

Kirklees Climate Commission

Movement, Innovation and Transport sub-group

Consultation document on the WY + TF A629 Halifax Road Phase 5 Carbon Impact Assessment

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Scope

This document is to report on the examination of the WY + TF A629 Halifax Road Phase 5 Carbon Impact Assessment and to highlight points raised regarding that document for which the Commission seeks clarification.

Introduction

There are plans for Kirklees Council to implement major changes to the main A629 route from the M62 junction 24 at Ainley Top to the town centre. These changes involve improvement and widening of the A629 to include junction improvements, re-positioning of footways and footway improvements, pedestrian crossing provision, the alteration, demolition and erection of walls, construction of retaining walls, erection of fencing, hard and soft landscaping to include the removal of trees and replacement planting, replacement street lighting, change of use of land to highway and change of use to and formation of car parks at Edgerton Cemetery and land adjoining 103 Halifax Road (within a Conservation Area). This is a highly visible project, having already been the subject of regional TV coverage owing to the question of removal of mature trees, and so should be seen to be transparent in relation to the Council's declaration of a Climate Emergency. To this end, the Commission examined the Climate Impact Assessment for the project in order to give an independent but informed viewpoint on how this project aligns with the Council's stated objectives regarding carbon reduction.

A sub-group of the main Commission was tasked with examining the Carbon Impact Assessment (CIA) and raising any points which they considered requiring clarification. These have been captured and broadly categorised below.

General Comments

The scope of the document is unclear from the beginning. The purpose of the report states that "This Carbon Impact Assessment (CIA) has been prepared to assess the associated greenhouse gas (GHG) emissions of the A629 Phase 5 project (hereinafter 'Scheme') that are estimated to be generated during construction and operation", however, of the 36 pages of the document, less than half a page considers "Operation Carbon". This section was changed between the original version of the report issued on the Council's planning website and the version which superseded it. Despite the first version scope only covering emissions "generated during construction" in that opening statement, the original report included sections 4.2.3 to 4.2.5 which considered the monetary value of the impacts on greenhouse gases (GHG) of some future unspecified traffic usage, however these sections were removed from the updated version which purports to cover "construction and operation".

No details are given for how the calculations leading to the figure of 39,574 tonnes operational CO₂e was reached, despite this making up the bulk of the net carbon emissions quoted in the report Carbon Summary Table. The CIA is effectively a Mass Balance exercise of all inputs against outputs or in the case of GHG assessment, positives against negatives, therefore, for it to be meaningful it needs to have all positives and negatives included to understand the true GHG balance. It is unclear

from the CIA exactly what the boundaries of the assessment are, as there appears to be some indication that Primary Raw Materials are included and yet the GHGs/tonne of material to produce/source the materials appears to be excluded. The CIA should consider the whole life of the development and the carbon impacts or the changes to the physical structure and the way it is used going forward, including impacts from external influences, such as, active travel and new active travel networks, change in working behaviours, digital connectivity, additional job creation and housing projects anticipated through the Local Plan, etc. This document did not include a 'do nothing' scenario given the potential changing habits, behaviours and developments that may impact on the scheme, nor does it consider the additional maintenance and repair costs over the life of the project.

The Kirklees Council adopted the Climate Emergency Motion on 17th January 2019, prior to the adoption of the most recent Local Plan. The Climate Emergency Motion provides a primary focus on the council reducing GHG emissions. The Local Plan has not been reviewed by the council in light of the declaration of the Climate Emergency Motion, however LP Strategic Objective 7 states that proposals in the Local Plan should be consistent with promoting development that helps to reduce and mitigate climate change, and development which is adapted so that the potential impact from climate change is reduced and to help the transition towards a low carbon economy. It is not clear from the CIA how this objective is to be met.

There appear to be several errors and points of confusion in the document. For instance, section 2.2.2 references the government's target of 80% reduction of GHG by 2050, however, by the time this CIA report was published (September 2020), the government had already publicly enabled the 2050 amendment order to the Climate Change Act 2008 (as amended) to target 100% reduction. What effect does this have on the calculations made by the consultants?

The CIA states in 3.1.2 final bullet that the outputs of the GHG emissions assessment have been made available along with data sources and any relevant assumptions. This document does not provide underlying evidence to validate its claims and the underlying data does not appear to have been published. Without such data it is almost impossible for the reader to have meaningful engagement with the assessment.

There are many models and datasets mentioned and it would be helpful to understand how the consultants verified and validated the models as being the appropriate ones to use. It would also be helpful to have confidence that the models harmonise or support each other's methods. It would be useful to know what compatibility and confidence or certainty rating the consultants assessed when choosing the methodologies. Where are the annexes or appendices of data to support the body of the report findings?

Many assumptions have been made without reference to how these were validated as appropriate. For example, why is it assumed that all plant on site will use grid electricity, when it is highly likely that the contractors will use diesel power for most operations. These kinds of assumptions and those relating to the material resources to produce the construction products being excluded (3.2.1), while at the same time stating that 'the embodied carbon emissions of material resources are the **total** [bold text added for emphasis] carbon dioxide equivalent emissions released (3.2.2), again raise the question as to what is and isn't included in the scope of the CIA.

Many of the datasets are from old data and reports. The Carbon Plan: Delivering our Low Carbon Future 2011 is 10 years old and there are many subsequent reports from government that supersede this document. The Bath Inventory is now at v3.0 (2020). The PAS 2080:2016 Carbon Management in Infrastructure highlighted as the underlying common framework is now 5 years old.

It would be useful to clarify which datasets were used by the consultants and understand the impact of any changes in data values if the previous versions were used.

Much emphasis has been placed by the consultants on the PAS 2080:2016 and yet we understand through the CIA that much of the data for the CIA is not available in enough detail to carry out the CIA. If the scheme is being operated under the PAS 2080:2016 requirements, then the CIA would have been an integral part of the carbon management process and the quantification of GHG emissions. It appears as if the CIA is secondary to the project development. For the CIA to have any meaning within the delivery of the project, the contractors for the project should be required to be certified to PAS 2080:2016 and the project run under the requirements of PAS 2080:2016. The project should then be monitored and managed against the PAS 2080:2016 requirements, as a minimum.

Specific queries

Section 3 Construction Carbon and Energy

Section 3.1.2 states that

“A proportionate approach has been taken to the scope of the assessment methodology, consistent with principles associated with GHG emissions set out in PAS 2080:

Relevance – data and assessment methodology has been selected and presented in Table 8.4.

Completeness – the GHG emissions assessment has been based on a Life Cycle (LC) approach.

Consistency – consistent methodology and data sources for GHG emissions have been used to allow comparison of emissions over time.

Accuracy – the quantification of the GHG emissions have neither been over nor underestimated, as far as can be judged. Also, uncertainties have been reduced as far as reasonably practicable.

Transparency – the outputs of the GHG emissions assessment have been made available along with data sources and any relevant assumptions. “

There are multiple issues with this section. Firstly, there is no Table 8.4 presented in the report. Next, it is not clear what the life cycle is which the assessment has been based on – is it the life cycle of the construction, or of the overall scheme effect? As far as consistency is concerned, many different sources have been used, some of which are contradictory in places. There are also questions about the choice of methodology, particularly the use of the i-Tree Toolkit, which is not from the UK and leads to questions as to whether the underlying methodology and datasets are appropriate for the UK (i-Tree is a US toolkit for trees based on US flora). The accurate quantification of emissions must be questioned when over 8000 of the approximately 8900 HGV movements described are effectively ignored by assuming that the majority of the construction waste will remain on the site. This equates to some 86900 tonnes of material, however, table 8 appears to have the carbon cost of removal set to zero. E.g. Bituminous mixtures waste has only 30.57 Tonnes taken to a waste management facility, whereas there are 158.53 Tonnes stored on site. This equates to ~80% waste bituminous mixture not removed from site. Where does this material go and how much GHG is not accounted for if removed? Each of those waste materials stored on-site will need removing at some point.

Section 3.1.2 also identifies transparency relative to data sources and any relevant assumptions made. While reference is made to many methodologies and data sources, it is unclear what has actually been used and whether that was appropriate and proportionate as required.

Section 3.2.2 states that GHGs are converted to CO₂e based on their global warming potential (GWP). It is the individual gases (species – greenhouse gases) that are factored against CO₂ in the GWP to provide a CO₂e value to enable values to be compared in the assessment. These factors are also based on time periods for the impacts of the gases. No mention or understanding of the values used have been given, for example, if methane CH₄ factor is being used is it for the 20-, 100- or 500-year horizon (e.g. factor of 56, 21, or 6.5ⁱ * CO₂ per kilogramme, respectively)? This is important to understand that all the different methodologies are using the same timeframes and factors. As the GWP factors change over time with better understanding, the factors used need to be explicitly stated and if necessary adjusted to ensure that the factors are the same in all calculation methodologies (CIA 3.1.2 bullet 3 – consistency (PAS 2080 4.4 definition)).

In section 3.5.4 the CO₂ value of emissions have been factored by 3.67 to reduce the 1992 tCO₂ to 543 tCO₂e. 3.67 is not the factor to use from CO₂ to CO₂e, but for 1 kg of CO₂ in comparison to elemental Carbonⁱⁱ. CO₂e is a way of measuring the GHG effect of emissions other than CO₂ in terms of an equivalent amount of CO₂, therefore has a direct equivalence to CO₂ amounts. The 1992 tonnes of CO₂ therefore equate to 1992 tonnes CO₂e, not 543 tonnes. If all of the document has had the CO₂ divided by 3.67, then the whole of the emissions reported in the document could be significantly out by a factor of approximately two thirds.

ⁱ Figures adapted from the Greenhouse Gas Protocol table 2014 (AR5) https://www.ghgprotocol.org/sites/default/files/ghgp/Global-Warming-Potential-Values%20%28Feb%2016%202016%29_1.pdf

ⁱⁱ The atomic weight of a carbon atom is 12 and the atomic weight of oxygen is 16, so the total atomic weight of CO₂ is 44 (12 + (16 * 2) = 44). This means that a quantity of CO₂ can be expressed in terms of the amount of carbon it contains by multiplying the amount of CO₂ by 0.27 (12/44). E.g. 1kg of CO₂ can be expressed as 0.27kg of carbon, as this is the amount of carbon in the CO₂, (Therefore, 1kg of CO₂ is 3.67 (44/12) times the weight of carbon). NOTE: This document was written in 2012 and the CO₂e factors may have changed for some species

ⁱ <https://ecometrica.com/assets/GHGs-CO2-CO2e-and-Carbon-What-Do-These-Mean-v2.1.pdf>

Unfortunately, as with many of the numbers in the report there is no calculation and breakdown shown for the 1992 tCO₂ or how this number has been generated. It is not clear what the energy CO₂ values quoted do include, if petrol or diesel are used, they should be CO₂e values which include the other GHG emissions from the fuel as well as the CO₂.

Section 4 Operation Carbon

This section is key to the overall assessment of carbon impact, if the objective of carrying out the works is to reduce carbon, then surely the long-term impact on carbon emissions from use of the road should be the focus. However, this section is so short and lacking in detail as to be meaningless. As discussed previously, some attempt had been made in the original version of the report to assess a monetary value attributable to the scheme, this appears to show a negative benefit and the section was then deleted from the version which superseded it. The reason for this deletion and the detail behind the calculations should be made public and debated, as, based on this, there may be a case for the “do nothing” scenario which has not been considered.

The two scenarios chosen do not get benchmarked against a “do nothing” scenario, with a review of road use, change in vehicle volumes and types, etc. So unfortunately, there is little understanding of whether doing nothing is a better option. The “do something” models also appear to consider the whole road scheme as one and, from a carbon perspective if not for other perspectives, there may have been different outcomes by looking at restricting certain parts of the road scheme to other more limited upgrades or alterations.

If road usage (4.2) was a key metric, then it is unclear as to whether the disruption and diversion of traffic accounted for. What account has been made of:

- the changes in active travel and active travel networks (including the Kirklees route up to Ainley Top);
- the changes in vehicles from petrol and diesel to EV over the period;
- the changes in motor vehicle use with the changes in potential working patterns;
- the upgrade of the rail network.

Short of reviewing all the WYCA road use analysis reports it is hard to understand what data are being used and whether from a carbon sense the project is logical. Also, it is noted that there may be limited road use surveys as the data shown on the supportive information appear to be for just occasional days and realistically should be for an appropriate sample size to represent the whole lifecycle of the road use.

Converting monetary value of impacts into GHGs appears to be a strange approach. If vehicle movements are estimated and the length of the road is known, then the emissions by types of vehicles can be calculated year by year and then aggregated for the scheme. Again the consistency of modelling needs to be questioned.

No view appears to have been considered of alternatives such as vehicle access routes using alternate day use (e.g. number plate even number one day and odd numbers another) for cars and small vans, or creating bus lanes, or single person occupancy penalties, or Electric vehicles using bus lanes. The approach seems to be extremely “business as usual” when there are many potential gains to be made by considering new advances and technologies.

Section 5 Ecosystem Services

The Ecosystem services appear to be a desktop study by the tree consultants. There is plenty of conjecture about the trees and their impact on the environment and carbon emissions and sequestration. The use of the i-Tree Design Tool is questionable from a carbon perspective because it is a US tree calculation tool and it is not clear if the correct tree species can be used, along with the correct carbon factors for the tree types identified in the Kirklees environment. There appear to be Forestry Commission and Woodland Trust models available, so why was a US model necessary? It is again unclear how the consultants considered the GHG pollutant emissions being sequestered from the current mature trees and effectively offsetting them with saplings that have a different carbon profile.

The scope of the scheme comes into question again when considering the loss of and replanting of trees. Many small new trees will need to be planted to offset the loss of the mature trees involved, however this will need far more area than that incorporated within the project. For trees to be counted as carbon reduction on private land there would need to be a legally binding requirement to replant for scenario 2 to make any sense.

Section 6 Mitigation Measures and Enhancements

This whole section is exceptionally limited. Given the two scenarios at the beginning of the CIA it appears that very little has been considered against the two scenarios for carbon mitigation and carbon reduction. Most of the opportunities proposed, while being eminently sensible, are either current standard practice or partially required already and are unlikely to make significant carbon savings. The Energy Saving and Efficiency section should be written into all contracts anyway and therefore cannot be considered additional carbon savings.

Summary

There are still many questions to be answered regarding the Carbon Impact Assessment of this project. To fully address the Climate Emergency, schemes such as this need to not only help to reduce the overall carbon budget for the district but should be seen to do so in a transparent manner.

Although the scheme is the focus of this appraisal, the A629 is purely a single branch in a wider West Yorkshire network - its Key Route Network, KRN - which is made up of its heavily trafficked arterial routes. On this basis, the impact of one branch - good or bad in relation to emissions or traffic congestion etc., will have a knock-on impact on the wider network.

At a time when we are looking for wholesale reductions in emissions, any scheme of this size should be reviewed against wider environmental objectives. Which is to say, how does the impact of this scheme - good or bad - see Kirklees reach its ambition.

The Commission notes more broadly that this scheme appears to be based on traditional traffic growth assumptions and fails to consider the upcoming changes in transport habits i.e. electric vehicles, autonomous vehicles, and Mobility-as-a-Service; as well as the shift from analogue to digital broadband infrastructure which is improving the reach of mobile and home working. If we have learned anything from COVID lockdown, it is that, for many sectors, traditional transport trips can be replaced by Zoom and Teams.

Setting aside the impact appraisal methodology and whether the scheme offers true and long-lasting environmental benefits or indeed dis-benefits, it's unfair to judge in isolation without knowing how the route's purpose will change over time. For example, by 2025 20% of all new cars sold globally will be electric, and that will rise to 40% by 2030, and by 2040 virtually every new car sold globally will be electric, according to a report by the BBC.

Although impossible to predict every eventuality, it's clear that the wider KRN will likely see significant emission reductions in time based on the migration to electric vehicles alone.

So in summary, without an appraisal detailing the whole life benefits or dis-benefits of this scheme; and without having a Kirklees wide road map in place setting out year on year emissions savings required across the KRN, it's impossible to state whether any benefits predicted as part of the A629 will support Kirklees in meeting its objectives.