



**Haweswater Aqueduct Resilience Programme - Proposed Marl Hill
Section**

Environmental Statement

Volume 2

Chapter 16: Transport Planning

June 2021



Haweswater Aqueduct Resilience Programme - Proposed Marl Hill Section

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16. Transport Planning

16.1 Introduction

- 1) This chapter presents an assessment of the potential for likely significant effects of the Proposed Marl Hill Section on traffic and transport. This chapter will summarise:
 - Assessment methodology
 - Baseline conditions along the Proposed Marl Hill Section and the immediate environs
 - Likely significant environmental effects
 - Potential mitigation measures
 - Likely residual effects.
- 2) The methodology is presented in more detail within a separate Transport Assessment (TA), contained within Appendix 16.1 as well as proposed off-site highways works in Volume 5.
- 3) The geographical scope of this chapter is defined by the routes which Heavy Goods Vehicles (HGVs), abnormal loads and employees would use to travel to the identified sites associated with the construction and operation of the Proposed Marl Hill Section. The geographical scope is illustrated within the figures below which also indicate the location of the traffic data collection surveys.
 - Figure 16.1: Traffic Count Survey Locations
 - Figure 16.2: Proposed Vehicle Routeing.
- 4) This chapter begins by summarising consultations held with Local Highway Authorities (LHAs) and Highways England as the strategic highway authority, and providing a review of the legislation and planning policies relevant to Transport Planning. The assessment area and methodology are then outlined. The existing baseline environment is then identified before an assessment is made of the potential effects on transport for the Proposed Marl Hill Section, and the potential for cumulative effects with other proposed major developments. The assessment takes into account the effect of the Construction Traffic Management Plans (CTMP) for the relevant planning applications, and other good practice measures are proposed.

16.2 Scoping and Consultations

16.2.1 Scoping

- 5) A Transport Planning chapter was included within the EIA scoping report which was submitted to Ribble Valley Borough Council in October 2019 followed by a Scoping Addendum in February 2021, required due to design changes and refinements. A Scoping Opinion was provided by Ribble Valley Borough Council, taking account of submissions provided by among others Lancashire County Council and Highways England. These have been reviewed and the October 2019 scoping report responses incorporated into the assessment. Scoping comments and responses are outlined in Appendix 4.1.
- 6) A summary of the principal matters raised in the EIA Scoping Report consultation (October 2019) are provided below:
 - TA to be produced
 - Key focus of the assessment should be on potential construction / decommissioning phase impacts
 - Inclusion of the potential origin / destinations of material supplies and disposal of material off site
 - Inclusion of access strategy and highway network operational assessments
 - Committed and emerging development to be included in the Transport Assessment (TA)
 - Inclusion of the impact on equestrians, pedestrians and cyclists and existing Public Rights of Way

- Must be undertaken fully in accordance with the Department for Transport (DfT) Circular 02/20131 The Strategic Road Network and the Delivery of Sustainable Development
- Reference should also be made to Planning for the future: A guide to working with Highways England on planning matters and the relevant chapters in the Planning Practice Guidance
- TA to include spatial and temporal coverage
- Baseline data to inform the TA should include traffic flow and collision data
- Trip generation and distribution assumptions to be adopted in the TA
- Committed development to be factored into the assessment of the peak hour traffic impacts to M6 Junction 31 needs to be confirmed by the respective local planning authorities where those junctions are to be located, not with Highways England (paragraph 572)
- New accesses to the Strategic Road Network (SRN) associated with a development of this nature are not permitted under the terms of Circular 02/2013 (paragraph 581)
- Safety analysis of the SRN junctions affected should be included within the TA considering the record of incidents over the last five years
- The TA should reflect all vehicle traffic being generated by the proposals during the weekday peak hours and not be presented in percentage impacts
- Depending on the agreed levels of traffic generated, an analysis under the Design Manual for Roads and Bridges standard TD22 to assess the appropriateness of the slip roads at Junction 31 to accommodate the increase in flows could be necessary.

16.2.2 Consultation

7) During this assessment, detailed scoping and pre-application consultation took place with relevant statutory and non-statutory consultees, stakeholders and third parties, through both correspondence, teleconferences and face-to-face meetings. This has been summarised in Table 16.1.

Table 16.1: Pre-Application Transport Planning Scoping and Consultation Summary

Consultee	Type of Engagement	Date(s)	Discussion Points
Lancashire County Council	Traffic pre-application meeting	2 August 2019	<ul style="list-style-type: none"> ▪ Overview of indicative programme of works and planning strategy affecting Lancashire County Council ▪ EIA scoping discussion including access arrangements, potential traffic routes, passing places, Swept Path Analysis (SPA), conflicts between pedestrians / cyclists / equestrians and construction traffic, accident data coverage, numbers and types of estimated construction trips, Staff Travel Plan and seasonality ▪ Primary interest around access arrangements and demonstration that routes are safe and workable ▪ Reference to Cuadrilla fracking sites in Lancashire; however, it was acknowledged that the nature of the Proposed Marl Hill Section is significantly different from those sites

¹ Department for Transport (2013) *The Strategic Road Network and the Delivery of Sustainable Development* [Online] Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/237412/dft-circular-strategic-road.pdf [Accessed: May 2020].

Consultee	Type of Engagement	Date(s)	Discussion Points
			<ul style="list-style-type: none"> Surveys to inform transport documents including non-motorised users, pre-survey site walkover and seasonality² Mitigation strategy to include route training, vehicle storage areas and car sharing and / or minibus.
Highways England	Traffic pre-application meeting	20 August 2019	<ul style="list-style-type: none"> Overview of indicative programme of works and planning strategy affecting Highways England Delivery / movement strategy to avoid peak hours on the Highways England network to be identified Cumulative impacts were discussed and the potential for detailed assessment / traffic modelling, Environmental Impact Assessment / Transport Assessment standards, capacity and physical manoeuvring implications to be considered, SPA, staff numbers and timings to form part of the assessment and major projects to be considered within the assessment Direct access from the motorway not permitted, new accesses from the SRN to be avoided.
Lancashire County Council	Bowland and Marl Hill Traffic Route Workshop with Lancashire County Council	23 January 2020	<ul style="list-style-type: none"> Discussion of proposed traffic routes, proposed vehicles, proposed traffic movements through Wray and Clitheroe and mitigation measures such as holding areas.
Lancashire County Council	Haweswater Aqueduct / use of Bradford Bridge email liaison	24 March 2020	<ul style="list-style-type: none"> Queries raised by West Bradford Parish Council and local residents in relation to proposed traffic routes.
Lancashire County Council	Bowland, Marl Hill, Haslingden and Walmersley Traffic Route Workshop with Lancashire County Council	12 May 2020	<ul style="list-style-type: none"> Update on progress in relation to the Proposed Programme of Works, public engagement, proposed traffic routes and indicative traffic numbers Requirement to consider private equestrian provision and formal / informal cycle routes such as cycle club routes was raised Mitigation measures including lower speed limits to reduce noise and vibration, passing places, parking restrictions, avoiding school hours and satellite compounds Safety audits were discussed.
Lancashire County Council	Bowland and Marl Hill Traffic Route Workshop with Lancashire County Council	10 June 2020	<ul style="list-style-type: none"> Clarification of proposed working hours by activity and type of vehicle, taking into account local restrictions and potential noise issues Discussion of proposed Bowland and Marl Hill traffic routes which included clarification of proposed accesses, traffic volumes, mitigation measures including parking

² Due to Covid-19 restrictions it was not possible to undertake surveys to establish representative usage levels of public roads and rights of way by non-motorised users.

Consultee	Type of Engagement	Date(s)	Discussion Points
			restriction requirements, satellite sites and potential road widening and SPA.
Lancashire County Council	Traffic and Transport Technical Group Central and Southern Sections – Lancashire County Council	19 June 2020	<ul style="list-style-type: none"> Discussion to obtain agreement on traffic routes in the Bowland and Marl Hill Sections to be taken forward for Environmental Impact Assessment and possible mitigation.
Highways England	Traffic pre-application meeting update	8 September 2020	<ul style="list-style-type: none"> Discussion of the Proposed Programme of Works including the current proposals and indicative vehicle numbers and access to compounds TA methodology, including the use of a link capacity assessment against the baseline situation was discussed as well as assumptions associated with this.
Lancashire County Council	Bowland and Marl Hill – Traffic and Transport Technical Group	1 October 2020	<ul style="list-style-type: none"> Update on progress in relation to public consultations Discussion about updates for the proposed compounds including proposed haulage routes, site accesses, vehicle movements and highways mitigation proposals Radar speed checks and peak traffic flows should be taken into consideration when proposing mitigation measures Other mitigation measures being considered such as road widening, Park and Ride facilities, by-passes, use of local quarries, restriction on use of routes at certain times or advanced notification systems.
Highways England	Traffic pre-application meeting update	26 November 2020	<ul style="list-style-type: none"> Discussion of the proposed surplus materials management strategy Discussion that for the purpose of transport modelling, it has been assumed a 40 % north – 80 % south split; based on a reasonable assumption of possible supplier locations Scope of the TA was discussed and the potential requirement of modelling of SRN junctions as well as the inclusion of SPA in reporting.
Lancashire County Council	Traffic and Transport Technical Group Central and Southern Sections – Lancashire County Council	17 February 2021	<ul style="list-style-type: none"> Update on progress in relation to the Construction Traffic Management Plans (CTMP), discussion of content and further details to be included such as duration of peak traffic movement, daily / hourly HGV limits to help control movements or how weather conditions would be managed Peak traffic diagrams at specific locations on routes where the public would be interested to be included in the CTMPs.

16.3 Key Legislation and Guidance

- 8) This section discusses the key legislation and guidance that has been reviewed to assess the Proposed Marl Hill Section. The key legislation and guidance include the National Planning Policy Framework

(NPPF) and the Department for Transport Circular 02/2013. Further transport policy and guidance is provided in the TA (Appendix 16.1). Environmental, national and local planning policies are also covered in Chapter 5: Planning Policy and Context.

National Planning Policy Framework, Ministry of Housing, Communities & Local Government, February 2019³

- 9) The NPPF seeks to encourage development which accords with the sustainable objectives of minimising the need for travel, particularly road journeys, and promoting the efficient delivery of goods and supplies. It notes that:

'Transport issues should be considered from the earliest stages of plan-making and development proposals, so that:

a) the potential impacts of development on transport networks can be addressed;

b) opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised – for example in relation to the scale, location or density of development that can be accommodated;

c) opportunities to promote walking, cycling and public transport use are identified and pursued;

d) the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; and

e) patterns of movement, streets, parking and other transport considerations are integral to the design of schemes and contribute to making high quality places' (Paragraph 102)

'In assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:

a) appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;

b) safe and suitable access to the site can be achieved for all users; and

c) any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree' (Paragraph 108)

- 10) Additionally, from a highway perspective, the NPPF works on a presumption in favour of development as it demonstrates that:

'Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe' (Paragraph 109)

- 11) The NPPF notes that if significant amounts of traffic are produced that:

'All developments that will generate significant amounts of movement should be required to provide a travel plan, and the application should be supported by a transport statement or transport assessment so that the likely impacts of the proposal can be assessed' (Paragraph 111)

³ Ministry of Housing, Communities & Local Government (2019) *National Planning Policy Framework* [Online] Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf [Accessed: May 2020].

Circular 02/2013, The Strategic Road Network and the Delivery of Sustainable Development, Department for Transport (DfT), 2013⁴

- 12) Circular 02/2013 addresses development proposals on Highway England's SRN for the Proposed Marl Hill Section which relates to the M6. The circular states the following key principles:

'Development proposals are likely to be acceptable if they can be accommodated within the existing capacity of a section (link or junction) of the strategic road network, or they do not increase demand for use of a section that is already operating at over-capacity levels, taking account of any travel plan, traffic management and/or capacity enhancement measures that may be agreed. However, development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe' (Paragraph 9)

'However, even where proposals would not result in capacity issues, the Highways Agency's prime consideration will be the continued safe operation of its network' (Paragraph 10)

16.4 Assessment Methodology and Assessment Criteria

16.4.1 Assessment Methodology

- 13) Reference has been made to national and local policy documents, relevant British Standards, national guidance and other relevant information in determining the assessment methodology and criteria to be used.
- 14) A detailed assessment is provided within Section 5 of the TA (Appendix 16.1) and is summarised within this ES chapter. It has been identified within the TA that the potential transport-related environmental effects would occur during the construction period and to a lesser degree during the decommissioning and operational periods. Within this context, it was noted that activity could vary across the construction programme, and would be generally temporary in nature at a given location, especially where it relates to the forward progression of a pipeline component.
- 15) The assessment focused on the busiest construction concurrent period within the Proposed Programme of Works, which, dependent on gaining planning consent, would commence in 2023 and conclude at least six years later. Following scoping discussions with the relevant LHAs and frequent discussions with United Utilities and the Early Contractor Involvement (ECI) team in relation to the construction programme, it was concluded that August 2024 represented the period of greatest concurrent construction activity. This month was therefore anticipated to represent the greatest potential effect on the highway network. Any seasonal differences which occur in the area have been considered to depict the best representative construction scenario.
- 16) The assessment of potential effects was based upon traffic surveys collected by Tracsis (on behalf of United Utilities) during October and November 2019 at six locations, on the local highway network. Further to this, additional data were also obtained through DfT counts,⁵ as well as traffic count information from Lancashire County Council. The survey data conducted by Tracsis included fully classified turning counts at junctions over a 12-hour period; this was to obtain the adjacent two-way traffic flows on each adjacent arm approaching the junction. Additional traffic counts to obtain speed data and traffic were also conducted. The traffic count type and locations are identified in Table 16.2 and illustrated in Figure 16.1.

⁴ Department for Transport (2013) *The Strategic Road Network and the Delivery of Sustainable Development* [Online] Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/237412/dft-circular-strategic-road.pdf [Accessed: May 2020].

⁵ Department for Transport (2020) *Road Traffic Statistics* [Online] Available from: <https://roadtraffic.dft.gov.uk/downloads> [Accessed: June 2020].

Table 16.2: Traffic Count Site Locations

Traffic Count Type / ID	Traffic Count Sites	Easting SD	Northing SD
ATC 11	Unnamed road west of Newton-in-Bowland (west)	369205	450083
ATC 12	B6478 Clitheroe Road	372932	443736
MCC 21	Unnamed road / Back Lane	369569	450364
MCC 22	A671 / Waddington Road / York Street / Waterloo Road	374630	442148
MCC 23	B6478 / Moor Lane / Queensway	374283	441372
MCC 24	A59 / A671	374367	438986
LCC ATC_27278	A671 (Pimlico Link Road)	376094	442613
LCC ATC_27267	B6478 (Slaidburn Road, north)	372662	444020
LCC ATC_27712	A59 (east of Clitheroe) (northern section)	376330	441990
LCC ATC_27310	A59 (east of Pimlico Link Road)	376688	442899
LCC ATC_28935	Crow Trees Brow	375845	443296
LCC ATC_27436	Ribble Lane	376653	444390
LCC ATC_27582	West Bradford Road south of Cement Plant	374718	443553
DfT Manual count 16566	A59 between M6 Junction 31 and A667	360000	430190
DfT Manual count 36608	A59 between A667 and Mellor Brook roundabout	365040	432000
DfT Manual count 6582	A59 between B6245 and A666	370000	434560
DfT Manual count 46603	A59 between A666 and A671 (south)	372000	435940
DfT Manual count 36607	A59 between A671 (south) and A671 (north)	374200	438000
DfT Manual count 941447	West Bradford Road (west)	373226	444056

- 17) The potential environmental effects of the Proposed Marl Hill Section have been assessed using the following scenarios:
- 2024 Background ('Do Nothing') Scenario – traffic growth within the network
 - 2024 Background + Cumulative ('Do Minimum') Scenario – traffic growth within the network and quantifiable cumulative schemes
 - 2024 Construction ('Do Something') Scenario – parallel activities taking place in August 2024.
- 18) The details associated with the identified assumptions are addressed in detail within the TA (Appendix 16.1) and CTMP (RVBC-MH-APP-007_01 within the Planning Documents).

16.4.2 Assessment Criteria

- 19) The assessment criteria outlined below were used to determine whether likely significant environmental effects might occur. For the purposes of this ES, anything with a 'moderate' or above effect was considered to be 'significant'.
- 20) The assessment used a quantitative analysis through the 12-hour traffic model outputs during the peak of each road link as well as a qualitative analysis based on sensitivity. Sensitivity was determined by, among other things, the level of designation or protection, susceptibility to or ability to accommodate change, the timescale of the change, and professional judgement. Table 16.3 provides an illustration of how the significance of effects were assessed by forecasting the magnitude of change and a receptor's sensitivity to that change.
- 21) The potential highways and transport-related environmental effects of delivering the Proposed Marl Hill Section were assessed with reference to good practice guidance outlined within *Guidelines for the*

*Environmental Assessment of Road Traffic (IEMA, 1993)*⁶ which were used as a basis to develop appropriate thresholds. These guidelines inform the environmental assessment of road traffic associated with major new developments and were designed to be applied to off-site traffic impacts.

- 22) The guidance also demonstrates that there is a requirement to consider '*particular groups or locations which may be sensitive to changes in traffic conditions*'; those identified for consideration are summarised below. The guidance also notes that other groups / interests can be added if the assessor considers this as appropriate:
- *'People at home*
 - *People in work places*
 - *Sensitive groups including children, elderly and disabled*
 - *Sensitive locations, e.g. hospitals, churches, schools, historical buildings*
 - *People walking*
 - *People cycling*
 - *Open spaces, recreational sites, shopping areas*
 - *Sites of ecological / nature conservation value*
 - *Sites of tourist / visitor attraction*'.
- 23) Environmental effects associated with traffic were quantified against the following IEMA thresholds, denoting where a more detailed analysis would be required:
- Rule 1: *'Include highway links where traffic flows will increase by more than 30 % (or the number of heavy goods vehicles will increase by more than 30 %)*
 - Rule 2: *'Include any other specifically sensitive areas where traffic flows have increased by 10 % or more.'*
- 24) With respect to Rule 1 (30 % threshold), the IEMA guidance states that traffic forecasting is not an exact science and that it is generally accepted that accuracies greater than +/- 10 % are not achievable. Day-to-day variation of traffic on a route corridor is frequently at least +/- 10 % of data recorded on a single survey date. The IEMA guidelines suggest that projected changes in traffic of less than 10 % would create no discernible environmental impact.
- 25) However, with respect to IEMA Rule 2, a 10 % change in traffic is considered significant in environmentally 'sensitive' areas. The IEMA guidelines highlight places which could be considered to represent a 'sensitive' receptor, including but not limited to accident *blackspot* locations, conservation areas, hospitals and links with high pedestrian flows. The IEMA guidance notes that it would not normally be appropriate to consider links where traffic flows have changed by less than 10 %, unless there are significant changes in the composition of traffic, such as a large increase in the number of HGVs. It is up to the professional judgement of the assessor to determine the level of sensitivity of any location, and consequently whether further assessment of the environmental effects is necessary.
- 26) The assessment of potential impacts has taken into consideration primarily the site preparation and construction activities. It is acknowledged that the operation of the pipeline would have a negligible impact on the operation of the highway network. There are 13 quantifiable environmental effects identified within the IEMA guidance; however, a number are covered in separate sections of this ES document which are summarised below:
- Landscape and Arboriculture (Chapter 6)
 - Ecology (Chapter 9)
 - Cultural Heritage (Chapter 10).

⁶ Institute of Environment Management and Assessment (1993) *Guidelines for the Environmental Assessment of Road Traffic*.

- Noise and Vibration (Chapter 17)
- Air quality (Chapter 18).

27) Table 16.3 outlines the criteria that were used in the evaluation of core impacts.

Table 16.3: Analysed Impact Definitions and IEMA Guidance

Core Impacts	Criteria
Severance	<p>This impact is the perceived division which could occur within a community if it becomes separated by increased traffic levels. Severance could be due to:</p> <ul style="list-style-type: none"> ▪ The difficulty of crossing a heavily trafficked road ▪ The road itself (as it creates a physical barrier) ▪ Pedestrian access to essential facilities impeded by minor traffic flows. <p>Severance can also be experienced by residents, motorists or pedestrians. Factors which should be analysed to determine the level of severance include <i>'road width, traffic flow and composition, traffic speeds, the availability of crossing facilities and the number of movements that are likely to cross the affected route'</i>. It is also identified that certain groups may be more affected than others such as old people or young children as they may be more sensitive to traffic conditions than other groups.</p> <p>According to the IEMA guidelines, changes in traffic flow of 30 %, 60 % and 90 % are regarded as producing 'slight', 'moderate' and 'substantial' changes in severance respectively.</p>
Driver delay	<p>Driver delay generally occurs where vehicles are required to either give way or receive priority at junctions where there are opposing movements. There is no quantitative standard for assessing driver delay; however, it is likely to be significant when demand exceeds or is approaching capacity. IEMA guidance suggests four main areas where a project is likely to cause driver delay; these are:</p> <ul style="list-style-type: none"> ▪ Key intersections along the network ▪ Side roads where finding a gap in the traffic may become harder ▪ Site entrances where additional turning movements would occur ▪ Where additional parked cars on roads would reduce the width of the road.
Pedestrian delay	<p>Pedestrian delay generally occurs when traffic flows impact on the ability of pedestrians to cross a carriageway. The provision of crossing facilities, the geometric characteristics of the road and the traffic volume, speed and composition are all factors that can determine pedestrian delay. It is advised within IEMA guidelines that quantitative thresholds should be avoided, with professional judgement to be used instead due to the number of local factors that need considering.</p>
Pedestrian amenity	<p>Pedestrian amenity relates broadly to the relative pleasantness of a journey, which can be affected by speed, composition and traffic flow in addition to footway width and the separation / protection from traffic. Pedestrian anxiety is incorporated within pedestrian amenity. Fluctuations are common between projects and areas, so there is no fixed specification; however, IEMA guidance suggests a <i>'tentative threshold'</i> of a significant impact if the traffic flow or HGV flow is doubled.</p>
Accidents and safety	<p>Accidents and safety can be obtained through accident data on the road network which provides the location, number of accidents and their associated severity. Additionally, this data can also identify any accident blackspots. A certain extent of qualitative professional judgement is involved in assessing any potential changes in accidents and safety which will also be based on local information such as junction types, road widths, average speeds and traffic flows.</p>

Core Impacts	Criteria
Hazardous loads	An assessment of the chance of an accident involving any hazardous loads should be determined, along with the chance of a spillage occurring in an accident. The resulting chance of a spillage would hopefully be low, although, in cases where there are numerous hazardous loads being transported, discussions with the local emergency services and the Health and Safety Executive should be conducted. The environmental impact of a hazardous load spillage should also be assessed if the chance of a spillage is deemed significant.

28) The magnitude attributed to each impact identified reflects the magnitude of change as a result of the Proposed Marl Hill Section and the sensitivity of the affected receptor. A scale of major, moderate, slight and negligible in accordance with the IEMA guidance of the magnitude of change to the affected receptor has been applied.

16.4.3 Embedded Mitigation and Good Practice

29) Embedded mitigation is inherent to the design, and good practice measures are standard industry methods and approaches used to manage commonly occurring environmental effects. The assessment presented in Section 6 of this chapter takes into account embedded mitigation and the implementation of good practice measures.

30) The need for any topic-specific essential mitigation (generally for effects likely to be significant in the context of the EIA Regulations) is considered in Section 7 of this chapter.

Embedded Mitigation

31) Chapter 3: Design Evolution and Development Description explains the evolution of the design with input from the EIA team, including mitigation workshops and the use of GIS based constraints data.

32) Construction Traffic Management Plans (CTMP), one for each Haulage Route Option, have been prepared which outline mitigation embedded in the design of the Proposed Marl Hill Section to mitigate adverse construction traffic effects of the Proposed Marl Hill Section does not give rise to undue adverse impacts on the highway network. The CTMPs provide the framework for the management of construction traffic from the strategic road network to the proposed compounds. The CTMPs cover the following aspects:

- Proposed vehicle routeing
- Proposed peak traffic flows
- Other road users
- Traffic management.

Good Practice Measures

33) The CTMPs also include good practice measures and a Travel Plan, to be further developed by a Highways Stakeholder Group comprising the construction contractor(s), key stakeholders and the LHAs.

34) The Travel Plan has been developed to mitigate against the potential effects of vehicle access to the compounds on the surrounding highway network. Although some locations are classed as urban, it is recognised that limited options exist to promote sustainable travel alternatives (such as public transport, walking and cycling) due to the nature and location of the Proposed Marl Hill Section. The emphasis is therefore placed on the consolidation of movements within multi-occupancy vehicles and the management of vehicles within the site compounds so that they do not have a wider impact upon the surrounding highway network, especially within residential areas and close to schools / community facilities. The following good practice measures are proposed in the Travel Plan to limit the impacts that employee travel may have on the local highway network and the immediate environs of the construction compound areas:

- Encouraging staff involvement in a car-sharing scheme. Employees would be encouraged to car share with other staff members; this could be by a staff matching scheme operated on recruitment or via external car-sharing options such as car-share websites like Liftshare.com
 - Management and utilisation of Park and Ride facilities to reduce the use of private car and local parking does not become problematic within surrounding residential areas. Where demand exceeds supply, steps would be taken to ensure that staff travel in multi-occupancy vehicles
 - No living accommodation would be provided within any construction working areas. It is anticipated that workers would be accommodated in the general area
 - Welfare facilities would be provided within the working area to minimise the need for off-site trips by staff during the working day.
- 35) A Highways Stakeholder Group would be convened between the construction contractor(s) and the following groups on a bi-monthly basis or as agreed by the group, dependent on the progress of work:
- Lancashire County Council
 - Highways England
 - Other developers progressing major schemes within the area.
- 36) This Stakeholder Group would facilitate the successful operation of both the local and strategic highway networks during the construction period, particularly in regard to the following:
- Understanding the coincidence of other construction programmes
 - Understanding the potential for coincidence of construction works in the highway associated with the Proposed Marl Hill Section and other construction projects, e.g. any requirements for closure
 - Understanding the planned maintenance programmes of the LHA, Highways England and other undertakers that may have a bearing on the Proposed Marl Hill Section construction programme.
- 37) Transport routes to and from the proposed compounds have been identified, and highway works along these routes would be required to improve safety for construction vehicles and general road users. These comprise:
- Construction of new passing places classed as temporary and to be reinstated on completion of the works
 - Road widening within highways limits of deviation which would be retained following completion of the works. All road widening works which encroach onto third party land would be reinstated back to pre-works alignment and condition on completion of the HARP construction programme. Please refer to Volume 5 for further explanation of the off-site highways works.
- 38) Following the completion of the HARP construction programme, some reinstatement works would be carried out. However, discussions between United Utilities, the LHA and landowners is on-going to confirm reinstatement requirements.

16.4.4 Assumptions and Limitations

- 39) Discussions were undertaken to confirm parameters for the assessment which included key assumptions to accord with scoping requirements of the LHA and United Utilities; these assumptions included:
- The duration of construction programme – assumed to be from April 2023 to September 2030 with a peak in activity for the Proposed Marl Hill Section of August 2024
 - The location of construction compounds and Park and Ride / satellite compounds – as identified in Volume 3 Figure 3.1 and described in Volume 2 Chapter 3: Design Evolution and Development Description.
 - Origin / destination of material, tunnel ring deliveries and other material deliveries – assumed to be via the SRN using the M6, unless operating from a specific supplier. For the destination of exported material for the Proposed Marl Hill Section (and for the Proposed Newtown-in-Bowland Compound

in the Proposed Bowland Section), surplus excavated material would be directed to the nearby Waddington Fell Quarry

- Origin of employee trips to construction areas – assumed that workers would be accommodated in the employee catchment area and travel to the Park and Ride areas by minibus / vans / private car, then use a shuttle bus service to the compounds
- Duration of working hours – underground tunnelling and surface works to support tunnelling works would likely be undertaken on a 24/7 basis. Construction-related vehicle movements would be limited on weekdays (Monday and Friday) to between 07:00 to 19:00 and on Saturday mornings between 07:00 and 13:00 unless there is a requirement to work longer days using artificial lighting. Exceptions for weekends and bank holidays can be agreed
- Within the 07:00 to 19:00 period for vehicle movements on the public highway, further restrictions would apply in connection with the Proposed Marl Hill Section. For example, HGV movements would be permissible only between the hours of 09:00 and 14:45 and then from 16:00 to 18:45 in order to avoid the school run periods. These times would be reviewed and agreed with the relevant LHA near the commencement of construction activities to consider the most up-to-date school schedules. The high-level coordination of the construction programme is addressed within the CTMPs (RVBC-MH-APP-007_01 within the Planning Documents).

16.5 Baseline Conditions

40) This section details the transport planning baseline for the assessment area and identifies receptors where there is potential for significant effects to arise. The Proposed Marl Hill Section is located within the Ribblesdale Borough Council administrative area, approximately 4 km north of Clitheroe extending from approximately 1.3 km south of Newton-in-Bowland to 1.3 km north of Waddington. The existing aqueduct between the Hodder multi-line siphon and the Ribblesdale multi-line siphon would be replaced with a single tunnel. The new tunnel would be driven from south to north, with a launch shaft at the Braddup Compound (south) and reception shaft at Bonstone Compound (north).

41) Baseline data were collated from a variety of sources in compiling this assessment, including:

- Desk-based assessment
- Traffic counts
- Site visits
- Dash camera footage
- Road safety information
- Ordnance Survey mapping
- ECI contractor vehicle dimensions for anticipated construction traffic.

16.5.1 Information Sources

42) The assessment was undertaken with reference to the sources detailed in Table 16.4.

Table 16.4: Key Information Sources

Data Source	Reference
Existing highway networks, operating conditions and development components	<ul style="list-style-type: none"> ▪ Ordnance Survey Open Roads⁷ ▪ Open Street Map⁸ ▪ Google Maps and Street View⁹

⁷ Ordnance Survey Open Roads [Online] Available from: <https://www.ordnancesurvey.co.uk/business-government/products/open-map-roads> [Accessed: 2019-2020].

⁸ Open Street Map [Online] Available from: <https://www.openstreetmap.org> [Accessed: 2019-2020].

⁹ Google Maps [Online] Available from: <https://www.google.com/maps> [Accessed: 2019-2020].

Data Source	Reference
	<ul style="list-style-type: none"> ▪ Dash camera footage ▪ Site visits ▪ Advice from LHAs and Highways England.
Traffic counts	<ul style="list-style-type: none"> ▪ Surveys undertaken in October and November 2019, Department for Transport traffic counts¹⁰ and Lancashire County Council traffic counts.
Road accident data	<ul style="list-style-type: none"> ▪ Department for Transport Road Accidents and Safety Data (2015 – 2019).¹¹

16.5.2 Existing Highways Networks and Operating Conditions

- 43) The local and strategic network is a mixture of rural and urban roads and is characterised by four main access routes from the M6 motorway network, with an additional surplus material transfer access route for each compound to the Waddington Fell Quarry. For the Bonstone Compound three routes have been proposed depending on the type of construction vehicles:
- Route 1 – General construction traffic (HGVs under 3.5 m in height and light vehicles) via the M6 Junction 31, along the A59, then Pimlico Link Road, Chatburn Road and through Clitheroe along the B6478 Well Terrace / Waddington Road / Clitheroe Road / Slaidburn Road. This route is approximately 37 km in length from the M6 junction and consists of A-roads and B-roads
 - Route 2 – Abnormal loads and HGVs over 3.5 m in height via the M6 Junction 31, along the A59, then Pimlico Link Road, Clitheroe Road, Crow Trees Brow, Ribble Lane, Grindleton Road, West Bradford Road and along the B6478 Slaidburn Road. This route is approximately 40 km in length from the M6 junction and consists of A-roads and B-roads
 - Surplus material transfer south to Waddington Fell Quarry – B6478 Slaidburn Road (approximately 3 km from the compound to the quarry).
- 44) For the Braddup Compound three routes have been proposed depending on the type of construction vehicles:
- Route 1– General construction traffic (HGVs under 3.5 m in height and light vehicles) via the M6 Junction 31, along the A59, then Pimlico Link Road, Chatburn Road and through Clitheroe along the B6478 Well Terrace / Waddington Road / Clitheroe Road / Slaidburn Road. This route is approximately 32 km in length from the M6 junction and consists of A-roads and B-roads
 - Route 2 – Abnormal loads and HGVs over 3.5 m in height via the M6 Junction 31, along the A59, then Pimlico Link Road, Clitheroe Road, Crow Trees Brow, Ribble Lane, Grindleton Road, West Bradford Road along the B6478 Slaidburn Road. This route is approximately 35 km in length from the M6 junction and consists of A-roads and B-roads
 - Surplus material transfer north to Waddington Fell Quarry – B6478 Slaidburn Road (approximately 3 km from the compound to the quarry).
- 45) The routes outlined above comprise Haulage Route Option 1, as described in Appendix 3.1 of the Proposed Bowland Section ES. Haulage Route Option 2 (the Proposed Ribble Crossing) is assessed in Volume 6 Chapter 16.
- 46) All roads sections of the access routes for the Proposed Marl Hill Section are further detailed in Table 16.5 below.

¹⁰ Department for Transport (2020) *Road Traffic Statistics* [Online] Available from: <https://roadtraffic.dft.gov.uk/downloads> [Accessed: June 2020].

¹¹ Department for Transport (2019) *Road Safety Data* [Online] Available from: <https://data.gov.uk/dataset/cb7ae6f0-4be6-4935-9277-47e5ce24a11f/road-safety-data> [Accessed: November 2020].

Table 16.5: Existing Highway Network Proposed Traffic Routes

Proposed Compound	Delivery Routes
<p>Bonstone Compound</p> <p>Route 1 for general construction traffic (HGVs under 3.5 m in height and light vehicles)</p>	<p>Inbound M6 from north (40 %) and south (80 %) via Junction 31, A59, Pimlico Link Road, Chatburn Road, then the B6478</p> <p>Outbound B6478, Chatburn Road, Pimlico Link Road, A59 then M6 to north (40 %) and south (80 %) via Junction 31</p>
<p>Bonstone Compound</p> <p>Route 2 for abnormal loads and HGVs over 3.5 m in height</p>	<p>Inbound M6 from north (40 %) and south (80 %) via Junction 31, A59, Pimlico Link Road, Clitheroe Road, Crow Trees Brow, Ribble Lane, Grindleton Road, West Bradford Road, then the B6478</p> <p>Outbound B6478, West Bradford Road, Grindleton Road, Ribble Lane, Crow Trees Brow, Clitheroe Road, Pimlico Link Road, A59 then M6 to north (40 %) and south (80 %) via Junction 31</p>
<p>Bonstone Compound</p> <p>Surplus material transfer to Waddington Fell Quarry</p>	<p>Inbound B6478 Slaidburn Road</p> <p>Outbound B6478 Slaidburn Road</p>
<p>Braddup Compound</p> <p>Route 1 for general construction traffic (HGVs under 3.5 m in height and light vehicles)</p>	<p>Inbound M6 from north (40 %) and south (80 %) via Junction 31, A59, Pimlico Link Road, Chatburn Road, then the B6478</p> <p>Outbound B6478, Chatburn Road, Pimlico Link Road, A59 then M6 to north (40 %) and south (80 %) via Junction 31</p>
<p>Braddup Compound</p> <p>Route 2 for abnormal loads and HGVs over 3.5 m in height</p>	<p>Inbound M6 from north (40 %) and south (80 %) via Junction 31, A59, Pimlico Link Road, Clitheroe Road, Crow Trees Brow, Ribble Lane, Grindleton Road, West Bradford Road, then the B6478</p> <p>Outbound B6478, West Bradford Road, Grindleton Road, Ribble Lane, Crow Trees Brow, Clitheroe Road, Pimlico Link Road, A59 then M6 to north (40 %) and south (80 %) via Junction 31</p>
<p>Braddup Compound</p> <p>Surplus material transfer to Waddington Fell Quarry</p>	<p>Inbound B6478 Slaidburn Road</p> <p>Outbound B6478 Slaidburn Road</p>

47) The villages and other settlements situated along the route including Mellor Brook, Copster Green, Clitheroe, Chatburn, West Bradford and Waddington.

16.5.3 Road Safety Review

- 48) Road collision and safety statistics data for a five-year were period obtained from the DfT Road Accidents and Safety Data (2015 – 2019).¹² This dataset comprises road collision statistics collected from information about personal injury road collisions, and their consequent casualties in Great Britain to a common national standard. To establish a baseline position, a 200 m buffer around the proposed traffic routes within the Proposed Marl Hill Section, including junctions off the SRN, were analysed.
- 49) The DfT Accidents and Road Safety Data have been used to identify any accidents which have occurred along the four main routes within the Proposed Marl Hill Section.
- 50) To access the Braddup Compound and Bonstone Compound, the traffic routes would travel along certain sections of the SRN and local road network. Further information is detailed in Table 16.5.
- 51) Analysis of any clustering of collisions has also been undertaken and it is noted that where collision clusters occur around the proposed accesses to the compound sites, further investigation and highways design would be required to ensure that sufficient safety requirements are in place.
- 52) Accident analysis of the 200 m buffered traffic routes, which includes SRN junctions, identified a total of 406 accidents over the five-year data period. A total of 204 accidents occurred along the route accessing the Bonstone Compound and 202 accidents occurred along the route accessing the Braddup Compound. Three fatal accidents occurred within both buffered routes along the A59 near the junction with the A677, Copster Green and near Langho. A total of 56 serious accidents occurred along both traffic routes. A total of 173 slight accidents occurred along the traffic route to the Bonstone Compound and 171 slight accidents occurred along the traffic route to the Braddup Compound. Of the 204 accidents that occurred along the route to the Bonstone Compound, nine of these accidents involved HGVs and of the 202 accidents which occurred along the route to the Braddup Compound, also nine of these accidents involved HGVs. None of the accidents occurred near the compounds; however, two of the nine accidents that occurred along each route were classed as fatal. Table 16.6 shows the number of accidents and severity classification for both traffic routes within the Proposed Marl Hill Section.

Table 16.6: Collisions by Severity on Proposed Traffic Routes

Severity	Bonstone Compound	Braddup Compound
Total number of accidents on the proposed traffic routes	204	202
Fatal	3	3
Serious	28	28
Slight	173	171

- 53) Collision clusters within a 200 m buffer of the proposed traffic routes were also identified, the majority of which occurred at highway junctions, roundabout junctions and motorway slip roads, including:
- A59 / Preston New Road / M6 on slip (northbound)
 - A59 / Preston New Road / M6 on slip (southbound)
 - A59 / Vicarage Lane junction
 - A59 / A677 roundabout
 - A59 / B6245 / Ribchester Road junction

¹² Department for Transport (2019) *Road Safety Data* [Online] Available from: <https://data.gov.uk/dataset/cb7ae6f0-4be6-4935-9277-47e5ce24a11f/road-safety-data> [Accessed June 2020].

- A59 / A666 / Whalley Road roundabout
- A59 / A671 roundabout
- A59 / Holm Road roundabout
- A59 / A671 / Whalley Road roundabout
- A59 / Pendle Road roundabout
- A671 / Pimlico Link Road junction
- Chatburn Road / Pimlico Link Road roundabout.

16.5.4 Screening of Development Components

- 54) The study area was defined by the location of the compounds and the main access routes that would serve them for the purpose of delivering materials, removing waste and transferring the workforce to the site. As such, the screening of development components was potentially wider than the immediate environs of the Proposed Marl Hill Section, and covered the wider local highway network where no construction activity would take place. To that end, the effects associated with a single development component could be identified on strategic routes that are remote from the site. Further details can be seen in Figure 16.2. The period of assessment covers the full construction period for the Proposed Marl Hill Section (April 2023 to September 2030) and the operational phase. Elements related to the cessation of abstraction and decommissioning of existing assets have been screened out. Further details of the development components are identified in the TA (Appendix 16.1).

16.6 Assessment of Likely Significant Effects

- 55) The following section describes the effects of the Proposed Marl Hill Section on Transport Planning during the construction and operational phases.

16.6.1 Construction Phase

- 56) A review of daily (12-hour) link flows across the highway network demonstrated that increases in total of two-way traffic flows as a consequence of construction activities would exceed 10 % in two locations (links 63 and 140) and would not exceed 30 % in any location, with a maximum of 14.9 %. As these changes would occur on links that present low levels of background traffic, and encompass rural settlement, these links were regarded as 'sensitive' receptors, and were therefore considered for assessment in further detail against the IEMA criteria. It should be noted that the overall 12-hour increase in two-way traffic flow would be modest in real terms, and would be of a temporary duration for the peak period of construction; however, within the existing rural context, it may represent a perceptible increase.
- 57) With respect to changes in HGV demand within the assessment area, it was noted that seven links would experience daily increases in excess of the Rule 1 (30 %) threshold and were therefore considered for further assessment. As with total traffic, there would instances where existing HGV levels are low, so local receptors would be sensitive to a small (in real terms) increase in short-term activity during the construction period. Conversely, and as a means to limit the overall effects of construction activity in sensitive areas, there would be a number of key strategic links where the level of daily HGV activity would exceed 30 % against a higher level of background flow. At these locations, it was considered that the increase would be less perceptible to receptors; however, the increase may contribute to issues of congestion that could be present on the network. As a result, the TA provides a more detailed commentary on highway capacity, and the changes that would result from the addition of construction traffic. The TA also explores cumulative impacts with other identified schemes during the identified period of 'peak' construction, as agreed with the relevant LHA on the basis of being robust and suitably representative of network conditions.
- 58) The links which exceed the thresholds identified within the IEMA guidance are summarised in Table 16.7. The individual 'receptors' for each link in exceedance of the thresholds are considered in further detail within Table 16.8 to Table 16.13 against the following categories:

- Severance (Table 16.8)
- Driver delay (Table 16.9)
- Pedestrian delay (Table 16.10)
- Pedestrian amenity (Table 16.11)
- Accidents and safety (Table 16.12)
- Hazardous loads (Table 16.13).

Table 16.7: 12-Hour Traffic

			Background			Construction			Background + Construction			% Change	
Development Component	Link	Link Name	Total Traffic	HGVs	% HGV	Total Traffic	HGVs	% HGV	Total Traffic	HGVs	% HGV	Total Traffic	HGVs
Bonstone Compound access route 1	59	B6478 Waddington Road	2,723	97	3.6 %	110	71	64.1 %	2,833	168	5.9 %	4.1 %	73.0 %
	61	B6478 Slaidburn Road (north)	1,899	210	11.1 %	181	141	78.1 %	2,080	351	16.9 %	9.5 %	67.0 %
	63	B6478 Slaidburn Road (south)	1,913	212	11.1 %	219	184	84.0 %	2,132	396	18.6 %	11.5 %	86.8 %
	140	B6478 Slaidburn Road (north)	1,913	212	11.1 %	286	242	84.7 %	2,199	454	20.7 %	14.9 %	114.2 %
Bonstone Compound access route 2	123	Ribble Lane	1,842	228	12.4 %	70	70	100.0 %	1,912	299	15.6 %	3.8 %	30.7 %
	124	Grindleton Road	1,735	125	7.2 %	70	70	100.0 %	1,806	195	10.8 %	4.0 %	56.3 %
	60	West Bradford Road	1,629	54	3.3 %	70	70	100.0 %	1,699	124	7.3 %	4.3 %	129.5 %
	61	B6478 Slaidburn Road (north)	1,899	210	11.1 %	181	141	78.1 %	2,080	351	16.9 %	9.5 %	67.0 %
	63	B6478 Slaidburn Road (south)	1,913	212	11.1 %	219	184	84.0 %	2,132	396	18.6 %	11.5 %	86.8 %
	140	B6478 Slaidburn Road (north)	1,913	212	11.1 %	286	242	84.7 %	2,199	454	20.7 %	14.9 %	114.2 %
Braddup Compound access route 1	59	B6478 Waddington Road	2,723	97	3.6 %	110	71	64.1 %	2,833	168	5.9 %	4.1 %	73.0 %
	61	B6478 Slaidburn Road (north)	1,899	210	11.1 %	181	141	78.1 %	2,080	351	16.9 %	9.5 %	67.0 %
Braddup Compound access route 2	123	Ribble Lane	1,842	228	12.4 %	70	70	100.0 %	1,912	299	15.6 %	3.8 %	30.7 %
	124	Grindleton Road	1,735	125	7.2 %	70	70	100.0 %	1,806	195	10.8 %	4.0 %	56.3 %
	60	West Bradford Road	1,629	54	3.3 %	70	70	100.0 %	1,699	124	7.3 %	4.3 %	129.5 %
	61	B6478 Slaidburn Road (north)	1,899	210	11.1 %	181	141	78.1 %	2,080	351	16.9 %	9.5 %	67.0 %
Bonstone Compound surplus material	140	B6478 Slaidburn Road (north)	1,913	212	11.1 %	286	242	84.7 %	2,199	454	20.7 %	14.9 %	114.2 %

			Background			Construction			Background + Construction			% Change	
Development Component	Link	Link Name	Total Traffic	HGVs	% HGV	Total Traffic	HGVs	% HGV	Total Traffic	HGVs	% HGV	Total Traffic	HGVs
transfer to Waddington Fell Quarry													
Braddup Compound surplus material transfer to Waddington Fell Quarry	63	B6478 Slaidburn Road (south)	1,913	212	11.1 %	219	184	84.0 %	2,132	396	18.6 %	11.5 %	86.8 %

Table 16.8: Severance

Link	Link Name	IEMA Rule	Severance	Effect
59	B6478 Waddington Road	Rule 1 – >30 % HGV	Frontages of residential and business properties with limited footway are situated on both sides within Clitheroe and Waddington.	Slight
60	West Bradford Road	Rule 1 – >30 % HGV	Frontages of residential and business properties with limited footway are situated on both sides within West Bradford and Waddington. It was noted that Waddington and West Bradford CofE Voluntary Aided Primary School is located between West Bradford and Waddington. However, as some sections of West Bradford Road have footway provision and car parking on site, it was considered unlikely that additional traffic would contribute to severance.	Slight
61	B6478 Slaidburn Road (north)	Rule 1 – >30 % HGV	Frontages of residential and business properties with limited footway are situated on both sides of the road within Waddington.	Slight
63	B6478 Slaidburn Road (south)	Rule 1 – >30 % HGV Rule 2 – >10 % Total	The volume of additional vehicle movements is unlikely to contribute to severance; however, negative perceptions could be further avoided by managing site operations during school opening / closure times to reduce coincidence with activity.	Negligible
123	Ribble Lane	Rule 1 – >30 % HGV	Frontages of residential and business properties with limited footway on both sides are situated within Chatburn.	Slight
124	Grindleton Road	Rule 1 – >30 % HGV	Frontages of residential and business properties with limited footway on both sides are situated within West Bradford.	Slight
140	B6478 Slaidburn Road (north)	Rule 1 – >30 % HGV Rule 2 – >10 % Total	The volume of additional vehicle movements is unlikely to contribute to severance; however, negative perceptions could be further avoided by managing site operations during school opening / closure times to reduce coincidence with activity.	Negligible

Table 16.9: Driver Delay

Link	Link Name	IEMA Rule	Driver Delay	Effect
59	B6478 Waddington Road	Rule 1 – >30 % HGV	The total vehicles on the link would increase from 2,723 to 2,833 per 12 hours. HGVs per 12 hours would increase from 97 to 168. The link is a principal part of the network; however, turns from side roads are unlikely to be affected, and additional roadside parking is unlikely, except for the sections at Clitheroe and Waddington, though additional site entrance turns would occur. Potential delays may occur due to the proposed traffic controls required on junction between West Bradford Road and B6478 Slaidburn Road.	Slight to Moderate
60	West Bradford Road	Rule 1 – >30 % HGV	The total vehicles on the link would increase from 1,629 to 1,699 per 12 hours. HGVs per 12 hours would increase from 54 to 124. The link is a principal part of the network; however, turns from side roads are unlikely to be affected, though additional site entrance turns would occur, and additional roadside parking is likely. Potential delays may occur due to the proposed traffic controls required on junction between West Bradford Road and B6478 Slaidburn Road, pinch point at West Clough Bridge and around the 3 Millstones in West Bradford.	Slight to Moderate
61	B6478 Slaidburn Road (north)	Rule 1 – >30 % HGV	The total vehicles on the link would increase from 1,899 to 2,080 per 12 hours. HGVs per 12 hours would increase from 210 to 351. The link is a principal part of the network; however, turns from side roads are unlikely to be affected, and additional roadside parking is unlikely, except for the sections at Waddington, though additional site entrance turns would occur. Potential delays may occur due to the proposed traffic controls required on junction between West Bradford Road and B6478 Slaidburn Road.	Slight to Moderate
63	B6478 Slaidburn Road (south)	Rule 1 – >30 % HGV Rule 2 – >10 % Total	The total vehicles on the link would increase from 1,913 to 2,132 per 12 hours. HGVs per 12 hours would increase from 212 to 396. The link is a principal part of the network; however, turns from side roads are unlikely to be affected, and additional roadside parking is unlikely, though additional site entrance turns would occur.	Slight
123	Ribble Lane	Rule 1 – >30 % HGV	The total vehicles on the link would increase from 1,842 to 1,912 per 12 hours. HGVs per 12 hours would increase from 228 to 299. The link is a principal part of the network; however, turns from side roads are unlikely to be affected, though additional site entrance turns would occur, and additional roadside parking is likely. Potential delays may occur due to the proposed traffic controls required at Grindleton Bridge and the junction between Grindleton Road and East View.	Slight to Moderate

Link	Link Name	IEMA Rule	Driver Delay	Effect
124	Grindleton Road	Rule 1 – >30 % HGV	The total vehicles on the link would increase from 1,735 to 1,806 per 12 hours. HGVs per 12 hours would increase from 125 to 195. The link is a principal part of the network; however, turns from side roads are unlikely to be affected, though additional site entrance turns would occur, and additional roadside parking is likely. Potential delays may occur due to the proposed traffic controls required at the junction between Grindleton Road and East View.	Slight to Moderate
140	B6478 Slaidburn Road (north)	Rule 1 – >30 % HGV Rule 2 – >10 % Total	The total vehicles on the link would increase from 1,913 to 2,199 per 12 hours. HGVs per 12 hours would increase from 212 to 454. The link is a principal part of the network; however, turns from side roads are unlikely to be affected, and additional roadside parking is unlikely, though additional site entrance turns would occur.	Slight

Table 16.10: Pedestrian Delay

Link	Link Name	IEMA Rule	Pedestrian Delay	Effect
59	B6478 Waddington Road	Rule 1 – >30 % HGV	Residential and business frontages and footways are situated on both sides of this link within Clitheroe and Waddington. A 73.0 % increase in HGVs represents an additional 71 against a background flow of 97 over a 12-hour period. In combination this represents an additional vehicle every 8.5 minutes.	Slight to Moderate
60	West Bradford Road	Rule 1 – >30 % HGV	There is no footway for most of this link and the location is rural; however, residential frontages and footways are situated on both sides within West Bradford and Waddington. A 129.5 % increase in HGVs represents an additional 70 against a background flow of 54 over a 12-hour period. In combination this represents an additional vehicle every 8.5 minutes.	Slight
61	B6478 Slaidburn Road (north)	Rule 1 – >30 % HGV	There is no footway for most of this link and the location is rural; however, residential frontages and footways are situated on both sides within Waddington. A 67.0 % increase in HGVs represents an additional 141 against a background flow of 210 over a 12-hour period. In combination this represents an additional vehicle every 4.3 minutes.	Slight
63	B6478 Slaidburn Road (south)	Rule 1 – >30 % HGV Rule 2 – >10 % Total	There is no footway at this location and the location is remote and rural, therefore limited pedestrian activity possible. An 86.8 % increase in HGVs represents an additional 184 against a	Negligible

Link	Link Name	IEMA Rule	Pedestrian Delay	Effect
			background flow of 212 over a 12-hour period. In combination this represents an additional vehicle every 3.3 minutes.	
123	Ribble Lane	Rule 1 – >30 % HGV	There is no footway for most of this link and the location is rural; however, residential frontages and footways are present on both sides within Chatburn. A 30.7 % increase in HGVs represents an additional 70 against a background flow of 228 over a 12-hour period. In combination this represents an additional vehicle every 8.5 minutes.	Negligible
124	Grindleton Road	Rule 1 – >30 % HGV	There is no footway for most of this link and the location is rural; however, residential frontages and footways are present on both sides within West Bradford. A 56.3 % increase in HGVs represents an additional 70 against a background flow of 125 over a 12-hour period. In combination this represents an additional vehicle every 8.5 minutes.	Negligible
140	B6478 Slaidburn Road (north)	Rule 1 – >30 % HGV Rule 2 – >10 % Total	There is no footway at this location and the location is remote and rural, therefore limited pedestrian activity possible. A 114.2 % increase in HGVs represents an additional 242 against a background flow of 212 over a 12-hour period. In combination this represents an additional vehicle every 2.5 minutes.	Slight

Table 16.11: Pedestrian Amenity

Link	Link Name	IEMA Rule	Pedestrian Amenity	Effect
59	B6478 Waddington Road	Rule 1 – >30 % HGV	Vehicles per 12 hours would increase from 2,723 to 2,833 at the peak of construction. HGVs per 12 hours would increase from 97 to 168, equalling an additional HGV every 8.5 minutes. Footways and residential properties exist on both sides of the link at Clitheroe and Waddington. A level of pedestrian demand is likely for the southern and northern section of the link, with low pedestrian demand for the middle sections of the link.	Slight
60	West Bradford Road	Rule 1 – >30 % HGV	Vehicles per 12 hours would increase from 1,629 to 1,699 at the peak of construction. HGVs per 12 hours would increase from 54 to 124, equalling an additional HGV every 8.5 minutes. Footways and residential properties exist on both sides of the link at Waddington and West Bradford. A level of pedestrian demand is likely for the eastern section of the link, with low pedestrian demand for the western and middle sections of the link.	Slight

Link	Link Name	IEMA Rule	Pedestrian Amenity	Effect
61	B6478 Slaidburn Road (north)	Rule 1 – >30 % HGV	Vehicles per 12 hours would increase from 1,899 to 2,080 at the peak of construction. HGVs per 12 hours would increase from 210 to 351, equalling an additional HGV every 4.3 minutes. Footways and residential properties exist on both sides of the link at Waddington. A level of pedestrian demand is likely for the southern section of the link, with low pedestrian demand for the northern and middle sections of the link.	Slight
63	B6478 Slaidburn Road (south)	Rule 1 – >30 % HGV Rule 2 – >10 % Total	HGVs per 12 hours would increase from 212 to 396 at the peak of the project’s construction. An additional HGV every 3.3 minutes. There is little or no pedestrian demand on this link and no footway exists.	Negligible
123	Ribble Lane	Rule 1 – >30 % HGV	Vehicles per 12 hours would increase from 1,842 to 1,912 at the peak of construction. HGVs per 12 hours would increase from 228 to 299, equalling an additional HGV every 8.5 minutes. Footways and residential properties exist on both sides of the link at Chatburn. A level of pedestrian demand is likely for the eastern section of the link, with low pedestrian demand for the western and middle sections of the link.	Slight
124	Grindleton Road	Rule 1 – >30 % HGV	Vehicles per 12 hours would increase from 1,735 to 1,806 at the peak of construction. HGVs per 12 hours would increase from 125 to 195, equalling an additional HGV every 8.5 minutes. Footways and residential properties exist on both sides of the link at West Bradford. A level of pedestrian demand is likely for the eastern section of the link, with low pedestrian demand for the western and middle sections of the link.	Slight
140	B6478 Slaidburn Road (north)	Rule 1 – >30 % HGV Rule 2 – >10 % Total	HGVs per 12 hours would increase from 212 to 454 at the peak of the project’s construction. An additional HGV every 2.5 minutes. There is little or no pedestrian demand on this link and no footway exists.	Negligible

Table 16.12: Accident and Safety

Link	Link Name	IEMA Rule	Accident and Safety	Effect
59	B6478 Waddington Road	Rule 1 – >30 % HGV Accidents – 5 Slight – 4 Moderate – 1 Serious – 0	A 73.0 % increase in HGVs would occur over a 12-hour period, an additional HGV every 8.5 minutes. All the reported accidents occurred during times when additional vehicles would be on the road. The current accident rate is one every 12 months. Peak hour traffic when HGVs would be on the link would be 8.5 % of hourly capacity. Therefore, additional accidents are unlikely to occur.	Negligible
60	West Bradford Road	Rule 1 – >30 % HGV Accidents – 1 Slight – 0 Moderate – 1 Serious – 0	A 129.5 % increase in HGVs would occur over a 12-hour period, an additional HGV every 8.5 minutes. The reported accident occurred during times when additional vehicles would be on the road. The current accident rate is one every 60 months. Peak hour traffic when HGVs would be on the link would be 11.9 % of hourly capacity. Therefore, additional accidents are unlikely to occur.	Negligible
61	B6478 Slaidburn Road (north)	Rule 1 – >30 % HGV Accidents – 2 Slight – 1 Moderate – 1 Serious – 0	A 67.0 % increase in HGVs would occur over a 12-hour period, an additional HGV every 4.3 minutes. All the reported accidents occurred during times when additional vehicles would be on the road. The current accident rate is one every 30 months. Peak hour traffic when HGVs would be on the link would be 8.5 % of hourly capacity. Therefore, additional accidents are unlikely to occur.	Slight
63	B6478 Slaidburn Road (south)	Rule 1 – >30 % HGV Rule 2 – >10 % Total Accidents – 1 Slight – 1 Moderate – 0 Serious – 0	An 86.8 % increase in HGVs would occur over a 12-hour period, an additional HGV every 3.3 minutes. The reported accident occurred during times when additional vehicles would be on the road. The current accident rate is one every 60 months. Peak hour traffic when HGVs would be on the link would be 11.6 % of hourly capacity. Therefore, additional accidents are unlikely to occur.	Slight
123	Ribble Lane	Rule 1 – >30 % HGV Accidents – 1 Slight – 1 Moderate – 0 Serious – 0	A 30.7 % increase in HGVs would occur over a 12-hour period, an additional HGV every 8.5 minutes. The reported accident occurred during times when additional vehicles would be on the road. The current accident rate is one every 60 months. Peak hour traffic when HGVs would be on the link would be 13.0 % of hourly capacity. Therefore, additional accidents are unlikely to occur.	Negligible
124	Grindleton Road	Rule 1 – >30 % HGV Accidents – 2	A 56.3 % increase in HGVs would occur over a 12-hour period, an additional HGV every 8.5 minutes. All the reported accidents occurred during times when additional vehicles would be on	Negligible

Link	Link Name	IEMA Rule	Accident and Safety	Effect
		Slight – 1 Moderate – 1 Serious – 0	the road. The current accident rate is one every 30 months. Peak hour traffic when HGVs would be on the link would be 11.8 % of hourly capacity. Therefore, additional accidents are unlikely to occur.	
140	B6478 Slaidburn Road (north)	Rule 1 – >30 % HGV Rule 2 – >10 % Total Accidents – 1 Slight – 1 Moderate – 0 Serious – 0	A 114.2 % increase in HGVs would occur over a 12-hour period, an additional HGV every 2.5 minutes. The reported accident occurred during times when additional vehicles would be on the road. The current accident rate is one every 60 months. Peak hour traffic when HGVs would be on the link would be 13.4 % of hourly capacity. Therefore, additional accidents are unlikely to occur.	Slight

Table 16.13: Hazardous Loads

Development Component	Hazard and Origin	Nature of Hazardous Load	Effect
Bonstone Compound access route 1	Operation of fuel stations and manufacturers' deliveries	It is noted that there are some fuel stations located within Preston, Mellor Brook and Clitheroe which should be taken into consideration. Additionally, there are also waste and recycling centres in Preston and Clitheroe as well as manufacturers who may receive hazardous goods. It is also noted that there are two quarries located along the proposed traffic route.	N/A
Bonstone Compound access route 2	Operation of fuel stations and manufacturers' deliveries	It is noted that there are some fuel stations located within Preston, Mellor Brook and Clitheroe which should be taken into consideration. Additionally, there is also presence of waste and recycling centres in Preston and Clitheroe as well as manufacturers who may receive hazardous goods. It is also noted that there are two quarries located along the proposed traffic route.	N/A

Development Component	Hazard and Origin	Nature of Hazardous Load	Effect
Braddup Compound access route 1	Operation of fuel stations and manufacturers' deliveries	It is noted that there are some fuel stations located within Preston, Mellor Brook and Clitheroe which should be taken into consideration. Additionally, there is also presence of waste and recycling centres in Preston and Clitheroe as well as manufacturers who may receive hazardous goods. It is also noted that there is a quarry located along the proposed traffic route.	N/A
Braddup Compound access route 2	Operation of fuel stations and manufacturers' deliveries	It is noted that there are some fuel stations located within Preston, Mellor Brook and Clitheroe which should be taken into consideration. Additionally, there is also presence of waste and recycling centres in Preston and Clitheroe as well as manufacturers who may receive hazardous goods. It is also noted that there is a quarry located along the proposed traffic route.	N/A
Bonstone Compound surplus material transfer to Waddington Fell Quarry	Operation of deliveries to Quarry	It is not anticipated that any hazardous loads associated with the Proposed Programme of Works would include toxic material; however, it is understood that there could be spillages associated with it which could result in accidents.	N/A
Braddup Compound surplus material transfer to Waddington Fell Quarry	Operation of deliveries to Quarry	It is not anticipated that any hazardous loads associated with the Proposed Programme of Works would include toxic material; however, it is understood that there could be spillages associated with it which could result in accidents.	N/A

16.6.2 Operational Phase

- 59) The operational phase of the Proposed Marl Hill Section has been reviewed in respect of the potential level of vehicle activity which would be required, and the small number of staff who would be required to inspect the asset from time to time. The potential additional traffic would be negligible within a 12-hour period, and so the operational phase would not exceed the levels identified during the construction period. It is therefore considered that a detailed assessment of these effects would not be necessary.

16.7 Essential Mitigation and Residual Effects

- 60) Mitigation is most effective if considered as an integral part of the Proposed Marl Hill Section design in order to avoid, reduce or offset any adverse effects arising from construction vehicle movements. As set out in Section 4, the proposals include both embedded mitigation and good practice solutions:
- CTMPs
 - Travel Plan
 - Highways Stakeholder Group
 - Off-site highways works to alleviate safety risks.
- 61) During the construction period, there would be a number of locations where impacts could be considered as 'slight' prior to mitigation. This was generally identified in areas where the existing level of background traffic is low, and the local receptors (schools, shops, residential) can be considered to be 'sensitive'. It was acknowledged that whilst the duration of construction activities within individual work areas would be generally short term, and returned to the 'Do Nothing' scenario baseline on completion, there would still be impacts requiring mitigation. To this end, CTMPs are proposed, one for each Haulage Route Option, that would serve to limit the impacts of HGV activity within sensitive areas through the delivery of a routeing strategy to be agreed between the construction contractor(s), Lancashire County Council and Highways England.
- 62) On sections of highway where interaction with receptors was considered to be unavoidable (e.g. on an access route to a compound), the CTMP would be used to identify which periods are considered to be most sensitive, and appropriate measures put in place so that HGV movements, where reasonably practicable, do not coincide. It is likely that this measure would be required in Clitheroe, Chatburn, West Bradford and Waddington.
- 63) A Travel Plan has been developed to mitigate against the potential effects of vehicle access to the compounds on the surrounding highway network. It was acknowledged that limited options exist to promote sustainable travel alternatives (such as public transport, walking and cycling) due to the rural nature of the Proposed Programme of Works and the transient nature of the works. The emphasis is therefore placed upon the consolidation of movements within multi-occupancy vehicles and the management of vehicles within the site compounds so that they do not have a wider impact upon the surrounding highway network, especially within residential areas and close to schools / community facilities.
- 64) Off-site highways works would also be implemented along the proposed routes to and from the proposed compounds to improve safety for general road users (see Volume 5 of the ES).
- 65) A summary of the mitigation and residual impacts are identified within Table 16.14.

Table 16.14: Summary of Mitigation and Residual Effects

Development Component			Severance	Driver Delay	Pedestrian Delay	Pedestrian Amenity	Accidents and Safety	Hazardous Loads	Mitigation (Embedded / good practice)	Potential Effect / Magnitude	Residual Effect / Significance
Link	Development Section	Name									
59	Bonstone Compound access route 1	B6478 Waddington Road	Slight	Slight to Moderate	Slight to Moderate	Slight	Negligible	N/A	Construction Traffic Management Plan, Travel Plan, Stakeholder Group	Slight	Negligible – Not Significant
	Braddup Compound access route 1										
60	Bonstone Compound access route 2	West Bradford Road	Slight	Slight to Moderate	Slight	Slight	Negligible	N/A	Construction Traffic Management Plan, Travel Plan, Stakeholder Group	Slight	Negligible – Not Significant
	Braddup Compound access route 2										
61	Bonstone Compound access route 1 and 2	B6478 Slaidburn Road (north)	Slight	Slight to Moderate	Slight	Slight	Slight	N/A	Construction Traffic Management Plan, Travel Plan, Stakeholder	Slight	Negligible – Not Significant
	Braddup Compound access route 1 and 2										

Development Component			Severance	Driver Delay	Pedestrian Delay	Pedestrian Amenity	Accidents and Safety	Hazardous Loads	Mitigation (Embedded / good practice)	Potential Effect / Magnitude	Residual Effect / Significance
Link	Development Section	Name									
									Group, off-site highways works		
63	Bonstone Compound access route 1 and 2 Braddup Compound surplus material transfer to Waddington Fell Quarry	B6478 Slaidburn Road (south)	Negligible	Slight	Negligible	Negligible	Slight	N/A	Construction Traffic Management Plan, Travel Plan, Stakeholder Group, off-site highways works	Slight	Negligible – Not Significant
123	Bonstone Compound access route 2 Braddup Compound access route 2	Ribble Lane	Slight	Slight to Moderate	Negligible	Slight	Negligible	N/A	Construction Traffic Management Plan, Travel Plan, Stakeholder Group, off-site highways works	Slight	Negligible – Not Significant
124	Bonstone Compound access route 2	Grindleton Road	Slight	Slight to Moderate	Negligible	Slight	Negligible	N/A	Construction Traffic Management Plan, Travel	Slight	Negligible – Not Significant

Development Component			Severance	Driver Delay	Pedestrian Delay	Pedestrian Amenity	Accidents and Safety	Hazardous Loads	Mitigation (Embedded / good practice)	Potential Effect / Magnitude	Residual Effect / Significance
Link	Development Section	Name									
	Braddup Compound access route 2								Plan, Stakeholder Group, off-site highways works		
140	Bonstone Compound access route 1, 2 and surplus material transfer to Waddington Fell Quarry	B6478 Slaidburn Road (north)	Negligible	Slight	Slight	Negligible	Slight	N/A	Construction Traffic Management Plan, Travel Plan, Stakeholder Group, off-site highways works	Slight	Negligible – Not Significant

16.8 Cumulative Effects

- The following section provides an overview of the potential cumulative effects from different proposed developments and land allocations, in combination with the Proposed Marl Hill Section (i.e. inter-project cumulative assessment). Data on proposed third party developments and land allocations contained in the development plan documents were obtained from various sources, including local planning authority websites, online searches, and consultations with planning officers. Proposed development data were then reviewed with a view to identifying schemes or land allocations whose nature, scale and scope could potentially give rise to significant environmental effects when considered in combination with the likely effects arising from the Proposed Marl Hill Section.
 - Intra-project cumulative impacts. i.e. two or more types of impact acting in combination on a given environmental receptor, property or community resource, are considered in Chapter 14: Communities and Health.
 - The over-arching cumulative effects of the Proposed Programme of Works i.e. the five proposed replacement tunnel sections in combination, are considered in Volume 2 Chapter 19: Cumulative Effects. In addition, Volume 2 Chapter 19 examines the cumulative effects associated with the outcomes from Volume 2 (delivery and operation of the main construction compounds, tunnel and construction traffic routes), Volume 5 (proposed off-site highways works and satellite compounds), and Volume 6 (Proposed Ribble Crossing).
- 66) Based on professional judgement, it was concluded that there is potential for environmental effects associated with the Proposed Marl Hill Section to act cumulatively with the following developments. Table 16.15 lists the cumulative effects of the identified developments. Further detail is provided in Appendix 16.1.

Table 16.15: Summary of Cumulative Developments

Proposed Development	Nature / Scope of Effects	Commentary on Cumulative Developments
3/2018/0914	Residential	<p>As part of the mitigation identified within Section 4 of this chapter, it is proposed that a Highway Stakeholder Group be set up to manage the potentially negative effects of concurrent construction operations across the SRN resulting from identified schemes within Lancashire. Of particular interest is the M6 corridor between Junction 30 and Junction 32.</p> <p>The Highway Stakeholder Group would collate the following elements associated with each scheme to ensure that a combination of factors do not create unacceptable levels of additional traffic generation on the highway network, or concurrent road closures do not serve to restrict access to the Proposed Marl Hill Section. It would require attendance from the following stakeholders:</p> <ul style="list-style-type: none"> ▪ Highways England and their managing agent ▪ Lancashire County Council and their managing agent ▪ The Police ▪ National Grid ▪ United Utilities (with respect to planned maintenance) ▪ United Utilities’ contractors for the Proposed Programme of Works ▪ LPAs of Ribble Valley and South Ribble with regard to committed and proposed schemes within the planning process.
LCC/2019/0008	Education	

Proposed Development	Nature / Scope of Effects	Commentary on Cumulative Developments
		<p>Agreements would be implemented to address the following activities that may have a bearing on the operation of the highway network</p> <ul style="list-style-type: none"> ▪ Planned highway maintenance works ▪ Planned highway works ▪ Planned utility works ▪ Detailed construction programmes (of each major project) ▪ Anticipated road closures ▪ Anticipated periods of abnormal loads accessing the network ▪ Specified diversionary routes (of Lancashire County Council and Highways England) ▪ Major seasonal events resulting in additional traffic / temporary traffic management.

16.9 Conclusion

- 67) The potential transport planning impacts associated with construction and operation of the Proposed Marl Hill Section have been considered. Traffic and transport impacts were assessed for the highest period of activity within the anticipated construction programme. Furthermore, a conservative approach was applied to the principles for traffic generation and daily / weekly working periods. This avoided under-representation of the traffic movements associated with construction of the Proposed Marl Hill Section on a representative day within that period. It therefore represented a robust assessment of combined effects on the highway network during a reasonable worst-case period of activity.
- 68) The assessment considered the local and strategic highways networks within the full construction period, over an extensive area which encompasses the strategic routes which would be used to convey materials to / from the construction compound areas. A total of 25 traffic 'links' were quantified for the Proposed Marl Hill Section, based on surveys undertaken in October / November 2019, DfT traffic counts and Lancashire County Council traffic counts.
- 69) Each link provided two-way flows over a 12-hour period during which the effects of additional traffic were assessed against the criteria identified within the IEMA guidance. A total of seven locations within this section were identified for further assessment. None of these locations exceeded a threshold of a 30 % increase in total traffic. All seven links for further assessment exceed a 30 % increase in HGVs, however the majority of these links have been assessed against low background traffic flows. There are also increases in movements focussed upon the B6478; however, these routes have sufficient capacity to accommodate the additional predicted flows.
- 70) A mitigation strategy is proposed to reduce potentially traffic and transport impacts at locations which are most sensitive to an increase in traffic levels. The strategy aims to limit the effects on local receptors, noting that the works are progressive and of mainly short-term duration at a single location. The mitigation strategy includes:
- A CTMP, which would be agreed with Lancashire County Council and Highways England, with a view to defining the most suitable access routes to / from locations chosen by the contractor(s) for the import of materials and export of waste (refer to the CTMP at RVBC-MH-APP-007_01 within the Planning Documents)
 - A Travel Plan to effectively manage vehicle trips to / from the compound areas, which would moderate on-street car parking demand

- A Highway Stakeholder Group would be established to avoid concurrent construction operations associated with other proposed developments would not create significant cumulative impacts during any periods where parts of the local highway network may be closed due to the Proposed Marl Hill Section
- To improve the safety for general road users, off-site highways works would be implemented along some sections of the proposed routes.

71) These mitigation measures should ensure that effects upon local receptors are limited, noting that the nature and scope of works changes over time.

16.10 Glossary and Key Terms

72) Key phrases and terms used within this technical chapter relating to Transport Planning are defined within Appendix 1.2: Glossary and Key Terms.