthermore, it is considered that the birds associated with the SPA have become habituated to noise levels associated with the substantial industrial establishments in the area and road traffic noise from the N28, and that they will also become habituated to road traffic noise from the M28 project. As such, it is considered that there would be no cumulative effects from the operation of the M28 on the bird population associated with the SPA.

In terms of construction, the applicant has confirmed that it is not proposed to undertake piling or blasting along the sections of the proposed road project in proximity to the Douglas Estuary and its component sections of Cork Harbour SPA. Noise levels will not exceed those associated with the existing N28 and there will be no disturbance related impacts to SCI species. There is potential for blasting or ripping effects between Chainage 12,00 and 12,300 south of Ringaskiddy which may result in localised disturbance of avifauna associated with Cork Harbour SPA, However, the applicant has agreed to impose seasonal restrictions for blasting and ripping in this area to ensure that the over-wintering period of October to March is avoided, as recommended by the NPWS.

Potential Noise disturbance to adjacent field feeding Curlew - the numbers of avifauna do not occur in sufficient numbers to cause significant displacement of birds for Cork Harbour SPA and fields in question do not provide essential feeding or roosting grounds associated with this European site. The over-wintering surveys also established that these areas are utilised on an intermittent basis only, generally when the fields provide suitable foraging conditions, such as after a period of heavy and prolonged rainfall. I would accept that it is likely that avifauna will habituate to traffic regimes, similar to the behaviour of avifauna close to the N25, and will continue to use the feeding fields intermittently.

Air pollution of sensitive ecosystems – the principal pollutants in terms of impacts on sensitive ecosystems are nitrogen oxides (NO_x), which can affect photosynthesis and nitrogen assimilation/metabolism. The alignments of the N28 and M28 are in

close proximity to Cork Harbour SPA at Bloomfield Interchange, Monkstown Creek, Ringaskiddy Village and Lough Beg. The findings of local monitoring were that the levels of NO_x are approx. 43µg/m³, which is above the annual limit for the protection of vegetation (30µg/m³). A Nitrogen Deposition Assessment was carried out for the wetland area at Cork Harbour SPA. The results are shown in Table 5.2 of the NIS. The predicted nitrogen deposition levels are slightly lower than the predicted levels for the N28, which is stated as being a result of moving the traffic further away from the SPA. It is further stated that a comparison of the predicted results with the UNECE critical loads for nitrogen in moist to wet dune slacks is 20% below this standard, with the proposed M28 in operation. It is further noted that the 'Do Minimum' Scenario in 2020 indicates a higher rate of nitrogen deposition than the 'Do Something' Scenario.

Dust deposition during construction could give rise to impacts that would affect photosynthesis, respiration and transpiration in plants. However, once mitigation measures which will restrict dust deposition rates to 350mg/m²/day are implemented, there would be no significant impacts on sensitive ecosystems such as Cork Harbour SPA or its Qualifying interests.

21.3.2 Potential Impacts on Great Island Channel SCA and Mitigation

Great Island Channel SAC (Site Code 001058) stretches from Little Island to Middleton with its southern boundary being formed by Great Island. The Qualifying Interests are Sheltered Tidal Sand Flats and Mud Flats (Not covered by Seawater at Low Tide), and Atlantic Salt Meadows. It is an extremely important site for wintering waterfowl and contains three of the top five areas within Cork Harbour, i.e. North Channel, Harper's Island and Belvelly-Marino Point. The Site-Specific Conservation Objectives were published in June 2014. These are to maintain the favourable conservation condition of the Annex I habitats of Great Island Channel SAC. The specific attributes and targets, by which maintenance of favourable conservation condition of these QIs is measured, are set out in Table 3.3 of the NIS.

The route of the proposed M28 does not intersect with Great Island Channel SAC and consequently, there will be no direct impacts on this European site as a result of

the M28 project. However, there is potential for indirect impacts to Great Island Channel SAC, by means of potential run-off of construction and operational phase pollutants to the receiving watercourses draining the site, i.e. Glounatouig Stream, Donnybrook Stream and Woodbrook Stream. These watercourses drain to and support connectivity with Cork Harbour, which in turn provides a tenuous link to Great Island Channel SAC. Indirect impacts as a result of deterioration of water quality to Cork Harbour may impact on the Annex I coastal habitats for which the SAC is designated.

The potential impacts are from run-off which would enter Cork Harbour during both construction and operational phases via these watercourses, which could carry potentially deleterious substances such as suspended solids, particulate matter and hydrocarbons. However, the implementation of best practice design and robust, standardised mitigation measures in relation to surface water attenuation and regulation, will restrict the release of potential deleterious matter from reaching the watercourses which support connectivity to the European sites. Furthermore, as stated above, the applicant has agreed to monitor all works for the Motorway Services Area with the potential to cause water pollution as well as annual monitoring of hydrocarbons, heavy metals and microplastics for a period of 15 years. It is considered that the implementation of the proposed design and mitigation measures, in addition to the monitoring proposals, will ensure that significant impacts are not, therefore, likely to occur.

21.4 Likelihood of significant effects having regard to Site Specific Conservation Objectives

21.4.1 Overwintering bird populations of Cork Harbour SPA

The C.O. is to maintain favourable conservation condition for the over-wintering species in Cork Harbour SPA. One target is to maintain the long term population trend as stable or increasing. As the footprint of the route does not traverse areas that are integral or routinely utilised over-wintering, roosting or feeding habitats that are critical to these populations, the proposed project will not have any direct or indirect impacts or changes in population trends. Another target is for no significant

decrease in the range, timing or intensity of use by avifaunal species other than that occurring from natural patterns of variation. Although some fields adjacent to the footprint of the route support intermittent or opportunistic occurrences of Curlew, these are sporadic and do not occur in numbers that are important for the population of the SPA. A further target is for the permanent area occupied by the wetland habitat to be stable and not significantly less than the area of 2,587ha, other than that occurring from natural patterns of variation. There will be no direct land-take or indirect habitat degradation arising from the M28 project and indirect impacts to the wetland areas will be avoided by best practice design and mitigation measures.

21.4.2 Common Tern population within Cork Harbour SPA

The C.O. is to maintain favourable conservation condition of Common Tern in Cork Harbour SPA. The targets are for no significant decline in breeding population abundance; productivity rate; distribution; prey biomass; or barriers to connectivity and for human activity not to affect breeding common tern population. The proposed M28 project is not located within or proximal to breeding sites for Common Tern and will not directly impact upon key feeding or breeding habitats which sustain Common Tern in Cork Harbour SPA. Indirect impacts could arise through deterioration of water quality, but this will be mitigated through best practice design and mitigation measures. There will be no indirect disturbance effects through construction or operation to breeding populations.

21.4.3 Mudflats and Sandflats not covered by Seawater at Low Tide in Great Island Channel SAC

The C.O. for this Annex I habitat is to maintain favourable conservation condition. There will be no loss or deterioration of habitat as the mudflats and sandflats will not be impacted by the proposed scheme due to remote and tenuous connectivity between the M28 and this European site. The community distribution and condition of the habitat will not be impacted for the same reason.

21.4.4 Atlantic Salt Meadows

The C.O. for this Annex I habitat is to maintain favourable conservation condition. The targets are for the area of the habitat to remain stable or increase, and for no significant decline or change in habitat distribution subject to natural processes. There will be no loss or deterioration of habitat and the community distribution will not be impacted by the proposed development due to the remote and tenuous connectivity with the European site. The targets for maintaining the Physical Structure are the maintenance of natural circulation of sediments/organic matter, the maintenance/restoration of creek and pan structure subject to natural processes, and maintenance of natural tidal regime. The Physical Structure of the habitat will not be impacted for the same reasons.

The targets for maintaining the Vegetation Structure are the maintenance of the range of coastal habitats, the maintenance of structural variation within sward, the maintenance of more than 90% area outside creeks vegetated and the maintenance of sub communities within typical species listed in SMP. Due to the remote and tenuous connectivity between this European site and the M28 road project, there will be no impacts on the vegetation zonation or range, the vegetation structure and sward variation or the vegetation composition of the Annex I habitat. The Vegetation Structure target of maintaining a stable or increasing area including erosion and succession will not be impacted due to the remote and tenuous nature of the connectivity.

21.5 Potential In-combination Effects

Plans and projects in the area which may result in potential combination effects are considered in Section 5.4 and 5.5 of the NIS. Table 5.5 sets out the key elements/objectives or policies for these projects/plans together with an assessment of the in-combination effects. In general, the impacts in respect of the plans is positive or neutral, provided that the overarching policies and objectives are adhered to. The developments which have been granted planning permission, which could give rise to in-combination effects to Cork Harbour SPA, have generally been permitted on the basis that site-specific mitigation measures be implemented in order

to minimise any potential impacts on this European site. The tenuous and remote connectivity between the Great Island Channel SAC and the proposed road project means that potential impacts are unlikely. It is considered that the implementation of best practice design, construction and operational measures will ensure that there are no impacts on either of these European sites.

Thus, it is accepted that provided that the policies and objectives of the plans and programmes are adhered to and that best practice design and mitigation measures are implemented in respect of individual projects, it is considered that no in-combination effects will arise between these plans/projects and the proposed M28 road project.

21.6 Conclusion Appropriate Assessment

The Natura Impact Statement addresses the likely significant impacts arising from the proposed development on the integrity of the relevant European sites. There will be no direct impacts on any Natura 2000 site arising from the proposed development. The potential for significant indirect effects largely relate to water quality and disturbance of avifauna associated with Cork Harbour SPA.

Given the remote and tenuous connectivity with Great Island Channel SAC, the potential for significant effects is very low. Detailed mitigation measures have been developed to prevent and ameliorate these impacts. Subject to the implementation of these measures, I do not consider that any element of the proposed development, either alone or in combination with other plans or projects, will adversely affect the integrity of this European site in view of its conservation objectives.

The construction and operational phases of the development have the potential to impact over-wintering avifauna associated with Cork Harbour SPA. Notwithstanding the close proximity of the proposed development to Cork Harbour SPA, the proposed development will not impact the qualifying interests or the SCI species for this European site. The footprint of the proposed project and the immediate environs

support over-wintering avifauna for field feeding purposes, such as Curlew, but only on an intermittent basis, and the numbers using the fields adjacent to the project are not significant in the context of over-wintering populations for Cork Harbour SPA. Feeding avifauna displaced by the proposed road project will be able to relocate to proximal improved grassland habitats that offer similar feeding opportunities. It is considered, therefore, that the displacement of Curlew, which feed intermittently within these fields, will not give rise to any significant effects on avifaunal populations associated with Cork Harbour SPA. In addition, the implementation of best practice construction mitigation measures and monitoring as proposed, will restrict the release of potential deleterious substances from reaching watercourses which support connectivity to both this European site.

It can therefore be concluded, with reasonable certainty, and on the basis of best available scientific knowledge, that the proposed development will not adversely affect the favourable conservation status of over-wintering avifaunal populations, including Curlew, or any other Qualifying Interests, associated with Cork Harbour SPA, or of the Qualifying Interests of Great Island Channel SAC. It is reasonable to conclude, therefore, on the basis of the information on the file, which I consider is adequate to carry out a Stage 2 Appropriate Assessment, that the proposed development, individually or in combination with other plans or projects, would not adversely affect the integrity of any European site, and in particular, Cork Harbour SPA and Great Island Channel SAC, (with site codes 004030 and 001058, respectively), in view of the sites' conservation objectives.

22 Compulsory Purchase Order

22.1 Introduction

The statutory powers of the local authority to acquire land are contained in Section 213 of the Planning and Development Act 2000 (as amended) and approval under Section 49 of the Roads Act 1993 (as amended) authorises the Road Authority to acquire land or rights in relation to land specified in the Scheme.

An erratum to the CPO Schedule was presented to the oral hearing on 1/12/17 and provides for amendments and/or additions to the owners or reputed owners and occupiers. The following changes were made to the plot boundaries:

CPO Ref. 105 – Minor adjustment to CPO line in vicinity of Ted Neville’s property at Carr’s Hill Interchange. This will allow the boundary wall between Mr. Neville and Douglas golf Club to be retained.

CPO Ref. 168 – Adjustment to CPO line at Shanbally where land was to be acquired for the translocation of Pennyroyal. NPWS has confirmed that translocation is no longer required.

No other changes were made to plot boundaries, plot identifications, plot descriptions, plot areas, plot location townlands or plot location DEDs. Confirmation of notification of parties was also presented which allowed for objections to be made. I consider that the proposed amendments are reasonable and would not be likely to prejudice the position of any person

The following amendments were made to the Schedule in respect clarification of reputed ownerships of seven plots.

CPO Ref. 103 – Frances Gordon to be added as ‘Owner or Reputed Owner’.

CPO Ref. 105a.110 and 105a.111 – IDA to be added as ‘Owner or Reputed Owner’ and as ‘Occupier’.

CPO Ref. 123 – Louise and Michael Cotter identified as owner on schedules, Murnane & O’Shea to be added as ‘Owner or Reputed Owner’.

CPO Ref. 124 – Maurice Walsh identified as owner on the schedules, Murnane & O’Shea to be added as ‘Owner or Reputed Owner’.

CPO Ref. 144 – Mary Cogan identified as owner on the schedules, Astra Construction to be added as ‘Owner or Reputed Owner’.

CPO Ref. 145 – Mary Cogan and Mary O’Brien identified as owners on the schedules, Astra Construction to be added as ‘Owner or Reputed Owner’.

CPO Ref. 153 – William Ahern identified as owner on the schedules, Castleventry Ltd. to be added as ‘Owner or Reputed Owner’.

As noted above, 59 submissions were made in respect of the compulsory purchase order, with some landowners making more than one submission to the CPO, and some landowners making a submission of support (including Port of Cork, IDA, Indaver). However, at the time of writing this report, 30 objections to the CPO remain, which have not been formally withdrawn. The following objections have been **withdrawn** before and during the course of the oral hearing:

Cork Diocesan Trust, Douglas Parish, (St. Patrick’s Church) (Plot 106); Ted Neville (Plot 112); Elizabeth Pettit (Plot 122); Timothy Cashman (Plot 125); Collette Sweetnam (Plot 126); Breda McCarthy (Plot 128); Marie Saunders (Plot 129), John Saunders (Plot 130); Brothers of Charity (Plot 131); Francis Cronin (Plot 132); Dermot Hanlon (Plot 134); Margaret Mary O’Neill (Plot 141); Mary O’Mahony (Plot 143); John Cooney (Plot 147); Pat Cooney (Plot 148); Kevin Cooney (Plot 149); Novartis (Plot 151); Castleventry (Plot 153); Hibernian AFC (Plot 155); Daniel Brady (Plot 159); Patrick C. Coughlan (Plot 138); Agnes and Jeremiah Walsh (Plots 207, 208); Cork Diocesan Trust, Monkstown Parish (Plot 212).

22.2 Community Need for the Development

As detailed in Sections 10.4 and 11.4 above, the need and justification for the proposed development has been adequately established. Furthermore, it has been demonstrated that the proposed motorway, protected road and service area meet the scheme objectives which are: -

- **Environment** – to facilitate a reduction in the traffic related impact of the existing N28 on the human environment in the communities through which the road passes; and to minimise the impact of any improvement works on nearby environmentally sensitive sites.

- **Safety** – to improve road safety by reducing the number of road collisions and associate injuries/fatalities in the N28 corridor;
- **Economy** – to facilitate strategic development at the Port of Cork facilities at Ringaskiddy by improving access for Port related traffic along the N28 corridor; To reduce peak hour congestion and travel delays in the N28 corridor; and to facilitate general economic development within the Cork Gateway and Ringaskiddy Strategic Employment Area by improving journey time reliability, at an investment cost that offers good value for money.
- **Accessibility and Social Inclusion** – To facilitate improved accessibility to the Ringaskiddy peninsula and associated employment opportunities for cyclists and other road users; and to return to communities along the route such as Shanbally, easier and safer access to their local facilities by the removal of strategic through traffic from their environment.
- **Integration** – to support the National Ports Policy (NPP, 2013) and Trans European Network – Transport (TEN-T) policy by creating a high-quality route from the port at Ringaskiddy to the N40 South Ring road.

It is noted that the principle of the proposed development is not in dispute. It is accepted by the community, as represented in the submissions made to the Board, that there is a definitive community need for an upgrade of the existing N28 road, which suffers from undue traffic congestion, delays and a poor-quality alignment that presents significant safety hazards, and that a motorway scheme is an appropriate and suitable means of meeting the stated objectives of the project. Furthermore, the congestion and delay are forecast to continue and to worsen without any major intervention. It has also been clearly demonstrated that the proposed development would facilitate the expansion of the Port of Cork at Ringaskiddy and the relocation of the port activities from Tivoli and the City Docks, thereby freeing up city centre lands for more sustainable development. The need for a Services Area for HGV traffic is also accepted.

I would concur with the above and consider that the proposed development would result in improved access and a high-quality route between a Tier 1 port and its urban hinterland and with the national and European road network in line with national, regional and local policy, will improve journey times and reduce traffic congestion, will improve road safety and accessibility by all road users, will provide for improved environmental conditions and will provide an economic return on investment. The proposed development will result in a roadway and motorway services area that meet the standards and safety requirements of a strategic national route and service area as established by TII. It is considered, therefore, that the proposed development will benefit all road users and the CPO can be justified by the exigencies of the common good. I consider that the community need for the scheme has therefore been established.

22.3 Compatibility with the Development Plan and other planning policies

As detailed in Section 10.4 above, the proposed road project and service area accords with European, national and regional transport policy, including TEN-T and the National Ports Policy, as well as with national, regional and local planning policy. Chapter 2 of the EIS provides a comprehensive review of an extensive range of public policy and sets out how the proposed development complies with this policy. Since the publication of the EIS, the Draft Ballincollig-Carrigaline Municipal District LAP has been replaced by the adopted MDLAP (2017) and the Government has published Project Ireland 2040, encompassing the National Planning Framework and the National Development Plan.

As detailed in 10.4 above, it is clear that the proposed road project is consistent with four of the ten Strategic Outcomes/ National Priorities in the National Planning Framework, namely, Enhanced Regional Accessibility, Sustainable Mobility, High-quality International Connectivity and Transition to a Low Carbon and Climate Resilient Society. I consider that the nature and the extent of the proposed development is compatible with the goals, policies and objectives set out in Project Ireland 2040, the National Planning Framework, the National Development Plan, Smarter Travel and the Southwest Regional Planning Guidelines. It is further considered that the upgrade of the N28 is fully supported in the Cork County

Development Plan and in the Cork City Development Plan, as detailed in 10.4 above.

The adopted MDLAP includes specific objectives for the finalisation of the M28 (IN-02 and RY-GO-04), based on the route currently before the Board. Although there was some community opposition to the route alignment through lands that are zoned for open space, this has to be balanced against the fact that this open space buffer zone doubles as a utility corridor and that the MDLAP also contains other objectives for the finalisation of the M28 route, which includes an undertaking for the provision of alternative areas of open space lands as compensation, should part of this buffer zone be developed as part of the M28, (as discussed at 16.4.1 above). The route alignment also traverses lands zoned industrial, which form part of large land banks owned by the IDA. It was acknowledged by the IDA that notwithstanding the fact that the proposed route would result in substantial severance of land parcels, it considered that the overall benefits of the proposed road scheme would outweigh these adverse impacts. Thus, I consider that the proposed development is consistent with the objectives of the Ballincollig-Carrigaline Municipal District LAP, 2017.

22.4 Alternatives

I refer to the consideration of alternatives in Chapter 4 of the EIS and to the Evaluation of Alternatives, set out in Mr. Bergin's Report, as summarised in Section 11.0 above. These include an evaluation of the Do-Minimum compared to the Do something options; alternative route corridors; alternatives within the route corridor; an evaluation of the cross-section; and alternative junction strategies and layouts. In addition, an evaluation of the alternative route corridors was undertaken by me in Section 10.4, in the context of policy objectives and need for the development.

There was much community opposition to the route corridor selected and the matter was debated at length during the oral hearing, as detailed in 10.4 above. However, it is considered that the process undertaken by the applicants has been a robust assessment of alternative options having regard to environmental considerations and the stated Scheme Objectives, which are considered to be reasonable. I agree that

the route corridor chosen is the one which best meets these objectives. I also accept that the consideration of options within the selected corridor, the cross section, the junction strategy and layout/location of the service area was a rigorous process, which had regard to environmental considerations and to the Scheme Objectives. I generally concur with the reasons for choosing the preferred alternatives as presented in the EIS, and revised during the oral hearing, and as amended by conditions set out below.

Objections submitted by landowners and residents have identified potential impacts on properties and lands, as well as environmental considerations including impacts on human health, noise, air and visual impacts and on terrestrial and aquatic ecology. The issues relating to properties and lands are likely to arise no matter which route is chosen. The environmental issues have been addressed in detail in the preceding sections of this report. It is acknowledged that sections of the proposed route present burdens in respect of residential owners and agricultural operations, and that these impacts will, in many cases, be permanent impacts notwithstanding the mitigation measures proposed. Issues relating to severance and loss of lands arising are matters to be addressed by way of compensation.

22.5 Suitability of Lands to meet the Community Need

I refer to Section 12.0 of this assessment and to the conclusions that the proposed cross section and junction strategy are appropriate, as is the location and layout of the proposed services area. The extent of land that would be acquired under the compulsory purchase order is determined by the specifications for same. It is considered reasonable to conclude that, having regard to the development of the route as proposed, the lands proposed to be acquired are necessary to facilitate the provision of the scheme. It is, therefore, accepted that there is a requirement for all of the lands included in the CPO, excluding those proposed by the applicant to be removed/adjusted, (CPO Ref. 105 and 168). Some objections contend that the proposed acquisition is excessive. These individual objections will be considered below. However, it is considered that the lands identified in the CPO are required for the construction of the project.

22.6 CPO Issues common to several objectors

- 22.6.1 Access to retained lands – Several objectors claim that the access proposed to the retained lands within the landholding is inadequate and/or that accommodation works to mitigate severance issues are inadequate. These issues were discussed in respect of many individual objectors at the oral hearing and will be addressed below. Where agreement was not achieved in respect of alternative access arrangements, it is noted that financial compensatory matters on severance and other issues are not the subject of the decision-making process.
- 22.6.2 Professional fees and advisory costs should be borne by the applicant – it is considered that this matter is one to be resolved between the applicant and the individual landowner and is not the subject of the decision-making process. However, an application for costs can be made to the Board.
- 22.6.3 Construction phase mitigation inadequate – Construction impacts in respect of noise, dust, air pollution, water pollution, traffic management etc. have been addressed in the planning assessment and the Environmental Impact Assessment under the relevant headings above. I am satisfied that the mitigation measures proposed, as revised and augmented in the Schedule of Commitments submitted on 1/12/17, together with any specific conditions outlined below, will adequately address construction impacts arising.
- 22.6.4 Access to private properties during construction must be maintained – this issue was discussed in respect of some individual objectors at the oral hearing and will be addressed below. However, the applicant has advised that access to individual private properties will be accommodated/maintained at all times during construction.
- 22.6.5 Conflict with utilities – objectors sought confirmation that where conflicts arise with utilities, there will be no interruption to services such as electricity, gas, water, wastewater facilities. In addition, confirmation was sought that any damage to utilities during construction must be repaired by applicant. This issue was discussed during

the oral hearing on a number of occasions. The applicant has confirmed that extensive liaison has been undertaken with the utility service providers and that arrangements will be in place to ensure that there will be no interruption to services. It was also confirmed that any damage caused by the applicant during construction works will be repaired. Some objections related to the proposal to relocate some electricity pylons in Shanbally and Ringaskiddy, which it was considered should be part of a separate planning application. However, the relocation of the pylons is directly linked to the road proposal and it is, therefore, considered appropriate that it should form part of the current application.

22.6.6 Route options and junction strategies/layouts – Several objections to the CPO made reference to issues such as road closures (Maryborough Hill slip road and the closure of Old Post Office Road) which were considered to be unacceptable. Others made reference to the proposed realignment of L6472, to the design and justification for Shanbally Interchange and to the capacity of Loughbeg roundabout. A further objection related to the routing of the proposed M28 at Upper Shanbally and queried why it could not be routed through Shanbally Quarry instead. These matters have been discussed in considerable detail in the Traffic and Transport section of this report (12.0). I am satisfied that the route options and junction strategies/layouts have been robustly assessed and that adequate justification has been provided for the preferred design and layout.

22.6.7 Road safety/Health and Safety – Some objections referred to the need for traffic calming on the Mount Oval diverge and sought more detail on road signage. Some objectors in Shanbally raised concerns regarding traffic hazards associated with the existing road through Upper Shanbally and that the proposed realignment would exacerbate this. Some observers raised concerns regarding the impacts associated with the transport of dangerous goods on the M28. These matters were discussed in detail in the Traffic and Transport section of this report (Section 12.0). The issues relating to the transport of hazardous materials and dangerous goods was discussed in Section 15.0 above. It is considered that the proposed mitigation measures, as revised and augmented by the Schedule of Commitments submitted on 1/12/17,

together with any specific conditions outlined below will adequately address these matters.

22.6.8 Landscape/visual impact issues – objections were raised to the erosion of the green belt buffer zone in Ringaskiddy, which has been addressed in 22.3 above. Several objectors to the CPO also raised issues relating to unacceptable landscape and visual impact, particularly in respect of Rowan Hill, Mulcon Valley and Shanbally Village. It was also asserted that mitigation in these instances was not adequate. It was requested that woodlands should be retained and slopes maintained as far as possible in the Mulcon Valley. Objections were raised to the Shanbally interchange due to the adverse visual impact on the residential properties facing the elevated junction. These issues have been addressed in detail in section 16.4 above, where it has been outlined that the applicant has proposed additional mitigation measures in the form of screen planting and woodland planting in these and other areas. It was also emphasised that it is intended to retain as many trees as possible within the CPO line and that no trees are to be felled outside the CPO line.

22.6.9 Operational Noise – Objections to the CPO included objections to operational noise impacts, which were considered to be unacceptably high, and to the mitigation measures proposed, which were considered to be unacceptable. These issues have been addressed in detail in the preceding sections, (Noise 13.4, Health 15.4 and Visual impact 16.4). It has been established that the operation of the road, subject to the stated mitigation measures, would generally result in compliance with the TII Design Goal for the off-line section and the Cork Noise Action Plan Targets for the on-line section of the proposed route.

Given that it is predicted that noise levels will increase in the ‘Do minimum’ scenario, this is considered to be acceptable. It is acknowledged that the noise levels at the northern end are unacceptably high. However, I accept that noise levels will reduce for all properties within the 300m band, that the number of properties within the higher band will decrease, and that the increase in noise levels for a small number of

properties is inevitable given the rural nature of much of the off-line section of the route.

I also consider, however, that noise levels will be mitigated even further than that predicted in the EIS, due to the additional mitigation measures, principally in the form of absorptive barriers, which were included in the final Schedule of Commitments submitted on 1/12/17, and to the likely improved performance of modern Low Noise Surfaces. I accept that the proposed development would result in a temporary adverse impact on noise and vibration during the construction phase, which will be of short and temporary duration and can be adequately mitigated as proposed. I would accept, therefore, that the proposed development can be constructed and operated without significant adverse impacts on noise and vibration.

22.6.10 Operational Air Quality – Objection was raised to the impacts on air quality in Shanbally Village, which it is stated are predicted to increase. This issue was discussed in detail in Section 14.4 above. Although there may be some increases in air pollution levels along certain sections of the route, the impacts are predicted to be negligible and there will be an overall benefit to the area in relation to air quality, with a reduction in the number of properties exposed to air pollutants. This is mainly due to the fact that the current source of pollution will move further away from residential areas and other properties, particularly in areas such as Shanbally and Ringaskiddy, but also to the fact that the traffic model predicts a substantial reduction in congestion levels.

I would accept that there would be a negligible impact on air quality for all properties but that critically, levels of air pollutants will remain well below the relevant limits for the protection of human health.

22.6.11 Ecology issues at Shanbally Quarry – Objections to the CPO have been raised by the owner of Shanbally Quarry, Eugene O'Brien (Plot 168) and by the adjoining neighbour Daniel O'Connell (Plot 162) to the proposal to utilise part of this

abandoned quarry to the North-east of Upper Shanbally for the translocation of Pennyroyal mint, and in terms of the potential for the spread of invasive plant species. Objection was also raised by Mr. O'Brien to the proposal to provide an artificial nest box for peregrine falcon in an unspecified location, as he did not want this nest box to be placed on his lands. These issues have been discussed in considerable detail in Section 17.4 above. It has been established that the plant Pennyroyal occurring in the nearby Raffeen Quarry is not a native variety and is no longer required to be translocated. The Corrigenda submitted on 1/12/17 indicates that the CPO line has been adjusted to exclude the lands that had been designated for translocation of Pennyroyal. There is a comprehensive Invasive Species Management Plan in Appendix 12 of the EIS, which addresses the issue of prevention of the spread of invasive species. The additional mitigation measures regarding the provision for Peregrine Falcon nesting sites are included in the revised Schedule of Commitments (1/12/17), and do not include Shanbally Quarry.

22.7 Site specific CPO Issues

22.7.1 O'Flynn Construction, Rowan Hill - Plot 101

A presentation was made on Day 6 (15/11/17). Issues raised regarding maintenance of as much as possible of the slope and woodlands at Mount Oval, traffic calming on the approach to Mount Oval and Noise during the operational phase have been addressed at 22.6.7/8/9 above. It should be noted that revised screen planting and materials for the masonry wall and noise barrier adjacent to Rowan Hill were proposed during a later session, on Day 12 (1/12/17). It was confirmed that the retained slope would be reshaped and replanted with mature woodland. It was confirmed that existing traffic calming would be maintained within Mount Oval but that it would not be provided on the diverge itself. Issues relating to property values are financial compensatory matters which are not part of the decision-making process.

22.7.2 Diamond Developments, Bloomfield - Plot 102

This CPO relates to approx. 29.5% of the landholding owned by Diamond Developments. The lands are currently vacant and are not zoned (Existing Built-Up area). The proposed widening of the south-bound carriageway will mean that the existing access to these lands will be under the footprint of the proposed road and it

is, therefore, proposed to provide an alternative means of access to the lands. It is proposed to realign the existing road to enable the access to be provided. The applicant responded to the objections that the land take is excessive, the access to retained lands is inadequate and noise mitigation is inadequate by stating that the lands are necessary to construct the M28, that the access is designed to the required TII standards and that mitigation is provided in the form of a 3m noise barrier and low noise surfacing.

This matter was discussed in detail, in conjunction with a discussion regarding the adjacent lands owned by the McGrath/Fitzgerald family on Day 10 of the hearing. It would appear that there is some dispute between the third parties regarding matters of title. Mr. Martin (for Diamond Developments) stated that his clients want their lands to be omitted from the CPO and stated that they would provide access to the lands themselves, so long as they had sufficient lands available to them within their ownership following the roadworks. Although this point was not fully confirmed/clarified, there is considerable doubt that Diamond Development would be able to provide independent access to their lands, if the Scheme goes ahead. Mr Flanagan objected to the proposal that the lands be removed from the CPO, as he was concerned that it could result in a landlocked or sterilised site, which could potentially become a serious liability for the acquiring authority in due course. He asserted that there was no justification for the omission of these lands from the CPO as there is an obligation on the applicant to provide access to the retained lands.

I would agree with this view and can see no rationale or justification for the omission of the lands as it would be likely to result in sterilisation of the lands. The applicant has put forward a sound basis for the need to acquire the lands in question. In the absence of agreement, the matters raised are ones which will have to be decided at arbitration.

22.7.3 Margaret Fitzgerald, Lucy McGrath and Frances Gordon Plots 103,104, Bloomfield

Issues raised regarding construction impacts, access during construction, conflict with utilities, operational noise, adequacy of mitigation and loss of trees have been addressed at 22.6.3/4/5/8/9 above. The applicant responded that fencing will be

provided along the road in accordance with TII standards (timber post and tension mesh) but that negotiations were ongoing in respect of the type of fencing. It was confirmed that once in place, the fencing will be maintained by TII.

As stated in respect of the Diamond Developments site, the CPO of the McGrath/Fitzgerald lands was also discussed at length on Day 10. It was established that there are three folios involved, one for Diamond Developments (which was acquired from the McGrath family) and the other two for the McGrath/Fitzgerald family. The discussion revealed that the titles are quite complex and intricate, and that the purpose of the CPO is to provide a retaining wall and 2 no. independent access points, one to each of the parties. Lucy McGrath, who appeared for the McGrath/Fitzgerald family, stated that notwithstanding the applicant's response and the clarifications given by both the applicant and Diamond Developments, their objection to the CPO stands.

However, having regard to the clarification provided and the mitigation measures proposed by the applicant, I am satisfied to conclude that the proposed development will not result in adverse impacts during the construction of operational phases. Issues relating to title and property values are financial compensatory matters which are not part of the decision-making process.

22.7.4 Nicholas Douglas Plot 108, Clarke's Hill/Rochestown Road

Issues raised in relation to Mulcon Valley woodland and professional fees have been addressed in 22.6.2/8 above. Other issues relating to need for and size of land take, need for retaining walls and regrading of driveway were discussed on Day 6 of the oral hearing.

Applicant response – the proposed works to Clarke's Hill referred to by Mr. N Douglas form part of a separate scheme (Part 8) by the non-national roads design office. The current road project involves widening of Rochestown Road in order to provide a right turn lane with signals, and will involve taking 3-4 metres of his property. It will also require a retaining wall at the front of the property along Rochestown Road and a realigned driveway on the adjoining property (Plot 109). It was confirmed that as many trees as possible on the northern boundary will be

retained, but cannot comment on the trees on the Clarke's Hill boundary. It was confirmed that accommodation works could be conducted from the road side as far as possible to retain existing.

Having regard to the mitigation measures proposed, I am satisfied to conclude that the proposed development is not likely to give rise to adverse impacts on this property during the construction or operational phases. The extent of the land take is considered to be necessary and appropriate.

22.7.5 Robin and Adeline Douglas Plot 109, Rochestown Road

Similar issues raised by R & A Douglas to those raised by N. Douglas, with same response as in 22.7.4 above. Issues relating to noise, tree planting and access during construction have been addressed under 22.6.3/4/8/9 above.

Applicant response to other issues – the land take is quite substantial but the reason for this is that the existing driveway is very steep and the set back is required to provide for an appropriate gradient for safe access onto Rochestown Road. It was confirmed that gates, post boxes etc would be reinstated and that temporary acquisition would be for a minimum period with minimal interference and that any damage would be repaired.

Having regard to the mitigation measures proposed, I am satisfied to conclude that the proposed development is not likely to give rise to adverse impacts on this property during the construction or operational phases.

22.7.6 Paul and Barbara Kelleher Plot 111, San Martino, Maryborough Hill

Issues raised relating to loss of slip road, noise and disruption during construction of overbridge and operational noise have been addressed under 22.6.3/6/9 above.

The applicant responded that the CPO relates to road widening at this location and that it is only the road bed outside their property that is required to be acquired. It was also confirmed that the CEMP will be in place to control construction impacts and that low noise surfacing will be used on Maryborough Hill.

Having regard to the mitigation measures proposed, and to the limited extent of the CPO at this location, I am satisfied to conclude that it is unlikely that there would be any adverse impacts arising in respect of this property.

22.7.7 Douglas Golf Club Plot 112

Douglas Golf Club is located at Maryborough Hill. It is bordered to the northeast by Maryborough Hill (including 'Massabielle' – Plot 113) and the house to be demolished adjacent to the overbridge. The N28 borders the eastern boundary, the southern part of which is known as 'Cotter's Field', and the south-western boundary is with the R609 (Carrigaline Road). Cotter's Field is a triangular piece of land which abuts, but does not form part of the layout of the golf course, and was purchased in recent years. The entrance to the golf course is from Maryborough Hill, but there are two maintenance access points, one from Maryborough Hill and one off the R609. The golf club was established in 1909 and is set in a mature parkland landscape with substantial stands of trees both within and bordering the course.

The CPO includes a number of small acquisitions, some permanent and some temporary, but the main element is the acquisition of a substantial portion of Cotter's Field and part of the established golf course between Cotter's Field and the Maryborough Flyover. The purpose of the CPO of this latter section is to provide the two-way link road between Carr's Hill and Maryborough Hill. The other smaller elements relate to road widening of Maryborough Hill and the realignment of the R609. Douglas Golf club does not oppose the CPO of their lands, but have raised considerable objection to the proposed boundary treatment of the retained lands and have also objected to the elimination of the maintenance access from R609.

The submission from the Golf Club was accompanied by a sketch plan which subdivided the sections of boundary/access points that are in contention and labelled them as follows:

- A-B Section of existing stone wall (2m high) fronting Maryborough Hill to be demolished, moved back and rebuilt. DGC wants it rebuilt like for like.
- C-D A short section of newly exposed boundary that would result from the demolition of the house (Twomey's) next to bridge, which is currently

surrounded by a dense copse of trees. DGC wants a stone wall to match that requested at A-B.

- D-E Section of eastern boundary with the new link road which would cut through part of the fourth hole and 5th green of the golf course and result in the removal of a significant number of mature trees. (D-E is approx. equivalent to half the distance between Maryborough Hill and Carr's Hill, at the northern end). DGC seeks a boundary which offers the same level of visual screening, noise reduction, safety and security as the current boundary offers.
- E-H Southern section of boundary with link road – DGC seeking mature trees, ball netting, noise and visual barriers required here as creating new boundary with road.
- F Maintenance access – DGC wants an alternative maintenance access point from R609, and suggests a point directly adjacent to the northernmost house (Mrs. Pettit's).
- G-H Noise Barrier AB13 – DGC wants this barrier extended along its boundary.
- I Boundary with R609 next to 16th Tee – DGC requires boundary treatment to replace loss of trees at this location which would provide sound, visual and ball safety mitigation.

Applicant's response - agreement has been reached in respect of A-B (like for like); C-D (existing trees retained and thus no new boundary treatment); and that there would be no impact in respect of Point I, due to the redesign of the section of road alignment in response to Mr. Neville's lands. Regarding Point F, the applicant states that there is no scope to provide an access in the location suggested and that it is not proposed to introduce a maintenance access point onto a busy road on the approach to Carr's Hill interchange. With regard to G-H, the applicant does not propose to extend the noise barrier here, which is intended to mitigate noise impacts on the three residential properties, (this will be discussed further below). The remaining points of contention relate to the new boundaries to be created adjacent to the proposed link road, i.e. D-E and E-H. These points generated much discussion over Days 6, 10 and 11 of the hearing.

Douglas Golf Club was represented by Mr. Lucey S.C., Mr Galvin (Solicitor), Mr. Conor O'Brien (General Manager), Mr. Harrington (Engineer) and Jeff Howes (Golf Course Designer), and presentations were made on Day 10. Discussions and negotiations between the parties were ongoing throughout the course of the oral hearing, and although agreement was reached on some issues, the objection remains at the time of writing this report. Mr. Flanagan (for the applicant) emphasised that any works within the retained lands were matters of compensation. However, it is considered that the issues regarding appropriate boundary treatment are complicated by the need to redesign part of the golf course, which will take place within the retained lands and will incorporate elements such as landscaping, noise reduction measures, screening and ball safety measures. Notwithstanding this, it is considered that the desire for a suitable form of boundary treatment where the golf course will adjoin the proposed road, to minimise the impact in terms of visual screening and security is reasonable.

The Golf Club had initially sought a 3m high stone wall (D-E) and mature tree planting at extra heavy standard with a reasonable density, ball netting and visual/secure barriers (from D-H). The applicant, however, considers that there are significant constraints which would prevent it from providing these measures, as the CPO line is very tight against the proposed road. The Applicant's proposal is to replace the existing boundary at D-E with a standard TII post and rail fence. During the course of the hearing (Day 10), the applicant provided an alternative form of boundary treatment for D-E, without prejudice, which was in the form of a low masonry wall with a railing on top, which would allow for planting within the retained lands. However, DGC objected to this proposal stated that it would not provide any visual screening effect and would not address the security or aesthetic issues.

On Day 11, (30/11/17), Douglas Golf Club provided a revised sketch plan indicating what was sought in terms of boundary treatment as follows:

- D – E Masonry faced wall 3.0m high
- E - E* Masonry faced wall 2.5m high
- E* - H Masonry faced wall 2.0m high

The reason for the reducing height of the wall is to match the gradient.

DGC also provided evidence as part of its submission which challenged the conclusions of the noise assessment in respect of the golf course. This included noise level readings from within the golf course, which it was stated were much lower than that taken at Maryborough Hill (a noisy road). However, Mr. McKeown pointed out that the levels given were dB Laeq, which would differ from the Lden levels by approx. 2dB, as the Lden incorporate a penalty for night-time. Although it is not proposed to provide noise barriers, he stated that the link road and the mainline would have low noise surfacing. He concluded that the golf course, which is not a Noise Sensitive Location, would experience no material difference between the Do Minimum and the Do Something scenarios.

There is no longer any objection to the applicant's proposals in respect of points A-B, C-D and Point I. I would accept that it is not possible or practical to provide a maintenance access from the R609, (Point F) and that this is a matter to be resolved as part of any compensation package. I do not accept that the golf course would suffer disamenity in respect of noise levels that would justify the extension of the noise barrier beyond G-H.

I would, however, accept that the amenity of the golf course would be affected by the proximity of the proposed road to the boundary along points D-E and E-H combined with the removal of a mature treelined boundary which currently provides screening, security and safety measures. Thus, the golf club may have a reasonable case in seeking a more robust and secure boundary treatment on the eastern boundary where it abuts the proposed link road. However, I also accept the applicant's case that there are constraints in terms of adequacy of space to provide the measures sought by the club within the CPO line. It may be that the measures required to provide an equivalent level of security and visual screening will have to be provided, at least partially, on the retained lands. These matters would, therefore, fall within the realms of potential injurious affection, which could be addressed as part of any compensation package. The issue of ball netting has, however, been addressed as part of the planning assessment under health and safety matters (15.4 above), where it was concluded that in the interests of the safe functioning of the road and

the proper planning and sustainable development of the area, ball netting should be provided along this boundary as part of the Scheme.

22.7.8 Ted Neville Plot 112, Carr's Hill

The applicant responded that the reason for the CPO here is that the existing R609 is to be realigned and the section serving the three residential properties at the eastern end will be turned into a cul-de-sac. However, the applicant now proposes to tighten the radius on this access road, which will avoid the pinch point. Thus, it would no longer be necessary to acquire Mr. Neville's boundary wall and driveway. A revised sketch has been sent to Mr. Neville, and although he appears satisfied, he has not yet formally withdrawn his objection. This will necessitate the revision of the CPO line slightly. It is noted that the revised sketch was submitted to the oral hearing on 15th November 2017 and that the corrigenda indicated that the CPO line would be adjusted as described above. I am satisfied to conclude, having regard to the foregoing, that the proposed development is not likely to result in adverse impacts on the amenity of this property.

22.7.9 Anne O'Dea Plots 112, 113 'Massabielle' Maryborough Hill

The property is a large detached bungalow to the northwest of the flyover (opposite entrance to existing slip road), and is bounded to the north and west by Douglas Golf Course, to the south by the lands containing the derelict house to be demolished and to the east by Maryborough Hill. The acquisition relates to part of the curtilage (part of front garden) and will involve the removal of her front boundary wall and temporary acquisition of the land around the wall to enable the wall to be reconstructed. Concerns were raised regarding the extent of CPO, (which includes the loss of the domestic garage which contains the boiler), as well as issues relating traffic safety and congestion, lack of a footpath, air and noise pollution and public lighting as well as noise, vibration, structural impacts and dust during construction.

Applicant's response – the existing front boundary wall will be replaced on a like for like basis and it will be moved back approx. 3m. Mr. Noonan suggested that RPS could visit 'Massabielle' and peg out the line of the permanent and temporary CPO lines. It was confirmed that noise barriers would be provided on either side of the new flyover bridge and that low noise surfacing will be used on both Maryborough

Hill and on the proposed slip road and mainline. Public lighting will be provided as shown on Drawing No. PL0001 (Vol. 5 of EIS). Existing vegetative screening on the adjoining property to be demolished will be retained as much as possible.

Construction impacts are addressed at 22.6.3 and air quality, noise and vibration during the construction and operational phases are addressed at 22.6.9/10 above and in more detail in the planning assessment of this report, (13.4 and 14.4).

Clarification was provided that the reconstruction of the bridge would take approx. 9 months, but that the demolition would take place over a long weekend.

The issues relating to traffic safety, congestion and need for a footpath were discussed in detail on Day 6 (15/11/17). Mr. Noonan confirmed that he could look at revising the radius of the left turn lane from the priority junction to avoid speeding/cutting the corner. He also agreed to consider signalling the junction and providing pedestrian crossing facilities and a footpath in front of 'Massabielle'. He provided a revised drawing on (Day 9) 28th November 2017. Mr. Bergin queried whether a Northbound cycle lane could be accommodated at some stage in the future, without a further CPO, which would affect Mrs. O'Dea's property. The applicant responded that there are no plans to provide a cycle lane downhill (Northbound) and that there would be no further impact on this property.

Having regard to the mitigation measures proposed, including the revisions to the proposed road layout in the vicinity of Maryborough Hill flyover and 'Massabielle', including the signalisation of the new junction and provision of a clearway and pedestrian facilities, I am satisfied to conclude that the proposed development is not likely to result in adverse impacts on the health and amenity of this property. Issues relating to property values come within the financial compensatory matters which do not form part of the decision-making process.

22.7.10 Elizabeth O'Connell, Piper's Croft, Maryborough Hill – Plot 115b

A written submission was not received by the Board in advance of the oral hearing. However, Mrs. O'Connell made a written and oral presentation to the hearing, on Day 5 (14/11/17). She pointed out that the impact of the CPO is listed as insignificant, but she considers it to be much more substantial than this and

requested that the entire property be acquired. Her property is located immediately adjacent to the Maryborough Bridge flyover. Her concerns relate to 24-hour construction works, with associated noise, dust and light pollution, and once operational, she stated that her home would be “hanging on the edge of an already busy road”. Specific concerns related to visual impact, loss of trees and shrubs, structural concerns (including how the property will be shored up), health impacts, irreversible impact on value of property and inadequate financial compensation.

Applicant’s Response - The applicant confirmed that the acquisition is a temporary one which relates to road bed only and that it is proposed to undertake works to the existing public road outside her property in order to construct a new roadway to align with Maryborough Hill. Mr. Noonan (RPS) explained that this section of the N28 would be widened within the existing corridor and that substantial retaining structures would be required from here to Carr’s Hill. He advised that it is intended to demolish the existing bridge over a long weekend and that part of the proposed bridge would be put in place in advance of this. He said that pre and post condition surveys would be carried out and that best construction management practices would be employed.

Having regard to the mitigation measures proposed, I am satisfied to conclude that the proposed development is not likely to result in adverse health, amenity or visual impacts arising from the construction or operation of the project. Issues relating to property values are financial compensatory matters which are not part of the decision-making process.

22.7.11 RSM Maryborough Ridge Plot 119

The applicant responded that noise mitigation would be provided for existing development and where planning permission has been granted. However, it is not proposed to provide noise mitigation for zoned lands where no permission has been granted. This issue was addressed in the planning assessment above, (13.4) when it was suggested that, in the interests of proper planning and development, a condition should be attached to any approval by the Board requiring the extension of AB12 by approx. 1000m, to join up with AB14 to the south. The issue of the extent of the CPO is a financial compensatory matter which is not part of the decision-making process.

It is considered that provided that the noise mitigation measures are revised as suggested above, the proposed development is not likely to result in adverse impacts health or amenity impacts to the future occupiers of these residential lands.

22.7.12 Murnane & O'Shea Plot 124, Castletreasure

The objection is based on inadequate access to retained lands, reflective of the status of these lands as SLR3, which has been identified as likely to come forward as residential development. The objector did not appear at the oral hearing and was not represented. It is unclear where it is sought to locate the proposed revised access. It is considered that this is a matter that can be resolved between the parties as part of the compensatory measures and ongoing negotiations.

22.7.13 Samuel and Rosie Vickery Plot 127 represented by Martin & Rea

Mr Martin represented the objector on Day 10 (29/11/17) of the hearing. He outlined the main effects of the CPO. The landholding is 500 acres of agricultural land and it is proposed to CPO 21 acres and approx. 74 acres will be severed. The landholding is located immediately to the west of the N28 at Ballinrea, (to the south of Carr's Hill), and to the south of the Board of Works road. It excludes the land on the NW corner of the Board of Works road with the N28. Mr Martin advised the hearing that there is no objection to the land take but that there are two outstanding issues which relate firstly, to access to the retained lands and secondly, to access between the farm and the severed lands.

At present the landholding has road frontage to three roads, N28, Ballinrea Road and Board of Works Road. There are two private access roads from the N28, one serving the house and one serving the farmyard. The farmhouse and farmyard are located to the south of the proposed M28 route, which means that the two access roads will be severed from the N28 and the lands to the east. However, the farmyard/house are not accessible from the Board of Works road or Ballinrea Road. The applicant has proposed accommodation works in the form of two access roads and a livestock pass (at chainage 3670). The Board of Works road (a public road) will also have an underpass. Access Road 02 serves both the Vickery property and lands to the east of their property, and Access Road 03 serves the Vickery property.

Proposed Access Road 03 runs parallel to the proposed M28 (to the west), from the farmyard lane to the Board of Works road. It is 4m wide with grass margins on each side and it is proposed to provide 2-3 passing bays. The length of the road is stated to be approx. 1000m. This would be tar and chip dressed. Mr. Martin said that his clients were happy with the width and location of the road but objected to the surface dressing, as it is multifunctional (residential, farm machinery and livestock), it needs to be a more durable surface such as tarmac or concrete. It was pointed out that this one road would be replacing two existing roads.

The second area of concern is the proposed livestock underpass, which is located at Ch 3670, 3m wide and 2.5m in height. The width and height are considered to be totally inappropriate as this is a large farm with large machinery, e.g. combined harvesters etc. It is requested that an alternative location be looked at where the height can be achieved, such as adjacent to the underpass of the Board of Works road, (c. Ch. 3350) where there is plenty of embankment height (approx. 5m). This would mean that the farm machinery would not need to come out onto the public road and could use the new access road, together with a livestock pass here. It was clarified that what is sought is that a separate parallel livestock/machinery underpass would be provided within the private lands, directly adjacent to the public one.

I questioned the role and function of the road and the need for a width of 4m with passing bays, and whether it was possible to provide alternative shorter access roads elsewhere. Mr. Bergin questioned the design standard of the road and the structure and surfacing of the road in terms of normal practice for accommodation roads such as this. Mr. Conrad Wilson (RPS) replied that this is in accordance with standard practice across the country. Mr Martin pointed out that the proposed surface dressing would not be capable of being cleaned and given the livestock use, this would be essential. Mr. Wilson stated that there is existing access from all three public roads and he did not see the necessity to clean the road. However, Mr. Martin stated that the other access points are merely field gates and that as the proposed accommodation road would be replacing two existing private roads, one residential and one agricultural, it was considered reasonable to require a higher standard of surface dressing.

Mr Barry (RPS) stated that the revised underpass requested would involve a significant additional cost. However, Mr. Martin disputed this and said that a 4.5m height is required and that in his experience, it would cost approx. €50,000 extra. He pointed out that this would replace the proposed 2.5m high underpass and that there is sufficient embankment height created by the proposed underpass at the Board of Works Road.

Access Road 02 is required to provide access to the severed lands to the east of the M28, which is required due to the fact that there is no right turn permitted either to/from the Board of Works Road with the N28. Thus, it would be necessary to go to Carr's Hill junction in order to turn right to access the severed lands to the east. Mr. Bergin queried whether the lands to the east of the M28 were currently accessed from the N28 and whether the option of dropping the ban on the right turn had been considered. However, Mr. Barry said that whilst it was acknowledged that the traffic levels on the N28 would be reduced, the issue of safety relates to forward visibility, and as such, it was unlikely that the ban would be lifted. Mr. Flanagan also stated that the objection to the CPO of the lands on which this accommodation access is proposed, (Sweetnam, Plot 126), has been withdrawn.

It may be that the objectors have a reasonable case in seeking a more appropriate road surface given that the accommodation road would be the main access to their dwelling combined with access to the farmyard, it is considered, however, this is a matter which could be addressed as part of any compensation package.

With regard to the livestock pass, I note that the proposed arrangements would require large agricultural machinery to exit the landholding onto the Board of Works road via a tight junction, travel under the overbridge and to turn right onto Access Road 02 in order to access the severed lands to the east. However, standard machinery and livestock could access the severed lands via the proposed underpass. The objectors may well have a reasonable case in respect of the operation and functioning of their farm after the Scheme is complete, but there is inadequate information at this juncture in respect of the feasibility of the alternative underpass or the cost of such a structure. It is considered, therefore, that this matter is one which would be addressed by means of any financial compensatory package.

22.7.14 Teresa Leahy Plot 132 Shannonpark

Neither the objector nor any representatives appeared at the CPO module of the oral hearing. The objection submitted to the Board referred to issues relating to land values. As there are no specific details of the objection, it is not possible to discuss this any further.

22.7.15 Estate of Mary Cogan Plot 144

Neither the objector nor any representatives appeared at the CPO module of the oral hearing. The objection submitted to the Board was very vague and merely recorded an objection. As there are no specific details of the objection, it is not possible to discuss this any further.

22.7.16 Estate of Bartholomew Cooney Plot 146

These lands are located to the southeast of Shannonpark interchange and are part of the Shannonpark Masterplan area. The landholding has frontage to both the N28 (to the north) and Rock Road (Ballyhemiken Road) to the east. There are a number of other landowners with the same surname who own adjacent folios, all of whom have withdrawn their objections to the CPO. The landholding is zoned for medium density housing (C-R-16 and C-R-17) and as a Strategic Land Reserve. These lands are identified in the Ballincollig-Carrigaline Municipal District LAP as Phase 3 of the Shannonpark Master Plan. The landholding will be severed by the proposed motorway. The Rock Road will be passed over by the proposed road, but it is proposed to provide an underpass, so that Rock Road remains open.

The objection relates to the design of the underbridge, the lack of noise mitigation on the northern side of the road project and visual impact of the embankment and drainage issues. It is requested that the tie-ins to the underbridge should extend as far as Heron's Wood and to Shannonpark to the west. This objector was represented by McCutcheon Halley. The only issue which was discussed in any detail at the hearing was noise mitigation, which was discussed in conjunction with the objection from RSM (also in relation to noise mitigation and represented by the same agent). The applicant responded that noise mitigation would not be provided for undeveloped, zoned lands where no permission has been granted.

This issue was addressed in the planning assessment above, (13.4) when it was suggested that, in the interests of proper planning and development, additional mitigation be provided for the residential lands at Maryborough Ridge on the basis that they form part of a landholding that is being developed in phases for housing, is zoned and serviced and forms part of the built-up urban area. However, in this instance (Plot 146), the lands are currently agricultural and located in a rural area, and although identified in the LAP as an SLR, forming part of the Shannonpark Masterplan, it is not clear when these lands would come forward for development. I note that the LAP indicates that certain infrastructural works would be required to be completed prior to these lands being developed. AB21 and AB22 appear to be in place to protect lands to the south which are zoned for housing but the lands to the north of the proposed road do not appear to be zoned.

The development potential of the lands is a matter for arbitration, should the Scheme be approved. The issue of the adequacy of the tie-ins is a transport matter which has been addressed in Mr. Bergin's report, wherein he recommended that Rock Road be upgraded. Landscape mitigation (SLM12 – mature planting) is proposed for the embankment. It is considered that provided that the proposed mitigation measures are implemented, the proposed development is not likely to result in adverse impacts to the future occupiers of these lands.

22.7.17 Janssen Laboratories Plot 151, Shanbally

On Day 3, Mark Collins, Facilities Manager for Janssen attended the hearing and reiterated the support of the company for the development, and the Shanbally interchange in particular, and restated the concerns regarding security and boundary treatment. It is considered, however, that should the Scheme be approved, these would be matters for arbitration in terms of the impacts on retained lands.

22.7.18 Carrigaline AFC Plot 155, Shanbally

The objection relates to the loss of one of two playing pitches. The objector did not attend for the CPO module of the hearing. It is noted that the other user of these facilities, Hibernian AFC, had withdrawn its objection. It is considered that the loss of

lands is a financial compensatory matter which does not form part of the decision-making process.

22.7.19 John Joseph Twomey Plot 157, Upper Shanbally

Mr. John Twomey addressed the oral hearing on Day 5 (14/11/17). He stated that he was representing himself, Mr. Patrick Twomey, (Plot 158), Ms Aine O'Mahony (Plot 161) and Mr. Oliver Jordan (Plot 166). Concerns relate to the fact that the proposed realignment road (L6472) will run 50m from their homes, resulting in loss of privacy and amenity and the creation of a road safety hazard at this location. It is asserted that this road is unnecessary as there are at least three other alternative routes available. Twomey's Boreen is at present a private residential road and the proposed public road will increase traffic and make it more dangerous. In the past, there have been a number of serious incidents where cars have crashed into the garden walls of houses fronting the proposed road. Objection was also made to the lack of a separate application for the relocation of powerlines.

Applicant's Response – the proposed realignment is to link with Cogan's Road, which is to be closed. It will not impact on Twomey's Boreen, which is to be closed. There are no changes proposed to local roads in this location. The proposed new road will be accessible to all residents of Shanbally.

The issues raised relating to residential amenity, road safety and utilities have been addressed in 22.6.5/7/8/9 above. The Board's Traffic and Transport Consultant has recommended the omission of the realignment, and a requirement to upgrade Ballyhemiken Road instead, a recommendation which I agree with. Having regard to this and proposed mitigation measures, I am satisfied to conclude that the proposed development is not likely to give rise to adverse impacts in terms of amenity and road safety.

22.7.20 Patrick Twomey Plot 158, Shanbally

Patrick Twomey was represented by John Twomey, as discussed at 22.7.19 above.

22.7.21 Daniel Brady Plot 159, Shanbally

Mr. Brady was represented by Solicitor Joanne Kiely who read a statement on Day 10 (29/11/17) of the oral hearing. She stated that it was accepted that the property

would be acquired but wanted to put on the record that he and his family have suffered undue stress and worry over the period of uncertainty and that he will have a need to buy another property and wants to remain in the community. Mr Flanagan replied that the concerns of the objector were acknowledged and that it is intended to acquire the entirety of this property. He stated that if the Scheme is approved, notice will be served in due course and the matter can then proceed to arbitration.

22.7.22 Aine O'Mahony Plot 161, Shanbally

Aine O'Mahony was represented by John Twomey at the oral hearing as discussed at 22.7.19 above.

22.7.23 Daniel O'Connell Plot 162, Shanbally

Mr. O'Connell addressed the hearing on Day 5 (14/11/17). His objections were mainly related to the extent of the land take and the inadequacy of the access proposed to the retained lands. Other issues raised related to the design and justification for the Shanbally interchange, the necessity for the proposed overbridge and the air quality at Shanbally. These latter issues have been addressed in the Traffic and Transport Section 12.4 and the Air Quality Section (14.4) above. In terms of the access to the retained lands, Mr. O'Connell object to the removal of the access next to the grotto (southern boundary of his lands), and the proposals by the applicant to provide an alternative access from the western boundary on traffic safety grounds. He is therefore seeking access directly from Shanbally Interchange. Mr. O'Connell was insistent that the existing two entrances from Marian Terrace are inappropriate as the northern one was described by Cork County Council as being unsafe and the southern one was effectively closed in c.1967.

The applicant responded that there did not appear to be any impediment to providing a safe alternative access on the western boundary and that as such reasonable access can be provided to the retained lands, either by means of one of the existing entrances or by means of a new entrance with his agreement. Mr. Flanagan stated that in the absence of agreement, this is a matter of financial compensation, which in the event that the lands are effectively sterilised, would be significant.

Mr. O'Connell also raised an issue regarding conflict with an existing watermain which would be traversed by the proposed road. However, on further investigation, it transpired that this watermain is not within the lands to be acquired from Mr. O'Connell. He was insistent, however, that the presence of the watermain had dictated the design of Shanbally interchange, and hence the extent of the land take. Mr. Noonan stated that the previous alternative designs that Mr. O'Connell was referring to related to the '2008 Route' and that the extent of the land take was not dissimilar in so far as it affected Mr. O'Connell's property. He also stated that the justification for the design of the junction was partly influenced by the decision not to re-route the watermain (which is an important 1200mm watermain for Ringaskiddy), but said that it did not rely solely on this matter, (as set out in the EIS).

It is considered that the issues of the design of the Shanbally interchange and the alternatives considered by the applicant have been addressed comprehensively in Mr. Bergin's Report and in the Alternatives Evaluated and Traffic and Transport Sections of this report (11.4 and 12.4), respectively. I would agree that the matters raised by Mr. O'Connell are issues which relate to financial compensation, in the event that agreement is not reached with respect to the provision of alternative reasonable access to the retained lands, which do not form part of the decision-making process.

22.7.24 Sharon Rogers Plot 163, Shanbally

Ms Rogers did not attend the CPO module of the hearing. It is considered that the issues raised are similar to those raised by John Twomey, which have been addressed at 22.7.18 above.

22.7.25 Paul & Victoria O'Sullivan Plot 165, Shanbally

Mr. and Mrs O'Sullivan did not attend the CPO module of the hearing. It is considered that the issues raised are similar to those raised by John Twomey, which have been addressed at 22.7.18 above.

22.7.26 Eugene O'Brien Plot 168, Shanbally Quarry

Mr. O'Brien did not attend the CPO module of the oral hearing. The issues relating to Pennyroyal have been discussed in detail in Section 17.4 above. During the course of the hearing, the variety of pennyroyal was established as non-native and the

NPWS advised that there was no longer a requirement to translocate it. The CPO schedule was subsequently amended to exclude that portion of Mr' O'Brien's lands that had been identified for translocation of Pennyroyal. The issue of Peregrine Falcon nest boxes was also discussed in detail in 17.4 above. During the course of the oral hearing, the applicant identified the location for such nest boxes, and none were proposed for Mr O'Brien's lands.

22.7.27 Kathleen Bowen Plot 202, Old Post Office Road

Ms. Bowen did not attend the CPO module of the oral hearing. The issues relating to inadequate access to retained lands relates to the closure of Old Post Office Road, and she seeks that the road remain open and/or that Tower Road be upgraded between Old Post Office Road and Warren Cross Roads. It is considered that this is a traffic and transport matter which has been considered under section 12.4 above and in Mr. Bergin's report. There is no justification for the upgrading of Tower Road to the west of Old Post Office road, as the existing school is to be relocated to a new site at Barnahely. The issue of development potential is considered to be a financial compensatory matter which does not form part of the decision-making process. The issues of greenbelt lands, construction impacts and conflict with utilities have been addressed in section 22.6 above.

22.7.28 Brendan Roynane Plot 203 Old Post Office Road Ringaskiddy

The site is a large L-shaped landholding which is currently in agricultural use. It is accessed from Old Post Office Road. There are two fields immediately to the south of 'Martello', which is owned by the Objector's brother, Jim Roynane (Observer regarding the project). The northernmost of these fields (Plot 204) is owned by Kevin and Elizabeth O'Grady (the objector's cousin, which will be discussed below). The other field forms part of Brendan Roynane's landholding and provides access to the remainder of his lands which extend eastwards and northwards toward the rear of properties fronting the main street. This is the only access to these lands which are used for grazing approx. 100 animals. The lands are zoned open space - buffer - RY-O07 at the point where the Protected Road Scheme traverses the lands and to the north and south of this point. The remainder of the lands to the north east are zoned RY-T-02 Town Centre).

The lands will be severed by the proposed road scheme, which will involve taking the land currently used as access to the land holding. The applicant has proposed to provide two alternative means of access to the lands, one on each side of the proposed road. The northern access necessitates the acquisition of Plot 204 (O'Grady referred to above) and the southern one requires acquisition of a further plot (200). The severed lands are zoned open space to the south and both open space and town centre to the north.

Mr B. Roynane objects to the CPO on the basis that the access to the retained lands is inadequate. The applicant proposes access in respect of the present use, i.e. accommodation access to agricultural lands. However, Mr. Roynane claims that the proposed access arrangements would necessitate unloading livestock in very close proximity to his brother's house, which could prove to be a nuisance. He further states that as Old P.O. Road would be closed, he would have to go all the way around through Ringaskiddy to access his lands. He also objects on the basis that he has considered developing the TC zoned lands for medium density housing and is concerned that the access would be inappropriate, which could undermine his attempts to gain planning permission.

Mr. Barry (RPS) stated that the access arrangements are typical accommodation works for agricultural lands and would involve a 4m wide access to the north of the proposed road, (RCD 700-6), with an agricultural field entrance to the south. He stated that it would be possible to provide a stock underpass between the lands to the north and south of the road. He stated that the matters raised are financial compensatory matters. Mr Flanagan also stated that should Mr. Roynane not agree to the access as proposed, it would be a matter for the arbitrator. Mr. Roynane confirmed that planning permission had neither been granted nor applied for in respect of developing the retained lands. I would agree with the applicant, therefore, that this is a financial compensatory matter which is outside the decision-making process.

22.7.29 Elizabeth & Kevin O'Grady Plot 204, Old Post Office Road

Mr. and Mrs. O'Grady did not attend the CPO module of the oral hearing. However, as stated in 22.7.27 above, Plot 204 is to be acquired in order to provide

accommodation works and access to Brendan Roynane's retained lands. Mr. Roynane stated that the O'Grady's had obtained planning permission for a dormer dwelling on this site but also confirmed that it had expired. The stated objection to Plot 204 is that it would interfere with lands in their ownership. It is considered that this is a financial compensatory matter which is outside the decision-making process.

22.7.30 Fastnet Recycling Plot 209, Loughbeg Road, Ringaskiddy

Mr Brian Murphy (MHL) represented the objector on Day 10 of the hearing. He referred to the fact that he had previously made a submission during Module 2 (Traffic and Transport) of the hearing. It was stated that the access being proposed is total substandard and inadequate for the purposes of the Business Park and would undermine future development potential. He reiterated that an alternative access is being sought in the form of a fifth arm off the Loughbeg roundabout, which he believed would resolve all of the issues regarding the entrance, loss of parking, traffic backing up on the right turn lane etc.

The adequacy of the access has been considered in detail in Mr. Bergin's report and has been addressed above in Section 12.0. Mr. Noonan pointed out that the alternative access being sought would require a formal departure from TII standards and that in his opinion, it would be highly unlikely to receive such permission for a private development. He also stated that there had been considerable negotiations on this issue with the owners of Ringport Business Park, and that it is currently vacant, which means that the anticipated traffic demand is unclear at this point. Mr Murphy pointed out that his clients had engaged Senior Counsel in respect of their position that the proposed roundabout itself did not form part of the Protected road Scheme. Although the applicant disputes this, Mr. Noonan commented that even if the roundabout is technically outside the Protected Road Scheme, it would still be extremely difficult to gain access to the protected road under the TII standards.

Mr. Flanagan also pointed out that this is a route of strategic importance and that a private access onto the roundabout would be inappropriate. He stated that as alternative access is being provided to both the residential and the business parts of the site, the adequacy of access to retained lands would ultimately be one for the arbitrator. He also stated in respect of the additional access proposal further south

on Loughbeg Road, that this is a matter for any future planning application for development and is not one for this public road project. I also sought clarification from the applicant regarding other possible alternative access points, such as from Tower Road. However, this was not favoured by the objector as it would conflict with the location of existing buildings within the site. The applicant also stated that there would be a need for road improvements to Tower Road to facilitate this. However, the objectors are seeking an ancillary access from Tower Road, which would be for emergency vehicles.

It is considered that the issues regarding adequacy of access to the site have been considered in detail in Section 12.0 (Traffic and Transport) above, where it was concluded that the access as proposed would be adequate given the light traffic flows predicted for Loughbeg Road and given the recommendation to put traffic management measures in place to direct ferry port traffic away from Loughbeg Road and to enter the Protected Road at Ringaskiddy East instead. The applicant has proposed two alternative access points and an ancillary emergency access point from Tower Road. It is considered that any further issues relating to access to the retained lands and future development potential is a financial compensatory matter which does not form part of the decision-making process.

23 Conclusions on CPO and PRD

Having regard to the assessment carried out above, I am satisfied to conclude that:

- The community need for this road project and service area has been established.
- The particular lands that constitute the route corridor are suitable to meet the needs of the road scheme.
- The scale, layout and location of the proposed Motorway Scheme, Protected Road Scheme and Services Area have been justified.
- All lands included in the CPO, excepting those lands owned by Ted Neville (part of Plot 112) and Eugene O'Brien (part of Plot 168), respectively, which were agreed to be excluded, are required, and

- The proposed road scheme and services area are compatible with the relevant development plan provisions.

Further to this, I am satisfied that the proposed development would not result in significant adverse environmental impacts, subject to the provision of mitigation measures as proposed and with adherence to the Schedule of Commitments given by the applicant at the oral hearing. Furthermore, I am satisfied to conclude that the proposed development would not adversely affect the integrity of Cork Harbour SPA or of Great Island Channel SAC either alone, or in combination with other plans and projects, in view of the Conservation Objectives for these sites. I, therefore, conclude that the proposed development is acceptable in environmental and planning terms and recommend that the CPO be confirmed and the application for the road scheme and services area be approved.

24 Recommendation

I recommend as follows:-

(i) The Compulsory Purchase Order

I consider that the land take is reasonable and proportional to the stated purpose to provide a Motorway Scheme and a Protected Road Scheme between Cork and Ringaskiddy and a Motorway Services Area at Ringaskiddy. I am satisfied that the process and procedures undertaken by Cork County Council have been fair and reasonable, that it has demonstrated the need for the lands and that all of the lands being acquired are both necessary and suitable. I consider that the proposed acquisition of the lands would be in the public interest and the common good and would be consistent with the policies and objectives of the Cork County Development Plan 2014 and the Ballincollig-Carrigaline Municipal District Local Area Plan 2017.

DECISION

CONFIRM the compulsory purchase order for the reasons and considerations set out in Schedule 1 subject to the modifications set out in Schedule 2.

SCHEDULE 1

REASONS AND CONSIDERATIONS

Having considered the objections made to the compulsory purchase order, the report of the persons who conducted the oral hearing into the objections, the purpose of the compulsory purchase order and also having regard to:

- (i) The need to improve connectivity between the local, regional and national road network and with the Tier 1 Port;
- (ii) The reduced congestion on the local, regional and national road network;
- (iii) The community need, public interest served and overall benefits, including benefits to Cork City, the Port of Cork and the Strategic Employment Area of Ringaskiddy, and increased provisions for a range of road users to be achieved from use of the acquired lands;
- (iv) The provisions of the Cork County Development Plan and the Ballincollig to Carrigaline Municipal District Local Area Plan and the policies and objectives stated therein, which specifically identify the proposed road development; and
- (v) The proportionate design response to the identified need,

It is considered that, subject to the modifications to the order as set out in the Schedule below, the acquisition by the local authority of the lands in question, and the extinguishment of public and private rights of way, as set out in the compulsory purchase order and on the deposited maps, are necessary for the purpose stated, and that the objections cannot be sustained having regard to the said necessity.

SCHEDULE 2

The compulsory purchase order shall be modified in accordance with the modifications submitted to the Board at the Oral Hearing on the 1st day of December, 2017 as follows:

- (i) Minor adjustment to CPO line in vicinity of CPO Plot Ref. 105, Ted Neville's property at Carr's Hill Interchange to allow the retention of the boundary between Mr. Neville's property and Douglas Golf Club (Plot 112),
- (ii) Adjustment to CPO line at Shanbally Quarry, CPO Plot Ref. 168, where lands are no longer required for the translocation of Pennyroyal,
- (iii) The inclusion of the following
 - Frances Gordon as reputed owners of Plot 103;
 - The IDA as reputed owners and occupier of Plots 105a.110 and 105a.111;
 - Murnane and O'Shea as reputed owners of Plots 123 and 124;
 - Astra Construction as reputed owners of Plots 144 and 145; and
 - Castleventry as reputed owners of Plot 153.

Reason: To take account of updated information in respect of land ownership and other matters as agreed at the oral hearing.

(ii) Application for Approval of Proposed Road Development

DECISION

APPROVE the above proposed road development in accordance with the said documentation based on the reasons and considerations set out under and subject to the conditions set out below:

REASONS AND CONSIDERATIONS

In coming to its decision, the Board had particular regard to:

- (a) The European, national and regional transport policies including Trans European Networks (TEN-T) and the National Ports Policy;

- (b) The national, regional and local planning policies and objectives, inclusive of those set out in Project Ireland 2040 - encompassing the National Planning Framework and the National Development Plan, in Smarter Travel, the South West Regional Planning Guidelines, Cork County Development Plan, Cork City Development Plan and Ballincollig-Carrigaline Municipal District Local Area Plan.
- (c) The scheme constituting a key strategic transport route connecting Cork City and Region and the national road network via the N40 with the Port and the Strategic Employment Area at Ringaskiddy, which would alleviate traffic congestion and delays, facilitate the economic development of the area, improve road safety for all road users, reduce the traffic impact on the human environment for the communities along the N28 corridor.
- (d) The design, layout and alignment of the proposed development minimising the impact of the development on Cork Harbour SPA (Site Code 004030) and Great Island Channel SAC (Site Code 001058), and
- (e) The range of proposed mitigation measures set out in the submitted Environmental Impact Statement, Natura Impact Statement and Schedule of Commitments.
- (f) The submissions made in relation to the application and the report and recommendation of the Inspector.

Appropriate Assessment

The Board agreed with the screening assessment and conclusion carried out in the Inspector's report that the Cork Harbour Special Protection Area (Site Code 004030) and the Great Island Channel Special Area of Conservation (Site Code 001058) are the European sites for which there is a likelihood of significant effects.

The Board considered the Natura Impact Statement and all other relevant submissions and carried out an appropriate assessment of the implications of the proposed development for European Sites in view of the conservation objectives for the Cork Harbour Special Protection Area (Site Code 004030) and the Great Island Channel Special Area of Conservation (Site Code 001058). The Board considered

that the information before it was adequate to allow the carrying out of an Appropriate Assessment.

In completing the assessment, the Board considered, in particular, the likely direct and indirect impacts arising from the proposed development, both individually or in combination with other plans or projects, the mitigation measures which are included as part of the current proposal and the conservation objectives for the European sites. In completing the Appropriate Assessment, the Board accepted and adopted the Appropriate Assessment carried out in the Inspector's report of the potential effects of the proposed development on the aforementioned European sites, having regard to the sites' conservation objectives. In overall conclusion, the Board was satisfied that the proposed development would not adversely affect the integrity of European Sites in view of the sites' conservation objectives.

Environmental Impact Assessment

The Board completed an environmental impact assessment of the proposed development, under the provisions of EU Directive 2011/92/EU, taking into account:

- (a) The nature, scale, location and extent of the proposed development,
- (b) The Environmental Impact Statement and associated documentation submitted in support of the planning application,
- (c) The submissions made by observers and prescribed bodies in the course of the planning application and the oral hearing,
- (d) The responses from the applicant to the submissions,
- (e) The mitigation measures proposed
- (f) The report, assessment and conclusions of the Inspector.

It considered that this information was adequate in identifying and describing the direct and indirect effects of the proposed road development. The Board completed an environmental impact assessment of the proposed development, by itself in combination with other development in the vicinity, and concluded that subject to the mitigation measures proposed and the conditions set out below, the effects of the

proposed development on the environment would be acceptable. In doing so, the Board adopted the report of the Inspector appointed by the Board.

Proper Planning and Sustainable Development of the Area

It is considered that, subject to compliance with the conditions set out below, the proposed road development would assist in alleviating traffic congestion and delays, facilitate the economic development of the region including the strategic development of the Port of Cork at Ringaskiddy, would improve the human environment for communities along the route and improve road safety for all road users. The proposed development, therefore, would not have significant negative effects on the community in the vicinity, would not give rise to a risk of pollution, would not give rise to detrimental visual or landscape impacts, would not have a detrimental impact on archaeological and architectural heritage, would not seriously injure the amenities of the area or property in the vicinity and would be acceptable in terms of traffic safety and convenience. The proposed development would, therefore, be in accordance with the proper planning and sustainable development of the area.

CONDITIONS

1. The proposals, mitigation measures and commitments set out in the Environmental Impact Statement, and as further stated and clarified in the Schedule of Commitments submitted by the local authority to the Oral Hearing on the 1st day of December 2017, shall be implemented as part of the proposed development.

Reason: In the interest of clarity, to mitigate the environmental effects of the development, and to protect the amenities of properties in the vicinity.

2. In advance of the coming into operation of the proposed development the following traffic related matters shall be addressed:
 - (a) The revised layouts for the following elements of the Scheme shall be implemented in accordance with the details submitted by the local authority to the oral hearing on 28th day of November, 2017.

- (i) Incorporate auxiliary lane on approach to Northbound Diverge as shown on Drawing No. SK5067.
 - (ii) Revised junction layout for Carr's Hill/Maryborough Hill incorporating traffic signals, pedestrian crossings and footpaths, cycle facilities and road markings as shown on drawing submitted.
- (b) The proposed realignment of the L6472 at Shanbally shall be omitted from the Scheme and shall be replaced by an alternative proposal to upgrade Ballyhemiken Road to facilitate HCV deliveries to the ESB substation.
- (c) Ball netting shall be provided along the boundary with Douglas Golf Club lands where it adjoins the proposed two-way link road between Carr's Hill and Maryborough Hill.
- (d) Traffic management measures shall be put in place to achieve the following:-
- (i) Diversion of ferry terminal traffic along L2545 to access the M28 at Ringaskiddy East roundabout.
 - (ii) Traffic calming on Mount Oval Diverge at entrance to estate.

Reason: In the interest of road safety and the amenity of the area.

3. In advance of the coming into operation of the proposed development the following additional noise mitigation measures shall be implemented:

- (a) Noise Barrier AB12 at Maryborough Ridge, as shown on Drawing No. NB002 of the EIS shall be extended by c.1000 metres to the south.
- (b) Noise Barrier AB25 at Shanbally, as shown on Drawing No. NB005 of the EIS shall be extended by c.100 metres to the west.

Reason: in the interests of the residential amenities of the existing and future occupiers of nearby properties.

4. The proposed mitigation measure to erect a steel framed structure to provide for an artificial nest box for Peregrine Falcon south of at Chainage 11250, as provided for in Item 23 of 19.1.8 Schedule of Commitments submitted by the local authority on 1st day of December, 2017, shall be omitted from the Scheme.

Reason: the proposed structure at this location could give rise to conflict with the bird species for which the Cork Harbour SPA has been designated.

5. Bloomfield Woods adjacent to Chainage 220 shall be included in the pre-construction surveys for bat activity and potential roost sites, and should evidence of bat activity or roosts be found, these woods shall be included in the mitigation measures and monitoring programme as outlined in Items 22 and 25 of 19.1.8 Schedule of Commitments submitted by the local authority on 1st day of December 2017.

Reason: in the interests of the protection of any bat species present within these woodlands.

6. In advance of the coming into operation of the proposed development, the following additional landscaping mitigation measures shall be implemented:

- (a) The existing soil wall to the rear of the properties at Newlyn Vale, at Chainage 435, shall be retained and the Extra Heavy Standard trees to be planted at this location shall be planted at existing ground level.
- (b) The wing walls to Structures S8A (Shanbally underpass) and S10 (Old Post Office Road underpass) shall be flared and finished with a textured or patterned finish.
- (c) Retaining walls RW17 and RW18, located to the north of Forrester's Hall and the Grotto at Shanbally Upper, shall be planted with a 1.5m high instant hedge and 4.5m high Extra Heavy Standard trees immediately to the south of the said retaining walls.
- (d) The existing mature tree/hedgerow on the roadside immediately to

the south of 'Martello', Old Post Office Road, Ringaskiddy, shall be retained if possible. Should it be necessary to fell this tree, a replacement tree shall be planted at extra heavy standard (4.5m height) in the next planting season following the coming into operation of the Scheme.

Reason: In the interests of the visual and residential amenities of the area.

Mary Kennelly
Senior Planning Inspector
31st May 2018

APPENDIX 1

SUMMARY OF OBSERVATIONS

Approximately 124 submissions/observations have been submitted in respect of the application for approval of the proposed road scheme and services area and the Compulsory Purchase Order from a combination of individuals, community groups and elected representatives. Many of the elected representatives also made submissions at the oral hearing. 50 submissions related specifically to objections to the Compulsory Purchase Order. A list of all observers to the proposed project is set out below in Part 1 of this Appendix. A list of all objectors to the CPO, outstanding at the time of the completion of this report, is set out in Part 2 of this Appendix.

It is evident from the submission made that there is considerable overlap in terms of the issues raised in relation to the proposed project. In order to avoid undue repetition, the issues are summarised below under individual topics for the information of the Board (Part 3 of this Appendix). Where site specific issues arise regarding individual land parcels, properties etc. these are documented as appropriate.

Part 1

List of Observers to Project HA0053

1. Ringaskiddy Residents Association, Vivian Prout
2. M28 Steering Group, Ger Harrington & Frances Murphy
3. Lisadell Residents Association, Maryborough
4. Maryborough Residents Association, George Ryan
5. Upper Kensington Residents Association, Clarke's Hill, Rochestown
6. Lucy Mc Grath, Bloomfield, Rochestown (Bloomfield Residents Association)
7. Rochestown Rise Residents Association, John Hayes
8. Wainsfort Residents Association (Gina O'Brien)
9. Douglas Golf Club, Maryborough Hill
10. Rodney Daunt
11. Dr. Jo Goodyear & Others
12. Cork Nature Network
13. Attracta Úi Bhroin, An Claíomh Glas
14. Cork Environmental Forum
15. A.M. O'Sullivan on behalf of 9 no. multi-national & indigenous companies
16. Cork Chamber of Commerce
17. Janssen Sciences Ireland
18. Shannon Foynes Port Co., (Christy O'Sullivan ILTP)
19. Biopharma Chem Ireland, Matt Moran
20. American Chamber of Commerce
21. Jim Roynane, 'Martello', Old Post Office Road, Ringaskiddy
22. Mary Jordan, Suaimhneas, Barnahely, Ringaskiddy
23. Peter & Patricia Walter, Ringaskiddy
24. Frances Gordon, Bloomfield, Rochestown
25. Adrian & Nuala Culligan, 18 Newlyn Vale, Rochestown
26. John Treacy & Others, Rochestown Rise, Rochestown
27. Pdraig & Marian Ó'Drisceoil, 33 Wainsfort, Rochestown
28. Tom Treacy, 4 Wainsfort, Rochestown
29. Elaine Davis & Hilary Kennedy, Passage West
30. Pamela & Daragh Byrne, 39 Wainsfort, Rochestown
31. Margaret Mary O'Neill, Shannonpark

32. Marguerite Gleeson, 30 Rowan Hill, Mount Oval, Rochestown
33. Nerijus Lemunas & Gierdre Simkute-Lemone, 39 Rowan Hill, Mount Oval
34. Patrick Twomey, John Twomey & Others, Shanbally
35. Andrew Mangan, 23 New Lyn Vale, Rochestown
36. Donagh Long & Lorna Quigley, 60 Lime Trees Road East, Douglas
37. John Linehan, 45 Rowan Hill, Mount Oval
38. Margaret McGrath Fitzgerald & Declan Fitzgerald, Bloomfield, Rochestown
39. Sylvester Cotter, Hill House, Rochestown
40. Sean Forde & Others, Ringaskiddy
41. Paul Brohan & Dr. Mary C. Murphy, Gurteen, Coach Hill, Rochestown
42. Miriam & Neil Collins, Rock Hall, Rochestown Road
43. Lisa & Luc Roset, Sinead O' Mahony & Others, Bloomfield, Ringaskiddy
44. Kevin Hanley & Others, Rafeen Bridge, Monkstown
45. Declan Carey & Maeve Noonan, Maryborough Ridge
46. Dan & Nora Cullinane, 41 Rowan Hill, Mount Oval
47. Ray Cawley & Others, Rowan Hill, Mount Oval
48. Brian & Frances Murphy, 13 Maryborough Heights, Lisadell
49. John Brady, Marian Terrace, Shanbally
50. Rowan Hill Residents Association, John Manley
51. Sheehan, 38 Newlyn Vale, Rochestown
52. Donal Brady, Shanbally
53. Richard & Katrina O'Flaherty, Sunview, Loughbeg, Ringaskiddy
54. Richard & Valerie McCarthy, Thornberry, Loughbeg, Ringaskiddy
55. Ronan & Kett, 1 Wainsfort, Rochestown
56. Ciara Cullen, 23 Mount Ovel, Rochestown
57. Gertie O'Driscoll, Old Post Office Rd, Ringaskiddy
58. Conor & Sinead Hanlon, Old Post Office Rd, Ringaskiddy
59. Mary O'Sullivan, 26, Mount Ovel, Rochestown
60. Evonne Lester, Riverdale House, Old Post Office Lane, Ringaskiddy
61. Pauline & Catherine O'Connell, Elizabeth & Catherine O'Connell, 49 Wainsfort
62. Michael V. Barry & Others, Barlyn, Ringaskiddy
63. Claire & Michale Whooley, 12 Maryborough Heights, Lisadell
64. John Lynch, Breffni, Belmont, Rochestown

65. Deborah Griffin, Shannonpark
66. Mary Reynolds, 40 Wainsfort, Rochestown
67. Keith Burke & Deirdre Ennis, 50 Rochestown Rise
68. Conor Collins, Rock Hall, Rochestown Rise
69. Liam & Clodagh McGowan, 21 The Downs, Broadale, Douglas
70. Senator Jerry Buttimer & Cllr Deirdre Ford
71. Cllr. Marcia D'Alton
72. Micheal Martin T.D. & Cllr Mary Rose Desmond
73. Michael Mc Grath T.D. & Cllr Seamus Mc Grath
74. Donnchadh O' Laoghaire T.D. & Cllr M. Murphy, Cllr. E Jeffers
75. Simon Coveney T.D. (oral submission only)

Part 2

List of objectors to CPO, outstanding at time of completion of report (MA0014)

1. O'Flynn Construction, (MHL), Plot 101
2. Diamond Developments (Martin & Rea), Plot 102
3. Margaret Fitzgerald & Others, (FBA), Plot 103, 104
4. Nicholas Douglas, Plot 108
5. Robin & Adeline Douglas, Plot 109
6. Barbara & Paul Kelleher, Plot 111
7. Douglas Golf Club, Plot 112
8. Ted Neville, Plot 112
9. Anne O'Dea, Plot 112, 113
10. Elizabeth O'Connell, Plot 115
11. Maryborough Ridge, RSM Ireland, (McCutcheon Halley), Plot 119
12. Murnane & O'Shea, Plot 124
13. Samuel E. Vickery, Rosie Vickery & Others, (Martin & Rea), Plot 127
14. Estate of Mary Cogan, Plot 144
15. Estate of Bartholomew Cooney, (McCutcheon Halley, FBA), Plot 146
16. Janssen, Plot 151
17. Carrigaline AFC, Plot 155
18. John Joseph Twomey, (FBA), Plot 157
19. Patrick Twomey, (FBA), Plot 158
20. Daniel Brady, Plot 159
21. Aine O'Mahony, (FBA), Plot 161
22. Daniel O'Connell, Plot 162
23. Sharon Rogers, (FBA), Plot 163
24. Paul & Victoria O'Sullivan, (FBA), Plot 165
25. Eugene O'Brien, (Cunnane Stratton Reynolds), Plot 168
26. Kathleen Bowen, (Ristead O'Lionaird), Plot 202
27. Brendan Roynane, Plot 203
28. Elizabeth & Kevin O'Grady, (Coakley Moloney solr), Plot 204
29. Fastnet Recycling (MHL and Martin & Rea), Plot 209

30. Teresa Leahy, Shannon park, Plot 132.

SUMMARY OF OBSERVATIONS MADE

1. Summary of Issues raised regarding Need for Development

9. Cork Region is a key driver of the national economy and Ringaskiddy is designated as a Strategic Employment Area within the region. It has a significant cluster of Pharmas, IDA strategic sites, deep water port facilities and maritime research facilities. However, the existing infrastructure linking Ringaskiddy with the city, region and the national road network is hampered by daily traffic congestion and delays. The principle of the road project is, therefore, generally supported and the benefits to the economy, city and region are acknowledged.
10. Notwithstanding the acknowledgement of the need for the upgrade of the existing N28, there is substantial objection to the route as currently proposed.
11. The Strategic objectives contained in the South West Regional plans, the City and County Development Plans and Local Area Plans are fully supportive of the need for the upgrade of the N28. In addition, provision of a motorway linking Ringaskiddy with Cork City and the national road network is supported in the National Ports Policy and by the TEN-T.
12. The existing infrastructure deficit and daily traffic congestion are having a negative impact on the quality of life of residents and on the economy of the region, including tourism, maritime interests and the strategic employment area.
13. The upgrade of the N28 is crucial for the industrial development of the area. Existing levels of traffic congestion are hindering the potential for future jobs growth and Foreign Direct Investment in Ringaskiddy. Indecon carried out an economic assessment of the proposed route currently under consideration and assessed the cost of non-completion as €22 billion in terms of lost investment.
14. Collectively, Ringaskiddy provides employment for 5,000 employees with an annual salary spend of €388 million. Ringaskiddy also accommodates

20% of the Pharma/life sciences industry in the country. However, there is currently a significant skills shortage and difficulty is being encountered in attracting the most skilled and experienced personnel. There is substantial competition globally for such staff and the current infrastructure deficit is having a negative impact on the ability to compete. Thus the upgrade is a catalyst for further investment in the sector as well as the maintenance of the existing level of investment.

15. The delivery of improved infrastructure in a timely manner is of critical importance at present with the uncertainty arising from Brexit and the economic and political environment in the USA.
16. The Port of Cork is designated as a Tier 1 Port, which is a port of national significance. The port plays a significant role in the wider development of the region but is lacking in appropriate connectivity and infrastructure. It is necessary to maximise the redevelopment of Ringaskiddy as a Tier 1 port.
17. The Board granted permission under PA0035 for the expansion of Ringaskiddy port which would facilitate the relocation of the port activities from Cork City to Ringaskiddy in three phases. However, Phase 3, (the Roll-on Roll-off element), is not permitted to be relocated until the N28 is upgraded and the Dunkettle Interchange upgrade is complete. Thus there is a need to upgrade the N28 to facilitate the transfer of port activities out of the city and to concentrate all port related activities in one location.
18. The transfer of the port to Ringaskiddy will facilitate the redevelopment of the City Quays and the Tivoli docks for more appropriate and sustainable development, including residential development.
19. The relocation of port activities will result in a significant reduction in port related and HGV traffic travelling through the city centre, with associated environmental improvements for the city.
20. The relocation of the Port of Cork is not dependent on the upgrade of the N28 as the relocation can proceed without Phase 3. The Ro-Ro terminal is the only element that cannot be moved.
21. The need for a motorway as opposed to a dual carriageway is not accepted. TEN-t requires a high quality link to a Tier 1 port in the form of a motorway/expressway, but this does not mean it has to be a motorway between Bloomfield and Carr's Hill. It is disputed that TEN-T policy

supports the need for the development as proposed, as it does not include a rail or an air connection.

22. The proposed M28 is an unsustainable form of development and will increase car dependency and reinforce the unsustainable pattern of development in the area. Traffic congestion and associated GHG emissions will increase, yet the council has done nothing to address this issue or to improve public transport.
23. Car dependence in the southern suburbs is very high, and Carrigaline is the most car-dependent town in Ireland. The M28 proposal will increase this trend, as it is a well-established fact that road traffic volumes expand to fill the available capacity. Thus it is misguided to invest large sums of money in overly engineered road solutions in suburban areas and to fail to invest adequately in public transport. Increasing road capacity here will exacerbate urban sprawl and will not alleviate traffic congestion.

2. Summary of Issues raised regarding Legal/Procedural matters

10. SEA Directive – application fails to demonstrate that the proposal is based on an adequately assessed land use strategy which has been through the SEA process, such as the National Port Strategy and a Transport Strategy which addresses both road and rail strategies. There is a lack of alignment with other policies on health, climate change, transport and River Basin Management which would be addressed as part of an SEA.
11. New EIA Directive - EIA/2014/52/EU became effective on 16th May 2017, yet the notices for the application were published on that date. However, the application fails to comply with the requirements of this Directive as there is no Health Impact Assessment. Evidence must be provided that it was submitted before the deadline. It is also questioned whether the application should be considered under the new Directive given the deficit in any prior determination made under the Road's Act.
12. Screening for EIA – inadequate access to public participation in the screening process must be addressed following the decision in the CJEU case C-243/15, (Lesoochranské Zoskupenie VLK, Slovak Bear Case). The Grand Chamber found that Article 47 of the Charter of Fundamental Rights, when read together with the Aarhus Convention, precluded the application of national procedural rules allowing for swift decision making at the expense of rights granted to environmental NGOs.
13. Project splitting – the Board's decision (PA0035) tied the port expansion into the upgrade of the N28 WITOUT requiring the necessary links to the airport and the rail network. This is a questionable process and constitutes 'project splitting' as the road is part of the port project. This decision did not adequately consider impacts on the Mulcon Valley, as otherwise, the airport route would have been considered as a serious alternative in the current proposal.

14. Deficiencies in the EIS – The EIS is deficient in respect of

- Inadequate assessment of alternatives.
- Failure to address climate change. There are obligations under Section 15 of the climate change and Low Carbon Development Act 2015, which must be complied with.
- Failure to address species protected under Annex IV of the Habitats Directive, Otters. Surveys must be carried out in advance of consent.
- Failure to consider cumulative impacts in respect of air quality issues.
- No mention of invasive species.

15. Deficiencies in NIS – the conclusions are irrational and fail to acknowledge the importance of and intermittent usage of over-wintering sites for wild birds. The conclusion “no adverse impacts on site’s integrity” is unsound and unjustified and does not meet the requirement of scientific certainty. Art. 4 of the Bird’s Directive – importance of over-wintering provisions is fundamental to the ecological requirements of migrating birds.

3. Summary of Issues raised regarding Public Consultation

1. There has been insufficient early and meaningful public consultation regarding the project which is currently before the Board. Prior to 2008, all public consultation related to upgrading the route between Carr's Hill and Ringaskiddy. It was not until after the board's decision to grant permission for the port expansion (PA0035) that a proposal for a motorway emerged, which included the widening of the section between Bloomfield and Carr's Hill Interchanges.
2. The N28 upgrade Constraints Study was publicised in 2002, followed by the Emerging Route Corridor in 2003-2007. Following public consultation, an amended Emerging Preferred Route Corridor was published in 2008. This had the broad support of the communities along the route. However, the project went into abeyance with the onset of the recession and it was not until December 2014 that a revised route was presented at Carrigaline Court Hotel. However, the residents of Douglas and Rochestown were not consulted until November 2015.
3. The presentation of the scheme at Maryborough Hotel on 9/11/15 was as a 'Fait Accompli'. 600 people were present and 500 submissions were made in response. The M28 Steering Group sought consideration of an alternative route but were informed that it was too late. Thus the residents of Douglas and Rochestown were never adequately consulted. There has been a complete failure to meet the requirements of EIA 2014/52/EU.
4. The public consultation merely consisted of public displays with no opportunity to discuss the concerns of the residents with the project engineers.
5. There was no/insufficient notification or signage advertising the public consultation.

4. Summary of Issues raised regarding Alternatives

12. EIS inadequate - The alternatives examined in the EIS represent a minimalist approach, which is totally inadequate. A robust case for the chosen route has not been adequately demonstrated. The M28 may be the most convenient, but it is not the most sustainable. The best alternative would be to upgrade the existing road with small improvements which would result in considerably less harm to the human and physical environments.
13. TEN-T requirements – The Trans European Network -Transport policy requires a high quality link to a Tier 1 Port in the form of a motorway or expressway, but it does not specify that it has to be a motorway. The objectives to relocate the port and reduce congestion and delays could be achieved by means of a dual carriageway and a N28 upgrade between Bloomfield and Carr's Hill, together with the Dunkettle upgrade. The TEN-T requirements are not met by the current proposal in respect of the provision of a link to an airport or a rail link. The potential to provide air connectivity is not explored. Marino Point is linked by rail, but could only accommodate Phase 2 of the port expansion. The capital investment required to link Ringaskiddy by rail would be prohibitive. Thus all port activities are concentrated in Ringaskiddy at the expense of the environment and human health. These alternatives were never properly explored.
14. Orbital route - A holistic approach is needed. The EIS ignores the opportunity to provide for an orbital route linking the N40, the northern parts of the city, the N20 Cork-Limerick road, and the M28 at Upper Glanmire. The option of an Airport Orbital route is now more realistic as the Government has approved funding for the M20 upgrade and Cork City Co. is currently reviewing the Northern Ring Road. This would require an upgrade of Kinsale Road junction, where it would intersect the 'Orbital Route'.
15. The EIS is not future-proofed - as there would still be just one lane through Bloomfield interchange and inadequate attention has been paid to more

sustainable options including Park and Ride for Ringaskiddy Strategic Employment Area, cycling etc. in addition, the health impacts of the chosen route have been disregarded. The fact that the 'Do Minimum' Scenario would result in an increase in traffic on the existing N28 is insufficient justification for the choice of route, as the N28 could still serve Carrigaline and the HGVs could be re-routed elsewhere.

16. Dual carriageway – this option was not adequately considered. The route should be Dual Carraigeway all the way from Bloomfield to Ringaskiddy.
17. Motorway through dense residential area - The alternatives explored do not taken into account the disproportionate effect of the proposed development on the Rochestown/Douglas area. There is substantial objection to the driving a motorway through a densely populated area, when other alternatives exist. The Mulcon Valley would see increased traffic volumes through an inclined valley which is flanked by densely populated residential areas. The AADT in this area will increase by 60% by 2035 (Table 5.29 of EIS). It is therefore clear that the 'Do Minimum' in this case is better than the 'Do Something'.
18. Alternative modes of transport - Insufficient attention paid to alternative modes of transport. Given the high car dependency in the area this is unacceptable. There is a need for a comprehensive strategy which is costed, with a committed budget, to address the high levels of car dependency. If the modal choice is provided, then an effective alternative would exist. Thus the EIS is deficient in respect of consideration of alternatives.
19. Bloomfield Interchange – Bloomfield Bridge is a significant constraint but it is wide enough to accommodate 2 lanes of traffic in each direction, as it is 20.17m wide. This would increase its capacity. However, this was not considered as an alternative option. A further alternative would be to widen the Southbound lane for a short distance and the additional space gained could be used to avoid the need to provide the additional N-bound lane at the back of Newlyn Vale.
20. Downstream Bridge crossing – this alternative has not been considered. This crossing (near Jacob's Island) would facilitate port traffic accessing

the national road network without the need to traverse the road network in the vicinity of the city or residential areas.

21. Rafeen Quarry– the option which brought the road through the Fernhill golf course instead of Rafeen Quarry (2008 route) is a much better option as it created a buffer and landscaped berm for the residents in the vicinity. The current route is approx. 75m from the closest residential property and necessitates a massive void to be filled within the quarry which would be very expensive. It would also result in a significant loss of biodiversity. A Cost Benefit Analysis has not been carried out of other options which would involve less environmentally destructive and simpler engineering solutions.
22. Loss of amenity lands at Fernhill golf course - There has been a change in circumstances recently in that the golf course has been rezoned residential and is up for sale. Surely this warrants a revision of the route corridor to avoid the quarry? The rezoning undermines the justification argument that routing the M28 through the golf course would result in a loss of amenity lands. Furthermore, the proposed route results in the loss of a football pitch at Carrigaline AFC which is inconsistent with the objective to preserve amenity lands.
23. Ringaskiddy – the Loughbeg option (2008 Route) is the only appropriate solution for the village and this was abandoned without sufficient justification. The proposed route from Barnahely to Ringaskiddy East further isolates the village from the port and cuts the community in half. It would result in environmental damage due to the significant increase in the number of trucks which would encircle the village and would use the R613 with its steep gradient. The current route also results in the loss of a designated school site and the replacement proposal is unacceptable. Furthermore, the proposed route would erode the green belt which is designed to act as a buffer zone between the village and the industrial lands to the south.

5. Summary of Issues raised regarding Strategic Traffic matters

1. The pattern of development in the area is unsustainable as the Ringaskiddy Strategic Employment Area is located at the end of a cul-de-sac and Carrigaline is the most car-dependent town in Ireland. The relocation of the port to Ringaskiddy will increase employment further which will exacerbate traffic congestion in the area.
2. The need to designate the road as a motorway is questioned, rather than as a dual carriageway. It would be less costly and less environmentally destructive, yet it would deliver the same benefits and there would be less design constraints, leading to simpler engineering solutions.
3. The chosen route is the wrong choice due to the impact on the human environment. Need to facilitate improved linkage to other strategic routes e.g. Limerick, Dublin, Waterford without reliance on the Jack Lynch Tunnel.
4. The presentation of the proposed N28 upgrade as part of the TEN-T network elevates it from a mere upgrade to a port-oriented infrastructure but TEN-T has wider objectives than that. Seaports are required to offer rail connection by 2030 and airports should be connected by rail and road to seaports.
5. Bloomfield Interchange is a major constraint as it is just one lane in each direction. However, as the bridge traverses an SAC, it cannot be upgraded without significant adverse impacts on ecology. The alterations in the vicinity of Bloomfield give the impression of an upgrade, but in reality, it is just separating local and strategic traffic, and at huge expense to the environment and to human health.
6. Although the Board decision on PA0035 (Port expansion) identifies the Bloomfield Interchange as a critical element in the network, there are no proposals to upgrade it. 85% of Port Traffic from Ringaskiddy will travel through Dunkettle and Bloomfield to access the N8, N25, N20 and N40, but there is no capacity at Bloomfield to accommodate this level of traffic. The congestion at this interchange is caused by strategic, not local, traffic due to the bottlenecks at Dunkettle and the Jack Lynch Tunnel.
7. The M28 is designed to facilitate strategic traffic but fails to take account of commuter generated congestion, together with inherent constraints on the capacity within the system. As all North-bound traffic will converge on Bloomfield, the only way to control the traffic volume is to ensure that freight traffic retains priority, which means tolling. However, if the road is tolled, then

toll avoidance will undermine the credibility of the traffic modelling as commuter traffic will be effectively restricted from the M28.

8. N40 Demand Management Study seeks to maintain capacity as traffic volumes grow. Although not yet published, it is noted that one option proposed in this study is to toll the N40 in order to preserve the strategic capacity of the network. Although this may be the quickest and cheapest way to reduce traffic on the N40, it is likely to drive commuter traffic onto the local network which is already operating over capacity. Thus it would preserve the capacity of Bloomfield Interchange, but at the expense of the local community.
9. Car dependence in the southern suburbs is very high and the M28 will increase the trend. Road traffic volumes expand to fill the available capacity. It is therefore misguided to invest large sums of money in overly engineered road solutions in suburban areas and not to invest in public transport to reduce car dependency. Increasing road capacity here will increase urban sprawl and will not alleviate traffic congestion as experienced globally.

6. Summary of Issues raised regarding Traffic Modelling and congestion matters

7. Modelling flawed - The traffic modelling is flawed because it fails to address the knock on effects on the local road network and incorrect base statistics are used. AADT predictions have already been exceeded. The percentage of port traffic has also been underestimated. Traffic counts for other schemes have been relied on, many of which were undertaken during the recession.
8. Existing traffic congestion not addressed - It is unacceptable that the proposed development will not address existing traffic congestion problems on the network. The impact of the proposed development on the local network has been poorly considered. The findings of the model are not accepted in that the “As Is” is completely out of step with the existing as experienced by local residents.
9. HGV traffic - Port expansion will result in 4,000 extra HGVs per day. Over 10 years, the AADT will increase from 25,000 to 38,000. 6,500 HGVs per day means that there would be 6 per minute over 18 hours a day. As speed limits at present between Bloomfield and Rochestown Road are ignored, it will be essential to have speed cameras and live vehicle advisory signage to slow trucks down on approach to Bloomfield.
10. Traffic micro-modelling – the traffic modelling needs to be underpinned by micro modelling and data on queue length and degree of saturation statistics.
11. Closure of Douglas off-ramp – Plans by the County Council to close the Douglas East off ramp from the N40 must be included in the traffic modelling. This would have a devastating effect on the traffic in the Douglas area. Rochestown Road will not see any reduction in traffic as the closure of the exit will not allow traffic through the village in the future. Thus traffic will exit at Rochestown Road and double back to the Fingerpost Roundabout in order to access Douglas village. This will put even more pressure on Rochestown Road and will undermine the credibility of the model.

12. Traffic congestion on Rochestown Road (R610) will be exacerbated – the R610 will become an orbital route, especially during construction. At present all commuter traffic from Monkstown, Passage West, Upper Rochestown, Coach Hill and Mount Oval use the R610 to access Douglas, the city centre and the N40. The queues from Rochestown Road onto the N28 will not be addressed because there is only one lane from the East, which means that HGVs will have to queue to merge with the N40. The signalisation of Rochestown Road will create traffic gridlock and absolute chaos. Similarly, the replacement of the Fingerpost roundabout with traffic signals will create traffic chaos.
13. Clarke's Hill – The junction of Clarke's Hill with Rochestown Road currently operates on a gentleman's agreement, with one car at a time. The introduction of traffic lights at this junction will result in queues in all directions and will exacerbate existing congestion. When the N28 was permitted, constraints at Clarke's Hill were never addressed. Mount Oval is used as a distributor road for through traffic and this will be exacerbated by the changes.
14. Coach Hill – The L2472 (Coach Hill) links a number of large housing estates with Rochestown Road, yet it is only mentioned 3 times in the EIS. It is used as a rat run. The predicted increase in traffic volumes on this road is staggering, with an increase in AADT of 34.9%. Coach Hill cannot cope with this volume of traffic as it is narrow and steep and the bus route reduces it to one lane. There are no pedestrian facilities on this road and it needs a safety assessment. The proposed alterations to the Clarke's Hill junction will result in Coach Hill being used as a rat run even more so than at present.
15. Maryborough Estate – This estate is located between Rochestown Road and Maryborough Hill. Since the Kinsale Road Flyover and Mahon Point were completed, the estate has been experiencing significant rat running through the residential streets. The residents are concerned that the proposed M28 will result in an exacerbation of the existing situation due to the significant increase in congestion that is likely to be experienced on the local road network.

16. Maryborough Hill – suffers from serious congestion at peak times. This is likely to get significantly worse following the proposed introduction of the 2 way slip road, as the priority will be given to northbound traffic and traffic turning onto the proposed slip road leading to the M28 will result in queues and delays in both directions along Maryborough Hill. Additional development will use Maryborough Hill due to the Carr's Hill junction design, the additional development in the pipeline at Maryborough Ridge and at Castletreasure, the proposals to signalise the Fingerpost and the proposed alterations to the Douglas East Exit (N40). The cumulative effect will be increased rat-running and traffic flow on Maryborough Hill.
17. Closure of the Maryborough on-ramp to the N28 – this on-ramp is very convenient and provides access for residents of the area to the city, to the N40 (east and west) and to the N8, Dublin Road. It also serves as an alternative to the local road network, which will now experience even further congestion following its closure. It will result in significantly increased journey times. The safety issues raised regarding the existing ramp are not accepted.
18. Carr's Hill junction – this junction and associated slip roads will require vehicles to travel in the opposite direction and the need to queue, (with a low priority), in order to get back onto Maryborough Hill. It is unrealistic that traffic would stay on the M28 to Carr's Hill instead of exiting at Rochestown Road.
19. Cumulative impact on Maryborough Hill - additional housing developments in the vicinity at Shannonpark (800), Crosshaven (200) and west of Carrigaline (school and 500), together with the proposed new bridge and road linking Donnybrook and Grange with Carrigaline Road (R609) will combine to create significant additional pressure on both R609 and on Maryborough Hill. Traffic from Carrigaline and Ringaskiddy travelling towards Douglas will continue to have priority over Maryborough Hill residents.

7. Summary of Issues raised regarding Traffic Design matters

1. Additional Northbound lane – The existing pattern of weaving between lanes will not be resolved, yet the design of the proposed additional lane will result in such significantly adverse impacts on the residential amenities of the properties in the vicinity. It will 'sit' on the rear garden walls of at least 7 no. houses at Newlyn Vale and will be brooding and overwhelming presence. It will result in major concerns regarding noise, air pollution, visual impact, property values and health and safety matters in the event of an accident. It will destroy the wooded oasis of the Mulcon Valley which provides a substantial buffer between the N28 and the housing estates of Lisadell and Rochestown Rise.
2. Safety and Legibility of the upgraded Rochestown junction – The non-standard layout of the junction with the existing N28 on-ramp and the new North-bound lane means that traffic entering the roadway at Rochestown will do so between two lanes of fast moving traffic. This will result in traffic travelling at variable speeds in addition to the need to weave across lanes. Traffic coming on will be at 60kph, traffic travelling towards Bloomfield will have to slow down to 60 kph (to navigate the bend) and traffic on the west-bound and east-bound M28 will be travelling at 100kph. There is a conflict between fast and slow lanes as HGVs are obliged to use the left (slow) lane, which will cause confusion. It is essential that the traffic is calmed and that speed is controlled at this location.
3. Widening of off-ramp at Rochestown – The proposal to widen the off-ramp will result is the road coming very close to properties at Bloomfield, the destruction of the woodland at this location and the introduction of a huge retaining wall (3m high) alongside St. Patrick's Church, which would be an eyesore.
4. Signalising of off ramp at Rochestown – this junction is hugely complicated as large volumes of traffic are coming from different directions at variable speeds and signalising would result in queues on the N28 itself. An alternative to signalising the off-ramp would be to slow traffic down as it approaches the junction from the west (Douglas) to allow traffic exiting the N28 to join the R610 more easily and safely.

5. Signalising Rochestown Road – The existing 3 sets of traffic lights would be replaced by 9 sets which would be ineffective and counter-productive. The westbound approach along Rochestown Road currently results in bottlenecks at the junction of the R610 and Clarke’s Hill, which would undoubtedly get worse with queuing all the way back to Coach Hill junction and beyond.
6. Fingerpost roundabout – the proposals to replace this with a signalised junction would result in the loss of an iconic element of the character of Douglas, against which there is strong and widespread objection. Its removal would be counterproductive resulting in longer queues and gridlock in Douglas.
7. Mount Oval diverge – the redesign of this discrete exit ramp from the N28 as an exit ramp to motorway standards will result in substantial adverse environmental impacts at Rowan Hill. It will necessitate a substantial cutting into the existing hillside, which serves as an amenity area, bring the motorway very close to existing house (with associated noise barriers) and the significant loss of mature trees and woodland. A 3m high wall would be constructed within 4m of the houses on Rowan Hill. The exit ramp would also attract heavy traffic flow through Mount Oval Village, to the detriment of the amenity and environment.
8. Maryborough Hill overbridge – the substantial structure that would replace the existing overbridge would require enormous retaining walls and its additional width would encourage speeding.
9. Maryborough Hill Priority Junction – traffic safety and pedestrian safety have not been adequately addressed at this junction of the new 2-way slip road with Maryborough Hill. A priority junction and ghost island are more suited to a rural location. Accidents and restricted sightlines are likely to result for right-turning vehicles due to the design and location of the flyover, cycle lanes, pedestrian movements etc. A roundabout junction would be much better and safer. However, at the very least, proper provision for safe pedestrian movement must be made at this location and along Maryborough Hill, where there is currently a lack of continuous footpaths. This situation will be exacerbated by a combination of the

proposed road scheme and the new development being constructed and planned at Maryborough Ridge.

10. Emergency layby – the decision to include an emergency layby and retaining wall in close proximity to existing dwellings is of serious concern to the residents of Maryborough Hill. This would be 580m long and would have vertical retaining walls to a height of 3-8m. given the hazardous nature of the freight coming from Ringaskiddy, this would result in an extreme hazard in the event of an accident.
11. Carr's Hill junction – the design of the junction would result in too great a land take from the planned development at Maryborough Ridge and the road would be too close to the existing houses at this location. The proposed sound barriers would be just 7.5m from some of the houses. The inner lane radius is too narrow (as shown on Drg. GA0105) and there is no guarantee that the HGVs would not use this slip road. Queuing and hesitant traffic at this junction could lead to an accident and is also likely to result in traffic diverting to the Rochestown road on/off ramp instead to avoid delays.
12. Shanbally interchange – this junction is designed to incorporate an existing private IDA road linking the N28 with Janssen premises. This will result in security issues for Janssen, who currently benefit from the presence of a security gate at the N28 entrance to the road. This needs to be addressed. Janssen is also concerned regarding the likelihood of overspill parking on the R613 near the entrance to Janssen as a result on the proposed development.
13. The proposed link from Shanbally to Cogans Road – there is much opposition to the proposed new link road from the L2492 at Shanbally westwards to meet the L6472 mainly on health and safety and road safety grounds.
14. Ringaskiddy – the proposed route will result in significant increase in traffic and HGVs on a 24 hour basis which will be directly behind existing dwellings and will erode the green space and buffer zone with industry.
15. Geometric Design at junctions – it is disputed that the design of the slip roads, roundabouts and junctions are in accordance with the TII Geometric Design Guidance.

8. Summary of Issues raised regarding Health Impacts, General Amenity and Sustainable Development matters

1. EIS inadequate no assessment of quality of life - EIS assesses socio-economic impacts, but not the quality of life impacts in a scientific and meaningful way. WHO guidance states that long term exposure to noise and air pollutants shorten life expectancy. Noise exposure over 55dB can trigger heart attacks and high blood pressure. For a good night's sleep, it is necessary to have continuous background noise levels of less than 30dB.
2. Health Impacts general - increased noise results in health impacts and sleep deprivation, as well as mental health problems, tinnitus and stress. The increase in HGV levels is likely to increase noise levels significantly, which will be exacerbated by the increase in elevational changes to the road. Higher speed, noise and air pollution will result from traffic calming at northern end. People are exhausted and stressed from having to put up with excessive noise levels all day and night.
3. Dementia – research indicates that people living within 50m of a major road have a 7% higher risk of developing dementia.
4. Amenity value Mulcon Valley - The existing woodlands are highly valued and a much used natural; amenity with centuries old woodland. The proposed scheme will remove much of the woodlands and the current screening of family homes provided by the trees, which also assist in mitigating against pollution and noxious emissions from the road.
5. Destruction of woodlands is unacceptable with the loss of amenity and recreational spaces combined with the increased exposure to noise, air pollution and visual impact.
6. Bloomfield woods amenity values – this is a high quality woodland which has a high ecological and recreational value. It provides a much needed buffer from the road.
7. Impact on natural environment – there is an appalling lack of regard for green spaces and trees which provides a vital function for the environment. The proposal will double the pollutants and quadruple the noise and will also remove the beautiful natural environment of the Mulcon Valley.

8. Green belt in Ringaskiddy – the road cuts through the green belt in Ringaskiddy which is designed to provide an essential buffer zone between the existing industrial uses to the south. It is wholly unacceptable that the village, which has had to put up with so much in the past, would lose its green space which shields it from the industrial lands.
9. Impact on residential properties adjoining the new Northbound lane – the proposed additional northbound lane would have an overwhelming impact and brooding presence on the properties at Newlyn Vale, Wainsfort, Rochestown Rise and Lisadell which directly adjoin the proposed new roadway. The existing buffer of trees of 50m plus would be lost which would have a detrimental impact on residential amenity on a 24-hour basis, 7 days a week.
10. Unsustainable development – the County Council has done nothing to counteract the fact that the proposed development would be an unsustainable form of development, as it will increase car dependency and reinforce the unsustainable pattern of development in the area, thereby increasing traffic congestion and associated GHG emissions.
11. Proximity of embankments – the proximity of embankments and noise barriers would result in a loss of light and outlook for many properties along the route.
12. Devaluation of properties – the proposed development will devalue properties along the route.
13. Construction phase – inadequate assurances regarding mitigation of noise and dust during construction and risk of subsidence. Cannot accept that there will not be an impact on water quality of streams, rivers and the SPA as a result of construction works. Access to Bloomfield properties during construction must be maintained. Reassurance is also sought that Bloomfield will not be used as a construction compound.
14. Construction noise and night-time working – TII do not provide guidance for night-time working during construction, this is unacceptable particularly regarding elements of the project such as Maryborough Hill overbridge reconstruction, which will involve weekend and night working. TII will therefore be at liberty to work with no controls over hours or noise levels in order to meet project deadlines.

15. Lack of consultation on construction noise – as TII has not yet engaged with residents regarding noise control during construction, how can residents have confidence that they will be consulted about the massive impact these noise levels will have on their quality of life? Residents of Maryborough Hill had to endure severe disruption during construction of the N28 in early 1990s with construction work day and night, disruption to access etc., yet they are now expected to endure it once more.
16. Construction noise levels too high – the noise levels proposed are more than double or treble what is acceptable by EU and EPA guidelines (Table 14.12). there is no faith in the additional screening of the piling machine at Maryborough Hill.
17. Vibration levels during construction – vibration levels will have to be monitored during construction to ensure that there will be no cosmetic or structural damage to properties adjacent to the route, as well as the structural integrity and comfort of properties.
18. Impact from construction of northbound diverge lane – the impact from the construction of this new lane, which will involve splitting the existing N28 into two roads and the building of a new flyover over Rochestown Road, will involve the reconfiguring of the whole area. It is questioned how this can be achieved without demolishing the houses backing onto the road at Newlyn Vale. The distance from the gable wall of the closest house to St. Patrick's Church is 130m, yet it is proposed to accommodate 2 no. 2-lane slip roads, 4 no. motorway lanes, retaining walls and crash barriers. It does not make sense.
19. Safeguarding against toxic/chemical incident - There is no minimum threshold level of toxicity that will be transported along the route. This is unacceptable given the nature of the industries located at the port and in Ringaskiddy, with high levels of materials that are combustible, ignitable, toxic or waste products.
20. Chemical accident mitigation – What measures will be put in place to protect residents along the proposed route in the event of a pharma/chemical accident or spillage? Are the noise barriers masking as barriers in the event of a chemical accident?

21. Severance of communities – the proposed development will sever the communities of Shanbally and Ringaskiddy, respectively. The closure of Old Post Office Road in particular will cut the village off from the existing school and the residential properties that lie to the south of the proposed road.
22. Underpass will attract anti-social behaviour – the provision of a pedestrian underpass at Ringaskiddy will give rise to a serious loss of amenity as it will attract anti-social behaviour and if it was to be gated at night, it would remove pedestrian access along the route.

9. Summary of Issues raised regarding Noise emissions

31. EIS inadequate - The noise impact arising from the proposed development did not feature in the constraints study which led to the final choice of route through the Mulcon Valley, where the greatest concentration of noise sensitive receptors is located. Thus the noise impact assessment is flawed from the beginning.
32. Current noise levels intolerable – the noise levels at present in the Mulcon Valley already exceed TII guidelines and are intolerable. It is unacceptable that the proposed scheme does not seek to address this and that there is no intention to attempt to mitigate the noise levels so that an intolerable situation is not made worse.
33. EPA and WHO Guidelines – WHO guidance states that long term exposure to noise levels greater than 55dB can trigger elevated blood pressure and heart attacks. There is no attempt to meet the WHO or EPA Guidelines on noise limits for day (55dB) and night (40dB), or the European Commission’s aims in the EU’s 7th Environmental Action Program to 2020 for reducing noise exposure to environmental noise.
34. TII guidelines – have established a threshold for day and night of 60dB_{L_{DEN}}. However, at present the noise levels exceed 70dB_{L_{DEN}} and are predicted to rise in the ‘Do Minimum’ scenario. As a result, the EIS states that it is not practicable to mitigate noise levels to reduce them by 10dB, and as the section between Carr’s Hill and Bloomfield is not new, it is not subject to the TII guidance. However, this is not acceptable as the proposed new northern diverge and bridge to the N40 is a new section of road and it is exacerbated by the addition of thousands of additional HGVs daily. Furthermore, existing mitigation is paltry at best.

Noise modelling

35. Noise modelling data – CADNA is using data from CRTN that is almost 30 years old together with updated advice from NRA Good Practice Guide. However, the results are hugely dependent on the data input and on the theoretical assumptions made.

36. Predicted v. measured levels – the +/- 5dB tolerance levels are too high. EIS justification that modelled levels do not include other noise sources (present in measured levels) is not accepted and should be capable of being overcome with modern technology. Predicted levels are annual average levels and are not therefore directly comparable with short term measured levels. Validity of modelling is questioned.
37. Noise modelling flawed – There is a lack of multi-modal survey points. Model underestimated noise level in general by 5dB, which is equivalent to quadrupling of sound level. There is little transparency in respect of noise modelling with respect to variables such as traffic speeds, HGV brake noise, effects of tree planting etc. Topography of Mulcon Valley not taken into account.
38. Noise modelling does not include low frequency noise – does not seem to take into account noise from diesel engines and the low frequency components of this noise are more damaging to human health. A weightings are inappropriate if prominent low frequency components are present. One study showed that A-weighted measurements can underestimate loudness by 14dB when the noise primarily consists of low frequency components. Low frequency noise can penetrate inside homes and can be experienced at far greater distances and not so easily attenuated by noise barriers.
39. Validity of predicted noise levels questioned – the difference between the ‘Do Minimum’ and the ‘Do Something’ is not reflected in the likely significant increase in trucks. The use of ‘average’ noise levels spreads the effects across both busy and quiet periods which means that the actual noise levels which could exceed 80dB is not adequately reflected. Any average should be at busy times.
40. Topography of Mulcon Valley – The Mulcon Valley is so steep that the sound levels that will be experienced will be 80-85dBA, which is significantly greater than either the EPA guidelines or the TII threshold of 60dBL_{DEN}. The Mount Oval side of the valley is solid rock which means that sound will reverberate, which will be exacerbated by the impact of the sound waves from the retaining walls on the opposite side. The last time that Cork County council carried out noise measurements at Rochestown Rise, the sound levels were already well above the TII goal.

41. Noise levels and gradient of road – the increase in traffic and in particular HGVs will result in increased noise and air pollution with one HGV per minute and with the effect of gear changes up and down the hill. HGVs on an inclined motorway with sloped sides, which have been stripped of their existing treelines will funnel noise and fuel fumes towards adjacent houses.
42. Noise levels Maryborough Heights (Lissadell) – existing noise levels were measured by NRA over 24 hour period at property (No. 13 M. H.) in 2014 and found to be 70.8dBA (day), 68.3dBA (evening) and 60.2dBA (night), which translate to 71.2dBL_{DEN}. These are shocking levels, as in a work environment, it is necessary to wear ear muffs at levels over 55 dBA. Yet the TII have stated that there are under no obligation to put up sound barriers on an existing road. This is unacceptable.

Noise Monitoring

43. Noise monitoring general – there is insufficient detail of the dates and weather conditions during which noise monitoring surveys were undertaken. Information is also lacking in terms of the make and model of the noise monitors used and when it was last calibrated. Data was presented for only 20 of the 31 Noise Monitoring locations (Table 14.6), and of the 20 NMLs, 4 had a 5dB variance, 4 had a 4dB variance between predicted and measured levels. Thus 40% had significant differences. These flaws undermine confidence in the results.
44. Noise monitoring locations – no background monitoring was carried out in Kiltegan Park or Newlyn Vale. Notwithstanding this, these areas are identified as two of the noise priority areas in the Noise Action Plans for Cork. It is unacceptable that Ringaskiddy school site is not shown as a Noise Sensitive Location in Fig. 14.6.
45. Noise Monitoring Rochestown – only one monitoring station north of Rochestown Road (N3) which is 85m from the off-ramp. It is unclear why there is not one placed closer to the residential properties. The short-term measuring points N3-4 is to the north-west of Wainsfort (no. 11), but is in the shadow of a noise barrier at present. The intervals and sequencing of the mobile measuring units N3-4/5/6 are questioned. The height at which the measurements are taken should be at 4m, rather than at 1.5m, in order to represent 2 storey dwellings.

46. Predicted results Rochestown – the results are perplexing as only slight increases (1-5dB) on existing levels at Wainsfort (N3-4), Garryduff Road (N3-1), St. Patrick’s Church grounds (N4-1), Rochestown Rise (N4-2) and Lissadell (N4-3) and a predicted decrease at Fairways housing estate (N4-4) and Broadale Downs area, (N4-5). These results are not credible given the proximity of these residential areas to the proposed M28, to the new slip road and due to the significantly higher volume of traffic. Some properties were also monitored but not included in the modelling results.
47. Noise monitoring Ringaskiddy – ‘Martello’ Old Post Office Road, Ringaskiddy – Monitoring location N2-2 it is stated that the primary source of noise is traffic on the L6518 and that secondary noise is from school traffic, human voices, crows, chainsaw etc. However, the predicted impacts for all the NSLs on PO Road are grouped together. Thus there is no individual noise assessment, which is inadequate.

Noise mitigation

48. Noise mitigation general – little meaningful mitigation proposed as unacceptable that cannot meet TII guidelines. It is objectionable to state that 70dB_{L_{DEN}} is acceptable as it is existing and that it cannot be mitigated. Mitigation does not go far enough having regard to the projected increase in HGV volumes arising from port activities. This will be exacerbated by the 24-hour nature of the port and by the higher speeds facilitated by the widening of the road. Noise barriers provided on N40 need to be extended onto the M28.
49. Do not accept “new road only stance” – the failure to accept that the proposed northbound diverge qualifies as a new road is strongly objected to given that it is a new lane which is elevated through the woods. This section of road should be subject to the new threshold in the guidelines of 60dB_{L_{DEN}}, particularly as it will result in a significant increase in traffic, in HGV traffic and in an extra roadway in much closer proximity to existing houses.
50. Noise Action Plan targets subject to budget – the EIS refers to implementation of mitigation to achieve targets of NAPs but “subject to budgets and available resources (page 14-8)”. This is wholly unacceptable.
51. Retention of existing natural mitigation - Existing mitigation is inadequate and ineffective but the removal of trees and woodland, which break up and

absorb the sound waves, will make situation worse. Surely it is better to combine proposed sound barriers with retention of woodland? The retention of existing ground levels at Carr's Hill, combined with retention of trees and vegetation, would provide for existing natural barriers which could be supplemented by artificial ones.

52. Design of Noise Barriers – Design and materials are critical. There is inadequate specification provided in respect of the nature of the noise barriers such as concrete walls, fences, landscaped berms etc. EIS fails to examine international best practice and should consider insulation on a house by house basis. The design of the barriers needs to include “top edge profiles” and in particular, the use of a “T profile at the top of the barriers”. Multiple barriers on both sides of the road will result in reflective properties which can degrade the performance by up to 6dB. However, this could be overcome by use of absorptive properties.
53. Low noise surface – EIS states that low noise surface material would achieve a minimum of 2.5dB reduction in noise levels but it was previously stated that a 3dB difference in noise levels is imperceptible.
54. Residual impacts – the EIS states that the number of properties expected to experience L_{den} levels in excess of 70dB reduces from 23 to 7, and that they are all over 300m from the M28. It is not clear how this can be so if the projected levels were modelled for traffic noise only (i.e. not all noise sources).
55. Noise mitigation Rochestown – impact on properties close to road will be intolerable, especially at Newlyn Vale, where the residents cannot use their gardens at present. The height of the new northbound lane relative to these properties is likely to significantly worsen the impact. Request solid wall with perforated bricks rather than RW01 and AB01. The slope of the barriers is also questioned.
56. Noise mitigation at Rochestown Rise – noise levels of 55dBA are described by WHO as “serious annoyance” yet existing levels at Rochestown Rise exceed 70dBA. Night time levels are predicted to increase. Proposed 3m high barriers are wholly inadequate to mitigate the noise associated with the nature and volume of traffic at this location. In the event of a grant, request high quality absorptive barriers bordering Rochestown Rise as well as low

noise surfacing material. Furthermore, it is essential to provide adequate traffic calming on approach to Bloomfield interchange and to keep the impact on woodlands to a minimum and to reinstate any losses.

57. Noise mitigation Rowan Hill (Mount Oval) – off-ramp will necessitate significant cut and removal of woodland and green space. It will bring road much closer to existing houses on Rowan Hill with a 3m high noise barrier within metres of these properties.
58. Noise levels Newlyn Vale (NML Rochestown Rd 3) – the WHO guidelines say that noise levels above 55dB day and 40dB night have adverse health impacts and the TII guidance for new roads is 60dBL DEN, but the EIS states that this cannot be achieved at this location. However, at No. 38 Newlyn Vale, the ‘Do Nothing’ level is predicted at 65-69dB and even with mitigation, the average operational noise levels are predicted at 60-64dB with the front face of the house possibly still exposed to 65-69dB. This will have an unacceptable level of nuisance and adverse health impacts on the occupants of this house.
59. Noise barrier Shanbally AB25 – this proposed barrier is too short and will not adequately mitigate property at Marian Terrace (John Brady).
60. Noise barriers at Ringaskiddy – the proposed barriers on south side of proposed road are far shorter than those on the northern side of the road.

10. Summary of Issues raised regarding Air Emissions

19. EPA State of Ireland Environment 2016 - states that Ireland is close to the EU limits and that although emissions have reduced since 1970s, the anticipated reductions in Nitrous oxide emissions due to improved car technology has not been realised.
20. Background monitoring inadequate – Indaver site is at the end of a wind-swept peninsula and Heatherton Park is at the back of a housing estate. Neither are representative of the M28 between Bloomfield and Carr’s Hill. The mobile monitoring unit was sited at Monkstown, as the N28 was considered unsafe, but it still stated that PM10 was at a safe level for human health in 2007/2008 and there has been no monitoring since.
21. Insufficient information about monitoring inputs – no information regarding meteorological conditions, traffic speed, traffic flows as required by NRA guidelines. How can the model be verified?
22. EPA monitoring site - Baseline nitrous oxide levels – EPA readings at South Link Road are continuously above annual average limits for vegetation. As the proposed development will result in further increases in NOX, this will further compromise vegetation in the sensitive ecological areas. It will also increase the risk of lung cancer for residents living close to the roadway.
23. Baseline monitoring inadequate – as it is not comprehensive enough, especially regarding the lack of 3D modelling. Baseline ambient monitoring was carried out for just one month, but three months are recommended. The only parameters monitored were NO₂, PM₁₀ and VOCs, and excluded rest of parameters.
24. Baseline Nitrogen Dioxide is inadequate as insufficient readings (A9) and PM₁₀ was measured at only one location (A15).
25. Baseline Nitrous oxide emissions – EPA says Nitrous Oxide emissions are well above the limit specified in the EU Directive on National Emissions Ceilings for the majority of the Transport sector. If particulates and nitrous oxide levels are poor at the port, will these levels not increase as one travels along the route?
26. Baseline monitoring of particulate matter inadequate – Particulate matter is one of the most serious pollutants as it penetrates the lungs, yet it was

monitored at only one site. PM_{2.5} was not monitored for baseline air quality data. PM_{2.5} is more dangerous than PM₁₀ as the particles are smaller and are carried more easily into the lungs and cardiovascular system. Substantial international research indicates that exposure to PM_{2.5} over the long term reduces life expectancy. However, the baseline results are for PM₁₀ only and PM_{2.5} was only monitored at 2 locations.

27. Air quality monitoring at Newlyn Vale (No. 38) – The EIS indicates that the NO₂ levels at A10 (Newlyn Vale) are a higher level (25.6-31.6 µg/m³), similar to that at Shannonpark (A6), but states that this would not be representative of the residential area, as the monitor was placed at a kerbside at the entrance to the estate, adjacent to the road network. However, it is submitted that the levels are likely to be even higher, closer to the M28. This is extremely concerning and a review of these findings is sought.
28. Predicted impacts – construction – the scale of the construction works are such that the properties in Rochestown and Maryborough Hill will be affected by dust and will suffer adverse effects from dust nuisance.
29. Predicted impacts operation – The EIS predicts (Table 13.19) an overall reduction in nitrogen oxides and PM₁₀ if the proposed road is developed. This is perplexing as there will be a huge increase in traffic volumes, especially HGVs, which will result in increased emissions for PM₁₀ and NOX. The overall reduction in exposure is due to a net reduction in the number of properties being exposed. However this relates to just some areas, such as Shanbally and Ringaskiddy, and is not representative of other areas such as Rochestown and Maryborough Hill.
30. Predicted reduction in emissions unrealistic – the predicted reduction in emissions is based on a predicted reduction in congestion and a general increase in traffic speed. This is an extraordinary conclusion as 80% of traffic from the port will head east through a single lane over Bloomfield Interchange, which will have to give rise to increased congestion on both the M28 and on local access roads as commuters try to find alternative routes.
31. Cumulative impacts - There are 297 houses planned for Shannonpark (which is zoned for 1200 units) and 600 houses planned at Castletreasure. It is unclear if the cumulative effect has been taken into account. There will be

significant traffic congestion on Maryborough Hill as cars queue to access Carr's Hill

32. Air pollution predictions dependent on traffic modelling – there is no faith in the traffic modelling predictions as the NRA had previously predicted an increase in the traffic volumes on the N28 from AADT of 11,000 to 16,500 by 2019, yet the current AADT is between 25,000 and 28,000. This undermines credibility of air quality predictions.
33. Air quality modelling inadequate re HGV traffic – unclear if account taken of tailbacks from Bloomfield along the Mulcon Valley which will comprise a significant proportion of trucks, which emit noxious emissions as they approach the descent into the valley due to idling engines. Discrepancies in Fig. 15.3 as 7,400 HGVs daily is twice that predicted for the Port of Cork. It is unclear whether the increase in HGVs from the Port of cork has been factored into the overall increase predicted. The national averages for emissions are in no way comparable to port traffic emissions as there will be more trucks, more diesel and more particulates.
34. Northern section of road - The increase in traffic and HGVs will result in serious deterioration of air quality in one of Cork's most highly and densely populated areas. Increased exposure at the Northern section of the proposed road scheme is due to increased proximity of the road to dwellings and to the predicted decrease in speed associated with proposed traffic calming. The modelling does not take account of the topography of the Mulcon Valley which captures and distributes particulate matter. It is unacceptable that serious consideration has not been given to alternative routes through less populated areas.
35. Nitrogen Dioxide – there is evidence that NO₂ levels are on the rise and that levels measured at Rochestown Road and Rochestown Rise have risen over four months (Oct 2016-Feb 2017) by 22% and 5% respectively. The predicted increase in traffic levels is likely to increase NO₂ to dangerous levels over a short time period. Rochestown Road has highest levels of NO₂ and Volatile Organic Compounds (A 9, A10, A11).
36. Mount Oval off ramp – PM₁₀ and PM_{2.5} levels at Mount Oval (A15) indicate that with the increase in traffic levels predicted, these will soon exceed WHO Guidelines. There is no safe level of particulates, especially PM_{2.5}.

37. Local impact assessment inadequate – EIS predicts increase in exposure for Kiltegan Park and Delford Drive due to the increased proximity of the alignment, but it is assessed as a “small” increase. However, past predictions were grossly underestimated. Data for Rochestown and Maryborough Hill have been omitted from Table 13.20, (local impact data for days with $>50\mu\text{g}/\text{m}^3$ NO_2 , PM_{10} and $\text{PM}_{2.5}$). There is no explanation and it could mean that the magnitude of change was far greater than indicated in the EIS.
38. Mitigation construction – dust monitoring will be reported on a monthly basis. However, individual incidences of unacceptably high concentrations could be masked and residents will have to tolerate unacceptable levels of dust.
39. Mitigation operational – there is no mitigation proposed due to the predicted reduction in exposure. It is further noted that there is no planned monitoring of the operational phase.

11. Summary of Issues raised regarding Landscape and Visual Impact

14. Landscape impact – it will transform the rural landscape between Ringaskiddy and Shannonpark from agricultural to industrial.
15. Loss of trees and woodlands will destroy landscape – the loss of bands of mature trees and woodlands at various points along the route will destroy the landscape character and visual amenity of those areas, such as Bloomfield, the Mulcon Valley (Rochestown Rise and Mount Oval), Rowan Hill and Wainsfort.
16. EIS inadequate – The information contained in the EIS regarding landscape and visual impact is insufficient to enable an analysis of the likely impact on individual sensitive receptors along the proposed route.
17. Photomontages inadequate – no photomontages to demonstrate impact on Martello Tower, Catlewarren and views from National Maritime College and cluster of houses in Shanbally. Only 15 VPs
18. Drawings and visual representation inadequate – it is not possible to carry out an accurate assessment of the impact of the proposed development on 'Martello' which a house in close proximity to the road on Old Post Office Road in Ringaskiddy. Sectional drawings are required to illustrate the relationship between the house and the motorway, the pedestrian/cycleway underpass (Structure S10) and the proposed agricultural access road. Furthermore, the gradient of the embankment is unclear.
19. Mitigation unrealistic - There is inadequate information about landscape mitigation. The proposed mitigation shown in Viewpoint 2a is unrealistic as it would not be possible for the trees that are to be planted to achieve the level of maturity that would be required to provide the level of screening envisaged. VP10 and VP11 unclear how mitigated to minor.
20. Visual impact at Bloomfield – removal of trees and existing screen planting to the east of the N28 at Bloomfield would have a major impact on the properties here. The proposal to replace the trees with high concrete retaining walls and noise barriers is totally unacceptable. Clarification is

sought on the height and finish of the infrastructure and on the retention/replacement of the landscape/vegetation.

21. Rochestown Rise, Maryborough Heights and Lissadell – visual impact stated to be “major to substantial”, but the Viewpoints are taken from very specific locations and are not representative of the full impact. The proposed route will come within 50m, 80m and 180m of existing houses. At present, a buffer of 50m provided by trees and woodland which serves as a natural visual barrier to the N28, but these will be felled. Widening and upgrading of road will endanger mature trees to rear of gardens and the large overpass will diminish the quality of the remaining green space. Objection to loss of trees at bottom of garden and replacement with wall and noise barrier.
22. Newlyn Vale and Wainsfort – devastating impact due to height, scale and proximity of road to existing houses. Dense band of mature trees recently cut down by TII without any justification. Properties will be overlooked by 3m wall, compounded by loss of trees. The proposed north-bound diverge lane would bring the motorway to within 28m of property, which is too close, and would necessitate an additional flyover bridge over Rochestown Road which would be visually obtrusive. The sheer earth retaining wall, faced with concrete, along the eastern and north-eastern boundary of Newlyn Vale would have significant impacts of visual and residential amenity as it would be elevated 6-7 metres above the level of the existing road. There has been no proper visual assessment of the impact of the retaining structure on Newlyn Vale.
23. New flyover at Rochestown Road – The overpass would be widened from 20 to 40m and the overall footprint to 90m (which is the size of a football pitch). It would sever the community, reduce walkability of the area and be a “Class A eyesore”. EIS recognises that the visual impact here would be “Major to Substantial” and ‘Moderate to Major’. Both of these are the highest categories of adverse impact.
24. Rowan Hill – removal of significant amount of woodland and green amenity space, and replacement with 3m high wall and noise barrier, just 4m from property, is unacceptable. The proposed wall and noise barriers are too close to existing properties, would be overbearing and ugly and

would replace the natural landscape, which is much more pleasing. Views of open countryside would be obscured and disrupted.

25. Shanbally – the proposed interchange would result in a motorway to the south of nearest house with a flyover to the east and would impair the natural vistas available at present.

12. Summary of Issues raised regarding Cultural Heritage

1. Separates Castle Warren and the Martello Tower from the community in Ringaskiddy - The route of the proposed road would separate the historic sites of Castle Warren and the Martello tower, which are significant tourist attractions in the area, from the village community. This would be unacceptable but could be overcome by reverting to the 2008 route.
2. Castle warren separated from its associated graveyard by motorway – the driving of the proposed motorway through the historic site comprising the tower house, the church and its graveyard at Barnahely is unacceptable. The proposal would squeeze the motorway through with a distance of just 50m from Castlewarren and 25m from the graveyard, and would be elevated at 4-5m above ground. It would therefore dominate the landscape and overwhelm the ancient ambience of the site.
3. Curtilage of Protected Structure and character of Castlewarren would be materially affected – contrary to Architectural Protection and Heritage Guidelines and objective HE4-1 of the CDP.
4. Planning gain for Castlewarren – should commit to ensuring structure is secured and that public access is provided with interpretation.
5. Ring House – historical house of great local significance. It was built by ‘Guys’ in 1850 and has had various uses historically, e.g. as a detention centre and barracks in 1920s. serious concern about the impact of the proposed development on the property.

13. Summary of Issues raised regarding Flora and Fauna

12. EIS inadequate - The cumulative effects of the development of the road and the resumption of the extraction from the quarry have not been adequately addressed. If the quarry reopens to provide material for the road, access will probably be from the N28. This means that stockpiling and regrading is likely to occur on the sites where Pennyroyal and Yellow wort are now found. It will be necessary to secure translocation prior to the commencement of works. The assessment in respect of otters, is inadequate as the surveys fail to recognise that they breed all year round. There is no mention of invasive species.
13. Appropriate Assessment inadequate – there is a reference to ‘intermittent use’ of the area for over-wintering birds. However, there is insufficient justification for the conclusion of no adverse impact on the site’s integrity. The assessment is also inadequate in respect of otters as it does not comply with Art 3 of the Habitats Directive.
14. Bird’s Directive – the importance of the over-wintering birds provisions is fundamental to the ecological requirements for migrating birds. Thus there is a need for a threshold of scientific certainty to be met, which is not the case in this instance.
15. Biodiversity value of Ballyhemiken Quarry at Raffeen – the proposed route travels through the quarry, requiring a massive void to be filled. The quarry has developed a rich and unique biodiversity as it has not been operated since 2006. Unique habitats have developed including species rich limestone grassland and wetland areas. It also contains a quarry lake which supports a most diverse collection of dragonflies and damsel flies, cliffs which support Peregrine Falcon nesting sites and scarce plants such as Pennyroyal and bee orchids. It holds the last remnants of biodiversity of the Carrigaline area and must be protected.
16. Biodiversity policy contravened – the proposed development makes a mockery of the objectives of Cork Co. Co. Biodiversity Action Plan 2009-14, which has lapsed. The road must be rerouted away from the quarry.

17. Alternative route is available – the 2008 route to the south of the quarry should be pursued as this would avoid the destruction of the biodiverse site. There is little material remaining within the quarry, notwithstanding the current planning permission for extraction. The previous route went through Fernhill golf Course which is now seeking a re-zoning as the golf course is said to be unviable.
18. Alternative route much less damaging to environment – the quarry is much closer to the houses on Cogan’s Road than the golf course. The alternative option would no longer necessitate the filling of a large void and would enable the preservation of the lake and the habitats within the quarry. There is no justification to route the road through the quarry with increased impact on local residents and resultant loss of precious habitats and species. If an alternative route was used, the quarry could still be used for construction material as it is just “next door”.
19. Rate of extraction of quarry increased – there would be a phenomenal increase in the rate of extraction from 30 years as granted under the planning permission to 3 years, required for the road project.
20. Habitat classification within quarry disputed – A group of local naturalists (led by Dr. Jo Goodyear) has disputed the classification of habitats as follows:
 - FL8 - Other Artificial Lakes and Ponds – the lake has been classified as FL8, but this is disputed on the basis that it has naturally developed as a wetland within the quarry and should be FL3 (Mesotrophic Lake). It shows evidence of zonation and seasonal variation in levels and includes open water supporting ‘stone wort’. Thus it is considered that it has a brackish, mesotrophic calcareous status, which is regionally notable. It is claimed that the NPWS is the competent authority to decide if it is an Annex I Habitat corresponding to Oglia-mesotrophic waterbody with chara. It is pointed out that Annex I habitats may not be directly impacted without showing over-riding public interest. The quarry lake would be filled in and there are no proposals to replicate it elsewhere. Thus the road should be relocated outside the quarry.
 - GS1 - Dry Calcareous Grassland – this habitat within the quarry supports 3 species of orchid and meets the criteria for Annex I habitat

“Festuco-Brometalia Calcareous Grassland 6210”. It is noted that GS1 is not directly impacted by the proposed scheme but that it is proposed to translocate some areas of GS1.

21. Protected species within quarry - A group of local naturalists (led by Dr. Jo Goodyear) has pointed out that the following protected species are present within the quarry –

Smooth Newt – protected under the Wildlife Acts 1976 and 2000 and was recorded on 17th June 2017 at the lake. This is a protected amphibian (*Lissotriton vulgaris*) which needs damp meadows as an adult but a lake as a tadpole. The EIS does not record it but was recorded by this group. The road should be re-routed as translocation is an ecologically poor and costly solution and the wetland also supports common frog.

Pennyroyal – this is protected by a Floral Protection Order. Work is needed to encourage and protect this species on site as well as proposals for translocation.

Peregrine Falcon – this is an Annex I Bird of Prey which successfully breeds in the quarry. The proposed development will directly affect its breeding success and may drive it from this habitat. The proposed nest boxes are unlikely to be adequate to encourage the return of the bird to the quarry after the construction stage.

Yellowhammer – this Red species (BOCCI) has been recorded on site.

22. Other species present within the quarry include invertebrates such as 11 species of butterflies and moths, 17 species of dragon flies and damsel flies, 34 species of bird including Little Grebe, Kestrel and Buzzard and 80 plant species (including 3 orchid species).
23. Translocation of Pennyroyal – concern expressed regarding translocation rather than retention in situ as well as the Post- translocation strategy. It is stated that the calcareous grassland within the quarry is currently maintained by rabbit grazing but it is proposed to replace this with hay-cut. This is likely to alter the species composition of the grassland. The translocation of grassland and wetland will not be successful unless stringent planning conditions are put in place to maintain the ecological criteria. Receptor sites also need to be monitored and a long-term

management plan is required to maintain the biodiversity of the receptor sites.

24. Water quality survey dates and relevance questioned – it is claimed that many of the surveys are outdated (based on 11 year old unpublished reports) and incomplete, which undermines the credibility of the habitats assessment. Invertebrate water quality, aquatic plants, fish and ecological importance (10.3.3).????
25. Woodbrook Stream – there will be a massive structure (S2) alongside a steep incline adjacent to Woodbrook Stream. It is inevitable that there will be spillage and sedimentation, as there is no protection. Thus pollution and realignment of culverts will kill off most fish in the stream. Given that there is a hydrological link to the SPA and the SAC, this should not be allowed.
26. Woodlands of Mulcon Valley must be protected – Lissadell Woods, Rowan Hill Woods and Bloomfield Woods are of vital importance to the ecology, amenity and health of the population of the area. These woodlands have rich biodiversity which must be protected. There are bats in the trees and foxes and rabbits in the undergrowth and the habitats must be protected. The fish in the stream and otters alongside must also be protected. Any trees that are lost should be replaced. It is impossible to imagine how the residents will be able to endure the 3 year construction programme or the landscaping proposals that will take 20-30 years to mature. How does the applicant propose to replace 100 year old trees? Proposed works are contrary to County Development Plan objectives HE 2-3 and HE 2-5.
27. Construction impacts on Mulcon Valley woodlands severe – it will lead to direct loss of habitat for wintering and breeding birds. Removal of hedgerows will lead to the loss of breeding habitats whilst removal of grassland will lead to the loss of foraging areas for both breeding and wintering populations. Removal of areas of arable land will result in removal of the loss of wintering foraging areas for Yellowhammer. The road works will also lead to the potential loss of the current breeding buzzard site.

28. Impact on Cork Harbour SPA – diesel run-off into the local streams (Woodbrook, Donnybrook and Glounatouig) will eventually end up in Douglas Estuary, which is part of the SPA.
29. Bats – Bloomfield Woods – Habitats for bats will be irreparably damaged in respect of foraging, roosting, feeding and commuting. The dates that the bat surveys were undertaken are questioned as it would seem that it was just during winter 2017. Bats have been observed at Bloomfield woods north of the R610, but it is not recorded as a bat habitat in the EIS. 7 out of 10 bat species have been observed within 10km including “ubiquitous common pipistrelle and soprano pipistrelle”. There is ample evidence that the impact of this development will be to destroy bat life in Bloomfield Woods, which is in contravention of the law.
30. Impact on bats in Mulcon Valley woodlands - There are many records of a diverse range of bat species present in the existing woodlands and there is serious concern regarding the potential loss of roosts, feeding and foraging areas and disruption of commuting routes during construction. This would result from tree felling, disruption and use of lighting. There is also concern about the impact during the operation phase as bats have poor eyesight in conditions where there is too much luminance, and the proposed development will involve too much artificial lighting. This may reduce the availability of feeding and roosting sites which would be a long-term to permanent, irreversible and significant negative impact.
31. EIS inadequate re assessment of impact on bats – Although the EIS acknowledges the loss of habitats and potential roost sites for bats, there are three major weaknesses in the EIS –
 - Residual impacts – negligible yet acknowledged in EIS that certain species are likely to be displaced and lose habitats. There is no guarantee that they will survive the displacement.
 - Roost sites – there is a lack of evidence regarding confirmed roost sites, but this is not accepted as being adequate.
 - Breach of NRA Guidelines – bat surveys were not four season surveys as required by guidelines.
32. Bloomfield Marsh and salt marsh – needs to be protected and birds which use salt marsh also need to be given priority.

Summary of Issues raised regarding Soils, Water and Material Assets

1. EIS inadequate – The EIS does not provide a robust enough overview of the importance of each individual catchment for each fish species. Surveys conducted were inadequate and there should be electro fishing surveys with a minimum of 3 sample points over the longitude of each stream.
2. Donnybrook Stream – this stream contains Brown Trout and Lamprey. It is queried whether surveys of these fish were adequate. There are also Otters on this stream as well as the Gounatouig Stream.
3. Sedimentation and run-off – during construction there will be huge amounts of suspended solids generated which is likely to make its way into the local streams. There is insufficient information on the amount of sedimentation and hydrocarbons in the run-off and how it will be controlled.
4. Water Framework Directive – requirements not complied with in respect of water quality (European court of Justice C461/13).
5. Reopening of quarry – the most recent use of the quarry was 2006 and there has been no blasting since 2004. The capacity volume of the quarry is estimated to be 6.6million m and the M28 will need 1 million m The quarry has permission to extract material on a campaign basis with Phase 1 due to last 36 years. The M28 will increase the rate of extraction phenomenally. This will have a devastating impact on local residents.
6. Impact of flyrock on road – the NRA was concerned in 2008 about the hazard presented by flyrock from blasting close to the N28, when the application for the quarry was under consideration. It is considered that the same issues will arise in respect of the M28 as the quarry will continue to operate after the motorway is constructed.

