

IN THE MATTER OF AN APPLICATION TO
AN BORD PLEANÁLA

FOR APPROVAL OF THE FOYNES TO LIMERICK ROAD (INCLUDING
ADARE BYPASS) COMPRISING:

- (I) FOYNES TO RATHKEALE PROTECTED ROAD SCHEME,
2019;
- (II) RATHKEALE TO ATTYFLIN MOTORWAY SCHEME, 2019;
- (III) FOYNES SERVICE AREA SCHEME, 2019.

ABP Ref. ABP-306146-19 and ABP-306199-19

ORAL HEARING

Brief of Evidence
Human Health

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1. QUALIFICATIONS AND EXPERIENCE

- 1.1. My name is Dr Martin Gerard Hogan and I hold a primary medical degree from University College Cork (1987). Among other qualifications, I am a Fellow of the Faculty of Occupational Medicine of the Royal College of Physicians of Ireland and I am also a Fellow of the Royal College of Physicians of Ireland (FRCPI) since 2008.
- 1.2. I am a registered specialist in occupational medicine with the Irish Medical Council. I am currently a full time Consultant Occupational & Environmental Physician. I am a past Dean of the Faculty of Occupational Medicine of the Royal College of Physicians of Ireland. I am a Lecturer in Toxicology, University College Cork. I am a specialist trainer in occupational medicine since 1997. I am an examiner with the Faculty. I am a Member of the Board of the International Commission of Occupational Health.
- 1.3. My areas of special interest are, Toxicology, Environmental Health, Occupational Asthma, Health effects of Noise and Occupational Hygiene. I have prepared human health impact assessments for many projects, including road developments such as the M20, N5 Ballaghaderreen to Scramoge, Athy Ring Road, Naas Ring Road, N6 Galway Ring Road and M28.

2. ROLE IN PROPOSED ROAD DEVELOPMENT

- 2.1 My role in the Foynes to Limerick Road (including Adare Bypass) involved undertaking the human health appraisal in respect of the proposed road development. I conducted an assessment of the potential impact on Human Health and wrote the Human Health section of Chapter 6 of the EIAR on Population and Human Health.

3. EXECUTIVE SUMMARY

3.1 Chapter 6 of the EIAR is to be taken as read in its entirety and is not replicated here. To assist the Board in its consideration of the applications for approval, and for the convenience of all participants at this hearing and to set the context for responding to the objections and submissions, the key items pertaining to the human health assessment of the proposed road development detailed in Chapter 6 of the EIAR are summarised briefly below.

3.2 From a human health perspective, the receiving environment comprises human beings. A full description of the receiving environment is provided in Section 6.6 of Chapter 6 of the EIAR. This includes a description of:

- Identification of vulnerable groups, for example socially deprived, disabled people, elderly, children
- Community Profile as identified by the Lenus (the Irish Health research Repository)/ HSE publications

3.3 As set out in the European Commission's "*Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report*" (2017), human health is a very broad factor that is highly project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects on vulnerable groups, exposure to traffic noise or air). The potential impacts of health due to the proposed road development were assessed. This focussed on: health protection including psychological health, health improvement and improving services.

Health Protection

3.4 In terms of the protection of human health, the pathways through which the proposed road development could impact on health were assessed. These pathways were primarily noise, air, soil and water although any means by which there could be a potential effect on human health were considered.

3.5 The methodology used with regards to the protection of human health is detailed in Section 6.5 of Chapter 6 of the EIAR. In simple terms, it can be summarised as using Health Based Standards to assess Health Protection as a result of environmental emissions. Health Based Standards are set to protect against negative human health effects. The level at which the standard is set is chosen to protect the vulnerable, not the robust. The standard measures of significance are set at levels where there will be no significant health effects. This Health Based Standards approach is also consistent with the latest Irish EPA Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports (August, 2017).

3.6 The data collected in relation to the protection of human health for my assessment focussed on the results of technical assessments (such as noise, air, soil and water) dealt with elsewhere in the EIAR, in order to establish if there was any potential effect on health directly attributed to what is proposed by the construction and operation of the proposed road development. See, for example:

- Chapter 8 – Soils and Geology
- Chapter 9 – Hydrogeology
- Chapter 10 – Hydrology
- Chapter 12 – Noise and Vibration
- Chapter 13 – Air Quality and Climate

3.7 The assessment detailed in Chapter 6 of the EIAR concluded that there will be no adverse health impacts as a result of the proposed road development through the pathways of noise and air emissions, soils or water quality.

Health Protection (Psychological Health)

3.8 As noted in the European Commission's EIAR Guidance (2017), potential environmentally-related health impacts may arise from changes in living conditions as a result of a project and these have been considered in Chapter 6 of the EIAR., including potential psychological impacts: see, for example, Section 6.7.2 pages 6/50 and 6/51. Whilst some annoyance during the construction phase is to be expected, this will be of limited duration and is not usually considered to be a health effect. There are some benefits in psychological terms in terms of reduced journey times, unforeseen delays etc. as well as movement of traffic away from currently congested and more populated areas of the surrounding towns and villages. In addition in the operational phase there will be increased opportunities to exercise such as cycling which can be associated with health benefits, both physical and psychological.

3.9 The prospect of moving traffic to inherently safer roads and the prospect of reduced traffic accidents and fatalities is also an important benefit. This does not take away from the potentially adverse effects on individuals whose homes or lands are to be acquired. Whilst from the outset the proposed road development has been designed to try and avoid as many properties as possible, there remains a number of property acquisitions and although financially compensated, it is important to recognise that these individuals may experience stress and anxiety as a result of this process. The undoubted change in living conditions brought about by the acquisition of houses and lands and resulting from the construction and operation of the proposed road development, is a potential negative impact on human health for those individuals affected. This negative effect must be seen however in the context of the overall benefits of the proposed road development.

Health Improvement and Improvement of Access to Services

3.10 The data used to assess opportunities for health improvements and access to services included information gathered during the extensive public consultations and data extracted from the traffic model to identify accessibility to services.

3.11 From a community perspective, there are clear benefits in terms of health protection, opportunities for health improvements and access to services. There is potential for greater opportunities for pedestrians and cyclists.

3.12 In general, the project will lead to reduced journey times in particular in Adare but also in the villages and towns along the N69.

- 3.13 There will be more efficient access to emergency services including ambulances, particularly in a town like Adare. Reduced access times for these services will help to save lives.
- 3.14 There are significant opportunities for improved access to services including education and healthcare as a result of reduced, and more predictable journey times.
- 3.15 There is potential for socio-economic gain including economic growth thanks to improved regional access to Kerry and West Limerick and development of tourism as access to highly prized tourist locations in Kerry and West Limerick will be improved. Improved road access with decreased journey times may facilitate manufacturing development in areas served by the road which were previously hampered by journey time uncertainty. Improved socio-economic status is well recognised to have a positive impact on health outcomes. There is potential for increased employment and reduced unemployment particularly from tourism as reduced and more predictable journey times will enable access to tourist areas for both national and international tourists. Improved access for HGVs will facilitate manufacturing and other industries which require the transport of their goods. If this is achieved, there will also be benefits in terms of social health including decreased social inequality.

Overall

- 3.16 There are many potential benefits in terms of human health due to the proposed road development. It allows for more efficient road transport, within towns such as Adare and others, with all the potential socio-economic benefits as well as the access to services including healthcare and education that this brings. It will also bring benefits in accessing services to the more vulnerable in the community such as disabled people. The proposed road development will be safer and lead to fewer accidents.
- 3.17 Whilst there are benefits to the population and the society this does not mean each and every individual will benefit equally. Indeed, even though there will be benefits in terms of transport, air quality and noise emissions for the community, some individual residences may have higher noise than they would otherwise experience because of the proximity of their homes to the proposed road development.
- 3.18 As has been demonstrated in Chapter 6 of the EIAR, the impact of the proposed road development on human health in the population is overall significantly positive.
- 3.19 The EIAR concludes that the proposed road development will have no residual adverse effects on human health and as outlined above, the proposed road development will have overall positive impacts on human health, especially when one considers the totality of impacts on Human Health.

4. RESPONSES TO SUBMISSIONS

4.1 Overview

4.1.1 Of the 162 submissions/objections received by An Bord Pleanála in response to the proposed road development, 24 no. submissions/objections raised the issue of Human Health. These submissions raised the following issues:

- Noise Impacts on Human Health, including WHO Guidelines;
- Psychological Impacts;
- Vulnerable Individuals; and
- Light Pollution.

4.1.2 These issues are responded to in the following paragraphs.

4.1.3 It should be noted that the substantive consideration of potential noise impacts arising from the proposed development has been set out in Chapter 12 of the EIAR and the consideration of potential human health impacts arising from noise have been based on the predicted noise levels appraised in the EIAR. The submissions/objections raising issues in relation to noise impacts have been primarily addressed in the Brief of Evidence by my colleague, Jennifer Harmon on Noise and Vibration. However, I will deal specifically with the aspects of these submissions/objections directly impacting on human health.

4.2 Noise Impacts on Human Health

Issues Raised in Submissions / Objections

4.2.1 There are a number of submissions/objections which raise issues in relation to health effects of environmental noise during both the construction and operational phases, namely no's ENV-13, SCH-18 and SCH-123.

Response

4.2.2 As set out in Chapter 12 of the EIAR, construction noise will be short term and the potential impacts of construction noise will be mitigated through specific noise abatement measures and compliance with the recommendations of *BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise* and *BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Part 2: Vibration* and the European Communities (Noise Emission by Equipment for Use Outdoors) Regulations, 2001.

4.2.3 These mitigation measures, as outlined in more detail in Section 12.5.1 of Chapter 12 of the EIAR will include:

- Selection of quiet plant;
- Control of noise sources;
- Screening;
- Hours of work;
- Liaison with the public; and

- Monitoring.

4.2.4 Therefore, construction noise is expected to have negative effects on those in the immediate vicinity of the proposed road development under construction but, given the limited duration of these activities and with the strict implementation of the mitigation measures, which are in line with best practice and BS 5228, adverse health effects due to noise during construction are not predicted to occur.

4.2.5 The results of the noise modelling carried out for the operational phase shows that there may be potential noise impacts on residential properties adjacent to the proposed road development. However, the implementation of low noise road surfacing and noise barriers will mitigate these potential impacts.

WHO NOISE GUIDELINES

Issues Raised in Submissions / Objections

4.2.6 Several submissions/objections mention the relatively recent WHO Noise Guidelines and contend that noise mitigation was required to WHO Guidelines as opposed to TII Standards including submission / objection no's ENV-25, SCH-12, 26, 48, 51, 54, 61, 66, 67, 72, 80, 81, 85, 92, 98, 106, 114, 115 and 123.

Response

4.2.7 The WHO issued updated Environmental Noise Guidelines for the European Region in October 2018 and also issued specific guidelines for road noise.

4.2.8 For average noise exposure, they recommend reducing noise levels produced by road traffic below 53 decibels (dB) L_{den} , as road traffic noise above this level is associated with adverse health effects.

4.2.9 For night noise exposure, they recommended reducing noise levels produced by road traffic during night-time below 45dB L_{night} , as night-time road traffic noise above this level is associated with adverse effects on sleep.

4.2.10 It is noteworthy that the WHO provides the rationale for these guideline levels. The 53 decibels (dB) L_{den} level is based on annoyance criteria rather than serious health effects. In fact, the Guidelines suggest that, if a level was being set on Cardiovascular criteria alone that the level would likely be in the order of 59.3 decibels (dB) L_{den} . This closely corresponds to the TII Noise Guidance design goal of 60 dB L_{den} . It is worthwhile looking at how this is actually calculated. It is conservatively calculated at the level of noise that may be associated with a 5% increase in relative risk of a cardiovascular event. For the vast majority of people, the risk of a cardiovascular event in the next year is less than 1%. For an individual who has that risk of 1%, even allowing for the worst effects, the risk is 1.05%. The difference is therefore imperceptible on an individual basis. It is simply a far less significant effect than other risk factors, which is the reason that it is not considered one of the factors when calculating one's own cardiovascular risk. On an individual basis it simply is not significant. However, when one applies this across a large population, such as the population of Europe, even small changes can make a significant difference. This explains why the WHO guidelines are applicable for populations but not for individuals. The 45dB L_{night} level is based on sleep disturbance but it is perhaps surprising how

conservative the levels are when one realises that this level represents only 3% of the population self-reporting as highly sleep disturbed. To put this further in context, even at levels of 55dB L_{night} , the level considered in the EIAR prior to the issuing of the current WHO Guidelines, the percentage of people self-reporting sleep disturbance is still only 6%.

4.2.11 The WHO Guidelines specifically state that, *“to reduce health effects, the GDG (Guideline Development Group) strongly recommends that policymakers implement suitable measures to reduce noise exposure from road traffic in the population exposed to levels above the guideline values for average and night noise exposure. For specific interventions, the GDG recommends reducing noise both at the source and on the route between the source and the affected population by changes in infrastructure.”*

4.2.12 One might ask how one can reconcile these guidelines with road traffic anywhere? The answer is that these guidelines are for populations. The WHO readily acknowledges that guidelines cannot be reasonably achieved at every individual residence. However, the question in relation to the assessment of the impact on health will be determined by the overall impact on the population. As the population impacts due to environmental noise, particularly in the operational phase, will be largely positive the proposed road development would be in keeping with the WHO Guidelines.

4.2.13 Another issue that can arise is the comparison between the WHO guidelines and the TII guidelines. It must be remembered, however, that they serve different purposes. It is readily acknowledged that the WHO guidelines cannot be reasonably achieved for each individual residence. Data from previous WHO guidelines, for example, show that well over 50% of the population of Europe is exposed to noise that exceeds these levels. This underlines that they are not achievable on an individual receptor basis but can be best understood as guidance for populations as a whole. The TII guidelines, however, must be viewed as the achievable goal to protect individuals. It is also clear that the levels suggested are compatible with the prevention of the significant health effects of environmental noise such as cardiovascular effects. The TII and WHO guidelines should not be seen as competing with each other but rather complementing each other. In simple terms, TII guidelines should be used in relation to individual receptors such as residences whereas the WHO guidelines should be considered in terms of the population as a whole. The TII guidelines are used to indicate, in particular, when mitigation is advisable.

4.2.14 There is no contradiction between the TII and WHO guidelines when one realises the different purposes for which they are used.

4.3 Psychological Impacts

Issues Raised in Submissions / Objections

4.3.1 A number of submissions/objections raise issues relating to potential stress and psychological impacts. These include submission no's SCH-123, SCH-34 and FI-2.

Response

4.3.2 The topic of potential psychological impacts is assessed in Section 6.7.2 of Chapter 6 of the EIAR, as is appropriate in the context of the European Commission's EIAR Guidance, which considered that potential environmentally-related health impacts may

arise from changes in living conditions as a result of a project. It is worth noting, firstly, that the proposed road development will remove congestion and will reduce the potential number of collisions and possible fatalities. The avoidance of fatalities and serious injuries have a very significant positive impact on an individual basis. Any such injury or fatality would have a profound adverse impact on the individual's family, friends and colleagues such as that there can be a wider impact on the psychological health of the community. Indeed, the "Do-Nothing" scenario has potential for adverse psychological impacts. Progressively longer journey times and uncertainty will be associated with increased annoyance at least and at worst impact on psychological health.

- 4.3.3 There was also reference to effects on mental health by the "mammoth bombarding of all individuals within the Askeaton to Foynes area to constant blasting". As is outlined in the EIAR, while some blasting will be required, from the perspective of any human receptor, it will be for from constant and extensive mitigation is outlined, for example in the Noise Chapter. No receptor will suffer significant adverse effects, for example regarding air quality or noise and vibration. We can be therefore assured that there will be no adverse effects on mental health.
- 4.3.4 Overall, therefore, the assessment of the psychological impact on a population of community basis will be overall positive. While I accept that there will be some anticipatory anxiety which would be the same as for any project but the reality is that, in many cases, anticipated issues do not materialise to anything like the same extent as is feared. This may be particularly so in those whose homes and properties may be affected by compulsory purchase orders. One could expect some negative psychological impact in some such cases.
- 4.3.5 Indeed, the experience of other such projects, including road developments, is that, in very many cases, people adapt to the new reality. Whilst psychological impacts are still anticipated, these effects can be reduced, to some extent at least, by communication and early agreement with many of the affected individuals, such as those affected by CPO's, so as to allow certainty.

4.4 Vulnerable Individuals

Issues Raised in Submissions / Objections

- 4.4.1 A number of submissions refer to vulnerable individuals and express concern regarding the potential impact the development may have. The following submissions raised this point: ENV-13, SCH-63, SCH-115, SCH-123. This appears to particularly relate to emissions to air and noise but also light and vibration emissions have been mentioned.

Response

- 4.4.2 In response to the above submissions, the issue of vulnerable individuals was addressed in section 6.6.3 of Chapter 6 of the EIAR. Essentially the approach taken was that there were vulnerable individuals everywhere so that it is not necessary to identify particular vulnerable individuals affected by the proposed road development. Health based standards such as Noise and Air Quality standards are there to protect the vulnerable, not the robust who could tolerate higher levels. For example people with respiratory problems such as asthma and COPD (Chronic Obstructive Pulmonary

Disease) may be more vulnerable to air changes and others such as perhaps people with Autism Spectrum Disorder and anxiety may be more vulnerable to noise. However, these are not very rare conditions and many people with these conditions live by and close to roads and construction areas. By ensuring that these standards are not exceeded we can be sure that the vulnerable are protected. As discussed by my colleague Jennifer Harmon, in her Noise and Vibration Brief of Evidence, no significant effects are predicted in terms of vibration during the operational phase.

- 4.4.3 In response to submission SCH-63, dust mitigation measures as outlined in the EIAR are discussed by my colleague Dr Edward Porter in his Air Quality and Climate Brief of Evidence.

4.5 Light Pollution

Issues Raised in Submissions / Objections

- 4.5.1 One submission, ENV-13 raised the issue of light pollution from traffic to their home may have adverse health effects.

Response

- 4.5.2 Light pollution from traffic is not normally considered in terms of health effects, in the same way as noise or air quality. This is partly because it is quite easy to mitigate, even locally, with the use for example of curtains and blinds. Notwithstanding the above it is not anticipated that there will be significant light pollution to the residence concerned in the observation. In some locations, mitigation put in for other reasons, such as noise barriers, and shrub and tree planting as barn owl mitigation will also reduce light emissions overall from the road. Therefore, no adverse health effects are predicted.

5. CONCLUSION

- 5.1 A comprehensive assessment of the potential effects of the proposed road development and acquisition of properties on Human Health has been performed. The methodology used was in keeping not just with the recent draft EPA guidelines and other guidance (including European Commission and UK Institute for Environmental Management and Assessment) but also best practice as outlined in the EIAR.
- 5.2 The new WHO noise guidelines have been considered as detailed above. It is clear that, while these guidelines are designed for populations rather than individual receptors, moving traffic away from populations (as will happen with the proposed road development) will actually have a positive community effect. From a human health perspective, the assessed impact is largely positive, while accepting that this is not the case for each and every individual. The extent of the adverse effects, however, is limited by the mitigation measures proposed.
- 5.3 In terms of Health Protection, there will be no significant adverse effects in terms of emissions – whether from noise and air - even for the most sensitive individuals and receptors.

- 5.4 Psychological effects of the proposed road development have also been considered and, again, while it is accepted that some individuals will experience anxiety from any proposed change, and others such as those directly affected by compulsory purchase orders could also be expected to have some negative psychological effects, there are significant positive effects from an overall community perspective. For example, there will be less day-to-day annoyance arising from being stuck in traffic and better opportunities for exercise and accessing services.
- 5.5 There are major positive impacts, including but not limited to, reduced road accidents, improved access for emergency services as well allowing for socio-economic development – which will all have a positive effect on human beings and human health.
- 5.6 The issues raised in the submissions in relation to potential impacts on human health have been fully considered, and having considered those issues, the conclusions of the human health impact appraisal remain as set out in the EIAR, i.e. no residual adverse human health effects are expected.

Appendix 1

The following submissions have been responded to in this Brief of Evidence:

Submissions Responded to in this Brief of Evidence	
ENV-	13, 25
SCH-	12, 18, 26, 34, 48, 51, 54, 61, 63, 66, 67, 72, 80, 81, 85, 92, 98, 106, 114, 115, 123
FI-	2