The countryside charity
Peak District and
South Yorkshire

LOW CARBON TRAVEL FOR LONGDENDALE AND GLOSSOPDALE

Report by
Keith Buchan, MTRU

for

CPRE Peak District and South Yorkshire

September 2022

A57 Link Roads TR010034
CPRE PDSY Unique Reference: 20029243

Registered Charity No.1094975
Registered Company No. 4496754

Contents

Introduction and Summary

This report presents a sustainable package of measures *Low Carbon Travel for Longdendale and Glossopdale (Low Carbon Travel)* and considers the National Highways (NH) proposed road scheme, the A57 Link Roads, in light of five key matters:

1) Whether a "starting from scratch" analysis would have produced different options from the road scheme to address the area's transport related problems. This necessitates:
    i. the accurate definition of what those problems are
    ii. sufficiently detailed design of an alternative package
2) Whether the NH proposal is the best value way of addressing the problems in the area – this requires a preliminary analysis of value for money of an alternative using current methodology
3) Whether the appraisal and technical justification of the NH scheme conforms to guidance and good practice, in particular dealing with forecasting and uncertainty
4) Whether the NH proposal supports or conflicts with established local policies for transport, climate and the environment
5) Whether the scheme supports or undermines latest national Government policies for transport, land use and environment, in particular greenhouse gas emissions.

It also highlights a central paradox in the NH case. It will be a theme of this report that it is not possible to encourage travel by non-sustainable modes without undermining the promotion of sustainable modes. It is even possible to quantify the extent of the undermining using the Department for Transport (DfT)'s and NH's own economic analysis. These arguments were presented to the examination and are reproduced here. NH did not put forward an argument that this was not the case: to do so would have to ignore the fundamental laws of economics. There were arguments over the extent and how this was measured, but no evidence was given that encouraging car use did not discourage a switch from car to other modes.

Linked to this is a wider point: investment in any transport scheme whose detailed appraisal reveals they do not conform to the Government's carbon reduction pathway should not proceed. In this case neither the baseline without the scheme or forecasts with the scheme do so. This should have been flagged up at an earlier stage before any submission for consent was made.

The draft Development Consent Order (DCO) for the A57 Link Roads was submitted to the Planning Inspectorate on 28th June 2021 and accepted for examination on 26th July 2021. The examination commenced on November 16th 2021 and closed on 16th May 2022. During the course of the examination a great deal of material was produced and this report is based on the submissions made by MTRU in that context, but also the history of CPRE producing positive alternatives to road capacity increases. The first part of the report provides some history of the different proposals and policies for the local area, the National Park, and Greater Manchester. The second focusses on the alternatives, covering issue 1 above. The third focusses on the appraisal of the NH proposal and an alternative package (issues 2 and 3). The fourth deals with issues 4 and 5 on how the NH proposal conflicts with policies in a way which a sustainable package would not.

The majority of the material in this report was presented to the A57 Link Roads' DCO Examination, and was therefore available to the Examining Authority and NH, but in separate submissions. These are all listed below with their URLs for ease of access. The reason for producing a report now is to bring the relevant submissions into a coherent document and to add analysis that had to be undertaken after the examination closed.

Local data on public transport and HGV movements was sought from NH in order to complete the analysis but was not forthcoming by the end of the examination. No data was provided

subsequently by NH. Consequently the work has had to be completed post-examination as best we can using average data from DfT sources. We have also used methods of appraisal based on DfT tools and guidance, including the DfT Transport Data Book, WebTAG and the Active Mode Appraisal Tool (AMAT).

Overall *Low Carbon Travel* demonstrated alignment with national and local transport policies, provided wider benefits outside the immediate confines of the Mottram section of the A57, and demonstrated high value for money. It would support regional programmes such as Manchester's "50-50" plan to make transport more sustainable, rather than hindering them.

Beyond the issue of conformity with Government commitments to carbon reductions NH's assessment of the A57 Link Roads was seriously flawed in other ways, for example not conforming to current DfT guidance on how to treat uncertainty. A previous strategic assessment of alternatives in 2015 used outdated assumptions and focussed on road building options. Impacts on the National Park were underestimated or omitted altogether. A significant amount of the material revealing this was not submitted to the DCO.

It is essential that a fresh options appraisal and re-assessment of specific proposals which would meet future national and local commitments is undertaken.

Material submitted to the A57 DCO with urls

- REP2-070 Alternatives first draft – see REP12-032 for corrected Table on page 15

REP2-070 https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-000857-CPRE%20PDSY%20-%20Other-%20report%20to%20accompany%20CPRE%20written%20rep.pdf

REP12-032 https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-001556-CPRE%20PDSY%20-%20Other-%20correction%20of%20an%20error%20in%20REP2-070%20-%20revised%20version.pdf

- REP4-016 BCR package and scheme negative impacts on Government and local policies for sustainable travel

https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-001044-CPRE%20PDSY%20-%20any%20outstanding%20comments%20on%20Written%20Representations%20received%20for%20Deadline%202.pdf

- REP4-031 Response to ISH 2 with Annex

https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-001045-CPRE%20PDSY%20-%20Other-%20response%20to%20ISH%202%20and%20written%20summary%20of%20oral%20submission.pdf

- REP5-028 Rebuttal NH comments – supplementary note on traffic benefits page 12

https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-001078-CPRE%20PDSY%20-%20comments%20on%20submissions%20for%20Deadlines%203%20and%204.pdf

- REP6-033 New model runs for carbon KB comments

https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-001154-CPRE%20PDSY%20-%20Other-%20response%20to%20REP5-026%20&%20ExA%20WQ2%20Q8.2%20Cumulative%20Carbon.pdf

- REP7-034 How does the model include public transport

https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-001222-CPRE%20PDSY%20-%20Keith%20Buchan%20How%20does%20the%20model%20include%20Public%20Transport%20F.pdf

- REP7-035 Response to NH comments in REP6-033 on carbon and showing scheme is within a major conurbation

https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-001223-CPRE%20PDSY%20-%20Keith%20Buchan%20response%20to%20REP6-033.pdf

- REP7-036 Response to NH REP6-017 Scheme BCR and sustainable travel policies pp1-4

https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-001221-CPRE%20PDSY%20Response%20to%20NH%20REP6-017%20Answers%20to%20WQ2.pdf

- REP8-033 written summary of hearings KB Compatibility of scheme with Government and local policies for sustainable travel and carbon emissions; summary of scheme impacts https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-001364-CPRE%20PDSY%20-%20written%20summaries%20of%20oral%20submissions%20at%20hearings.pdf

- REP8-045 Clarification following ISH 3 Item 2 policy and transport pp 1-2

https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-001365-CPRE%20PDSY%20-%20Other-%20submission%20for%20clarification%20following%20ISH3.pdf

- REP10-013 comments on submissions for D9 Fixed cost function and masking pp1-3

https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-001475-CPRE%20PDSY%20-%20comments%20on%20submissions%20for%20Deadline%209.pdf

Part 1: History of proposals and policies for the A628 corridor

The A57/A628/A616T between the M1 in South Yorkshire and the M67 in Greater Manchester is the only trunk route crossing the Southern Pennines. For more than 50 years the DfT and NH and their predecessor bodies have been attempting to address the issues on the route by increasing road capacity[1]. To date road schemes have met with difficulties due to (i) the overarching transport policy agenda; (ii) piecemeal "out of context" development; and (iii) failure to plan strategically for both road and public transport (particularly rail) in the corridor. These are demonstrated by the 2007 collapse of the Mottram-Hollingworth-Tintwistle bypass public inquiry.

(i) The overarching agenda through those 50 years, has been to create a high standard all-purpose trans-Pennine route linking South Yorkshire and Greater Manchester. This was considered a vital component for successful urban regeneration on both sides of the Pennines[2]. As transport policy changed, and it became understood that in many areas it was not possible to build a way out of congestion, the proposal for a motorway connecting the two was dismissed in the 1970s. There were also huge environmental issues in relation to damaging the National Park. Nevertheless, the M67 was constructed as a separate bypass of Denton and Hyde. The Stocksbridge bypass opened in 1988 and increased the strategic importance of the route and traffic flows on it. The current scheme with plans for the Hollingworth-Tintwistle bypass and dualling further east[3] all reflect a continuing piecemeal approach.

(ii) Such piecemeal development, was rejected by the Government's independent Advisory Committee on Trunk Road Assessment (SACTRA) in the 1980s[4], because it avoids addressing the strategic impacts of the existing route and proposed upgrades. The A628T corridor even now threatens the integrity of the habitats and the special qualities of the Peak District National Park (PDNP). Plans for the Strategic Road Network (SRN) are required to avoid areas designated as National Parks, and go round them. The Peak District National Park Authority (PDNPA) has strong local plan policies that reflect this protection and seek reduction in traffic both within and through the area. Outside the Park, Greater Manchester and South Yorkshire both have targets based on Tyndall carbon budgets to reach net zero carbon by 2038 and 2040, respectively. In order to achieve these budgets Transport for Greater Manchester's (TfGM) Transport Strategy and Right Mix '50:50' policy aims for 50% of journeys by active travel and public transport by 2040, with a 17% reduction in car trips overall - a decrease in car trips of 6% for local neighbourhood journeys, 12% for the wider city region, 21% for trips connected to the regional centre and 7% for city-to-city journeys. These policies are not reflected in the A57 Link Roads' development.

Piecemeal upgrades also avoid planning strategically for trans-Pennine travel between the Scottish border and the A52. Twelve miles to the north of the A628T corridor the M62 is designated part of the EU Trans-European Network (TEN) or Trans-Pennine Corridor with the M56, M180, and the north-south Trans-Pennine rail routes. There has been no attempt to reduce traffic impacts on the sensitive Pennine uplands by focusing trans-Pennine movements on the M62 corridor using a braided approach to road, rail and water. Instead, upgrades of the M62, the A66T and the A628T are all being developed at present.

(iii) The failure to plan strategically, and with respect for key environmental assets and environmental and societal impacts, has led to difficulties in progressing upgrades for the corridor. The 1970s motorway was rejected because of its impacts on the National Park. The failure of the 2007

[1] The Case for the Scheme - Summary

[2] Mottram Hollingworth and Tintwistle The need for a bypass, 1988, Tameside MBC, Derbyshire CC and High Peak BC

[3] South Pennines Strategic Development Corridor, 2020, RIS2

[4] See SACTRA Report on Urban Road Appraisal, 1986, also Environmental Impact 1992, Traffic Generation 1994.

Mottram-Hollingworth-Tintwistle bypass to proceed was due not only to the weight of objections but also to errors in the traffic modelling and its inability to reflect the new realities of transport policy. The inquiry was postponed to allow corrections to be made to the modelling but the public inquiry never re-convened. It finally closed nearly two years later, without another meeting, in March 2009.

In that context, developing and evaluating an option that fulfils the policy framework is essential. CPRE has been developing and promoting alternatives to major road building in this corridor since 2004. Its 2004 'Way to Go'[5] proposals were well received but only a minority of them have been progressed. MTRU's[6] 2005 appraisal of CPRE's proposed Peak District-wide lorry control system[7] demonstrated its environmental benefits; in surveys it was the top solution chosen by local people[8].

After the 2009 closure of the Mottram-Hollingworth-Tintwistle bypass inquiry, Tameside Council consulted on the Longdendale Integrated Transport Strategy [9] (LITS) which included measures to improve conditions for walking, cycling and public transport use, as well as major road building. However it failed to receive central funding.

In 2014 MTRU developed for CPRE a package of travel demand management measures and Smarter Choices for consideration through the Trans-Pennine Routes Feasibility Study 2015[10]. These demonstrated strong benefits compared to road building and unambiguous evidence that they should undergo detailed appraisal. The rejection of these measures by HA is discussed further below in Part 2.

In 2020 CPRE undertook a broad on-line survey to collect views from both residents and visitors on the future of Longdendale and travel within it. This provided a long list of transport interventions that people wished to see. This was further developed through one-to-one interviews with residents and visitors to understand their specific travel experiences, and followed by an online professionally facilitated Green Travel Challenge to discuss the emerging measures. All this work has informed the final proposed package for Low Carbon Travel.

[5] South Pennines Integrated Transport Strategy 'The Way to Go' - CPRE Peak District and South Yorkshire Branch, 2004. Measures included Lorry weight restrictions; revitalised main roads; 20mph zones; safe routes to school and travel planning; good quality cycle infrastructure and cycle training for all children; improved access to rail; bus lane on A628; Peak District- wide Quality Bus Contract with promotion and marketing; traffic calming and 30 mph through villages; Hope Valley line passing loop; regional rail card; road pricing in Greater Manchester.

[6] http://www.mtru.com/

[7] CPRE lorry control proposal on the A628 – Assessment by MTRU, 2005

[8] Travel Survey, Alternative Proposals for Transport & Save Swallows Wood, 2006; Longdendale Integrated Transport Strategy, Public Consultation Report, Tameside MBC 2010 – the most supported measure to address congestion was an environmental weight restriction (89%) with the bypass coming second (81%)
https://www.tameside.gov.uk/TrafficManagement/Longdendale-Integrated-Transport-Strategy

[9] https://www.tameside.gov.uk/lits

[10] Final Report for the 2014 Trans-Pennine Routes Feasibility Study, incorporating the Interim Note of 31-7-2014 - Keith Buchan, Director of MTRU, 2014. Measures included HGV weight restriction; opportunities for local journeys using travel planning, new walking & cycling routes, car sharing, car clubs, raising travel awareness and providing information on rail and bus; enhancements to rail services; reallocation of road space to cyclists.

Part 2: Developing an alternative package - Low Carbon Travel for Longdendale and Glossopdale

2.1 Developing and testing Options

The development and testing of options is central to any scheme preparation and appraisal. This is embedded in both the earlier and the latest versions of the Treasury Green Book[11] and WebTAG[12]. The normal approach is to identify objectives which the options seek to achieve, and problems which are to be solved. The two are obviously related.

We have used this approach to generate elements of an alternative package, linking them to problem solving and achieving objectives. It is not claimed that any proposal is perfect, but there are some which perform much better than others.

Did NH undertake an option assessment?

In the case of this DCO, NH claimed that the option assessment stage was delivered by the February 2015 report[13] referred to in the HA/NH Environmental Statement[14]. NH confirmed that this document was the basis for their initial option assessment.

It is clear from the source documents that, even in 2015, the appraisal table lacked some key strategic environmental and social objectives, in particular reducing greenhouse gases and promoting Active Travel (Climate Change and Health)[15].

While it could be argued that, even in 2015, these objectives were clearly identified in local and national Government policies, policy development since then has been in a clear direction – raising the importance of reducing carbon (and other pollutants) and promoting sustainable travel. Supporting the economy remains a key goal but has to work within policies for levelling up and greener growth.

It is also clear that the rejection of the original HGV control scheme and sustainable travel measures was on the basis of the former being difficult to deliver and the latter not having enough impact. Apart from that the HGV control scheme scored reasonably well even on the limited objectives used (see Annex 2).

---

[11] An update was available in Dec 2020 during the A57 Link Roads statutory consultation - https://www.gov.uk/government/collections/the-green-book-and-accompanying-guidance-and-documents

[12] https://www.gov.uk/guidance/transport-analysis-guidance-tag

[13] Trans-Pennine Routes Feasibility Study Stage 1 Report February 2015 https://www.gov.uk/government/publications/trans-pennine-routes-feasibility-study-technical-reports

[14] APP-060 A57 Link Roads TR010034 6.3 Environmental Statement Chapters 1-4 June 2021 https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-000155-6.3%20Environmental%20Statement%20Introductory%20Chapter%201-4%20Introductory%20Chapters.pdf

[15] The objectives did not include carbon emissions reduction, reducing congestion impacts on the wider urban area beyond the trunk route, or encouraging modal shift to more sustainable modes. They included:
Connectivity – improving the connectivity between Manchester and Sheffield
Environmental – avoiding unacceptable impacts on the natural environment and landscape in the Peak District National Park, and optimising environmental opportunities;
Societal – improving air quality, reducing noise impacts, and addressing levels of severance on the trans-Pennine routes in urban areas;
Capacity – reducing delays and queues and improving the performance of junctions on the routes
Resilience – improving resilience through reductions in the number of incidents and reduction of their impacts;
Safety – reductions in the number and impacts of accidents

It is also important to make the distinction between "feasible" and "deliverable". HA agreed that the alternative package was feasible, i.e. deliverable in practical terms, but had some risks associated with it, for example objections to any TRO required and enforcement costs. The former is normal for any TRO, including those required as part of and subsequent to, this DCO. For the latter the HA judgement has clearly been overtaken by technologies such as ANPR[16] which is now very widely used and an established tool in the transport planner's toolbox. HA's 2015 sifting of options is therefore doubly out of date.

In terms of core objectives used for assessment, the importance of reducing carbon emissions and a move to sustainable transport has grown, especially with the passing into law of carbon reduction targets which depend crucially on mode transfers. This is reflected in the most recent national and local policies, for example the DfT Transport Decarbonisation Plan[17] (TDP) with walking and cycling 50% targets for 2030, and the TfGM "50-50" policy[18] which has locally specific targets for sustainable travel from now to 2040.

This is a transformation in policy objectives and legal targets since 2015. While the objectives used for the initial option appraisal were in our view incorrectly drawn at the time, they are now completely out of date. We have no hesitation therefore in revisiting the question of whether this road scheme is the best option to achieve strategic or local objectives.

2.2 Solving problems

In terms of the problems and objectives for this scheme, we would amend the HA/NH list as follows. The key existing problems we consider should be addressed are:

1) High carbon emissions from existing traffic
2) Noise, air pollution and severance caused by existing traffic in local streets
3) Noise, air pollution, severance and landscape detriment from much of the same traffic in the Peak District National Park (PDNP)
4) Unreliable journey times
5) Poor local conditions for walking and cycling (with associated health disbenefits)
6) Delays to local buses
7) Long journey times on strategic transport links between Manchester and Sheffield

In relation to these the A57 Link Roads scheme has a strong negative score in relation to carbon - it adds nothing other than the external impact of transfer to electric vehicles and will discourage established local and national plans to transfer traffic to sustainable modes. This is not necessarily the case with all road schemes – the A57 happens to be located within the outer area of a major conurbation, next to an important national asset (PDNP) which produces its own locally generated traffic, especially visitors.

The road proposal has a mixed picture on local impacts (2 above) with increases and decreases, and has a negative impact on the National Park (3 above). Journey times were only given for sections of road rather than a representative number of actual journeys. In relation to 5) walking and cycling routes are fitted on to the new road using "walk with traffic" schemes which hold users in the middle of the carriageway so as not to interfere with the traffic stream and offer no direct

[16] ANPR: Automatic Number Plate Recognition, used widely for traffic and speed limit enforcement on the strategic and local networks including congestion charging and air quality zones.

[17] Decarbonising Transport, A Better, Greener Britain, DfT 2021 https://www.gov.uk/government/publications/transport-decarbonisation-plan

[18] Greater Manchester Transport Strategy 2040 – 'Right Mix' Technical Note, TfGM January 2021 https://democracy.greatermanchester-ca.gov.uk/documents/s12589/GMTS%202040%20-%20Appendix%201%20Right%20Mix%20Technical%20Note.pdf

crossing[19]. If used at all, they will encourage risky behaviour from trying to beat the traffic cycle which could otherwise cause crossing times up to 2 minutes. No information is available on predicted walking and cycling use of these routes or route timings. Several footpaths are severed by the new road and an associated large scale junction.

Strategic route timings are predicted to get longer in future years compared to the present day, but are claimed to be less worse with the scheme. However this conclusion is subject to the criticism of the modelling in another section of this report (Part 3). Basically the impact of the traffic changes on the road network in Manchester are screened out by the use of a buffer network and "masking". This is referred to by NH as removing "model noise". A more technically detailed explanation of this screening is given in REP10-013[20].

It is important to emphasise that a scheme which makes road traffic faster will make such travel more attractive. The variable demand model is supposed to represent this, although it does not do so for freight. Neither does it identify exactly how this will change the balance of competition between sustainable modes and motorised vehicles across the area. This is important because it is traffic in these areas which is subject to the key Government policies to reduce carbon, for example as set out in the DfT Transport Decarbonisation Plan (TDP) and the TfGM "50-50" policy referred to previously. In this specific case the majority of the benefits appear to be to traffic in the local area - trips entirely within Greater Manchester represent 55% of total benefits.

Some of the elements of this package involve the concept of "coherence" in terms of creating an area where public realm and traffic control work together, and a series of consistent signs, planters, seating and crossings gain from a consistent and clearly signposted approach. This in turn moderates driver behaviour and improves safety. The importance of this approach is found, for example in the DfT guidance on walking and cycling networks[21].

2.3 Overall approach: building a package

Before setting out some more detailed proposals to the high level problems listed above a summary of the approach is set out below.

1) Reduce pressure on the system overall through traffic reduction and dispersal
2) Reduce the number of the most environmentally damaging vehicles on the local road network
3) Improve safety on the whole A628 PDNP route by reducing speed limits
    - 50 mph through the Park
    - 20 mph from Tintwistle to Hyde Road
4) Encourage more walking for local journeys and increase footfall in all the settlements at the Western end of the A628 by:
    - more frequent protected crossings

---

[19] There are exceptions at the major M67 roundabout: All pedestrian phases are 'walk with traffic' apart from 3 linked to the traffic timings and requiring demand actuation (push button) at:
eastbound exit onto Hyde Rd; southbound exit onto Stockport Rd; westbound exit onto Mottram Rd

[20] REP10-013 comments on submissions for D9 Fixed cost function and masking pp1-3
https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-001475-CPRE%20PDSY%20-%20comments%20on%20submissions%20for%20Deadline%209.pdf

[21] Local Walking and Cycling Infrastructure Plans, Guidance for Local Authorities, DfT April 2017
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/908535/cycling-walking-infrastructure-technical-guidance-document.pdf

- reduced speeds
- public realm improvements and “signals” to motorised users

5) Use junction reconfiguration, signalisation and revised signalisation to
   - control remaining traffic
   - introduce greater priority for buses, pedestrians and cyclists
6) Undertake a travel planning programme locally which would:
   - inform people about existing alternatives to car use
   - identify barriers to using alternatives
   - identify improved provision on the basis of the travel planning programme
   - implement improvements, monitor and modify
7) Improve sustainable North/South links as well as East/West

2.4 Summary Package: Low Carbon Travel for Longdendale and Glossopdale

Our alternative package would comprise a number of new combined pedestrian signals/bus stops and gates on the A628 route through the Longdendale settlements, linked to existing paths and developments

1) Public realm improvements to create a coherent network and encourage footfall
2) Enlarged junction at Woolley Bridge to include a priority entry lane for buses and cyclists from the A57.
3) A comprehensive travel plan for Longdendale, beginning with a travel planning programme including both workplaces and residential areas (these need different techniques)
4) Use the travel planning programme to:
   - define place to place local cycle and walking routes (not necessarily the same)
   - set up new or improved bus services with initial incentives to try them
   - better integrate rail and bus services locally
   - improve links to TfGM networks for public transport and cycling
   - pilot bike and e-bike deliveries from local shops
   - create financial incentives to overcome barriers and provide longer term support (particularly useful for workplace plans encouraging public transport and cycling)
6) Institute an HGV control scheme for the National Park to remove through HGVs. This would need an area based approach and have two options: restricting only the heaviest (over 24 tonnes) or all HGVs (over 7.5 tonnes) except for access.
7) Link new and existing traffic signals to a centralised area wide controller and the TfGM system.

2.5 Pedestrians and buses: improving access and controlling traffic

The need to improve public transport, walking and cycling in the area is well established, for example in the Tameside LITS study of 2010. This underwent extensive consultation and the results helped to inform this package. Some helpful work on what the bus improvements might

look like can be found in the summary and consultation documents[22]. A more detailed package would require the supply of local data which was not available from NH.

One of the points of the proposed travel planning programme is to reveal demand for facilities and refine services and infrastructure improvements rather than imposing solutions. This means they are more likely to be used (there are many workplace travel plan examples). However, some useful suggestions were gathered in the public consultation exercises, both for the original LITS in 2009 and through the CPRE Green Travel Challenge[23] consultation in October 2021.

The findings from the latter have assisted in preparing this package and the Green Travel Challenge report, which was submitted to the Examination, should be considered alongside it. In terms of possible elements of the package all authorities were invited to the consultation and we have had a useful follow up meeting with the PDNPA. The alternatives need to be co-ordinated with PDNPA's sustainable travel initiatives. These in turn are another relevant policy since they influence traffic flowing into the study area (and are part of the NH Area of Detailed Modelling).

The approach to pedestrian crossings is to provide more of them, both to encourage walking and also to create easy access to buses. A full review would be needed but initial work on the ground (including analysis of existing demand points and bus stops) and the responses from the consultation have been used to show how this would work. It takes full account of the need for coherence, and the other recommendations in DfT guidance. This states that walking (and cycling) should have "five core design outcomes":

- attractiveness
- comfort
- directness
- safety
- coherence

The package addresses all of these issues directly, whereas the proposed A57 Link Roads scheme essentially relocates them. The list of improvements in the guide is in Annex 1.

Overall on the 3 mile section of road between Tintwistle and Hyde Road there are currently 7 sets of signals of which 4 are pedestrian crossings. Four new sites have been identified as shown on the attached map. The photo below of an existing crossing in Hollingworth on the A628 shows the opportunities for also improving the existing facilities, for example through replacing guard rails and using coloured road surfacing and planters. The intention here is not just to create the improved crossings, but by having a series of them, properly integrated with public realm improvements, a sense is created in drivers that this is not an area where traffic alone dominates – there is a balance. Figure 2.2 below shows a first draft of sites for crossings[24]. All of these are associated with footpaths, local residential settlements and bus stops. Some of the routes to the latter via the crossings will also need items such as improved lighting.

---

22 See https://www.tameside.gov.uk/lits/summary

23 REP2-071 https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-000842-CPRE%20PDSY%20-%20Other-%20separate%20report%20accompanying%20written%20rep.pdf and https://www.cprepdsy.org.uk/news/car-free-longdendale-update/ This was conducted by independent specialist consultants and the Consultation Report published in November 2021

24 Please note: a crossing on the A57 for the Trans-Pennine Trail and a bus gate in Old Glossop are not shown

Figure 2.1 Existing pedestrian crossing on Market Street, Hollingworth which could be improved.

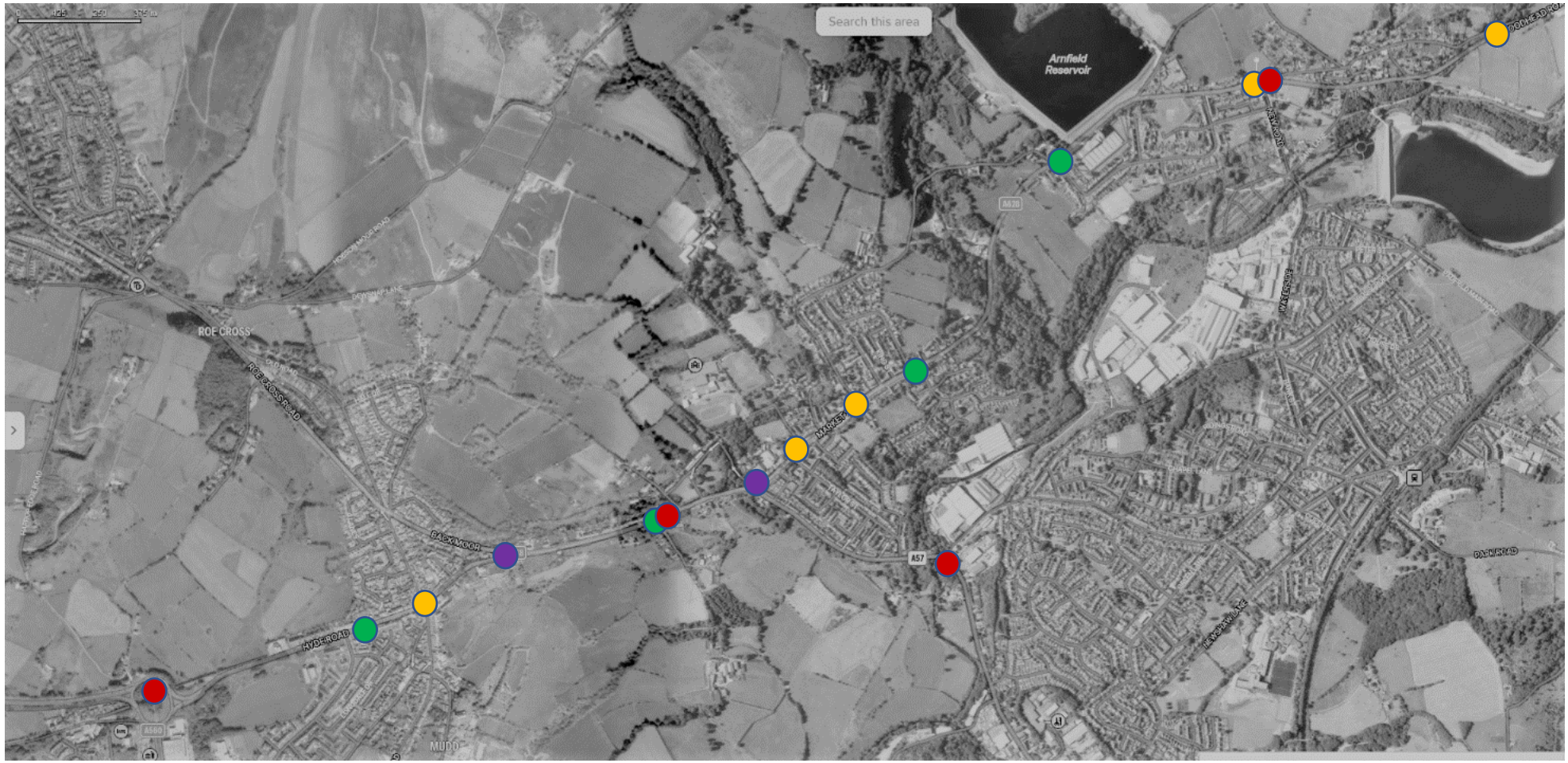


Figure 2.2

New signalised crossing

Existing signals

New bus priority/signalisation

Existing signals no pedestrian phase currently

Please note: a crossing on the A57 for the Trans-Pennine Trail and a bus gate in Old Glossop are not shown

2.6 Bus service improvements: an integrated approach

While improving conditions for walking as well as access to bus stops is one part of the picture, the package proposes improvements to:

- the stops and waiting areas
- the buses themselves
- service frequency and reliability.

Proposals for stop and shelter improvements were made by Tameside in its LITS Strategy from 2010. In this package the idea would be to co-ordinate with and reinforce the public realm improvements and driver behaviour indicators. Consistent signing would be used to emphasise that it is a local community and recreational area, including the theme of Longdendale's special qualities and connection to the National Park (e.g. as a "Gateway"). Such behavioural approaches are increasingly common and understood, particularly where space is shared between traffic and local movement on foot. The modern understanding that walking is not just a mode of transport, just without wheels, but an opportunity for social interaction and creating demand for local facilities such as retail is the basis for some of the proposals in the Low Carbon Travel for Longdendale and Glossopdale.

In terms of external air quality and internal comfort, buses should be replaced as soon as possible by electric versions with air circulation/conditioning and WiFi. However, the package also includes improved services. Using the data from NH, and the feedback from the consultation, both on the original LITS and the Green Travel Challenge conducted in 2021 the following is an indicative package:

- the purchase and operation of three new electric buses to raise the profile of bus services and allow for increased services
- one option could be reviving part of the X57 Glossop to Manchester to provide an hourly service (2 new buses). The A57 south of Hollingsworth and Hadfield has significant employment areas and a settlement at Gamesley. The latter has an hourly hail and ride service (no evenings) but much of it is less than the recommended minimum for bus stop access. This would enable a guaranteed interchange between local buses and the X57, for example from the existing 20 minute service on the 237. The package would enable much faster links between Tintwistle and Manchester destinations The X57 used to run from Sheffield, but was poorly used. It is not clear why this was, given that the NH scheme is predicated on a lack of links between the two cities.
- a new local hopper type service serving Tintwistle, Hadfield and Glossop (including South of the centre). This would be co-ordinated with the X57 so that some of the frequent stops for this service in Glossop could be avoided. This could be used to reduce the X57 journey time as an express service.
- A new junction layout at Woolley Bridge to widen access inbound from the A57 allowing for a bus and cycle approach lane and a priority entry. The junction should also be signalised. A picture of the junction approach which would be widened and be signalised to include a bus/cycle priority is shown as Figure 2.3 below. The existing bus stop would be in the proposed new priority lane.
- Bus gates at selected pedestrian crossings would have the dual function of breaking up and distributing any queuing traffic and improving bus journey times. These would be directional, with the ones at the eastern end having westbound priority

and vice versa. The use of gates instead of full length bus lanes is one which was pioneered in London but is now widely used and has three main advantages:

- Less disruption to general traffic of all types
- Lower space requirements and better compliance
- Easier to integrate with other functions, in particular pedestrian and cycling crossings

Figure 2.3 Woolley Bridge junction showing single file approach and current bus stop

Note: Woolley Bridge is to the left out of view.
Photo data: MTRU, August 26th 2021 15:47.

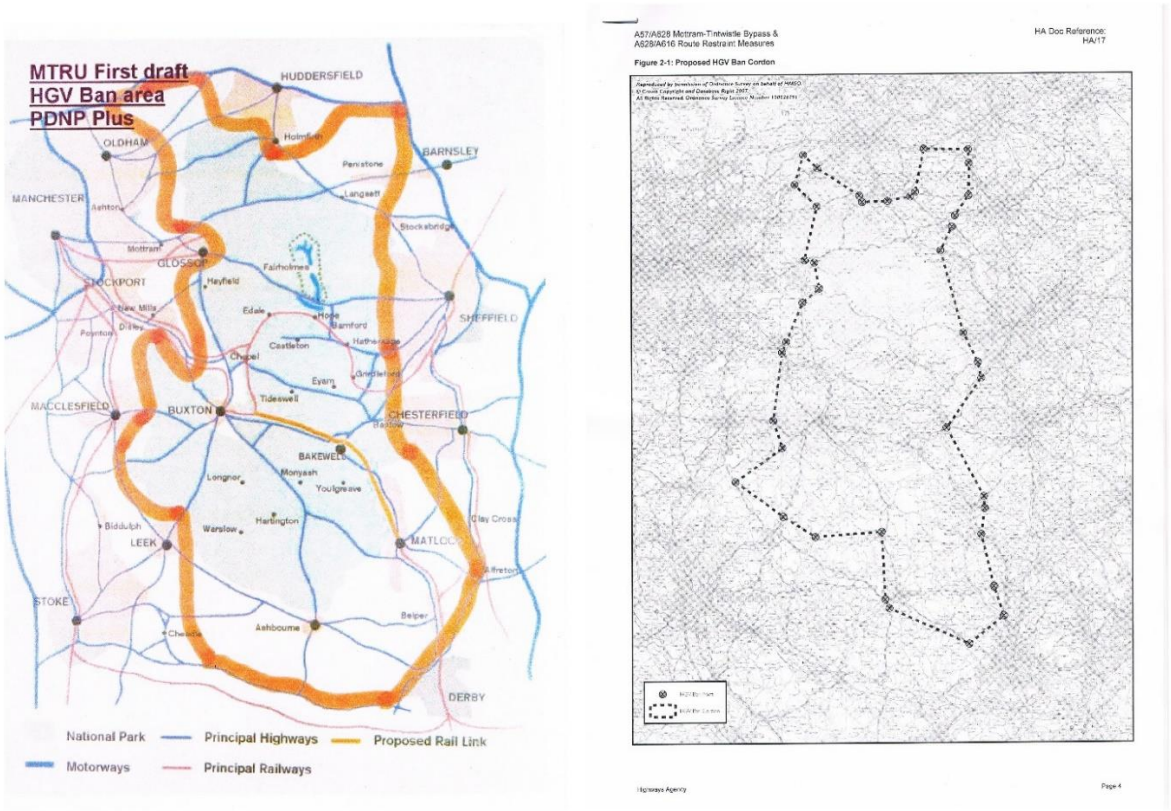
2.7 HGV control scheme

Introduction

An HGV control scheme on vehicles over 7.5 tonnes was first proposed by MTRU and included in the HA Strategic Assessment in 2015. An indicative map was produced, then translated into a detailed map suitable for the transport model. This included site visits to the proposed sign locations for costing purposes.

These two maps are shown in Figure 2.4 below.

Figure 2.4: HGV control scheme initial area proposal (indicative map left; detailed map right)



Access restrictions such as this are widespread and a local example from Old Glossop is shown below.

Figure 2.5: Example of local access restriction

Photo data: MTRU, August 27th 2021, 09:39

One of the key issues in 2015 was enforcement and since then there has been considerable progress in methodology, in particular use of cameras and number plate recognition. A recent example of an HGV scheme is the London Low Emission Zone (LEZ) which covers the whole of the Metropolitan area. This applies to all HGVs over 3.5 tonnes and is more stringent than many HGV restrictions which operate at 7.5 tonnes. Examples of the latter can be found locally, for example in Old Glossop (see Figure 2.5). The original CPRE proposal was for an HGV access only restriction but in developing such an option, and as part of any further consultation, other options should be considered. Additional work has indicated that an even simpler control would achieve most of the benefits.

A good example would be a restriction on the heaviest and most damaging vehicles only: for example those with four or more axles. These are basically over 32 tonnes and include most articulated HGVs. Analysis of the traffic flows at Chapel Brow and Woodhead from the DfT dataset shows how these are the dominant HGV type. Because the manual counts were not conducted in the same year, an extra check was done for Woodhead.

Table 2.1: HGVs and traffic A628

	All traffic	HGVs (%)	Large HGVs (%)
Chapel Brow 2019 Manual count	11676	1423 (12%)	1051 (9%)
Woodhead 2016 Manual count	12592	1537 (12%)	1137 (9%)
Woodhead 2019 Estimated	12957	1621 (12%)	1181 (9%)

Source: DfT at roadtraffic.dft.gov.uk

External costs and HGVs

One issue in assessing the alternatives is the extra costs of diverting HGVs from the PDNP. It is important to understand that HGVs, especially the largest HGVs, have a scale of environmental, infrastructure and congestion impact which is hugely greater than cars. The most extreme example is road surface damage, and thus road maintenance, which is about 180,000 times greater for the heaviest articulated HGV than a car[25]. Noise, vibration, visual intrusion, emissions and particulates are all greater, if not to the same extent. All of these effects (known to transport economists as external costs) are well known and documented.

Purpose built roads, such as motorways, are designed to minimise these external costs. The DfT data on external costs, in the TAG Data Book, sets out values for such impacts, to be used for broad brush assessment. Although the diversion of through traffic of HGVs from the PDNP is likely to cause an increase in distance, this will be at a lower rate of external cost. In this case there would likely be an overall reduction in external costs.

This is not the whole picture. Demand for using HGVs is directly related to the cost. Such an effect is included by NH in their modelling for cars, but not for HGVs. Use of the latter is in fact much more sensitive to cost than car use – this is because there are a variety of options to reduce HGV travel including use of other modes, time switching, use of alternative depots

[25] This is because damage rises rapidly with axle weight, usually calculated using the 4th power law

and modifying logistics systems to minimise external impacts. In addition, HGVs are significantly underutilised - they are in fact completely empty[26] for 28% of their travel.

There is sometimes some confusion between the amount of goods by weight which are delivered (usually referred to as "tonnes lifted") and the distances travelled by road in order to deliver them. The total weight of goods delivered, for example goods from ports to depots, is much less sensitive to price than HGV travel. This is because the options for the way the goods are transported are many and diverse (see above), including the obvious one of their current lack of efficient use of vehicle capacity.

DfT recommends using the TAG Data Book for broad brush assessment of external costs and these data are the same as those used for detailed appraisal, for example carbon values. Using this it is possible to calculate the external cost impact of the control scheme at the strategic level. The key factor is that external costs will be lower on motorways than A roads. This is fairly self-evident but specific data is available and this is illustrated in the table below which shows the significantly lower accident rates per mile for HGVs on motorways compared to non-built up A roads. In terms of HGV distance travelled, there are twice the number of road casualties, 3.3 times the number of killed and seriously injured and 4.4 times the number of fatal casualties, on non-built up A roads compared to motorways.

Table 2.2

Ratio of casualties on non-built up A Roads compared to Motorways		
Killed	Killed and seriously injured	All severities
4.4	3.3	2.1

Source: DfT tables RAS 30017 and TRA 0104

Initial assessments were that the maximum increase in journey length would be 32 miles replacing the A628 with the M1/M62. This will not apply to all trips but provides an upper bound. Using similarly congested networks, replacing travel on A roads with motorway travel results in a substantial external cost net benefit. While this point was made at the Examination, a full comparison with additional operating costs was held back pending further data from NH on the trip length and route of HGVs on the A628 – a "select link analysis" – at Woodhead. This was received and confirmed the original estimate for through traffic, but the other data requested was not available. In this case, and subsequent to the Examination, we have prepared an assessment based on what data is available and this is covered in Part 2.10 below.

In terms of traffic relief, and therefore congestion, HGVs clearly take up significantly more road space than cars. Most traffic assessments and modelling uses the passenger car unit (pcu) as its basis for comparison. The average for all HGVs is usually taken as 2.4 pcu or above (depending on specifics such as junction delays). However, this average conceals differences between smaller HGVs and heavy articulated vehicles which are rated at 2.9 pcu and above.

In this case, where there are high proportions of the heaviest HGVs, analysis shows that a majority of the congestion benefits from the control scheme would come from removing the

[26] DfT freight statistics Table FRS 0125 https://www.gov.uk/government/statistical-data-sets/tsgb04-freight

heaviest vehicles. This allows for a proportion which would require local access estimated from the flow differences at the count sites (10%).

Based on the opening year flows supplied by NH[27] a restriction on HGVs, using a 2.4 pcu value, would result in a traffic reduction of at least 17.3%. Removing only the heaviest (about 75% of the total) but applying the higher pcu value results in a traffic reduction of at least 15.4%. The remaining car traffic is subject to the sustainable travel package and the two results combined to provide an overall reduction. Again a more detailed analysis using standard cost benefit methods, and the available data, is provided in Part 2.10.

The initial figures have been public since October 2021 and were used in the CPRE Green Travel Challenge consultation. The slides from that, which summarise the first draft of the package and the impacts, are part of the Green Travel Challenge report[28] which should be read in conjunction with this more detailed analysis. The individual elements have been developed since the consultation and the overall reduction figures have increased marginally by around 1%.

2.8 Potential overall impact of Low Carbon Travel for Longdendale and Glossopdale

An initial assessment of local traffic which might be affected by the sustainable travel package was made from the flow data between the cross Pennine routes and the local flows at Mottram. More detailed car trip matrices were supplied by NH towards the end of the Examination. Local data was extracted from them to improve the local traffic assumptions used for the calculations. It is difficult to apply data to 2025 because the DfT TDP uses 2030 and TfGM use 2040 as target dates. Using TfGM assumptions, 2040 local traffic levels could reduce by about 17% but the impact of sustainable policies on the rest of the traffic is an unknown. Even assuming there is no impact from such policies (itself a limiting case) traffic reduction overall would be about half that, i.e. 8-9%. A more detailed analysis was difficult due to the lack of data from NH. However, national data and as much local data as possible were used to refine the impact assessment of the alternatives for this report.

Using the anticipated TfGM Right Mix policy impact on traffic reductions as a proxy for the impact of Low Carbon Travel sustainable transport and combining this with the HGV control scheme would lead to the traffic reductions on the A57 at Mottram Moor shown in Table 2.3. Figures are given for Low Carbon Travel with all HGVs subject to a weight restriction ie 7.5tonnes and over, and with only the heaviest HGVs (articulated) subject to a weight restriction. The differences between them are marginal as the heaviest HGVs predominate but this needs to be confirmed with better HGV data.

Table 2.3

	Gradual TfGM 2025	Gradual TfGM 2040	DfT TDP 2030	Updated DfT TDP 2030
Package + all HGV control	**-21.3%**	**-24.1%**	**-28.2%**	**-28.6%**
Package + heaviest HGV	**-19.5%**	**-22.3%**	**-26.4%**	**-27.7%**

[27] APP-151 Appendix 2.1 of NH Document 6.5, the Environmental Statement, Traffic Data https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-000234-6.5%20Environmental%20Statement%20Appendix%202.1%20Traffic%20data.pdf

[28]

2.9 Costs of Low Carbon Travel for Longdendale and Glossopdale

In seeking to move this package forwards some indicative capital costs have been allocated. The least certain aspects are the two major junctions: the M67 and Woolley Bridge. The latter is moderately sized while the M67 needs further detailed design work and is not included in the estimate below. The package has been costed at £9.7million at today's prices including optimism bias at 44%[29]. This is important because construction costs have some uncertainty at the moment.

Table 2.4: Low Carbon Travel for Longdendale and Glossopdale cost estimates

• Woolley Lane junction signalisation and provision of bus/cycle priority entry	£1,000,000*
• Three new signalised pedestrian crossings	£450,000*
• One new pedestrian crossing with bus gate	£250,000*
• One bus gate at existing crossing	£150,000
• Two additional pedestrian phases at existing signals	£150,000*
• Three new electric buses	£1,000,000
• Travel planning programme initial survey and planning	£500,000*
• Travel plan start up incentives 3 years @ £350k pa	£1,050,000*
• Walking route improvements (50 kms @ £5k per km)	£250,000*
• Cycling improvements (includes 50 kms plus parking and other incentives)	£500,000*
• 20 mph speed limit plus public realm (20 kms @ £10k/km)	£200,000*
• HGV signs including advance warning on motorways[30]	£1,200,000
• Total	£6,700,000
• Plus Optimism Bias 44%	**£9,650,000**

The items included in the walk and cycle part of the package are indicated with a *. Travel planning has been split 50-50 between walk/cycle and public transport, as has the cost of the Woolley Bridge signals including bus/cycle priority. This enables the walk and cycle elements to be subject to a cost benefit assessment on the same basis as the proposed A57 road scheme using the DfT's Active Mode Appraisal Tool (AMAT). Details are given in Part 2.10 below on package assessment. The other elements (HGV control scheme and public transport) are also subject to assessment using established DfT cost benefit parameters in Part 2.10.

As noted above, in regard to the cost table it is important to note that no additional costs are given for signalisation of the M67 roundabout. This could be modest if undertaken within the existing layout, but would become more expensive if more construction work was needed, of the order of £5million. NH said they would not supply details of the roundabout

[29] See TAG Unit A 1.2 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1102786/tag-unit-a1-2-scheme-costs.pdf Optimism bias is the demonstrated systematic tendency for appraisers to be overly optimistic about key parameters. Optimism bias of 44% is the recommended highest level adjustment for standard civil engineering projects - see Supplementary Green Book Guidance Table 1 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/191507/Optimism_bias.pdf

[30] In practise we would propose an engagement with freight users and operators to minimise costs and maximise benefits – analogous to travel planning for personal travel. The costs and benefits are not included here due to lack of data on HGV use. The benefits should however easily outweigh the costs.

costs separate from the rest of the scheme. In any case the layout with the sustainable package would not need as much major change as with the road scheme. It also seems very likely that the roundabout will have to be signalised as part of new development conditions so may not need funding as part of this package. While no costs have been calculated for the M67 works, there are also no benefits included in the assessment.

2.10 Low Carbon Travel for Longdendale and Glossopdale Cost Benefit Assessment

Achieving objectives

As we set out in Part 2.1, any transport scheme should have a full option development process, when overall objectives are assessed. These strategic quality of life objectives should continue to guide scheme development and appraisal throughout. Our analysis shows that this scheme would in fact undermine key objectives such as improving safety and reducing carbon emissions. The latter is considered in detail in Part 5 of this report. If full account had been taken of the key objectives, this scheme should never have passed its Strategic Case assessment (as mandated by the Treasury Green Book). The Green Book Review set out the issue in some detail and suggested remedial actions. Despite this, considerable weight is given to the next stage of appraisal, the detailed Economic Case, and in particular the production of a value for money figure as part of it – the benefit to cost ratio or BCR. Useful and more detailed data is usually collected for the Economic Case, and measuring costs and benefits for alternative proposals can be undertaken in a similar manner to that for the road scheme.

The traditional cost benefit approach and BCR

The proposed A57 Link Roads scheme has undergone a cost benefit analysis which claims to conform to DfT guidance. Part 3 of this report considers how in our view this claim is not justified, for example in the lack of traffic reduction in the urban areas adjacent to the proposed scheme, the lack of option assessment and the failure to deal with new policy and uncertainty.

As part of this traditional cost benefit approach a monetised BCR was produced for the A57 Link Roads scheme. The limits of monetisation are well known and not detailed here. The limits of the BCR are also well known and described in DfT guidance. However, to show the value for money of the proposed alternative we have undertaken a cost benefit analysis using the available data and this section presents its results. Throughout we have used the same DfT guidance and monetisation values, in particular in the DfT TAG Data Book. The aim has been to produce an assessment which can reasonably be compared to that for the A57 Link Roads. We have also drawn attention to the areas of uncertainty, as professional practice and DfT guidance require. As will be seen, much of the uncertainty is the result of inadequate NH data so is also present in their assessment but unacknowledged. This is the first issue considered below.

Making the best of the data

During the DCO examination it became clear that there was a lack of walking and cycling data or of any estimates for future use. The same was true for public transport – despite claims that it was included in the NH modelling. In fact there was some limited rail data which at the time of writing seems to have been used in a different and undisclosed high level model. Although NH claimed their modelling included variable demand, this was for car only, and was severely limited by the lack of sustainable personal travel modes. It completely excluded heavy goods vehicles. It was also clear that no specific account was taken of the

policies in the DfT TDP which aspires to a move to sustainable travel modes and away from car traffic.

Despite this surprising lack of data, it has been possible to produce assessments for the following:

- walking and cycling elements of the alternative package using DfT standard software
- costs and benefits of public transport improvements, but excluding time benefits to existing passengers (because of the inadequate NH data and model)
- estimates of the costs and benefits to operators and the public of the HGV control element using figures from the DfT Data Book (which uses the same parameters as used for all DfT appraisal)

For personal travel, the local car traffic at Mottram was estimated from the sector data supplied by NH and mode transfer assumptions were applied from the details in the Climate Change Committee's (CCC) 6th Budget. This is what underpins the DfT TDP. Technical work pre-dating the DfT TDP by TfGM for their "50-50" strategy was also used to check the existing programmes to promote sustainable travel.

For goods vehicles, the amount of through traffic was obtained from NH but there was no categorisation between rigid and articulated HGVs, nor between smaller and larger HGVs. As set out earlier in the traffic impacts, local DfT count data on the A628 was used to assess the balance between articulated and rigid – about 75% were articulated, higher than national averages. Average HGV trip lengths and categories from DfT were used since specific data was again not available from NH. Fine tuning the control scheme to cover articulated HGVs only would reduce its negative impacts since there appear to be a small number of lighter HGVs with much lower disbenefits and a higher likelihood of needing local access. However the current lack of origin and destination (O&D) data by HGV type (or detailed O&D) makes this difficult. This should be remedied urgently bearing in mind its important role in the NH appraisal.

Further details of each approach are set out below, starting with walking and cycling.

Walking and Cycling

The figures from the CCC provided a high and low estimate for walking and cycling use. It should be noted there is some interplay between these modes and public transport, particularly bus and cycle. There was not enough data from NH to assess this. Again this is rather surprising.

Obviously the creation of new walking and cycling routes is entirely in line with TfGM, local authority and Government policy. The reality of this is evidenced by the development and growth of the TfGM Bee Active network[31]. The original 2018 TfGM vision for the Bee Network was a 10-year, £1.5 billion plan to create 1,800 miles of routes and 2,400 new crossings connecting every neighbourhood, school, high street and public transport hub in the city-region. The forecasts for Low Carbon Travel are based on the overall CCC averages and do not take account of any enhanced effects from the Bee Network.

These figures were used as inputs to the DfT Active Mode Appraisal Tool (AMAT). This is the standard method for appraising such schemes and is in widespread use. MTRU has used it for a number of assessments, including some for National Park Authorities. The detailed assumptions and results are in Annex 3 (taken from REP4-016) but one important one is that

[31] See https://beeactive.tfgm.com/bee-network-vision/

the appraisal runs from 2023 up to the net zero end date of 2050 which is when the CCC forecasts also stop.

The results are as follows:

Table 2.5: Key outputs from AMAT

	Low CCC	Central	High CCC
Number of new users 2025	700	840	980
Rate of growth	5.5%	6.1%	6.7%
BCR	**5.34**	**7.98**	**10.21**

New users calculated from DfT TDP and TfGM 50-50 policies

In addition to the package costs in Table 2.4 there is one difference in that an additional ongoing sum of £100,000 per year up to 2050 has been added to the Low forecast, and £50,000 to the High and Central forecast. This is intended to provide sensitivity testing. A variation in the appraisal period, which would normally be done as a sensitivity test, is not required since the appraisal was run up to the specific end date for the net zero policy (2050).

In all cases the optimism bias was raised from the AMAT standard 15% to 44% as in our original submission[32].

In other respects the inputs to the capital side used the list in Table 2.4 above, which were circulated for comment to NH and local authorities during the examination.

Public transport: buses

Undertaking the assessment of public transport was more complex, with very little data from NH and none on bus use. Local checks produced a more up to date picture of available routes and frequencies than the NH data. Because the position on rail was not finally clarified at the Examination, proposals have not been included for the package. There would obviously be costs and benefits from any rail enhancements in addition to bus but there was insufficient clarity on how rail had been treated in the NH modelling to add this to the package. In practise a holistic public transport package would be needed and should achieve even better value for money.

On the bus side there were several elements. First were the TfGM, DfT and CCC high level assessments, these were supplemented by analysis of local routes and potential origins and destinations. This led to an assessment of the scale of passenger use and the number of new buses and size required. The proposal is for 3 new electric buses which can carry about 40 passengers each.

It should be noted that the most effective way of increasing bus use is through engagement with users, in particular through travel planning. The exact nature of the routes offered should reflect the work done in the travel plan. The expenditure for this is split between the bus part of the package and the walking/cycling part. This makes the proposal somewhat

[32] REP2-070 Alternatives first draft – see REP12-032 for corrected Table on page 15
REP2-070 https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-000857-CPRE%20PDSY%20-%20Other-%20report%20to%20accompany%20CPRE%20written%20rep.pdf

different from a traditional service by service approach looking at existing local demand. The end result should be services which are more closely aligned to what people will use. We have not used an enhanced forecast for this overall but do assume that a slightly higher proportion of new bus users will switch from car. The normal figure is 3 in 10, we have used 5 in 10, but have undertaken a test with the national figure as part of the assumptions for the Low forecast.

We have applied our predictions for increased public transport use to the proposed service levels with forecasts for peaks, interpeak and evening. This produces an average daily bus occupancy which can be checked against national figures. Our prediction is for a weighted average of 12, varying between 20 in the morning peak and 4 in the evening. This compares with the national figure of 10.7 for England outside London. While the low fares and travel planning should at least achieve 12, we have also done a test at 10.7 by using this reduction for the Low forecast.

There is some interplay between cycle and bus options but the level of data available precludes any detailed work on this. In the overall package assessment at the end of this section, this effect will be diminished but not completely eliminated.

One benefit is the removal of external costs from the road network as car drivers switch to public transport. This is used in all such appraisals and we have used the average for A roads from the DfT's TAG Data Book. This may well underestimate the impact since the Mottram stretch, although short, is so congested and polluted.

Because the exact routeing of the bus services has not been defined and there is insufficient data on existing services, the benefits from the bus priority and traffic reductions to existing bus passengers are not included in the bus benefits. This is an omission from the benefits which should be significant but is simply beyond the data available.

On operating costs we used two sources: one derived from DfT standard equations (Data Book Table 1.3.14), the other simply used an average per passenger from national data. The latter was higher and the former did not include charging costs so the national figure was used.

For fares we have used the TfGM standard figure of £2, discounted as with all other current costs to 2010 prices for the appraisal. In practice, this will be subsidised for the passengers as part of the incentives in the travel plan package.

There is a remaining benefit to be calculated: the social value of trips made on the new services which are not due to modal shift from car. The TAG Data book gives an average figure and we have used one for those with concessionary passes (the lowest). We have also used the DfT average bus trip generation proportion of 21.

The results of the appraisal and key elements are shown below:

Table 2.6: Key appraisal elements

	Low	Central	High
Number of passengers 2025	2101	2356	2612
Car transfer (car drivers)	630	1178	1306
External costs saved per day (Average A road)	£1058	£1978	£3079
Operating costs less fares per day (no capital)	-£37	£762	£844
Average car trip length miles	5	5	8.4
Value discounted over 10 years	**£4.838million**	**£7.227million**	**£12.481million**
Capital costs	**£1.968million**	**£1.968million**	**£1.968million**
BCR	**2.46**	**3.67**	**6.34**

All Costs and benefits in £2010,
External costs are for 2025 from TAG data book

We have tried to test the robustness of the appraisal for this element of the package by combining a number of pessimistic assumptions in the Low column. In addition the cost of the travel planning programme has a major impact on the BCR, and represents about a third of the £1.968million total.

Despite this, we do not consider this cost benefit assessment as definitive and as reliable as the one for walking and cycling. Without better local data there are a few costs and benefits missing, although we consider that on balance the impact would be to improve the BCR. In particular there will be significant benefits to existing bus travellers from new priority and from the reduction in and improved management of traffic, in particular making bus journeys faster and more reliable.

HGV control scheme costs and benefits

At our request NH were able to supply some additional data on HGV flows on the A628. However this revealed a lack of detail in two crucial aspects. First there was no distinction within the HGV category between the heaviest 44 tonne gross vehicle weight (gvw) and the lighter rigids, for example 7.5 tonnes gvw. Secondly there was no detailed O&D information other than at the broad sector level. This meant that journey information such as trip lengths or commodity were not available. However data was sufficient to confirm our original estimate from the count data that longer distance HGVs passing through the area were about 90% of total HGV flows. These vehicles were the subject of the MTRU proposed access only HGV control system which does not affect local goods vehicle traffic.

The first observation is that this lack of detail in the NH data is in itself surprising given that HGV flows on the A628 are such a major and obvious problem. There has clearly been a lack of analysis of this issue, even at this basic level. While the generation of extra car traffic

caused by the scheme has been addressed (albeit only in part as became apparent at the Examination) no such exercise was carried out for HGVs. This is often omitted where car flows are the dominant component of the problem being addressed and in the economic assessment. This is not the case for the proposed A57 Link Roads and a more thorough HGV assessment should have been undertaken.

A key reason for this is that HGV traffic is far more sensitive to changes in cost than car traffic. The amount of goods transported is not very sensitive, but the distances travelled and the mode used is very much so. This is because there are many behavioural options open for HGV transport in relation to cost increases:

- more efficient use of vehicles
- changing choice of depot to reduce vehicle kilometres
- changing mode – rail is particularly competitive for unitised goods such as containers on the largest HGVs.

Similar changes happen in reverse – for example logistics systems will prioritise efficiency to a greater or lesser degree according to transport cost.

Sensitivity is usually measured as an elasticity value. A value of one means that all the cost change is absorbed by behavioural change. In the case of HGVs, this varies by commodity and trip length but overall an elasticity value of 0.9 is widely accepted, including by DfT[33].

Given the limited data we have not calculated how much extra HGV traffic would be generated as a result of the scheme. This should have been done by NH as part of their variable demand work which they submitted to the Examination and is, in our view, a major omission.

For the MTRU control scheme we consider it helpful to give an estimate of the cost changes in the same way that the economics table for the A57 Link Roads has been approached, including an allowance for changes in HGV behaviour. This is possible because the additional distance involved in transferring HGV traffic to the motorway network away from the A628 can be measured. This will be a maximum but given the lack of O&D data for HGVs in the National Park this would provide a fair working basis for a calculation.

There are three steps to calculating the change in cost. The first is the external costs such as carbon emissions, pollution, accidents and congestion. These are significantly lower on motorways than A roads but vary according to level of congestion. The DfT Data Book (used for appraisals) has 5 different levels of congestion. For this analysis we have used Level 4 (second highest) for both A628 and the alternative motorway route. It is clear that despite the extra distance the external costs are so much lower on the motorway that the diversion creates significant cost savings.

On the external cost values used, they will clearly change over time. It should also be noted that, since average figures have been used, there will be a major underestimate of the benefits to the National Park in terms of landscape and visual intrusion, as well as journey quality for all users, including those travelling by car.

Of course this does not account for the internal HGV costs – i.e. the cost of extra driver time and vehicle operations including fuel. These will increase and again the DfT standard

[33] See*: Tax Information and Impact Note for Heavy Goods Vehicle charging proposals*, DfT October 2012 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/232294/hgv-charging-tax-information.pdf

equations are published in the TAG Data Book and have been used for this indicative analysis.

For the time costs we have used an average extra time, calculated by running Googlemaps for the alternative route over different times of day and days of the week. For the other operating costs we have used the change in distance and average speed, the latter using the same Googlemaps data.

Finally we have considered the variable demand response using the standard elasticity applied to the additional costs. This has an important effect in the calculations. It does not reduce the benefit from removing HGV traffic from the A628 since this is a fixed saving. However it reduces the extra traffic on the alternative route. This efficiency improvement also reduces the external costs on the new route, albeit at a lower rate than on the A628. It also reduces the total increase in internal (operational) cost. Ideally the elements of all the HGV journeys would be broken down into different road types and recosted. Since this data is not available we have simply illustrated the cost changes by changing the cost increases in line with the elasticity.

This is far from perfect but is all that is possible given the data and is set out in Table 2.7. The results are clearly subject to much greater uncertainty and sensitivity to assumptions than the passenger based elements of the package. We show some key results from the tests which we have applied using the methods above to demonstrate the variability as well as a best estimate. In particular it makes the point that the elasticity value causes major changes in the BCR because the environmental savings from HGV traffic reduction are constant and significant. It is also the case that the actual daily difference between costs and benefits in the zero behavioural response (£987 across all HGV traffic) is small and a very small percentage of the total operating costs. Despite this it produces a strongly negative BCR. By contrast the inclusion of behaviour change for HGVs creates a massively positive BCR.

In view of this we also calculated a limiting value for behavioural change (using the behavioural options quoted above) needed to give the HGV control scheme a good BCR. This is very small at 0.05 especially compared to the national average of 0.9, and should be easily achievable given the range of options available. Moving forward we recommend a more detailed analysis of existing HGV movements to provide a more robust appraisal.

Table 2.7: HGV control scheme appraisal: local access allowed all options

	Averaged figures No elasticity	Elasticity 0.9	Limiting e value (.05)
Net external costs saved per day	£27,072	£27,072	£27,072
Gross increase in daily operating costs	£28,059	£2,806	£26,656
Net change in daily cost (positive is benefit)	-£987	£24,266	£416
Capital cost (2010 prices)	£974,400	£974,400	£974,400
BCR	-9.2	+226.2	+3.94

All prices 2010, first year results discounted over 60 years using Green Book rates

HGV control scheme conclusions

As stated earlier, the lack of data from NH has been a major obstacle to providing a precise economic analysis. However, our testing using standard values and techniques has revealed the following:

1 Even using average figures there would be significant savings in external costs by transferring HGV traffic from the A628 to the motorway network
2 These savings would be very close to the extra operational costs involved in the longer route, again using average figures
3 While the savings stay constant, the extra costs are very sensitive to behavioural change on the part of HGV operators (represented by the elasticity value)
4 Using a standard elasticity there would be major changes in behaviour and a very large positive BCR
5 Given the uncertainty and variation these extreme values are best viewed as sensitivity tests pending a full analysis
6 Given the very small change in behaviour needed to produce a reasonable BCR from the scheme, our conclusion is that the most likely outcome is a positive BCR

Our best estimate therefore is that the HGV control scheme would reduce external costs sufficiently to cover increases in the operational costs experienced by operators. The use of average figures for the analysis rather than values specific to the National Park are likely to underestimate the cost savings which adds to the confidence in this conclusion.

Overall results for Low Carbon Travel for Longdendale and Glossopdale

Taking an overview of the economic performance is possible despite the different appraisal periods by weighting the individual BCRs according to the capital cost. The most difficult question was how to treat the high level of uncertainty over the HGV impacts. A conservative approach was adopted, including the capital cost of the HGV control scheme in the package but setting benefits at zero. Thus only the Low, High and Central BCRs for the other elements were included. This gave the following:

Table 2.8: Overall Economic Performance

	Low	**Central**	**High**
BCR	**3.34**	**4.99**	**6.98**

Overall this shows a strong economic case, with the central case for Low Carbon Travel in the DfT "Very High" category. For every pound of public money spent Low Carbon Travel would provide £4.99 of benefits for the central case. It is much stronger than the A57 Link Roads BCR which is in the "Low" category[34] and one which is more in tune with strategic policies. This is explored further in the following section where an analysis of the negative impact of the proposed scheme on policy, in particular carbon, is considered further.

[34] See https://www.gov.uk/government/publications/dft-value-for-money-framework

It is worth saying that sustainable travel schemes often score well in terms of BCRs and the score for this package is well within what might be expected. The exception is where sustainable packages involve large scale disbenefits to car and HGV traffic. In this case the changes for HGVs have been estimated separately and there are few disbenefits for car users. This is because queues are relocated rather than increased and the benefits from lower HGV use are used to create better walking and cycling conditions and improved bus and cycle priority. There would be some improved reliability for car users but this benefit is hard to estimate and has been omitted from the BCR above.

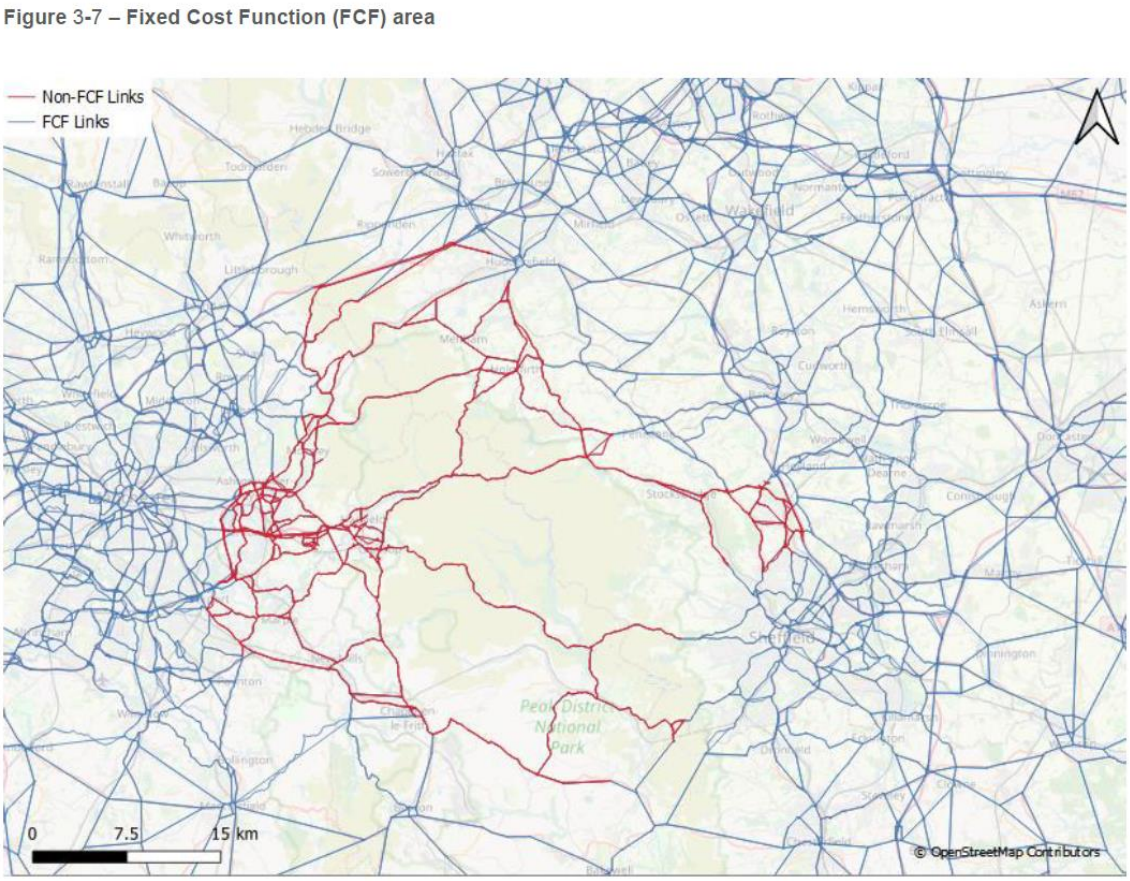
Part 3: Analysis of the National Highways A57 Link Roads proposal

3.1 Modelling and the modelled area

NH used an existing large area simulation traffic model (SATURN) for their main assessment. The area covered is shown in Figure 3-1 (13.1 in the NH report) of the Combined Modelling and Appraisal report[35]. This was supplied to CPRE following a data request and submitted to the Examination by CPRE as NH indicated it did not intend to submit the document. The wider model stretches from Liverpool to Grimsby and Harrogate to Matlock and includes Leeds and other major towns and cities at varying levels of detail.

It is normal to take such a broad model and produce greater detail in the area of interest. For example, NH have done this by expanding the model detail in the immediate neighbourhood of the scheme. This is called the Area of Detailed Modelling (**ADM**). What has not been done is to upgrade the level of detail for the modelling in the neighbouring areas where most of the traffic comes from and goes to: Greater Manchester. Although less traffic is related to Sheffield, this is not in the ADM either. This is clear in Figure 3.1 below, where the red network is essentially the ADM and the blue network has a Fixed Cost Function – i.e. it is not sensitive to changes in the cost of using the network caused by changing traffic patterns.

Figure 3.1 NH Map showing detailed and fixed cost networks



[35] REP2-090 pdf page 608 of 790 https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-000782-A57%20Link%20Roads%20Additional%20documents%20-%20anne%20robinson.pdf

In addition a further technique was used by NH to provide a stable model output. This is known as masking and reduces the impact of cost changes on traffic flows. The two techniques are described in the Combined Modelling and Appraisal report in section 13.7 on page 164 and 165[36].

It is clear from this that:

- Both Sheffield and Manchester are excluded from the detailed modelling
- Because of the base model's overall size and strategic nature the networks within both cities are limited.

For this reason the modelling cannot represent the impact of the scheme on traffic patterns in Greater Manchester.

In relation to travel between the two cities, it is limited for two reasons:

- the cities themselves are outside the ADM and modelled at a low level of detail
- access to the A628 is included in the ADM but strategic routes which are likely to be affected to the North and South are not.

3.2 Uncertainty and the Uncertainty log

The TAG Unit on this subject, M4, dated May 2019, states in para 2.1.1:

"There are two sources of forecast error: uncertainty in the inputs (such as size of new housing development) and error in the model parameters and specification (how these inputs propagate through the model). The practitioner should summarise all known assumptions and uncertainties in the modelling and forecasting approach in an uncertainty log. The uncertainty log will also be the basis for developing a set of alternative scenarios. The alternative scenario is used to understand the possible impact of an error in assumptions on the model forecasts."

This guidance is supplemented by the Uncertainty Toolkit, dated May 2021.

NH appear to have completed part of the log, relating to new development. They have not dealt with the second source of errors in terms of model parameters and specification. The Uncertainty toolkit gives more detail on what these might be in the table below.

Table 3.1: Extract from the DfT Uncertainty Toolkit

Technology	Economy	Behaviour
• Range of road vehicle types, and extent of technological standardisation;	• Economic performance; • Composition of labour market, different ways of working and changing business models; • Level of automation;	• Use of digital infrastructure and services; • Level of car ownership and extent of licence holding;
Take-up of Connected Autonomous Vehicles and Electric Vehicles;	• Patterns of spatial development and changes in regional distribution.	• Level of vehicle occupancy; • Demand for active travel; • Adoption of new technologies;

[36] REP2-090 pdf pages 610 of 790 https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-000782-A57%20Link%20Roads%20Additional%20documents%20-%20anne%20robinson.pdf

• Nature, sufficiency and cost of energy supply; • Connecting energy supply to vehicle energy demand.		
Social	**Political**	**Transport Supply**
• Changes in demographic composition (e.g. ageing population); • Changes in public health; • Importance of equity; • Climate change impacts and response; • Potential disruption to transport systems.	• Regulatory influence (e.g. road-pricing) • Decisions on national infrastructure projects; • Roles, responsibility and interconnectedness of the public and private sectors; • International action on decarbonisation.	• Other transport investments • Availability of and demand for public transport; • Carrying capacity of the rail network; • Digital vs. physical connectivity for access; • Production to consumption supply chains;

Some of these are directly relevant to this scheme: for example most of the Behaviour and Transport Supply entries. Climate change responses and decarbonisation are also major sources of uncertainty.

To give a specific example, it appears that it is unlikely that the current central road traffic forecasts are compatible with achieving international and national obligations on climate change. Carbon reductions will be required at a faster rate. However, the DfT has provided scenarios for forecasting and in this case, especially given that this is within a conurbation (albeit outside the centre), a more specific demand management forecast would have been advisable. Overall management of car demand to reduce the central forecast is assumed within the Climate Change Committee's sixth carbon budget report and subsequent work to translate the implications. At the very least this should have been in the Uncertainty log but it is so close to likelihood that it should have been included in the low forecast scenario.

In terms of alternatives, some of what is proposed by CPRE (demand management locally in Longdendale, and more widely across the National Park) is pretty much essential to achieving the carbon targets. To be effective it must transfer drivers from their cars (and achieve higher levels of car occupancy, as in Table 3.1 "Behaviour" column above and the DfT TDP).

Comparing what NH have done with the contents of Table 3.1 above, and WebTAG guidance, the conclusion is that NH have omitted a major part of the Uncertainty Log and have not undertaken an appropriate sensitivity test.

3.3: Conclusions on modelling

The two main conclusions are that:

1 The model is insufficiently detailed in areas where most of the traffic begins and ends – the negative impact of this is explored further in the next section.

2 Uncertainty – which is a key area of concern for modellers – is not dealt with in line with the latest DfT guidance and this is a particularly serious omission for carbon emissions and travel behaviour change.

3.4 Negative impact on local and national policies

Introduction

A key point that forms the basis of this report is that the proposed scheme is clearly within, and mainly affecting an urbanised area, not a rural one. Transport policy in such areas does not usually include major increases in road capacity such as this one. This applies to TfGM where they are not developing highway schemes themselves. They are however aware that others are, including NH and are obliged to acknowledge them in their plans.

The emphasis on sustainable modes in these urbanised areas is well established, however there are new Government and local policies which reinforce this even more strongly, and are reflected in legislation. These are driven primarily by climate change which has targets to move car drivers to sustainable modes. However, better health through Active Travel and air quality improvement are also key factors – discouraging car use is a key part of implementing those policies. It must follow that encouraging car dependency directly undermines it.

The key pathways for mode change in the latest policies include:

- From driver to passenger (car sharing/household consolidation). This is reflected in the Government target for increased car occupancy.
- From car driver to walking and cycling. This is reflected in the Government 2030 target "half journeys by walking and cycling" in towns and cities.
- From car driver to public transport. This is supported in Government policy statements but has no specific target. In GM there is the "50-50" target for sustainable modes overall by 2040, but this includes public transport.

One problem with assessing the negative impact of a scheme on a different scheme designed to promote a competing mode (as in this case) is that it is often expressed verbally or in a criteria analysis – for example red, green, amber. On the other hand the benefits of many schemes are expressed in hard money terms and cover a wide range of journeys which obscure the negative impact, for example on sustainable travel.

This has led some transport practitioners to introduce the idea of compensating within an individual scheme appraisal for negative impacts. For example the Decarbon8 partnership, which has as partners the Greater Manchester and the Sheffield Combined Authorities, and academic institutions such as Leeds Transport Studies Group, suggest this approach for carbon.

Nothing like this has been done in the current case and indeed would be difficult, since the extent of the sustainable transport modelling appears to be limited to car drivers who might choose public transport. This became clear during a technical meeting with NH (19 Jan 2022) and during the examination hearings it further emerged that there was only rail as an alternative mode, not bus. A further model was referred to by NH during the Issue Specific Hearing on public transport[37]. Clarification from NH was requested but was not forthcoming. Our original request was simple: what were the public transport use figures for the Do Minimum and Do Something in 2025 and 2040? As far as we know this is not in the

[37] EV-041 Transcript Issue Specific Hearing 3, Session 1, 1:05:26 https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-001279-TRANSCRIPT_ISH3_SESSION1_A57LINKROADS_05042022.pdf

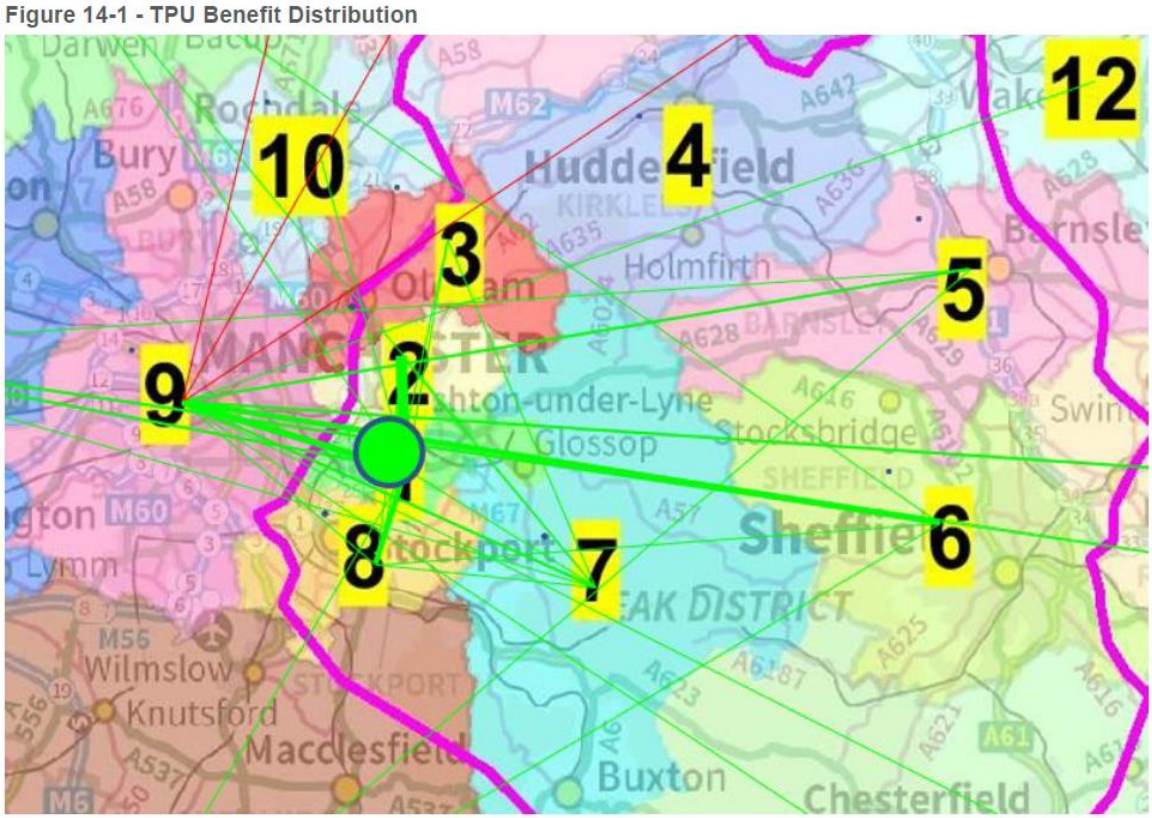
modelling and thus not available. Given the location of this scheme and its potential impact on public transport, this was a major omission.

However the lack of monetisation of negative impacts need not be the case for all impacts. Indeed it must be true that if Government policy is to discourage car travel in certain circumstances, any encouragement to driving will need to be compensated for in a direct way. This extra expenditure will have to be in place just to maintain the relative competition between driving and sustainable travel before any new policies are implemented. The level of encouragement to driving is in fact measured by the A57 Link Roads model through the time savings and lower operating costs. The estimates which follow have been based on the detailed NH data requested which allows the monetised benefits in the relevant areas to be extracted.

The proposed A57 Link Roads: negative impact on sustainable travel

A key point in our analysis is that the main impact of the scheme is on car travel in urbanised areas (see REP5-028 page 12). This was not explained in our deadline 2 submitted material (REP2-070) as it required a new analysis of where the predicted benefits were located, using detailed information requested from and supplied by NH later. This was supplied in a 25 Sector format designed by them which is not perfect, but allows a reasonable approximation. The material first submitted by NH has a diagram which is not sufficiently clear for this to be done (which is why the detailed information was requested). Sector 1 is obscured by the green blob. The diagram is reproduced below.

Figure 3.2: NH map of areas of benefit



The numbers in Figures 3.2 above and 3.3. below refer to the sector areas – Sector 1 obscured by the green blob is NH's study area; Sector 2 is the remainder of Tameside; and so on as listed in Table 3.2

The actual matrix of benefits is supplied in Table 3.2 below. This shows the sector to sector flows including in the policy sensitive area. It is clear from this relatively cautious approach that two thirds of the benefits are in sectors where strong sustainability policies apply, from both central and local Government.

Data underpinning the negative impact

In terms of Table 3.2, the rows and columns are as supplied by NH and represent the origins and destinations of journeys in terms of the 10 local zones. The column labels across the top of the table represent the same areas as the rows. Thus column 1 is Mottram, column 2 is rest of Tameside and so on. Journeys entirely within the local area of Mottram (row 1 column 1) provide the greatest benefits to road users at £29.3m. Journeys from Mottram to the rest of Greater Manchester comprise the majority of road user benefits as shown by summating column 1 and comparing this figure of £117.7 million (2010 prices) with the total national benefits of the scheme of £178.7 million (again supplied by NH). 2010 prices are used by DfT and NH for appraisal so are used here. The comparison produces the figure of 65.9% for the proportion of road user benefits falling to local traffic. This is important because the whole of Greater Manchester is subject to the Right Mix policy and, as an urban area, to DfT's goal for 50% of all trips in urban areas to be made by active travel by 2030. It is therefore clear that even with this relatively cautious approach that two thirds of the benefits of the A57 Link Roads are to road traffic in sectors where strong sustainable travel policies and expenditure to support them are in force from both central and local Government.

Table 3.2: Matrix of A57 Link Roads' road user benefits

Combined vehicle cost savings 2025 £million, 2010

		1	2	3	4	5	6	7	8	9	10	
Study Area (Mottram)	**1**	**29.3**	**5.1**	**1.6**	**0.2**	**0.1**	**0.8**	**1.7**	**3.1**	**7**	**0.8**	**49.7**
Rest of Tameside	**2**	**12.6**	**0**	**0**	**0**	**0**	**0.2**	**1.8**	**1.2**	**0.1**	**0**	**15.9**
Oldham	**3**	**2**	**0**	**0**	**0**	**0**	**0.3**	**0.8**	**0.5**	**0.1**	**0**	**3.7**
Kirklees	**4**	**0.1**	**0**	**0**	**X**	**X**	**X**	**X**	**0.1**	**-0.1**	**X**	**0.1**
Barnsley	**5**	**0.1**	**0**	**0**	**X**			**X**	**0.1**	**0.8**	**0**	**1**
Sheffield	**6**	**0.2**	**0.1**	**0.1**	**X**			**X**	**0.5**	**4.1**	**0.1**	**5.1**
Rest of High Peak	**7**	**0.4**	**0.6**	**0.3**	**X**	**X**	**X**	**X**	**0.2**	**1.9**	**0.2**	**3.6**
Stockport	**8**	**6.5**	**1**	**0.7**	**0.2**	**0.3**	**0.8**	**1.3**	**0.6**	**1.2**	**0.1**	**12.7**
Manchester (North West Region)	**9**	**11.2**	**0.3**	**0.2**	**0.6**	**3.5**	**6**	**2.4**	**0.7**	**0**	**0**	**24.9**
Rochdale	**10**	**0.6**			**X**	**0**	**0.2**	**0.2**	**0**			**1**
		63	**7.1**	**2.9**	**1**	**3.9**	**8.3**	**8.2**	**7**	**15.1**	**1.2**	**117.7**

Orange is "masked" by NH - i.e. not counted.

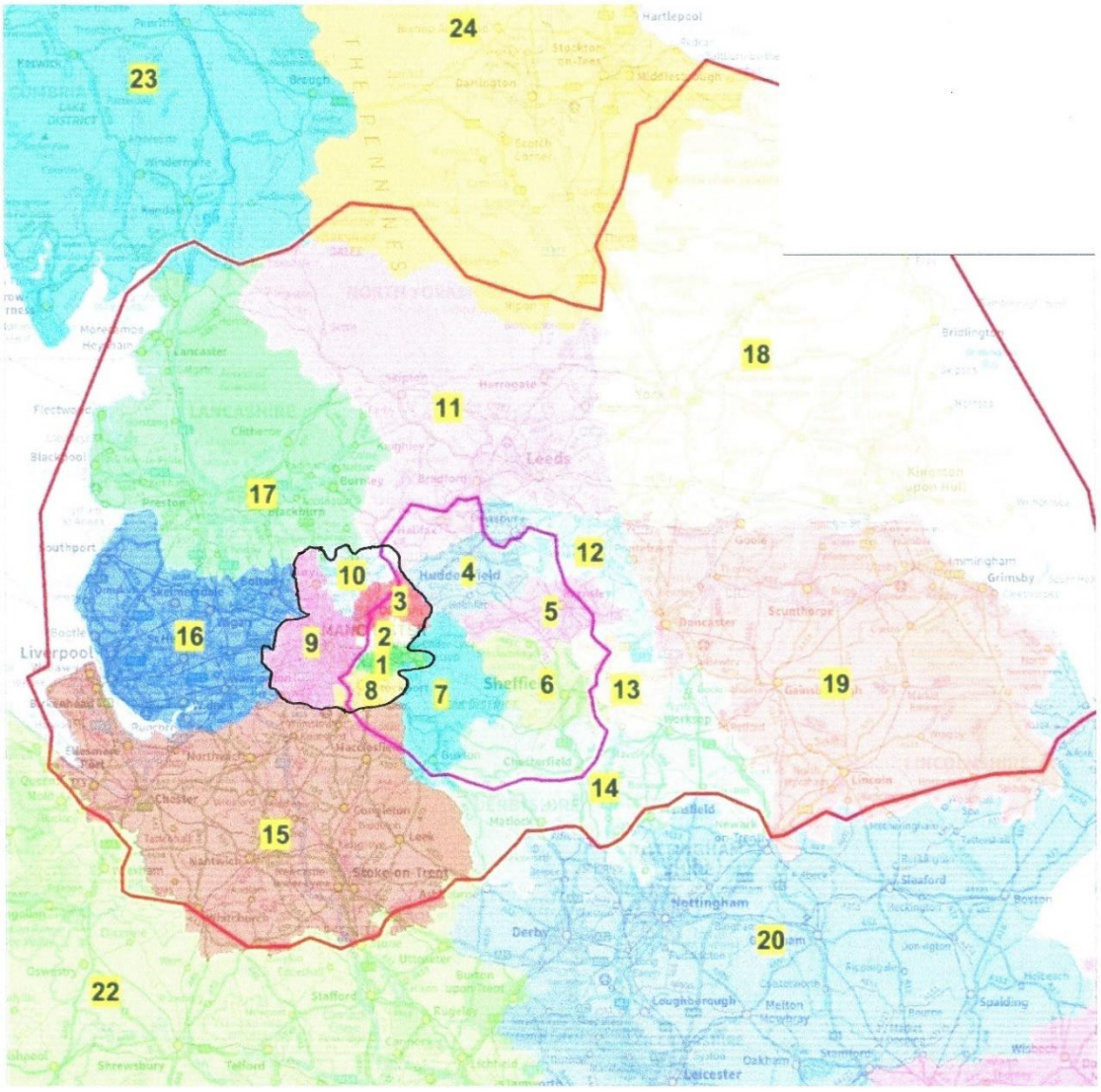
Total Benefit from scheme (NH data) **178.7** **Percent local** **65.9%**

X This shows where flows have been excluded from the analysis by MTRU due to the Sectors not allowing precise definition of the urban areas

It is surprising that such an analysis was not done because one key reason that road capacity increases designed to speed up car journey times are not used in towns and cities is that this makes it harder to attract people onto alternatives. It would be against the laws of economics if that were not the case. The matrix analysis in Table 3.2 shows the extent of this problem. We have translated the 2010 price benefits into today's prices using the DfT factors which we estimate amounts to £146million over the appraisal period. The equivalent benefits must be offered to users of sustainable modes just to maintain the status quo, before encouraging the transfers required by the new policies.

To test this further, we have considered only those trips which are entirely within Greater Manchester. These still provide 55% of the total benefits from the proposed scheme's economic analysis. This is despite the limitations in these areas caused by the Fixed Cost Function and masking referred to in the modelling section earlier. The area we have selected is the closest possible to Greater Manchester using the NH 25 sector system and is shown below outlined in black. As well as supporting the point that this is essentially a scheme with urban impacts which run counter to current policies, the figure below illustrates how much of Greater Manchester is outside the Area of Detailed Modelling (ADM) and thus why more detailed modelling should have been done in that urban area.

Figure 3.3: Map of areas included in the Greater Manchester only analysis



This also illustrates the confusion caused by the way NH supplied information during the Examination. In the map above (Figure 3.3) the area outlined in purple[38] is not the same as the ADM[39] which is smaller. In fact, it relates to another modelling function not used elsewhere. This map had to be used because the ADM map was not large enough to show the zones. It was supplied by NH in response to the CPRE request for data.

The next issue is how to represent this disbenefit to sustainable travel in a way which shows how much extra money would need to be spent now to compensate. This is because the benefit to drivers occurs each year over the whole appraisal period (although the costs are in the short construction period). We have therefore used the benefit profile in the Combined Economics and Modelling Report (Figure 14,2 REP2-090 page 635/790 in pdf) to translate the 60 year figure into an annual figure which shows the ongoing impact year by year – the same way the benefits unfold in the NH computer programme which produces the data for the economic assessment. The calculation is: annual benefit X 0.75 (to remove the impact on goods vehicles) X 0.659 (proportion of benefits in relevant area) X 1.24 (2010 prices to current prices). This illustrates (for the local authorities who have to implement the policies) how far sustainable travel spending would have to compensate each year into the future.

The benefit to drivers in the sustainable policy areas amounts to £3.75million in today's prices in the opening year (2025), rising to £7.4million in 2050 (again in today's prices and undiscounted). This illustrates the significant and growing negative impact the scheme will have on achieving local and national policies. Local budgets would have to find this money at least until 2050 but probably well beyond.

We have not considered the negative health aspects of discouraging active travel. Given the values used by DfT (for example in their AMAT tool) this would be a significant disbenefit.

In relation to value for money, the walking and cycling elements of the Low Carbon Travel package, which would achieve such policies, have been tested using the DfT's AMAT appraisal tool. That and the other approaches to testing value for money of the alternatives were set out previously in Part 2.10.

Above all this analysis illustrates the fact that the A57 Link Roads would significantly increase urban road capacity in the Greater Manchester area and as such is a significant anomaly in that area. It suggests that the development of alternatives would better meet the existing and most recent local and national transport policies. It would be possible for a joint approach by local authorities and the National Park to seek funding for alternatives from various sources including National Highways.

This illustrated another contradictory aspect of the approach to NH's A57 Link Roads. : NH's approach towards analysing the impact of the A57 Link Roads as a project appears inconsistent with its high level engagement with DfT on assessing sustainable travel, carbon and health impacts. Many practitioners including MTRU have witnessed this engagement first hand.

The conflict with current policies on carbon is considered in more detail in the following section.

[38] See REP2-090 Figure 13-1 Sector definitions, pdf page 608/790

[39] See REP 2-090 Figure 2-1 pdf page 17/790

Part 4: A57 Link Roads, Low Carbon Travel and conflicts with the carbon policy framework

4.1 Carbon emissions

Introduction

There is no doubt that policies on carbon emissions affecting this scheme have changed very significantly in the last few years. This includes legislation, such as net zero and Parliamentary acceptance of the Climate Change Committee's 6th Budget, policy statements such as the DfT Decarbonisation Strategy, and ongoing work revising guidance, for example the commitment in the Decarbonisation Strategy for a review of the National Policy Statement for National Networks (NPSNN) and the Secretary of State's statement to Parliament on 22nd July 2021 with a similar commitment. Meanwhile the existing NPS is in force. The A57 Link Roads Examination therefore took place immediately following a period of major change. However, that change had largely occurred and should have been fully taken into account.

Thus the Examination had to work in the context of what is in legislation and policy but not yet necessarily in habitual use by practitioners. This section seeks to clarify the position referring to the new legislative and policy context while still being guided by the NPS, in particular paragraph 5.17, which states:
It is very unlikely that the impact of a road project will, in isolation, affect the ability of Government to meet its carbon reduction plan targets. However, for road projects applicants should provide evidence of the carbon impact of the project and an assessment against the Government's carbon budgets.

Key questions to be answered

In relation to that statement there are five important questions considered in this section:

1) Which carbon should be counted and costed?
2) What is the real "Do Minimum"?
3) What is the cost of undermining Government and local policy?
4) What is significant?
5) What about the *de minimis* argument and the NPS?

1) Which carbon should be counted and costed?

In the current system, a marginal change is assumed between a Do Minimum and a Do Something future. To assess this, the appraisal must calculate how much carbon will be produced by the forecast levels of traffic. This is done in a simplified way by the DfT programme TUBA, and in a more complex way using DMRB guidance. NH have done both. The latter is used for the carbon cost calculations but not the economics. One reason is that TUBA covers a shorter time period than the DMRB method so is likely to be an underestimate.

The focus of interest for checking against policy however, should be consistency with the pathway to net zero, in particular that set out in the DfT TDP. For this reason, we requested this data from NH. They supplied TUBA carbon data (a standard output). The figures show that the total amount of carbon being emitted in a year is far higher in future years and does not meet the net zero pathway. NH did not consider this relevant – they only consider the marginal change between the Do Minimum and Do Something. This is completely inadequate for a strategic level test. The reduction in carbon from vehicle electrification is clear in the NH forecast, although it did not reach zero in 2051.

In fact, the cost of the Do Something in carbon terms should be tested against what the Government considers is essential to meet its climate change obligations. If the Do Minimum is

assumed to fail to meet Government commitments it cannot be considered to be a realistic prediction of future travel patterns. Policies such as those in the TDP and locally in the TfGM 50-50 programme are designed to achieve the pathway. Schemes which do not contribute, or, as in this case, undermine any programmes which would support the pathway, should not proceed. The key assumption by NH in the Do Minimum is that nothing would be achieved by central or local Government expenditure and this cannot be the correct basis for comparison. It was to test this that carbon emission data for the DM and DS were requested from NH. In fact, only TUBA data was available but at least provides a minimum guide.

Therefore the question considered here is how much of that total carbon is in excess of the amount required to meet the net zero/6th Carbon Budget requirements.

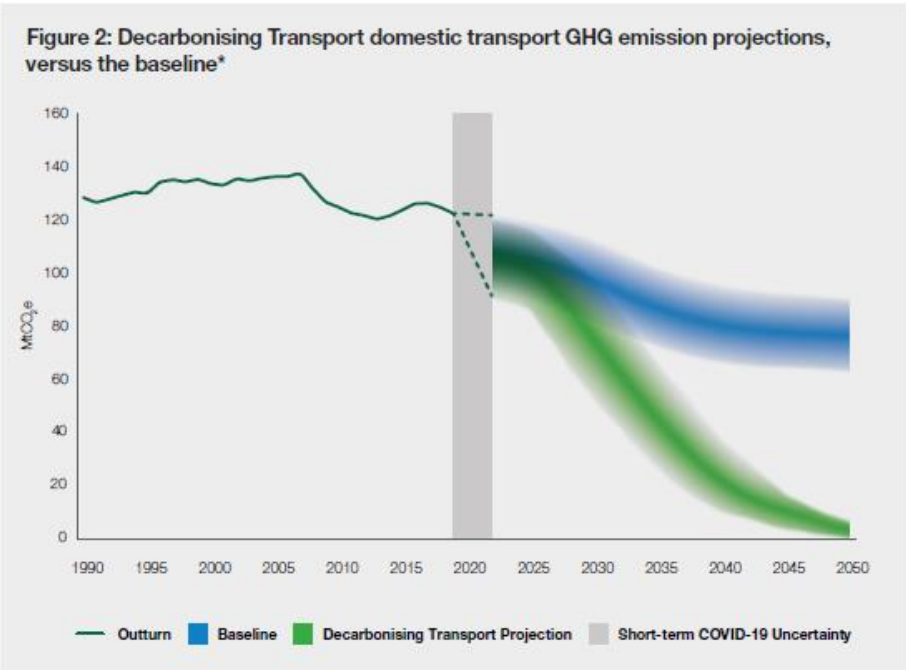
Table 4.1: Carbon emissions A 57 Do Something Core forecast

CO2e emissions based on TUBA (tonnes) per year	Do Minimum	Do Something
2025	641379	641842
2040	503272	503643
2051	480538	480650

Source: NH TUBA outputs

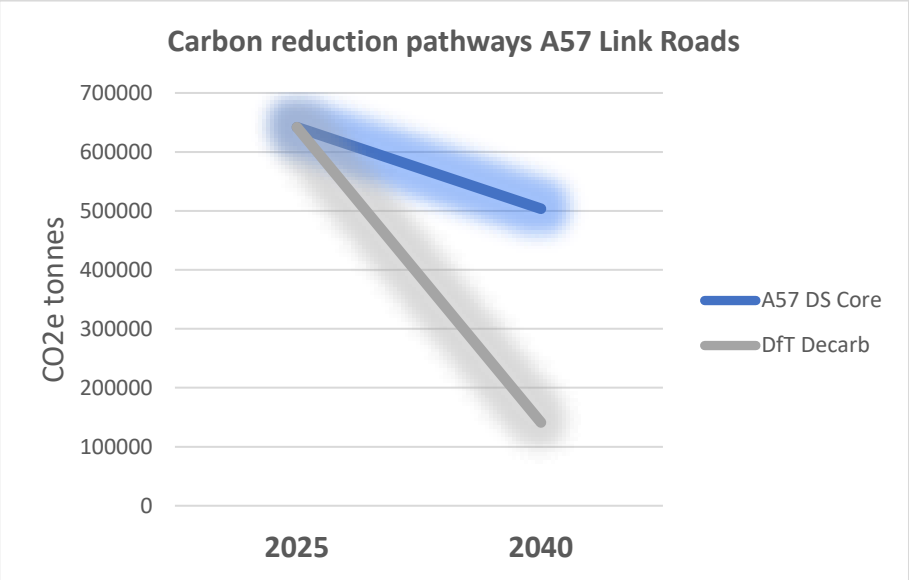
The first step was to look at the data in Table 4.1. This shows that the Do Something presented in the A57 Link Roads case shows clearly that there will be, after allowing for some electrification of the car fleet up to 2050, insufficient decrease in carbon to meet Government requirements. These are reflected in the chart in Figure 2 (page 45) of the Decarbonisation Strategy, shown below as Figure 4.1. The blue pathway is a Business As Usual baseline, the green pathway what should be achieved by TDP policies and programmes (containing both infrastructure and behavioural elements).

Figure 4.1: Extract from Transport Decarbonisation Plan



To test whether the future with the A57 Link Roads in place would meet the targets, the current scheme data from TUBA in Table 4.1 is set out in Figure 5.2 below.

Figure 4.2: Comparison of A57 Link Roads forecast with DTS



Note: NH does not seem to include latest Government plans in its modelling

Obviously we only have the data supplied by NH but the key point is that the NH best estimate shows the scheme as presented is delivering a huge amount of carbon in excess of the Government legally confirmed targets. Our serious reservations on this are included after Table 4.5 below.

Of course, a more aggressive electrification programme could deliver further reductions, together with HGV electrification, for example through overhead catenaries similar to those used for rail. These are being trialled by NH but are extremely unlikely to be achievable in the National Park - possibly achieving an HGV ban by default. This possibility should have been included by NH in the Uncertainty Log. However, some demand reduction will be required even with vehicle electrification. This is clear in the Climate Change Committee's (CCC) 6th Budget.

The table below is extracted from the CCC transport sector document published with the 6th Carbon Budget. We use this since it provides the core targets which underpin the TDP.

Table 4.2: Range of car traffic reductions from different measures

	Traffic		Trips	
	Tech (e.g. home working)	Car occupancy	Walk and cycle	Bus
2030	-1 to -4%	-6%	-5 to -7% *(-1 to -2%)*	-9 to -12% *(-5 to -7%)*
2050	-4 to -12%	-19%	-9 to -14% *(-3 to -4%)*	-17 to -24% *(-10 to -14%)*

The CCC give trip reductions for sustainable modes rather than traffic (distance travelled). These are likely to be higher than the traffic reductions would be because of lower trip lengths[40]. Using

[40] This can be compensated for by substituting a short walk trip for a longer car trip but is not included in this analysis.

the standard NTS data for average trip length which CCC uses, the trips have been converted to vehicle kilometres to produce the parenthetical figures in italics. The extensive work by CCC is used for the final central requirements in Table 4.3 below. These are reductions on the baseline – i.e. in real terms traffic is predicted to grow (as in the A57 Link Roads NH appraisal) but the CCC identifies the required reduction on that figure.

Table 4.3: 6th Carbon Budget combined demand management required

	Combined impact: car traffic reduction on baseline (as vehicle kilometres)
2030	-6%
2040	-12%
2050	-17%

Note: 2040 is derived from CCC table as a half way point

This does not appear to be taken into account in the NH traffic forecasts. What should happen is that a future scenario which achieves these reductions should be compared to the Do Something scheme, which is clearly part of a future which encourages driving rather than the modal and behaviour change required by the CCC 6th Budget.

There is thus a lack of basic data for this scheme, even in the context of the Examination in Public, which has been a source of ongoing problems reflected throughout this report. This makes it hard to be precise about how much additional carbon over the level required to meet the 6th Carbon Budget, is being produced.

The best indicator supplied so far is the NH "Low" forecast. This applies a lower car use forecast to the model and thus produces lower carbon emissions and outputs them for TUBA. The lower forecast is due to factors different from the CCC demand reductions such as lower economic growth and higher trip making. It is thus not the same as the CCC reductions although it goes some way towards them.

The key point is that it has been run through the transport model to predict the carbon emissions for a demand managed forecast in a form comparable to that for the NH's best estimate of carbon emissions with the scheme in place. The reductions with the scheme in place (mainly due to electrification of vehicles) can thus be compared to the reductions from the lower demand forecast. This reveals reductions as below which can then be compared to the CCC predicted reductions with a slower rate of car traffic growth.

Table 4.4: Carbon emissions A 57 Link Roads Do Something Core compared to Do Minimum Low

Target year	Reductions
2030	-6.3%
2040	-9.2%
2050	-10.9%

While 2030 Low forecast is close to the 2030 CCC reduction (in Table 4.3), the Low forecast increasingly underperforms at the required level. Despite this it is possible to use the Low forecast to indicate the missing amount of carbon reduction and, interestingly, its cost.

The TUBA table supplied by NH is shown below, with the carbon emission differences calculated by MTRU.

Table 4.5: NH TUBA carbon outputs

	Core Scenario			Low Growth Scenario			
GHG Benefit from DMRB (£m, 2010 PV)	-17.45			Not assessed			
GHG Benefit from TUBA (£m, 2010 PV)	-0.46			-0.79			
CO2e emissions based on TUBA (tonnes)	DM	DS	DS – DM	DM	DS	DS – DM	Difference tCO2e
2025	641379	641842	462	601341	602011	668	40,501
2040	503272	503643	371	457101	457433	330	46,542
2051	480538	480650	113	428,325	428610	286	52,325

The differences between the two can be annualised assuming a straight line. These can then be put through the DfT carbon cost toolkit to provide an estimate of additional carbon cost.

This produces a cost of £223million over the 60 year appraisal period and would turn the BCR for the scheme negative.

As a test of whether the carbon deficit is robust, the carbon toolkit was run against a cut-off date of 2051 (on the optimistic assumption that everything is net zero by then). This still produced a carbon cost of over £120million.

At this stage we wish to say that there must be serious concerns over the way in which carbon has been treated overall for this scheme. Our view is that the modelling includes some electrification but apparently not the latest commitments in 2030 and 2035. For this reason much of the NH work must be considered with a high level of uncertainty. However, at the moment everything calculated for this submission has followed the same procedures as NH so can be directly compared. At a late stage some additional statements were produced and it appears that these were not based on modelling and gave no detail of how they were derived[41]. Requests for clarification have so far remained unanswered.

2) What is the real "Do Minimum"?

This issue is familiar to transport practitioners and is directly related to, and follows on from, the previous section. In the current system, a marginal change is measured between a Do Minimum and a Do Something. This approach was justifiable when comparing futures in which the existence of the Do Something was totally disconnected from the Do Minimum, in this case building more road capacity in Greater Manchester is assumed to have no impact on what the future transport programmes without such capacity would be. Hence the same core forecast is used for both in the NH analysis. This is fundamentally wrong in cases such as this in complex outer/inner metropolitan and mixed areas.

[41] REP5-025 https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-001105-TR010034_9.58_Schedule_of_change_to_book%20of%20reference%20(tracked)%20D5%20230222.pdf

In reality there are two different futures being considered, the first is one in which there is less traffic, which requires a shift in competitive advantage toward sustainable modes. The other is one in which driving is given sufficient encouragement that traffic will continue to rise. The latter is the core forecast.

DfT had already moved to what it calls "scenario" forecasts in 2015 which allow for different assumptions about the future. It has also published the Uncertainty Toolkit, which suggests that the modelling and forecasting parameters should be considered, including the impact of demand management and behaviour change. This was set out in more detail in Part 3.2 so is not repeated here. However this guidance, which was ignored by NH, has moved away from the old "low, central, high" forecasts.

It is also important to say that this is not dealt with by modest adjustments to trip making in the modelling through the Diadem software. The A57 Link Roads modelling starts with the same base forecast and has only minor impacts, as shown clearly in the NH documentation. A significant section of Diadem was turned off for the NH modelling in any case. Evidence of the widespread understanding and acceptance by the profession of the approaches set out in answer to questions 1 and 2 posed above can be found in the joint local authority/professional body submission on Green Book reforms, PTRC papers and the TPS Annual Review extract in the Annex to REP4-031[42]). Much of this is reflected in the Uncertainty Toolkit and WebTAG.

3) What is the cost of undermining Government and local policy?

The second issue is the strategic fit of the scheme with relevant national and regional policies on carbon, including how it fits with CCC budgets. It is clear that encouraging people to use alternatives to the car needs to make them relatively more attractive. This can be done by making them faster or cheaper or more convenient (in the case of buses more frequent as well). The other method is to make car use less convenient or costly. Such approaches are well known and often referred to as "stick and carrot". As stated earlier in this report, anything which makes car journeys faster will move that balance of competition against sustainable travel, i.e. creates a carrot in the wrong direction.

At the moment Government policy is focussed on travel in towns and cities and there are clear targets for changes in the mode share for walking and cycling, and indications that mode switch is desired for public transport.

Using the information now obtained from NH it has been possible to assess how much of the economic advantage is provided to car use reasonably considered to fall within the scope of those targets (see page 36). This information is not in the original NH submissions to the Examination.

Another approach to this has been suggested by Professor Greg Marsden from the DecarboN8 partnership. This includes academia and local authorities (including Manchester and Sheffield) and runs a number of innovative projects. He proposes that schemes which have forecasts in excess of the CCC required reductions should identify specific additional reductions elsewhere and count the cost in the appraisal[43]. This would provide an alternative and perhaps more realistic approach than simply costing the extra using the carbon toolkit.

[42] REP4-031 https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-001045-CPRE%20PDSY%20-%20Other-%20response%20to%20ISH%202%20and%20written%20summary%20of%20oral%20submission.pdf

[43] For example see: https://decarbon8.org.uk/is-this-new-road-ok/

4) What is significant?

In this report the question of whether NH has counted the amount of additional carbon correctly has already been considered. However, it is important to note that there was also an issue over the significance of the amount estimated by NH and used for its carbon cost assessment. During the Issue Specific Hearing[44] it was clear that a straightforward and widely accepted definition of what was a significant amount of additional carbon was not available. This is related to the NPS statement and the *de minimis* argument is considered in the next question. On significance overall there are two critical aspects:

a. was the amount calculated by NH significant?

b. Should the significance of the amount used by NH be viewed in isolation or in light of other similar proposal to increase road capacity?

In relation to the first aspect, the 401,000 tonnes of extra CO2e calculated by NH can be judged against published emission reductions which are part of the net zero strategy and 6th Carbon Budget. For example, the Climate Change Committee estimates that an average battery electric vehicle (BEV) bought today will "save more than 35 tonnes of CO2 over their lifecycle versus a conventional equivalent".[45] Thus to compensate for the A57 Link Roads carbon deficit an extra 11,457 BEVs would have to be bought this year, above what would otherwise be the case. This number rises over time because conventional vehicles are getting more efficient, for example if they had to be bought in 2025 the number would be higher.

An alternative would be to consider the Government's urban policies for walking and cycling, these are estimated to save between 1million and 6million tonnes CO2e by 2050, clearly displaying a high level of uncertainty about what would be achieved. The A57 Link Roads carbon deficit (over a longer timescale) would be 40% of the lower figure and 7% of the higher figure. The cost of the measures to achieve the 1-6million tonnes reduction is £2billion over the first 5 years. Despite the wide range in estimated impact, using extra measures of this type to compensate for the A57 Link Roads carbon deficit would be in the hundreds of millions of pounds. This confirms the conclusion from Table 4.5 that including the correct amount of carbon from the scheme would turn the BCR strongly negative, even using the Government's current values.

The "in isolation" issue is related to final question considered here: *de minimis*.

5 What about the de minimis *argument and the NPS?*

The final issue is probably the best known - the *de minimis* argument – where the amounts of carbon from an individual action (or scheme) are considered too small on their own to undermine carbon reduction, even when part of a wider programme.

This is subtly different from the significance issue – if there was doubt over whether the amount was significant or not, is it really an isolated event or part of a wider programme?

This has been argued over extensively and to summarise: if this scheme were an isolated occurrence with no accompanying or associated actions or schemes this might possibly apply. It might be the case if there was only one road scheme in RIS2 or elsewhere in the UK. Clearly this condition does not hold true. A further issue is that the existence of a number of schemes to increase road capacity underpins the road traffic forecasts (and has done since the 1997 forecasts).

[44] EV-033 ISH 2 Day 2 Session 1, 45:16 onwards https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010034/TR010034-001000-TRANSCRIPT_ISH2_DAY2_SESSION1_A57LINKROADS_10022022.pdf

[45] Box M2.2 on page 18 of the Transport Sector document of the CCC 6th Carbon Budget Sector Summaries: https://www.theccc.org.uk/publication/sixth-carbon-budget/#sector-summaries

The NPSNN states that:
5.17 Carbon impacts will be considered as part of the appraisal of scheme options (in the business case), prior to the submission of an application for DCO. Where the development is subject to EIA, any Environmental Statement will need to describe an assessment of any likely significant climate factors in accordance with the requirements in the EIA Directive. It is very unlikely that the impact of a road project will, in isolation, affect the ability of Government to meet its carbon reduction plan targets. However, for road projects applicants should provide evidence of the carbon impact of the project and an assessment against the Government's carbon budgets.

The DfT Transport Decarbonisation Plan (TDP) says:
The current National Policy Statement (NPS) on National Networks, the government's statement of strategic planning policy for major road and rail schemes, was written in 2014 – before the government's legal commitment to net zero, the Ten Point Plan for a Green Industrial Revolution, the new Sixth Carbon Budget and most directly the new, more ambitious policies outlined in this document. While the NPS continues to remain in force, it is right that we review it in the light of these developments, and update forecasts on which it is based to reflect more recent, post-pandemic conditions, once they are known.

While that review has yet to take place, the statement supports the approach set out in this report in many sections, the forecasting to reflect net zero policies and programmes, the newly structured uncertainty log and the carbon strategy assessment. For example, the real comparison for carbon emissions is between a package of sustainable measures with less traffic and the scheme as proposed with the central traffic forecast and 'business as usual' of which it is an integral part.

There is thus a strong argument for finding against this scheme in light of the ongoing plans locally and nationally to decarbonise transport. However it would be wrong to ignore the fact that the NPS statement itself has always contained a lack of credibility in relation to its impact. It is clear, for example, that the failure of one person to purchase an electric car is very, indeed extremely, unlikely to derail the Government's carbon reduction target. If everyone adopted this approach, i.e. not in isolation, the Government's policy would fail completely.

HA and now NH road schemes are not promulgated in isolation – the *de minimis* argument does not hold in any normal sense. Yet the carbon increase forecast by NH is an isolated figure. It assumes that there is no relationship between this scheme and RIS2 as a whole. A more realistic question in this context would be: what would the position be if every scheme in RIS2 produced as much carbon as the A57 Link Roads?

The key point is that it is not a question of marginal change: schemes should be supporting these targets and not undermining them, both in terms of increasing carbon but in terms of negating the impact of other policies.

In the A57 Link Roads case there is capital expenditure of about £180million in today's prices. RIS2 is valued at £24.5billion but about £14billion is on capital schemes. If all of them produced as much carbon as the A57 Link Roads, it would amount to over 31million tonnes of CO2e. This is approaching the estimate for the total impact of electrifying the whole bus and coach fleet in the Decarbonisation Strategy (35-37million tCO2e). The total impact of electrification of all cars, taxis and vans is 620-850million tCO2e removed.

RIS2 should not allow schemes to remain in the programme which produce carbon on a scale which, if replicated, would fail to meet the level of reduction required if the Government target is to be met.

4.2 Costing carbon

There are two remaining issues on carbon which need to be addressed:

- The new valuations for carbon and impact on the BCR
- The issue of carbon persistence and its importance in assessment beyond the one-off cost.

New carbon value

NH did not supply their carbon spreadsheet so CPRE had to undertake its own calculation using the current carbon tool and this was confirmed by NH as accurate. It increased the central estimate for carbon cost significantly from -£17.45 to -£30.21 million. The low to high range also increases significantly.

To illustrate the impact, the following tables are set out. They show the results from the DfT carbon tool to create a high to low range of outcomes based on the NH traffic modelling. The tables can be compared to the ones in the existing NH documentation. Where there are disbenefits, for example accidents, air quality and carbon, these are shown as negative values. The first applies the low and high carbon values across the three traffic forecast scenarios: Low, Core and Optimistic (High).

Table 4.6: Impact of New Carbon Values

New carbon values: High to Low			
	Low Growth	Core Growth	Optimistic Growth
User benefits (TEE)	£153.44	£181.25	£210.19
Accident benefits	-£7.33	-£7.33	-£7.33
Indirect Taxation	£1.90	£1.41	£1.79
Greenhouse gas benefits	-£45.32	-£30.21	-£15.02
Air quality	-£3.77	-£3.77	-£3.77
Noise	£3.17	£3.17	£3.17
Delays during construction	-£1.04	-£1.04	-£1.04
Total (PVB)	£101.05	£143.48	£187.99
BCR	**0.94**	**1.33**	**1.75**

Table 4.7 displays a constant central value for carbon emissions for low and high as well as central forecasts. This does not seem logical but NH argued this was more comparable to their approach so we have recalculated it to show the impact. The key point remains valid.

Table 4.7: Impact of New Carbon Values: Constant Central

New carbon values: Constant Central			
	Low Growth	Core Growth	Optimistic Growth
User benefits (TEE)	£153.44	£181.25	£210.19
Accident benefits	-£7.33	-£7.33	-£7.33
Indirect Taxation	£1.90	£1.41	£1.79
Greenhouse gas benefits	-£30.21	-£30.21	-£30.21
Air quality	-£3.77	-£3.77	-£3.77
Noise	£3.17	£3.17	£3.17
Delays during construction	-£1.04	-£1.04	-£1.04
Total (PVB)	£116.16	£143.48	£172.80
BCR	**1.08**	**1.33**	**1.60**

In both tables the BCR falls significantly and is far below what we estimate for Low Carbon Travel. In view of the sensitivity of the scheme area adjacent to the National Park, and the fact that a majority of the traffic on the scheme travels through the Park, actions which encourage such traffic should be subject to the most rigorous assessment.[46] Damage to the Park would require a major justification and the BCR, at the lower end of what transport schemes, including road schemes, should achieve provides no such justification.

4.3 The real impact of carbon

The final issue to be addressed is how to measure failure to achieve carbon targets. This is not fully captured by the cost estimates.

Emissions are usually measured in tonnes of CO2 equivalent (tCO2e), and this the standard measure. The key objective, now enshrined in UK policy and across the world is to avoid a specific level of global warming, such that a catastrophic level of climate change can be avoided. The agreed critical end date is 2050. The level of warming depends, not on the tonnes emitted, but how long their warming effect lasts. Carbon dioxide persists as a warming influence for around 100 years. In relation just to the 2050 target, a tonne emitted now will have its warming effect for 30 years.

The failure to use the correct metric initially has had clear adverse results on the NH appraisal. Reducing tonnes emitted now is underestimated in assessment against objectives to avoid climate change, while reducing tonnes emitted later may be politically easier, and heavily discounted, but has far less benefit. These flaws were extensively discussed during 2007-2008, and led to the Climate Change Committee devising the budget periods for emissions. This is not perfect but seeks to address this problem.

[46] The National Park Authority opposes the A57 Link Roads and supports alternatives

A true assessment of carbon impact should take this into account (as do the Climate Change Committee forecasts). This is especially important because any carbon emitted now will still be having a warming effect past the target date for zero emissions and be contributing to temperature rise. Any excess over budget emitted now requires a proportionately higher reduction later, and this increases over time. It would be better to measure carbon in tonne years rather than tonnes for the purpose of our commitment to carbon reduction and keeping the temperature rise to 1.5 degrees. It is what is needed to achieve the target of avoiding climate change and would improve the way that demand management and active travel is treated in appraisal.

5 Conclusions

5.1 A new approach

The Low Carbon Travel package developed here, and subjected to a local engagement process, directly addresses the problems identified over many years along the trunk route[47].

It meets the strategic objectives of the A57 Link Roads; is feasible and deliverable; and provides Very High value for money with a BCR of 4.99 using our central assumptions.

It also avoids the adverse effects of the proposed A57 Link Roads and distributes benefits over a wide area, in particular bringing relief to other villages.

It therefore represents an option that requires full and proper testing before proceeding to a scheme which increases road capacity.

All this has been demonstrated despite the lack of information provided by NH.

5.2 A flawed appraisal of the A57 Link Roads

This view is reinforced by our analysis of the A57 Link Roads, which shows clearly that NH's formal appraisal has been deficient.

It has not assessed the impact of the scheme on HGV traffic demand and on public transport.

The modelling is insufficiently detailed in areas where there are major impacts and has had its sensitivity in such areas reduced through techniques such as fixing costs and "masking".

The forecasts have not been set within the framework of current Government and Greater Manchester policies for reducing car trips and increasing active travel and public transport use.

Uncertainty in modelling and forecasting has not been dealt with robustly, in particular the DfT Uncertainty Toolkit has not been followed and the Uncertainty Log is incomplete in key areas.

The carbon emissions assessment did not reflect the new carbon values which NH recognise are correct.

The carbon assessment did not reflect the key issue of non-conformity of the scheme forecast with the pathway in the DfT Transport Decarbonisation Plan. Within limited financial resources, schemes which do not contribute to the carbon reduction pathway, should not proceed. This is strengthened by the fact that in this case the scheme significantly undermines programmes which would support it.

5.3 Way forward

There would therefore be merit in refusing the A57 Link Roads DCO and asking NH to urgently commence:

1. Repeating the local options appraisal afresh, with our *Low Carbon Travel* measures fully developed and tested in light of the established local and national policies for achieving healthy and sustainable travel
2. Developing a similar strategic approach for the whole corridor, reflecting
    i. National Government's pathway to carbon reduction, in particular the TDP;
    ii. The special nature of the National Park and PDNP's policies for traffic management;
    iii. the transport policies of cities which the road is designed to serve including Sheffield as well as Manchester.

[47] Except for maintenance and asset condition where technological improvements have already been made by NH

Annex 1

Extract from Local Walking and Cycling Infrastructure Plans, Guidance for Local Authorities,

DfT April 2017

Chapter 6

6.33 Improvements that can potentially be implemented to address existing deficiencies may include the following:

- **new walking links**
- **additional pedestrian crossings**
- **improving existing pedestrian crossing facilities, e.g. crossing width, introducing refuges, reducing waiting times, and/or increasing crossing times**
- **replacing broken/uneven/rocking paviours**
- **resurfacing footways**
- **improving street lighting**
- **providing CCTV security cameras**
- **increasing pedestrian capacity (Pedestrian Comfort Levels) by widening footways and/or reallocation of carriageway space**
- **removing street clutter**
- **reducing traffic speeds, e.g. by introducing 20mph limits/zones and providing traffic calming features**
- **providing dropped kerbs and tactile paving**
- **improving signage and wayfinding**
- **improving planting, shade and shelter**
- **improving seating facilities to enable people to rest**
- **general improvements to the public realm, encompassing some or all of the above**

Annex 2: Initial Option Assessment 2015

Initial Sifting Criteria

Each option must meet the following sifting criteria to be considered further within EAST:

1: Overall moderate impact against identified problems (Appraisal score >4)

2: Overall moderate fit with route objectives (Appraisal score >3)

3: Must be deliverable in theory

4: Must be feasible in theory

Qualitative assessment against identified problems		Qualitative assessment against identified objectives		Deliverability (e.g. political, planning, timescale or third party issues)	Feasibility (e.g. physical constraint, land availability and design standards)
2	Large beneficial impact	2	Large beneficial impact		
1	Beneficial impact	1	Beneficial impact		
0	Neutral / marginal impact	0	Neutral / marginal impact	Deliverable in theory	Feasible in theory
-1	Adverse impact	-1	Adverse impact	Deliverable but with challenges	Feasible but with challenges
-2	Large adverse impact	-2	Large adverse impact	Very difficult to deliver	Not feasible / significant challenges

Reference (Route Section-Intervention)	Option Description	Problems (EAST Scale of Impact)								Objectives (EAST Fit with Other Objectives)							Deliverability	Feasibility	Initial Sifting Criteria Prior to EAST				Take to EAST
		1	2	3	4	5	6	7	Total	1	2	3	4	5	6	Total			1	2	3	4	
1.0	A628 HGV Control (inc. complementary sustainable measures)	2	0	1	0	0	2	1	6	-1	1	1	1	0	2	4	Very difficult to deliver	Feasible but with challenges	✓	✓	×	✓	×
2.0	A628 Peak Period Only HGV Control (inc. complementary sustainable measures)	2	0	1	0	0	2	1	6	-1	1	1	1	0	2	4	Very difficult to deliver	Feasible but with challenges	✓	✓	×	✓	×
3.0	M67 to A6018 Link Road	1	0	0	0	1	1	1	4	1	0	1	1	1	1	5	Deliverable but with challenges	Feasible but with challenges	×	✓	✓	✓	×
4.0	A57 Mottram One-Way	1	0	0	0	1	1	2	5	1	0	1	1	1	1	5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓
5.0	Dual Carriageway Link Road M67 to A57 Mottram Moor (tunnel under Roe Cross and spur connecting to A6018)	1	0	0	1	1	1	2	6	1	-1	1	2	1	1	5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓
6.0	A57(T) to A57 Link Road	1	0	0	0	1	1	1	4	1	0	1	1	1	1	5	Deliverable but with challenges	Feasible but with challenges	×	✓	✓	✓	×
7.0	Bypass of Mottram, Hollingworth and Tintwistle	1	0	0	1	1	2	2	7	2	-1	1	2	1	1	6	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓
8.0	M67 to M1 Dual Carriageway Link Road	1	1	0	2	2	2	2	10	2	-2	-1	2	1	1	3	Very difficult to deliver	Not feasible / significant challenges	✓	×	×	×	×
9.0	M67 to M1 Trans-Pennine Tunnel	2	2	0	2	2	2	2	12	2	1	2	2	2	1	10	Very difficult to deliver	Feasible but with challenges	✓	✓	×	✓	×
10.0	A628/A616 Selected Dualling	1	0	0	1	1	1	0	4	1	-1	0	1	1	1	3	Very difficult to deliver	Feasible but with challenges	×	×	×	✓	×
11.0	A628/A616 Dualling	2	1	0	2	2	2	0	9	1	-2	-1	1	1	1	1	Very difficult to deliver	Feasible but with challenges	✓	×	×	✓	×
12.0	A61 Dualling	1	0	0	1	1	1	1	5	1	0	0	1	1	1	4	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓
13.0	Climbing Lanes	1	0	0	1	1	1	0	4	1	-1	0	1	1	1	3	Deliverable but with challenges	Feasible but with challenges	×	×	✓	✓	×
14.0	Route Safety Improvements	2	0	1	0	1	0	0	4	0	0	0	0	0	2	2	Deliverable in theory	Feasible in theory	×	×	✓	✓	×
15.0	A616 Widening at Midhopestones	1	0	0	1	1	1	0	4	1	0	0	1	0	1	3	Deliverable but with challenges	Feasible but with challenges	×	×	✓	✓	×
16.0	A616 Langsett Widening Scheme	1	0	0	1	1	1	0	4	1	0	0	1	0	1	3	Deliverable but with challenges	Feasible but with challenges	×	×	✓	✓	×
17.0	A616/A628 Flouch Junction Improvement Scheme	1	0	0	1	1	1	0	4	1	0	0	1	0	1	3	Deliverable but with challenges	Feasible but with challenges	×	×	✓	✓	×
18.0	A628 Salters Brook Scheme - Carriageway Realignment	1	0	0	1	1	1	0	4	1	0	0	1	0	1	3	Deliverable but with challenges	Feasible but with challenges	×	×	✓	✓	×
19.0	Slow Vehicle Refuges	1	0	0	0	0	1	0	2	1	0	0	1	0	1	3	Deliverable but with challenges	Feasible but with challenges	×	×	✓	✓	×
20.0	Technology Package	1	0	2	0	0	0	0	3	0	0	0	0	1	0	1	Deliverable in theory	Feasible in theory	×	×	✓	✓	×
21.0	Maintenance Strategy	0	0	0	2	2	0	0	4	0	0	0	0	1	0	1	Deliverable in theory	Feasible in theory	×	×	✓	✓	×
22.0	A628 Peak District Tunnel	1	2	0	1	2	2	1	9	2	1	1	2	1	1	8	Very difficult to deliver	Feasible but with challenges	✓	✓	×	✓	×
23.0	Sustainable Transport Measures	1	0	0	0	0	0	0	1	0	0	1	0	0	1	2	Deliverable but with challenges	Feasible but with challenges	×	×	✓	✓	×

Problems

1	Accidents reduce journey time reliability, with high accident rates on some routes and a number of accident clusters
2	Severe weather causes road closures which reduce journey time reliability
3	There is a lack of technology to assist in the operation and management of the routes and provide information for travellers
4	Maintenance on single carriageway sections reduces journey-time reliability.
5	Asset condition, including the standard, age and damage to infrastructure, reduce journey-time reliability through significant maintenance operations and risk from closures
6	Journey-times are increased by delays at junctions and the geometry and topography of routes
7	Long term traffic growth will bring some urban sections of routes to their capacity

Objectives

1	**Connectivity** – improving the connectivity between Manchester and Sheffield through reduction in journey times and improved journey-time reliability
2	**Environmental** – avoiding unacceptable impacts on the natural environment and landscape in the Peak District National Park, and optimising environmental opportunities
3	**Societal** – improving air quality and reducing noise impacts, and addressing the levels of severance on the Trans-Pennine routes in urban areas
4	**Capacity** – reducing delays and queues that occur during peak hours and improving the performance of junctions on the routes
5	**Resilience** – improving the resilience of the routes through reductions in the number of incidents and reduction of their impacts
6	**Safety** – reductions in the number of accidents and reductions of their impacts

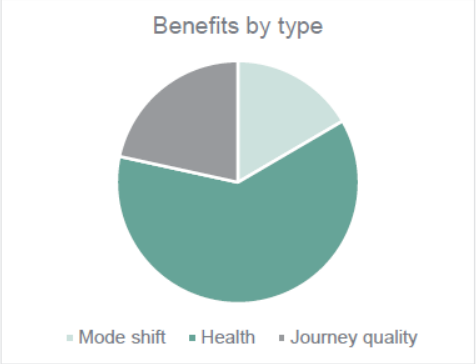
Annex 3

Output summaries for the DfT Active Mode Appraisal Toolkit (AMAT)

Central

Analysis of Monetised Costs and Benefits (in £'000s)	
Congestion benefit	3821.78
Infrastructure maintenance	10.60
Accident	326.38
Local air quality	56.99
Noise	21.76
Greenhouse gases	158.43
Reduced risk of premature death	13885.47
Absenteeism	1938.61
Journey ambience	5523.17
Indirect taxation	-152.91
Government costs	3214.61
Private contribution	0.00
PVB	25579.69
PVC	3204.01
BCR	**7.98**

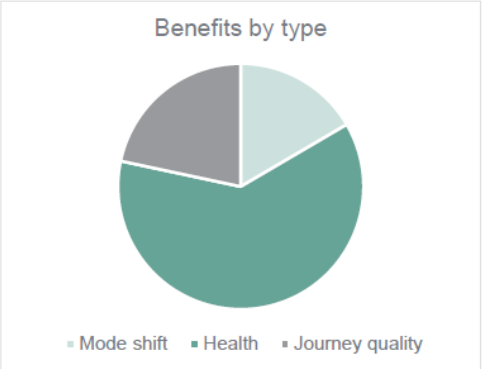
Benefits by type:		
Mode shift	4243.04	16.6%
Health	15824.08	61.8%
Journey quality	5523.17	21.6%



Low

Analysis of Monetised Costs and Benefits (in £'000s)	
Congestion benefit	2912.71
Infrastructure maintenance	8.11
Accident	249.55
Local air quality	43.74
Noise	16.64
Greenhouse gases	121.40
Reduced risk of premature death	10560.89
Absenteeism	1482.08
Journey ambience	4222.51
Indirect taxation	-119.31
Government costs	3658.49
Private contribution	0.00
PVB	19490.21
PVC	3650.38
BCR	**5.34**

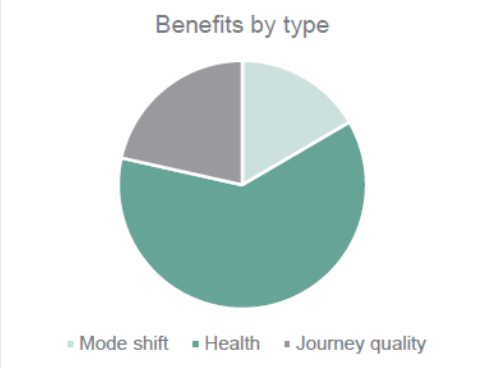
Benefits by type:		
Mode shift	3232.84	16.6%
Health	12042.97	61.8%
Journey quality	4222.51	21.7%



High

Analysis of Monetised Costs and Benefits (in £'000s)	
Congestion benefit	4881.28
Infrastructure maintenance	13.49
Accident	415.56
Local air quality	72.31
Noise	27.70
Greenhouse gases	201.30
Reduced risk of premature death	17768.34
Absenteeism	2468.63
Journey ambience	7033.23
Indirect taxation	-190.84
Government costs	3214.61
Private contribution	0.00
PVB	32677.52
PVC	3201.12
BCR	**10.21**

Benefits by type:		
Mode shift	5420.81	16.6%
Health	20236.97	61.9%
Journey quality	7033.23	21.5%



Example IMAT sheet

Active Mode Appraisal Toolkit User Interface Intervention

Intervention-specific information

User input required for all interventions

Intervention name	Longsdendale package Low
Intervention promoter	CPRE

Key

- User input required for all interventions
- User input required for all cycling interventions
- User input required for all walking interventions
- Default assumptions (can be revised with supporting justification)

Please fill in the 'Intervention details' to obtain a benefit cost ratio for an intervention. If local evidence is available, users may revise the default assumptions below but must also provide additional sources or supporting evidence to justify any changes (column H).
A worked example is provided in the accompanying AMAT User Guidance document to provide the user with a step-by-step guide to completing an assessment using AMAT

Intervention details

Appraisal year	2021		Current year
Intervention opening year	2023		
Last year of funding	2025		
Appraisal period	27	years	The appraisal period should correspond to the expected asset life. This should not exceed 60 years.
Local area type	Inner and Outer Conurbations		For applying Marginal External Costs used in mode shift calculations. Choices: London, Inner and Outer Conurbations, Other Urban, Rural, National Average

Mode Information

Please fill out the cycling and walking sections where relevant. If a intervention does not directly affect the number of users of a specific mode, the relevant section should be left blank.
Ideally, forecast trip numbers should be based on counts representing an average weekday in spring or autumn to avoid seasonal bias. Both automatic and manual counts can be used.
The number of trips currently (without the intervention in place) and expected (with the intervention in place).
These sections require projections of the number of users in a 'Do-something' scenario (with the intervention in place) can be based on data from evaluations of historical interventions, case studies, or surveys.
If the user does not have current or proposed numbers, please refer to the AMAT User Guide on potential sources of data to inform your assessment.
For behaviour change schemes: 'How much of an average...trip will use the intervention?' should be set to zero and there should be no change in the Current and Proposed infrastructure.

Cycling

User input required for all cycling interventions

			Evidence/Source
Number of trips without the proposed intervention	0	per day	
Number of trips with the proposed intervention	350	per day	
How much of an average cycling trip will use the intervention?	75.00%	%	maximum 100%
Current cycling infrastructure for this route	No provision		
Proposed new cycling infrastructure for this route	Off-road segregated cycle track		
Are any additional shower facilities being added?	No		
Are any additional secure storage facilities being added?	Yes		

Walking

User input required for all walking interventions

Number of trips without the proposed intervention	0	per day	
Number of trips with the proposed intervention	350	per day	
How much of an average walking trip will use the intervention?	75.00%	%	maximum 100%

Current walking infrastructure for this route

Street lighting	No
Kerb level	No
Crowding	No
Pavement evenness	No
Information panels	No
Benches	No
Directional signage	No

Proposed walking infrastructure for this route

Street lighting	Yes
Kerb level	Yes
Crowding	No
Pavement evenness	Yes
Information panels	Yes
Benches	Yes
Directional signage	Yes

Assumptions

Default assumptions (can be revised with supporting justification)
Default TAG assumptions have already been entered. Users should only revise these if they can provide supporting evidence.
Any additional evidence should be described in column H.

Decay rate	0.00%	%	

TAG A5.1 explains that the impact of a cycling intervention is likely to diminish year by year following investment.
The decay rate has been set at 0% for an infrastructure investment.
For revenue-funded initiatives, such as cycle training or personalised travel planning, the decay rate may be positive.
The default assumption is that 0% of new users are already active. This means all new users experience intervention-related health impacts.

Cycling

Average length of trip	4.64	km	National Travel Survey Data 2012-14	
Average speed	15	km/h	National Travel Survey Data 2016	
Proportion of cyclists who are employed	58.40%	%	National Travel Survey Data 2018	
Proportion otherwise using a car	50.00%	%	Targeted through Travel Plan	Please provide local evidence
Proportion otherwise using a taxi	0.00%	%	Literature Review carried out by RAND Europe/Systra for DfT	

Walking

Average length of trip	1.1	km	National Travel Survey Data 2012-2014	
Average speed	5	km/h	National Travel Survey Data 2016	
Proportion of pedestrians who are employed	58.40%	%	National Travel Survey Data 2018	
Proportion otherwise using a car	50.00%	%	Targeted through Travel Plan	Please provide local evidence
Proportion otherwise using a taxi	0.00%	%	Assumed to be the same as cycling diversion factors	

Additional Information

Return journeys	90%	%	National Travel Survey Data 2018

A return journey involves going to and from your destination using the same route.Trips that make up return journeys will appear twice in the daily trip count (opposite directions).

Background growth rate in trips	0.50%	%	Higher rate to reach CCC 2050 estimate	Please provide local evidence
Period over which this growth rate applies	27	years	To 2050 (net zero date)	Please provide local evidence

This is an annualised growth rate for increases in active travel trips. This could be due to a increase in population, changes in demographics or travel trends.

Number of days for which intervention data is applicable per year	365	per year	To be compatible with AADT for A57	Please provide local evidence
Car occupancy rate	1.6		Source: National Travel Survey 2002-16	
Taxi occupancy rate	2.4		Source: TAG Data Book 2019	

Promoters may want to change this depending on the intervention. For example, if the intervention is designed to shift modes from car to walking or cycling the occupancy rates may be higher.