Environmental Statement

Volume 2i: Scheme-wide Assessment

Chapter 14: Traffic and transport

Contents

14. TRAFFIC AND TRANSPORT 14-3

Summary of principal findings 14-3

14.1 Introduction 14-5

14.2 Legislative and policy context 14-5

14.3 Assessment methodology 14-9

14.4 Baseline conditions 14-26

14.5 Potential effects (including committed developments) 14-29

14.6 Mitigation measures 14-59

14.7 Residual effects 14-60

14.8 Summary of effects 14-61

Tables

Table 14-1 Relevant traffic and transport ministerial statements and policies/guidance 14-6
Table 14-2 Summary of stakeholder consultation 14-11
Table 14-3 Developments to be considered for inclusion in the assessment 14-16
Table 14-4 Sensitivity of traffic/transport receptors 14-20
Table 14-5 Magnitude of impact 14-21
Table 14-6 Determining significance of effect 14-22
Table 14-7 Do Something Scenarios and Interventions 14-23
Table 14-8 Construction compounds along Scheme 14-31
Table 14-9 Temporary road closures along Scheme 14-34
Table 14-10 Temporary closures of Public Rights of Way along Scheme 14-36
Table 14-11 Summary of magnitude of impacts for Driver delay, Pedestrian and cyclist delay and Accidents and safety 14-42
Table 14-12 Summary of significance of effects for Driver delay, pedestrian and cyclist delay and accidents and safety 14-43
Table 14-13 Overview of roads/links that will experience temporary significant adverse effects during construction for Driver delay, pedestrian and cyclist delay and accidents and safety 14-44
Table 14-14 Summary of magnitude of impacts for Pedestrian and cyclist amenity 14-47
Table 14-15 Summary of significance of effects for Pedestrian and cyclist amenity 14-48
Table 14-16 Overview of roads/links that will experience temporary significant adverse effects during construction for Pedestrian and cyclist amenity 14-49
Table 14-17 Summary of magnitude of impacts for Fear and intimidation 14-52
Table 14-18 Summary of significance of effects for Fear and intimidation 14-53
Table 14-19 Overview of roads/links that will experience temporary significant adverse effects during construction for Fear and intimidation 14-54
Table 14-20 Summary of magnitude of impacts for Severance 14-55
Table 14-21 Summary of significance of effects for Severance 14-55
Table 14-22 Overview of roads/links that will experience temporary significant adverse effects during construction for Severance 14-57
Table 14-23 Permanent changes during operation 14-58
Table 14-24 Summary of traffic and transport effects 14-62

14. TRAFFIC AND TRANSPORT

Summary of principal findings

This assessment evaluates the traffic and transport related impacts and consequential effects of the Scheme during both construction phase and operation. It has been carried out in accordance with the 'Institute of Environmental Assessment 1993 guidelines (now the Institute of Environmental Management and Assessment) comprising a desk study and informed by the supporting Transport Assessment (TA) included in Appendix 14-1.

The TA was undertaken to quantify the potential impacts of the Scheme on all modes of transport during both construction and operation. A comprehensive review of all the potential transport impacts of the Scheme has been undertaken with measures to mitigate any adverse consequences identified.

The TA and this assessment have been produced in line with current published guidance including the National Planning Policy Framework and Kirklees Local Plan and provides:

- An examination of baseline information, including traffic volumes, delays, Volume-Demand-to-Capacity Ratio and road safety within the study area;
- A qualitative and quantitative assessment of the potential effect of changes to traffic volumes and traffic composition during construction and operation on Driver delay, Pedestrian and cyclist delay/amenity, Fear and intimidation, Accident and safety, and Severance; and
- Recommendations for mitigation to minimise any potentially significant effects.

Forecasted traffic growth, committed developments agreed with Kirklees Council and trip estimates for the Scheme have been added to the Kirklees Traffic Model (provided by Kirklees Council) in order to provide a conservative (worst-case scenario) assessment.

The Kirklees Traffic Model included over 2000 links[1] and once screening criteria was applied (as detailed in Section 14.3), this left a total of 116 links within the study area which would require further assessment.

The assessment concludes that out of the 116 links identified within the study area, 107 links on 68 roads could be impacted by the Scheme during the construction phase:

- Driver delay, pedestrian and cyclist delay, and accidents and safety – temporary significant adverse effects are predicted for 48 links (37 roads);
- Pedestrian and cyclist amenity – temporary significant adverse effects are predicted for 28 links (27 roads);
- Fear and intimidation – temporary significant adverse effects are predicted for 47 links (37 roads); and
- Severance – temporary significant adverse effects are predicted for 67 links (42 roads).

Identified mitigation measures, including the provision of a Construction Traffic Management Plan (CTMP) (to be submitted pursuant to a condition to be attached to the deemed planning permission[2]) will help manage traffic throughout the construction phase and limit the impact on the highway network and receptors, however, due to the requirement for temporary road

[1] 'Links' represent sections of road that have the same properties (speed, capacity etc.) along the full length of that section. A road may be represented by one or many sequential model links, depending on whether the properties of the road change at points (modelled notionally as network 'nodes') along it.
[2] On making an order under the Transport and Works Act 1992, the Secretary of State may direct that planning permission shall be deemed to be granted, subject to such conditions (if any) as may be specified in the direction.

closures, it is expected that the magnitude of impacts and significance of effect will remain unchanged. Significant adverse residual effects during construction are therefore predicted to remain.

The operational phase of the Scheme will not result in notable changes to traffic flows as highlighted by the TA and will in most case have beneficial effect on non-motorised users in and around the stations. It is considered the operational phase of the Scheme will have a beneficial effect on road users and on rail travel. Overall, the Scheme is considered to have a permanent beneficial effect of Neutral to Slight significance, which is not significant.

As no significant effects have been identified during the operational phase, no mitigation measures are proposed and therefore the residual effect will remain as permanent beneficial effect of Neutral to Slight significance, which is not significant.

14.1 Introduction

14.1.1 This chapter presents the assessment of traffic and transport effects associated with the construction and operation of the Huddersfield to Westtown (Dewsbury) section of the Transpennine Route Upgrade (TRU) Programme. This chapter covers the assessment of the entirety of the Huddersfield to Westtown (Dewsbury) Route (herein referred to as the 'Scheme').

14.1.2 The chapter is set out as follows:

- Legislative and policy context – relevant international, national and local policy requirements, legal requirements and guidance which have been used to define the assessment approach are outlined;
- Assessment methodology – the methodology the assessment follows is defined including the justification for the study area and the approach for identifying significance of effects;
- Baseline – a summary of the traffic and transport baseline within the study area is provided;
- Potential effects/cumulative effect – the potential impacts (includes committed development/schemes i.e. cumulative) and effects (both beneficial and adverse) during construction and operation are characterised;
- Mitigation measures – agreed avoidance, mitigation, compensation and enhancement measures are described; and
- Residual effects – the significance of residual effects (both beneficial and adverse) following the implementation of mitigation measures are assessed.

14.1.3 A detailed description of the Scheme is provided in Chapter 2 (Scheme description) in Volume 2i of the ES and all appendices and figures referred to in this chapter are provided in Volumes 3 and 4 of this ES respectively.

14.2 Legislative and policy context

14.2.1 National, regional and local traffic and transportation policy and guidance relevant to the Scheme have been considered in this assessment and are set out in Table 14-1.

Table 14-1 Relevant traffic and transport ministerial statements and policies/guidance

Document	Key considerations for Scheme
Railways Action 2005 Statement High Level Output Specification	States that The Secretary of State expects Network Rail, working closely with train operators, to maintain focus on the delivery of performance for Control Period 6 (CP6), which, as Transport Focus has emphasised, is of paramount importance to users. CP6 forecasts an increase in rail passenger numbers and reduce the number of delayed trains. The Scheme will help deliver faster, more efficient and reliable trains as well as reduce the number of standing passengers through increased frequency.
National Planning Policy Framework (NPPF) 2019	The NPPF states that development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe.
National Policy Statement for National Networks (NPS)	The 'National Networks National Policy Statement' (NPS) was formally designated by Parliament in January 2015 and provides guidance regarding how decisions will be made relating to development consent orders for nationally significant infrastructure projects (NSIP). The NPS rejects a "predict and provide" approach in favour of a package of improvements that will ensure that economic benefits are balanced against social and environmental effects or value for money considerations. In England, the NPS may also be a material consideration in decision making for applications that fall under the Town and Country Planning Act 1990 or any successor legislation. Whilst the Scheme is seeking consent under the Transport and Works Act, given the nature of the Scheme as rail infrastructure it is considered appropriate that weight should be given to the principles set out in the NPS. NPS projects should be designed to minimise social/environmental impacts and to improve quality of life. Applications should include evidence that reasonable opportunities to deliver environmental and social benefits have been considered and that developments have been designed so as to be sensitive to potential adverse impacts. However, the NPS does acknowledge that the nature of major infrastructure projects is such that some adverse effects may remain, even when allowing for sensitive design and mitigation.
The Future of Transport: A Network for 2030	This document seeks to bring about improvements to all modes of transport through the creation of a coherent transport network. It focuses on three key themes of sustained investment, making improvements to transport management and planning ahead. In the context of the proposals, the Scheme will provide significant investments and improvements to the rail network. The document acknowledges that people are becoming more accustomed to travelling further, including commuting for long distances to work. This Scheme provides a public transport capability to do so, providing an alternative to the car. In terms of rail, the document states that the railways are a vital part of the country's infrastructure. As the economy grows there is increasing demand for travel, and the railways will play an important role in meeting this demand, providing an alternative to travelling by car

Document	Key considerations for Scheme
A Better Railway for a Better Britain: Strategic Business Plan 2019-2024	The Strategic Business Plan sets out plans for Britain's railways for a period between 2019 and 2024 which are built around four key themes: safe, reliable, efficient and growing through its Control Period 6 (CP6) Delivery Plan. The CP6 sets out the following vision, purpose and role for Network Rail. • Vision: A company that is on the side of passengers and freight users; that is easy to engage with and a dependable partner; a company people are proud to work for; instinctively recognised as an industry leader; • Purpose: Connecting people to places and goods, driving economic growth; and • Role: Running a safe, reliable and efficient railway, serving customers and communities. The CP6 for the North West & Central (NW&C) region states 'Building a bigger railway to carry more passengers and produce in the future, while continuing to run a reliable railway.' The TRU has been identified as a key project in CP6 which will deliver long term benefits in terms of capacity and connectivity. It further mentions that the TRU will complement the Great North Rail projects including Northern Powerhouse Rail (NPR), Midland Rail Hub and High Speed 2 (HS2).
Connecting People: A Strategic Vision for Rail (November 2017)	The strategic vision for rail published by the Department for Transport (DfT) is: • Near term priority – for better customer service and delivering planned upgrades, with the industry getting a grip on cost; • 2019 – 2024 (Control Period 6) – a more reliable, efficient and modern railway delivered by joined up local teams; • 2024 – 2029 – a step change for rail, with current reforms and HS2 delivering better journeys, better services and support for the economy; and • The railway beyond 2030 – a vision for the future: a world-class railway, working as part of the wider transport network, bringing new opportunities for the nation. The document sets out its ambition as 'the planned upgrade to the Transpennine route from Leeds to Manchester are an example of strengthening connections, dramatically increasing the number of seats and reducing journey times.
DfT Rail Network Enhancements Pipeline (October 2019)	The DfT published its five-year Rail Network Enhancements Pipeline in 2019 listing projects to increase the capabilities of the rail network in England & Wales where development is being funded as part of the enhancements budget in CP6. The schemes are listed by the latest decision gateway which they have passed: Decision to Initiate, Decision to Develop and Decision to Design. The publication highlighted that the Transpennine Route Upgrade is at the "Decision to Design" stage.
Government White Paper: Creating Growth, Cutting Carbon – Making Sustainable Transport Happen (DfT, 2011)	This report states that "Climate change is one of the greatest environmental threats facing the world today" and highlights the importance of access to sustainable travel modes and improving accessibility as this can "Make a significant contribution to public health and quality of life". The Scheme will deliver faster, more reliable and improved rail provisions.

Document	Key considerations for Scheme
West Yorkshire Combined Authority Transport Strategy 2040	The Transport Strategy 2040 vision is to 'enhance business success and people's lives by providing modern, world-class, well-connected transport that makes travel around West Yorkshire easy and reliable.' The key objectives identified to realise this ambition are: • Economy: Create a more reliable, less congested, better connected transport network; • Environment: Have a positive impact on our built and natural environment; and • People and place: Put people first to create a strong sense of place. The Strategy has also setup a mid-point target of 75% more trips to be made by rail by 2027. It further states that 'Although rail use has seen a 96% increase from 2005/6 to 2014/15, the existing public transport network capacity cannot support future growth opportunities in the region'. The document recognises that improvements to the TRU will release the capacity needed now, ahead of NPR with better links to Huddersfield and Dewsbury to Manchester and Leeds. Once NPR is delivered the improvements will result in a more resilient network
Kirklees Local Plan 2019	The Scheme is wholly contained within the administrative bounds of Kirklees. The Kirklees Local Plan was adopted in February 2019 and is the statutory development plan for Kirklees. The Kirklees district is of a strategic nature given its national motorway and rail links, and its central position between Leeds, Manchester and Sheffield. It therefore recognises that efficient transport systems for both goods and people is a key factor in supporting the vitality of the district. Kirklees Local Plan's vision statement states that 'Development will have taken place in a sustainable way (balancing economic, social and environmental priorities) and by making efficient and effective use of land and buildings supported by necessary infrastructure and with minimal effect on the environment'. It further states that *'The ability to move goods and people is particularly important given the district's strategic position on the national motorway and rail networks'*. As part of the Local Plan, it is critical that there is an integrated approach to transport, climate change, environmental objectives and development across Kirklees, in order to reach future economic targets and to facilitate sustainable communities. The Council's Economic Strategy makes a firm commitment to investing in public transport and physical improvements to the existing infrastructure for commuters and the uptake of sustainable modes of travel. "Improve transport links within and between Kirklees towns and with neighbouring towns and cities, giving priority to public transport, and to cycling and walking, providing an efficient highway network which supports the district's economy." The proposed improvement therefore aligns with the Local Plan's strategic objective of improving sustainable travel provision. The document also references the TRU as a key project to be delivered in CP6.

14.3 Assessment methodology

14.3.1 The assessment considers the following potential significant transport effects:

- Capacity of the local highway network;
- Effect on public transport;
- Fear and intimidation;
- Severance;
- Dust and dirt (involves a qualitative assessment of the effects of construction traffic);
- Driver delay:
  - at any temporary traffic management;
  - at construction site entrances where there will be additional turning movements during construction;
  - at junctions which might be affected by increased/re-routed traffic;
- Pedestrian and cyclist delay;
- Pedestrian and cyclist amenity;
- Accidents and safety;
- The highway network;
- Sustainable transport modes including public transport, walking and cycling;
- Accessibility to homes, services, employment and business; and
- Rail users.

14.3.2 The assessment methodology considers the likely significant effects on the transport network and its users during the construction and operation of the Scheme. It assesses:

- Any effects from construction that may arise as a direct result of construction activities (for example, demolition activities, building new structures) and from temporary use of land (for example, construction sites, compound areas, access routes), or from associated changes in traffic movements (for example, temporary traffic diversions, temporary road closures, temporary footpath diversions); and
- Any anticipated effects from the operation of the Scheme, such as new infrastructure (for example, new facilities at existing stations); altered traffic flows (for example, permanent highway closures, new and more frequent rail service patterns) and altered accessibility (for example, changes to journey times for pedestrians, cyclists and vehicles).

Scoping and consultation

14.3.3 Consultation has been undertaken during the development of the TA and production of the ES chapter with the following key stakeholders:

- Kirklees Council;
- Transport for the North;
- West Yorkshire Combined Authority (WYCA);
- Peak and Northern Footpath Society
- The Ramblers' Association Huddersfield Group; and
- Sustrans.

14.3.4 The Environmental Scoping Report and the subsequent Scoping Opinion informed the approach to the assessment reported in this ES. In addition, a separate Transport Scoping Report has been prepared in advance of the TA and ES chapter, and submitted to Kirklees Council in order to set out and agree the following:

- Details of the Scheme set out under the construction and operational phases and including details of:
  - Proposed temporary and permanent closures of roads; and
  - Proposed temporary and permanent closures of public rights of way (PRoW).
- The methodology for the TA including:
  - Policy context;
  - Baseline conditions including proposed data collection;
  - Committed developments to be included in the analysis;
  - Construction impact assessment, including an assessment of the likely traffic re-routing impacts due to traffic management during construction. This was undertaken using a SATURN highway assignment model; and
  - Operational assessment (opening year).
- Proposed next steps including a summary of information required from Kirklees Council.

14.3.5 The TA is included as Appendix 14-1.

14.3.6 Comments raised by all stakeholders have been considered in the traffic and transport assessment. Consultation has been ongoing throughout the EIA process and a summary of the stakeholder consultation in relation to the traffic and transport assessment is provided in Table 14-2.

Table 14-2 Summary of stakeholder consultation

Organisation	Date	Type	Key issues/responses	Comments/Outcomes
Department for Transport (DfT)	31 July 2019	Scoping opinion	• The ES should include a construction strategy including a schedule of works, details of depot locations and access arrangements	• Further detail in respect of scheduling of works, depot locations and access arrangements have been considered as part of this assessment.
Transport for the North	25 July 2019	Scoping opinion	• No comments	• N/A
West Yorkshire Combined Authority	31 July 2019	Scoping opinion	• The Combined Authority recognises that the size and complexity of the Scheme has the potential to cause disruption to the transport network in West Yorkshire and this will be over a prolonged period and look forward to working closely with the project team, Network Rail and the relevant TOCs to help mitigate the impact. • The Combined Authority is committed to working with the TRU Project team and district partners to try and ensure that potential disruption from the construction is kept to a minimum. This requires a phased and co-ordinated programme to ensure that public transport provides the optimum solution for travel in those areas impacted by construction. • A detailed forward plan is required to ensure that the Combined Authority is proactive rather than reactive to impacts of the construction and operation of the Scheme. This will ensure that the Combined Authority can plan in proposed changes to public transport and work with both bus and rail operators to ensure that the appropriate messages can be relayed to passengers.	• Consultation with WYCA will continue during the detailed design of the Scheme to ensure that impacts to the transport network and potential disruption during construction are minimised. • At present, no detailed programme is available as the design is still progressing, but indicative durations are given. Further discussions will be held throughout the process including pre-construction to manage communication of dates and confirmed durations for works (once known).
Kirklees Council	18 July 2019	Scoping opinion	Kirklees Council recommends that in respect of traffic and transport, the supporting ES should include: • A construction working strategy including the schedule of works. • Further details of depot locations (if outside the railway line boundary) including access arrangements. • Clarification on the proposed liaison with residents including a dedicated resident's liaison officer. • Details on method of communication with residents.	• Further detail in respect of scheduling of works, depot locations and access arrangements have been considered as part of this assessment. • Part B of the Code of Construction Practice (CoCP) will incorporate an External Communications Programme which will detail proposed liaison with residents and methods of communication with residents. This will be submitted to and agreed by the Local Authority pursuant to a condition to be attached to the deemed planning permission before construction works commence.
	4 October 2019	Meeting	• Draft Transport Scoping Report issued prior to meeting for review and consideration • Kirklees Council provided local knowledge on key areas of the Scheme and highlighted issues for consideration. • Specific design interfaces identified for key interventions • Discussion held on traffic count surveys and their locations, and available data. • Comments provided on Transport Scoping Report	• It was agreed to update and reissue the Transport Scoping Report to Kirklees Council following meeting. Feedback requested to inform traffic count surveys to be undertaken in November 2019.
	22 October 2019	Transport Scoping Report	• Kirklees Council has accepted receipt of the Transport Scoping Report and have not raised any issues with regards to its contents.	• Assessment undertaken in line with the updated Transport Scoping Report
	21 July 2020	Meeting	• Approach to construction phase assessment year identification discussed and agreed. • Specific Reasonably Foreseeable Future Projects (RFFP)/developments considered appropriate to include in the assessment were also identified.	• Agreed construction phase assessment year used in assessment • Agreed list of specific developments considered appropriate used in assessment.
	7 August 2020	Meeting	• An overview of the proposed highways works required to facilitate the Scheme was provided. This included information on road closures and related diversions and Temporary Traffic Regulation Orders. • Kirklees Council provided local knowledge on key areas of the Scheme and highlighted issues for consideration, including access issues and other major highways works.	• Comments noted and considered during Scheme design and assessment.
	14 August 2020	Feedback on Scheme designs –A62 Leeds Road Overbridge (MVL3/102)	• Kirklees Council provided feedback on the design for A62 Leeds Road Overbridge (MVL3/102), welcoming the proposed offline staged construction of the works. • It was noted that the proposed alignment affects the route of PRoW HUD/51/10 • In terms of walking/cycling, it was requested that the cycling lane provision be protected and enhanced where possible. Kirklees Council were pleased to see that the proposed new alignment improves on the existing horizontal alignment and provides standard footways on both sides. • It was acknowledged that construction phase proposals result in difficult alignments for road users which could compromise safety. Kirklees Council requested Stage 1 Road	• Comments noted and considered during Scheme design and assessment. • Road Safety Audits are being undertaken and further details will be provided to the Council once available.

Organisation	Date	Type	Key issues/responses	Comments/Outcomes
			Safety Audit (RSA) to be undertaken for the temporary situation as well as the permanent layout.	
	17 August 2020	Feedback on Scheme designs –B6117 Fall Lane, Thornhill Road Underbridge (MDL1/9)	• In terms of walking/cycling, Kirklees Council requested that existing cycle lane provision should be protected and enhanced where possible. • Although Kirklees acknowledged an improvement on the existing alignment, the council would welcome sight of the RSA.	• The design has ensured that the existing cycle lane provision is protected. • RSA are being undertaken and further details will be provided to the Council once available.
	29 September 2020	Consultation – issue of draft Transport Assessment	The scope, methodology and content of the assessment considered generally acceptable. The comments on the draft TA are summarised as follows: • Where it has been identified that the Scheme will have a severe impact on the operation of the highway network, consideration should be given to potential mitigation measures • Discuss and agree details of specific road closures and diversions with Area Working and Safety, Highway Operations, Structures and Major Projects Teams • Discuss and agree with WYCA any required diversions of bus routes and services • Provide site specific site access details for each compound • Assess implications of any displaced parking (Huddersfield Station Compound) and where this can be accommodated • Demonstrate that all compounds will provide adequate staff/contractor parking • Provide Scheme drawings, together with Stage 1 RSA for all proposed permanent highway works • Discuss and agree with the Council's PRoW Officer details of any temporary or permanent amendment of the PRoW network.	• Where significant impacts have been identified through the EIA process, potential mitigation measures have been outlined. These are set out in Section 14-6 of this chapter. • Consultation with relevant departments in Kirklees Council has taken place throughout the assessment, in conjunction with the design of the Scheme, approach to the TA and EIA. Consultation will continue to take place during detailed design and until construction commences, where required. • Details of diversions of bus routes and services will be discussed and agreed with relevant stakeholders and included in the CTMP) to be submitted pursuant to a condition to be attached to the deemed planning permission[3] and agreed with the Local Planning Authority • All compounds will provide adequate staff/contractor parking. This will be detailed in the CTMP. • Scheme drawings are provided in Figure 2-1. • Stage 1 RSAs are being prepared and will be submitted to the Local Authority for approval. • Details of temporary/permanent amendments to the PRoW network have been discussed with the PRoW officer.
Peak and Northern Footpath Society	9 October 2019	Environmental Scoping Report	• The loss of the Colliery Lane bridge is acceptable provided the footpath is diverted to continue to allow pedestrian access over the railway to the Calder Valley Greenway. • Expressed concerns regarding the proposed permanent closure of the public footpath at Heaton Lodge Junction (from Helm Lane to the Calder and Hebble Navigation)	• Footpath is to be diverted onto the reconstructed Wheatley's Overbridge (MVL3/103) as part of the design solution. • In view of comments raised, there are now no proposals to permanently close the footpath at Heaton Lodge, however a diversion of the route is proposed and detailed within this chapter. There will be a requirement for temporary closure of this footpath during construction works.
	8 January 2020	Letter	• Response to Technical consultation comments provided including clarity on the design for Wheatley's Overbridge (MVL3/103) and the Footpath at Heaton Lodge Junction	• N/A
The Ramblers' Association Huddersfield Group	23 October 2019	Technical consultation	• Expressed concerns regarding the proposed permanent closure of the public footpath at Heaton Lodge Junction (from Helm Lane to the Calder and Hebble Navigation) • Requested further detail on the diversion of the Calder Valley Greenway across Colliery Bridge	• In view of comments raised, there are now no proposals to permanently close the footpath at Heaton Lodge, however a diversion of the route is proposed and detailed within this chapter. There will be a requirement for temporary closure of this footpath during construction works.
	8 January 2020	Letter	• Response to Technical consultation comments provided including clarity on the design for Wheatley's (Colliery Lane) Overbridge and the Footpath at Heaton Lodge Junction	• N/A
Sustrans	3 November 2020	Meeting	• General overview of Scheme provided and discussed works affecting PRoW including temporary closures and proposed diversions. • No major concerns raised and appreciated the need for temporary closures during construction works. • Sustrans advised to consult with Kirklees Cycling Group with regard to planned temporary closures/diversions.	• Consultation with Kirklees Cycling Group will be undertaken in line with the External Communications Programme under Part B of the CoCP to be submitted pursuant to a condition to be attached to the deemed planning permission and agreed with the Local Planning Authority prior to construction.

[3] On making an order under the Transport and Works Act 1992, the Secretary of State may direct that planning permission shall be deemed to be granted, subject to such conditions (if any) as may be specified in the direction.

Data sources

14.3.7 Various datasets have been used to undertake this assessment including traffic surveys of existing traffic conditions, construction and operational data and other data sources, as detailed in the following section.

Traffic surveys

14.3.8 The traffic flows have been extracted from survey data, collected between 19 November 2019 and 19 December 2019. The surveys were undertaken using a combination of Manual Classified Counts (MCCs) for junctions and Automatic Traffic Count (ATCs) for links. All survey data has been processed for neutral days (Tuesday, Wednesday and Thursday) only.

14.3.9 The locations were chosen to capture traffic flows on roads where either construction traffic is expected and/or around the key locations within the study area of the station and the locations of these surveys are provided in Figure 14-1. The location of the traffic surveys is set out within the Transport Scoping Report. Kirklees Council has accepted receipt of this report and have not raised any issues with regards to its contents.

14.3.10 ATC surveys were undertaken at the following locations:

- H1 – Huddersfield – Oxford Street;
- H2 – Huddersfield – Northgate;
- H3 – Huddersfield – John William Street;
- HS1 – Hillhouse – Red Doles Road;
- HS2 – Hillhouse – A641 Bradford Road;
- D1 – Deighton – A62 Leeds Road;
- D2 – Deighton – Near Station Road;
- D3 – Deighton – B6118 Colne Bridge Road;
- D4 – Deighton – A62 Leeds Road;
- M1 – Mirfield – Station Road;
- M2 – Mirfield – Steanard Lane;
- M3 – Mirfield – Calder View;
- R1 – Ravensthorpe – Calder Road;
- R2 – Ravensthorpe – A622 Huddersfield Road; and
- R3 – Ravensthorpe – B6117 Thornhill Road.

14.3.11 MCC surveys were undertaken at the following locations:

- H1 – John William Street/Railway Street/Northumberland Street;
- H2 – John William Street/Fitzwilliam Street;
- H3 – Fitzwilliam Street/St Georges Car Park Access;
- H4 – Westgate/Trinity Street/Henry Street/Upperhead Row/New North Parade;
- HS1 – A641 Bradford Road/Flint Street;
- HS2 – Flint Street/Alder Street;
- HS3 – A641 Bradford Road/Willow Lane East/Halifax Old Road/Willow Lane;
- HS4 – Alder Street/Willow Lane East/Hillhouse Lane;
- D1 – A62 Leeds Road/Deighton Road;
- D2 – A62 Leeds Road/Whitacre Street;

- D3 – Deighton Road/Whitacre Street;
- D4 – A62 Leeds Road/A6107 Bradley Road/B6118 Colne Bridge Road;
- D5 – B6118 Colne Bridge Road/Mamas & Papas/Access Road;
- D6 – B6118 Colne Bridge Road/Jacamast Access/Private Access;
- M1 – A644 Huddersfield Road/Station Road;
- M2 – Hopton New Road/Back Station Road/Station Road;
- M3 – Hopton New Road/Granny Lane/Four Acres;
- M4 – A644 Huddersfield Road/Steanard Lane;
- R1 – Calder Road/Ravensthorpe Station Access;
- R2 – A644 Huddersfield Road/B6117 Temple Road/Broad Street/Fall Lane;
- R3 – A644 Huddersfield Road/ B6117 Thornhill Road;
- R4 – B6117 Thornhill Road/Fall Lane; and
- R5 – A644 Huddersfield Road/Calder Road/Queen Street.

Construction phase data sources

14.3.12 The following information has been used to undertake the assessment:

- Likely construction traffic routes and volumes, compound location, indicative construction programme, temporary road closures and restrictions/traffic management; and
- Temporary closures and diversions to PRoW and restrictions.

Operational phase data sources

14.3.13 Information on proposed permanent upgrades to the railway lines, stations, off-site highways works/improvements and changes to PRoW has also been used to undertake this assessment.

Other data sources

14.3.14 The following data has been provided by Kirklees Council to undertake the assessment:

- Committed developments and/or highways schemes that must be considered as part of the TA;
- Signal specifications for the signal-controlled junctions within the vicinity of the Scheme and operational timings for 'critical' junctions;
- Traffic flow data from permanent count sites;
- Traffic surveys (existing traffic conditions);
- The Kirklees Traffic Model (KTM) – The original KTM utilises the SATURN strategic modelling tool[4] and the original KTM was developed by AECOM in 2015 using data collected in the same year. The KTM modelled in its current form focuses on Kirklees and the immediate vicinity. Within this area all key highway links and junctions are modelled, with the road network modelled in more detail around the urbanised areas of the districts. KTM features an external network to allow appropriate routeing of trips into the fully modelled area;
- Accident data – extracted from the Department for Transport (DfT) website in relation to road safety and provide information on location, severity and number of accidents.

[4] **SATURN** (Simulation and Assignment of Traffic to Urban Road Networks) is a modelling tool to allow assessment of congestion on urban road networks by **modelling** the impact of queues that form at a particular junction based on capacity.

Reasonably Foreseeable Future Projects

14.3.15 A number of Reasonably Foreseeable Future Projects (RFFPs) were identified within the study area. These are generally considered to be developments of a scale whereby they would generate significant levels of traffic volumes and had required a TA in their own right as part of a planning submission. In addition, the location of such RFFPs was considered to identify where their geographical location presented a risk of interaction with the traffic effects of the Scheme.

14.3.16 Kirklees Council were consulted on the RFFPs that should be included within the traffic assessment. A review of the agreed developments was undertaken, which concluded that of the 11 developments, four were considered to be already included within the 2019 traffic counts used within the model (i.e. already constructed), three were considered to be aspirational (not considered committed or likely to be constructed) and four were considered to be committed developments that required further consideration in this assessment. Table 14-3 provides an overview of these developments.

14.3.17 Having considered these developments, those shortlisted as committed developments were agreed with Kirklees Council and included within the traffic model. Further details on how these committed developments are included within the modelling approach is provided in paragraphs 14.3.27 to 14.3.29. The four developments considered relevant for inclusion in the traffic cumulative impact assessment have been added to the model as part of the 2024 Do-minimum scenario – see modelling approach section below.

14.3.18 It should be noted that the discussion with Kirklees on the RFFPs to be included in the transport modelling was separate to the consideration of RFFPs for the wider cumulative impact assessment detailed in Chapter 22 (Cumulative effects) of this ES. The anticipated vehicle trips associated with the RFFPs have been added into the future baseline of the traffic model. The model only considers traffic data and does not assess the wider environmental impacts of increased traffic. However, the traffic model (including RFFP data) has informed the Air quality and Noise and vibration assessments of this ES (see Chapters 7 and 8 of Volume 2i of the ES).

Table 14-3 Developments to be considered for inclusion in the assessment

Application/ Scheme Ref.	Description	Location	Comment	Considered a Committed Development/Scheme
2018/62/93740/W	Re-development of training facilities, PPG Canalside Sports Complex	509, Leeds Road, Huddersfield, HD2 1YJ	Already constructed and therefore included within 2019 traffic counts	No
2018/62/91377/E	Erection of an extension to a production building to form a new process plan	Dr Reddys Ltd., Steanard Lane, Mirfield, WF14 8HZ		No
2017/62/94119/E	Demolition of existing building, erection of new building for educational classroom, cafe and toilets	Adjacent to fishing lakes off Sands Lane, Mirfield, WF14		No
2017/62/94080/E	Erection of precast concrete production unit, demolition of existing casting shed and ancillary buildings	C R Longley And Co Ltd, Ravensthorpe Road, Thornhill Lees, Dewsbury, WF12 9EF		No
2017/62/92997/E	Erection of 70 (over 55) retirement apartments,	Station Road, Mirfield WF14 8LL	Construction works have commenced, and development assumed to be complete and occupied by time of construction works for this Scheme.	Yes
2017/62/92997/E	Provision of a community building	Station Road, Mirfield WF14 8LL		Yes
2016/60/94117/E	Outline Application for residential development (120 units)	Land off Lees Hall Road, Dewsbury	Whilst its within area of Dewsbury Riverside Masterplan, greater weight will be applied to this site given application status.	Yes
2016/60/94118/E	Outline Application for residential development (120 units) including means of access	Land off Ravensthorpe Road, Dewsbury		Yes
A62/A644 Wakefield Road (Cooper Bridge)	Highways improvements to the junction of Bradley Road/Colne Bridge Road, Construction of a Cooper Bridge Relief Road, Highways improvements to the junction of A62 Cooper Bridge/A644 Wakefield Road/A62 Leeds Road, Widening of the A644 Wakefield Road		Included within the Local Plan TS4 but at this stage in the design process three route options/configurations are being looked at for the alignment of the relief road and improvements to the existing highway. Proposed	No

Application/ Scheme Ref.	Description	Location	Comment	Considered a Committed Development/Scheme
			scheme but not yet funded and therefore considered aspirational.	
A62 Smart Corridor (Leeds Road - Phase 1)	Large scale modifications to the following junctions: Huddersfield Ring; Road/ Southgate/Northumberland Street; Leeds Road/Lower Fitzwilliam Street/Gasworks Street; Leeds Road/Thistle Street/Hillhouse Lane; Leeds Road/Old Fieldhouse Lane.		Included within the Local Plan TS1 but is considered aspirational.	No
North Kirklees Orbital Route	This is a potential road scheme that could improve access to and from the area in addition to providing a strategic link from the M1 to the M62 and reducing congestion along existing routes, in particular in Ravensthorpe, Mirfield et al.		Work is now underway to produce an Option Assessment Report to determine if there is a viable scheme to further develop. Considered aspirational.	No
Housing Strategic Development sites	HS61 Dewsbury Riverside (1,869 units during the Local Plan period with potential for a further2,131 units beyond the plan period) HS11 Bradley Park (1460units)		Projected unit numbers within Local Plan period for Dewsbury Riverside and Bradley Park will be accounted for within local traffic growth figures. Lees Hall Road (planning ref: 2016/60/94117/E) and Ravensthorpe Road (planning ref: 2016/60/94118/E) which are part of the Dewsbury Riverside allocation have been specifically included as Committed development as noted.	No

Committed infrastructure schemes

14.3.19 Committed infrastructure schemes represent committed improvements to the transport network in the vicinity of the Scheme.

14.3.20 No committed infrastructure schemes were identified by Kirklees Council and therefore none are included as part of this assessment.

Modelling approach

14.3.21 The SATURN strategic modelling tool has been utilised to undertake an assessment of the cumulative impact of the Scheme.

14.3.22 The original KTM model, which itself utilised the SATURN modelling tool, was updated using 2019 traffic flow data. The process of updating the model is described in the 'SATURN Modelling Methodology' report which is included within the TA at Appendix 14-1. A brief overview is provided below.

14.3.23 The original KTM model covers a wide geographical extent, including areas outside the anticipated area of impact. It was therefore cordoned to focus the model along the A644, leading to the benefits of enhancing the stability in model outputs and improving model run times.

14.3.24 The model network was updated to resolve the specific issues raised within the original review and included provision for construction routes and compounds. The updates included:

- New zones and accesses;
- Correcting the coding of signals where necessary; and
- Adding additional network where necessary.

14.3.25 It was agreed with Kirklees Council that all the construction phase scenarios would be set to a common year enabling comparison of each of the construction scenarios to the same Do-Minimum scenario.

14.3.26 It was agreed that the identification of that year would be based on a temporal analysis of when the proposed interventions will happen which, in turn, would lead to the identification of scenarios. This analysis is set out in the 'SATURN Modelling Methodology' years (2024) has therefore been identified as the assessment year for the purpose of modelling and agreed with Kirklees. Paragraph 14.3.41 provides further details on the five do-something scenarios assessed.

14.3.27 The process for developing the future year demand matrices is as follows:

- 2024 Base Year utilised 2019 observed data which is factored to 2024 using rates derived from TEMPro (Trip End Model Presentation Program)[5] and based upon the National Trip End Model (NTEM) (Traffic forecast figures (includes forecasts based on local plans and land zoning);
- Trip estimates for each of the committed developments are added to these Base figures to produce 2024 Do Minimum trip matrices; and
- Trip estimates for the Scheme are added to the Do Minimum figures to produce a 2024 Do Something trip matrix.

[5] The TEMPro software allows users to view the National Trip End Model (NTEM) dataset and provides forecasts of trip ends and associated documentation

14.3.28 The 2024 Do Something trip matrix was assigned to the highway network to identify the cumulative effects of the development traffic in combination with the committed development traffic. A review of the traffic volumes suggested that the committed development traffic volumes were modest in comparison to the potential changes that the Scheme would have. The model outputs therefore provided a useful overview of the cumulative effects on the highway network.

14.3.29 Consideration of the RFFP at a localised level will also help identify potential overlaps or cumulative impacts with the Scheme and will highlight where more detailed engagement with the Highway Authority will be prudent going forward. A key finding for example is the Dewsbury Riverside development which is situated off Ravensthorpe Road, in close proximity to the proposed relocated Ravensthorpe Station and proposed new alignment of Calder Road and provision of a three-arm roundabout which will require temporary road closures to accommodate the works. This traffic management will need careful planning should the respective programme of works overlap. Discussions and coordination are ongoing with the local authority, as well as other respective parties (local developers), to ensure that works associated with the Scheme and other developments are coordinated to limit any impacts on the transport network during the construction phase.

Assessment criteria

14.3.30 A qualitative and quantitative approach has been undertaken in determining the significance criteria in accordance with the standard guidance for preparing Environmental Impact Assessment (EIA) contained within the Institute for Environmental Management and Assessment (IEMA) guidelines[6].

14.3.31 A TA has been prepared which considers the impact of the Scheme on all transport infrastructure within the Scheme area. Whilst the TA is used as source material, it predominately identifies the compliance of the Scheme with local and regional transport policy as well as quantifying the transport and highway impact of the Scheme; the environmental impact of traffic generated by the Scheme is considered within this chapter as it requires assessment against different criteria.

14.3.32 The environmental effects of changes in road traffic resulting from the Scheme are assessed upon the identified roads (i.e. construction phase and operational phase). This is conducted in accordance with the above guidelines and includes all links upon which a significant impact could potentially occur.

14.3.33 The significance of the effect reflects the combination of the sensitivity (or importance) of the receptors affected and magnitude (or scale) of the change on the receptors.

14.3.34 In order to define the scale and extent of an assessment, the IEMA guidelines recommend a screening process. The guidelines recommend two thresholds that would normally apply before the environmental effects of increases in traffic need to be looked at in more detail on a specific link.

- **Rule 1:** Include highway links where traffic flows will increase by more than 30% (or the number of Heavy Goods Vehicles (HGVs) will increase by more than 30%); and
- **Rule 2:** Include any other specifically sensitive areas where traffic flows will increase by 10% or more.

14.3.35 For the transport-related effects, categories of receptor sensitivity have been defined from the

[6] Institute of Environmental Assessment, Guidelines for the Environmental Assessment of Road Traffic, 1993 (now the Institute of Environmental Management and Assessment (IEMA))

principles set out in the IEMA guidelines, as summarised in Table 14-4.

Table 14-4 Sensitivity of traffic/transport receptors

Sensitivity	Receptors
Low	• Open space; • Tourist/visitor attraction; • Historical buildings; • Churches; and • Residential and employment areas (including individual properties).
Medium	• Hospitals, surgeries and clinics; • Parks and recreation areas; • Shopping areas; and • Roads used by pedestrians with narrow footways.
High	• Educational institutions; • Retirement/care homes; • Roads used by pedestrians with no footways; and • Road safety "black spots".

14.3.36 The receptor sensitivity of each link in the study area has been analysed to enable them to be categorised as Low, Medium or High sensitivity. Where a link is considered to be of a High receptor sensitivity (based on receptor types), the 'specifically sensitive' IEMA Rule 2 threshold will apply.

14.3.37 The magnitude of impact depends upon the category of effect being assessed, namely:

- **Driver delay** – such delays "… are only likely to be significant on road users when the traffic on the identified network is already at, or close to, the capacity of the system" (IEMA guidelines);
- **Pedestrian delay** – changes in the volume, composition or speed of traffic may affect the ability of people to cross roads. The guidance suggests that assessors use their judgement to determine whether pedestrian delay is a significant impact. For the purposes of this assessment, the pedestrian severance threshold levels will be applied to pedestrian delay;
- **Pedestrian and cyclist amenity** – broadly defined as the relative pleasantness of a journey, whereby it may be affected by traffic flow, traffic composition and footway width/separation from traffic. The guidance suggests a tentative threshold for judging the significance of changes in pedestrian amenity of where traffic flow (or its HGV component) is halved or doubled;
- **Fear and intimidation** – the impact of this is dependent on the volume of traffic, its HGV composition and speed, and its proximity to people or the lack or protection caused by such factors such as narrow footway widths. The guidance states that there are no commonly agreed thresholds for estimating this from known traffic and physical conditions, but it does suggest some thresholds which could be used. The criteria relating to pedestrian delay will therefore also be applied in addition to traffic levels;
- **Accidents and safety** – the likelihood of accidents increasing or decreasing. The guidance suggests that professional judgement will be needed to assess the implications of local circumstances, or factors, which may elevate or lessen risks of accidents; and
- **Severance** – defined as the perceived division or separation that can occur within a community due to a road and its associated traffic. Thus, an increase or decrease in traffic can have an effect in terms of severance.

14.3.38 The magnitude of the impacts is assessed in line with IEMA guidelines, summarised in Table 14-5.

Table 14-5 Magnitude of impact

Impact	Magnitude of impact				
	Criteria	Negligible	Minor	Moderate	Substantial
Driver delay	Peak Hours – Change in journey time* Daily – Change in Total Traffic Flows or HGV Flows	< 30%	30-60%	60-90%	> 90%
Pedestrian and cyclist delay	Change in Total Traffic Flow or HGV Flows**	< 30%	30-60%	60-90%	> 90%
Pedestrian and cyclist amenity	Change in Total Traffic Flow or HGV Flows***	<50%	50-60%	60-90%	> 90%
Fear and intimidation	Average 18hr Traffic flow Levels	• Average 18hr Traffic flows <600 • HGVS <1000 • <30% change in Traffic Flow	• Average 18hr Traffic flows 600-1200 • HGVS 1000-2000 • 30-60% change in Traffic Flow	• Average 18hr Traffic flows 1200-1800 • HGVS 2000-3000 • 60-90% change in Traffic Flow	• Average 18hr Traffic flows >1800 • HGVS >3000 • >90% change in Traffic Flow
Accidents and safety	Change in Total Traffic Flow or HGV Flows****	<30%	30-60%	60-90%	> 90%
Severance	DMRB Volume 11 Section 3 "New Severance" – Annual average daily traffic (AADT)	<8000 AADT (and less than 30% change in Traffic Flow or 10% in sensitive areas)*****	<8000 AADT	8000-16000 AADT	>16000 AADT

** Based on guidance, driver delay is only likely to be significant when the traffic on the identified network is already at, or close to, the capacity of the system. Therefore, consideration will be given to the Volume-Demand-to-Capacity Ratio (V/C) which is a measure that reflects the operation of a link. It compares traffic volume with link capacity. For example, a V/C of 1.00 indicates the link is operating at capacity. For robustness, a lower threshold of 0.8 has therefore been used i.e. links with a V/C value of 0.8 or less, are considered negligible).*
*** Again, links with v/c of 0.8 or less are considered negligible.*
**** Guidance suggests tentative threshold for judging the significance of changes in pedestrian amenity of where traffic flow (or its HGV component) is halved or doubled. Therefore, changes of less than 50% are considered negligible and for changes of more than 50%, for minor/ moderate/ substantial, the scales (changes in traffic) for other impacts have been used as a guide*
***** In lieu of specific assessment thresholds change in traffic volumes thresholds and v/c have been used.*
****** Severance thresholds are broken down as Slight, Moderate and Severe, and therefore, to determine Negligible effects, it is considered reasonable that roads with AADT of less than 8000 Vehicles and changes in total traffic flow of less than 30% (IEMA Rule 1) could be considered as Negligible.*

14.3.39 Each impact has also been identified as to whether it is:

- Beneficial or adverse;
- Temporary or permanent; and
- Short, medium or long term.

14.3.40 In order to determine the significance of the effect, the interaction of the sensitivity of the receptor (Table 14-4) and the magnitude of the impact (Table 14-5) has been accounted for as summarised in Table 14-6. Where an effect is described as 'Neutral' or ''Slight', this means there is either no effect or that the level of any effect is so small as to be of no significance. 'Moderate' and greater effects are considered to be significant in terms of EIA guidance and apply to both beneficial and adverse effects.

Table 14-6 Determining significance of effect

Receptor sensitivity	Magnitude of impact (degree of change)				
	No Change	Negligible	Minor	Moderate	Substantial
Very High	Neutral	Slight	Moderate	Large	Very Large
High	Neutral	Slight	Moderate	Large	Large
Medium	Neutral	Slight	Slight	Moderate	Large
Low	Neutral	Slight	Slight	Slight	Moderate
Negligible	Neutral	Neutral	Neutral	Neutral	Neutral

14.3.41 The following scenarios were considered within the assessments:

- Base year **[Do Minimum]** – 2019 – The year of the surveys for the Scheme;
- Assessment year (construction phase**) [Do Something]** – 2024[7]; and
- Scheme opening year – 2026.

14.3.42 For the 2024 Do-Something assessment, there were five scenarios tested and Table 14-7 provides an overview of these five scenarios. A detailed table is provided in Appendix 14-3.

14.3.43 Scenarios were identified by firstly categorising the interventions (such as temporary road closures, construction compounds, lane width restrictions, parking restrictions, traffic control measures, speed control measures etc) into measures by type and then severity (refer to Section 11.3 of the SATURN Modelling Methodology Report).

14.3.44 Each of the interventions were coded and then mapped out temporally against an indicative programme of works. In each case, where an intervention period has a more and less severe 'phase' of the works (i.e. temporary road closure), the more severe phase will be modelled assuming it coincides with the time periods of the model (Morning, Evening and Interpeak periods on a weekday).

[7]Agreed with Kirklees Council – see paragraph 14.3.24

Table 14-7 Do Something Scenarios and Interventions

Route Section		Interventions included within Scenario				
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
1 – Huddersfield	Operational compound	Bradford Road	Bradford Road	None	Fitzwilliam Street Cross Church Street Longroyd Lane	Fitzwilliam Street
	Temporary road closures	Castlegate Northgate	None	Fitzwilliam Street, John William Street, St. Johns Road	None	None
	Other temporary measures	Lane closures, parking restrictions	None	Lane closures, parking restrictions	None	None
2 – Hillhouse and Fartown	Operational compound	Hillhouse Hillhouse Lane	Hillhouse Hillhouse Lane	Hillhouse	Hillhouse	Hillhouse
	Temporary road closures	None	None	None	None	None
	Other temporary measures	Traffic signals, lane width restrictions, parking restrictions	Traffic signals, lane width restrictions, parking restrictions	None	None	None
3 – Deighton and Bradley	Operational compound	A62 Compound	A62 Compound	A62 Compound	Deighton Station and Whitacre Street:	None
	Temporary road closures	A62	A62	A62	Whitacre Street	None
	Other temporary measures	Only temporary traffic signals, restricted lane width, speed restrictions modelled	Links closed within model	Only temporary traffic signals, restricted lane width, speed restrictions modelled	Links closed in the model	None
4 – Colne Bridge and Battyeford	Operational compound	None	B6118 Colne Bridge Road	Paul Lane	B6118 Colne Bridge Road Paul Lane	Paul Lane
	Temporary road closures	None	Links closed in model	None	None	None

Route Section		Interventions included within Scenario				
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
	Other temporary measures	None		Bog Green Lane – lane restrictions	Bog Green Lane – lane restrictions	Bog Green Lane – lane restrictions
5 – Mirfield and Lower Hopton	Operational compound	Mirfield Station Mirfield Viaduct	Mirfield Station Mirfield Viaduct	None	None	None
	Temporary road closures			Station Road links closed in model to reflect temporary road closure	None	None
	Other temporary measures	Parking restrictions only – not modelled Back Station Road	Parking restrictions only – not modelled Back Station Road	None	None	None
6 – Ravensthorpe and Westtown	Operational compound	Ravensthorpe	Ravensthorpe Thornhill Road/Fall Lane	Ravensthorpe Thornhill Road/Fall Lane	Ravensthorpe Thornhill Road/Fall Lane	Ravensthorpe Thornhill Road/Fall Lane
	Temporary road closures	None	None	None	Calder Road	Thornhill Road
	Other temporary measures	Lane Restrictions	Lane Restrictions	Lane Restrictions	Lane restrictions	Lane restrictions

14.3.45 It was agreed with Kirklees Council that no Design Year (beyond 2026) assessment was needed given the very limited impact of the Scheme in the operational phase.

14.3.46 The assessment considers the effects for the entire Scheme and these are also identified by each Route Section (1 to 6) to help provide an indication on where these effects occur. Where significant effects have been identified, mitigation measures have been proposed where possible. The residual effects following mitigation has then been determined.

Study area

14.3.47 The study area has been based on the Scheme and surrounding transport routes that could potentially experience significant effects as a result of traffic associated with the operation of the Scheme and is shown in Figure 14-2. The study area has been identified through:

- The TA and associated transport impact analysis utilising SATURN modelling;
- Discussion with Kirklees Council;
- Review of proposed temporary rail/road/PRoW closures associated diversionary routes and other highway measures;
- Review of proposed construction traffic diversion routes and compound locations; and
- Review of available traffic count data.

Sensitivity of receptors assignment

14.3.48 In order to assign sensitivity to the links within the study area, it was necessary to firstly identify the type of receptors (as defined within Table 14-4) and their location; these are shown in Figure 14-3. A list of the links, road names and sensitivities within each Route Section is set out within Appendix 14-4.

14.3.49 Based on the type of receptor and their associated sensitivity, each of the links within the study area have been assigned a sensitivity level of Low, Medium and High. Out of 2,385 links in total, 1,195 are low, 282 are medium and 908 are high as illustrated in Figure 14-4.

Initial screening approach

14.3.50 Given the scale of the study area, a screening approach has been utilised to focus the assessment on routes/links that could be significantly impacted upon.

14.3.51 Taking into consideration Rule 1 and Rule 2 of the IEMA guidelines, as set out in paragraph 14.3.34 of this chapter, the screening approach discounted all links that experience less than 10% increases in all traffic or HGV traffic over a 24 hour period as these are considered to result in Negligible changes.

14.3.52 The next stage was to remove all links considered ‘Low’ or ‘Medium’ sensitivity and experience less than 30% increases in all traffic or HGV traffic over a 24 hour period, which are also considered to result in Negligible changes as set out in Table 14-5.

14.3.53 Driver delay is only likely to be significant when the traffic on the identified network is already at, or close to, the capacity of the system. Therefore, remaining routes/links with V/C of 0.8 or less have been removed.

14.3.54 V/C is a measure that reflects the operation of a link and it compares traffic volume with link capacity. For example, a V/C of 1.00 indicates the link is operating at capacity. A V/C value of 0.8 or less therefore removes links that are not already at or close to capacity.

14.3.55 The remaining links are therefore considered the 'core' study area that allows assessment of Driver delay, Pedestrian and cyclist delay, and Accidents and safety. The core study area is illustrated in Figure 14-5 and further details for each Route Section are included in Appendix 14-4.

14.3.56 This screening approach highlights that of the 2,385 links within the KTM (SATURN Model), only 116 links (less than 5%) require further assessment. Within the model, a road could be represented by one link or represented by a series of connecting links and therefore, 116 links do not necessarily translate to 116 different roads (i.e. Whitacre Street is modelled as a series of connecting links).

14.3.57 The remaining links sensitivity breakdown is provided as follows:

- Low on 19 links;
- Medium on 13 links; and
- High on 84 links.

14.3.58 Although the magnitude of impact thresholds for Pedestrian and cyclist amenity, Fear and Intimidation, and Severance is slightly different to the other impacts noted in paragraph 14.3.37, it is considered that the 'core' study area is a starting point for all impacts noted in Table 14-5. In assessing the impacts on Pedestrian and cyclist amenity, Fear and intimidation, and Severance, their associated thresholds will result in more links being screened out and less links requiring assessment.

14.4 Baseline conditions

14.4.1 This section provides a high-level overview of the baseline traffic conditions for the Scheme. Further detailed information on pedestrian/cycle/public transport facilities and infrastructure, as well as existing traffic conditions (volumes and road safety) for each Route Section is provided in Appendix 14-5.

Non-motorised users

14.4.2 The key cycle routes and PRoW shown on Figure 2-2 and within the core study area include:

- National Cycle Network Route 69 which connects Morecambe with Grimsby via Settle, Skipton, Cullingworth, Huddersfield, Horbury, Pontefract, Althorpe and Caistor. Local to the Scheme, this is known as the Dewsbury to Oakenshaw Route; and
- National Cycle Network Route 66 which runs from central Manchester to Spurn Head via Bradford, Leeds, York, Beverley, and Kingston upon Hull. Local to the Scheme, this is known as the Calder Valley Greenway.

14.4.3 Additional baseline information for key links/roads within the study area (i.e. those identified in the later sections of this chapter to experience significant effects) is provided within Appendix 14-6. This includes details on the number and location of pedestrian/cyclist crossing points, types of crossing, pedestrian/cycle infrastructure.

Public transport users

14.4.4 Details on existing bus/rail stations within the study area as well as existing bus stops locations, service information and type of bus stops along key routes is provided within Appendix 14-7.

Existing traffic conditions

14.4.5 The existing traffic levels for the links within the study area are illustrated in Figure 14-6 as

traffic flow bands, with specific details of traffic flows being provided in Appendix 14-5. Figure 14-6 shows the 24hr traffic flows for all traffic and Figure 14-7 shows the 24hr traffic flows for HGVs.

14.4.6 The following key roads have been identified to have notable levels of traffic flows. However, this list is not exhaustive and levels of traffic flows for all links/roads are shown in Figures 14-6 and 14-7:

- Route Section 1 – Huddersfield:
  - Ring Road around Huddersfield (Castlegate, Queensgate, Southgate);
  - Wakefield Road;
  - Manchester Road;
  - A616;
  - New Hay Road;
  - New Road/Edgerton Road/Halifax Road;
  - A641; and
  - A62 Leeds Road.
- Route Section 2 – Hillhouse and Fartown:
  - A641; and
  - A62 Leeds Road
- Route Section 3 – Deighton and Bradley:
  - A62 Leeds Road;
  - Deighton Road; and
  - B6118 Colne Bridge Road.
- Route Section 4 – Colne Bridge and Battyeford
  - A62 Leeds Road;
  - Cooper Bridge Road; and
  - A644 Huddersfield Road.
- Route Section 5 – Mirfield and Lower Hopton:
  - A644 corridor.
- Route Section 6 – Ravensthorpe and Westtown:
  - B6177;
  - A644,
  - A638;
  - Bradley Road;
  - B6409; and
  - Thornhill Road.

14.4.7 The existing traffic performance of links in terms of V/C is illustrated in Figure 14-8. It should be noted that for robustness, a threshold of 80% (instead of 85%) has been used to show junctions operating below capacity. This demonstrates that 2242 links are below capacity, 118 links along 38 roads are at capacity and 25 links along 14 roads are over capacity. A list of the roads which are either at or over capacity is provided in Appendix 14-5.

14.4.8 The existing traffic performance of links in terms of typical delay is illustrated in Figure 14-9.

14.4.9 Further details in terms of V/C and delay on all links is provided in Appendix 14-5.

Road safety information

14.4.10 Data was extracted from the Department for Transport (DfT) website in relation to road safety. The vehicle data covers the most recent 5-year time period inclusive up to the end of 2018 and is presented in Figure 14-10. The analysis is focused around serious and fatal accidents, in addition to whether large vehicles (bus/HGV) were involved.

14.4.11 The following accident clusters have been highlighted within each Route Section:

- Route Section 1 – Huddersfield:
  - Fitzwilliam Street/Trinity Street;
  - Castlegate/Trinity Street;
  - Castlegate/Manchester Road/Queensgate;
  - Southgate/Northumberland Street/Leeds Road; and
  - Fitzwilliam Street.
- Route Section 2 – Hillhouse and Fartown:
  - Bradford Road/Willow Lane;
  - Leeds Road Corridor from Learoyd Street to Galloway Street;
  - Leeds Road/Bradley Mills Road/Barr Street; and
  - Braford Road/Fartown Green Road.
- Route Section 3 – Deighton and Bradley:
  - Leeds Road/Neptune Way;
  - Leeds Road/Bradley Jn Industrial Estate Entrance; and
  - Leeds Road Corridor from Bradley Road to Fearnley Mill Drive.
- Route Section 4 – Colne Bridge and Battyeford
  - Cooper Bridge Road/Leeds Road Junction; and
  - Leeds Road/Huddersfield Road.
- Route Section 5 – Mirfield and Lower Hopton:
  - A644 Corridor from Royd Crescent to Trinity Street.
- Route Section 6 – Ravensthorpe and Westtown:
  - A644 Corridor from John Street to Church Street;
  - A644 Corridor from Hebble Street to the Lewton Yarns Factory;
  - A644/Fall Lane/Thornhill Road;
  - A644/Watergate Road;
  - A644/Dewsbury Ring Road/Mill Street West; and
  - Thornhill Road/Wormalds View.

14.4.12 Further details on these accident/clusters are provided within the TA in Appendix 14-1.

Assumptions and limitations

14.4.13 The KTM used to assess the development impacts included future year demand forecasts to reflect potential future traffic conditions. These forecasts included detail on some specific developments that were considered as approved for construction in addition to background growth to reflect wider development.

14.4.14 At the time of updating the KTM, the committed developments added to the matrices were correct and agreed with Kirklees Council. This is considered a reasonable and robust approach and it is acknowledged that some developments may gain planning approval after

the traffic forecasts have been prepared.

14.4.15 This is not unusual, and this additional growth will already be accounted for in the background traffic growth assumptions also included. These assumptions were informed using data drawn from NTEM/TEMPro which is a standard industry approach. This tool enables the derivation of traffic growth factors based on assumptions regarding residential and employment activity within the study area.

14.4.16 It should be noted that these assumptions did not include any reductions to future traffic growth trajectory in light of the current COVID-19 traffic levels.

14.4.17 The designs as well as the construction phasing and timing are subject to detailed programming. Until construction commences, there will be ongoing discussion with Kirklees Council departments such as Areas Working and Safety, Highway Operations, Structure and Major Projects Teams.

14.4.18 A CTMP for each stage of the Scheme, will be submitted pursuant to a condition to be attached to the deemed planning permission and agreed with the Local Planning Authority. Through that process more specific information in relation to the construction compounds, construction routes, staff numbers and working hours, associated trips and parking requirements as well as the construction programme and associated traffic measures will be provided.

14.4.19 Design of the Scheme is currently at outline design stage, which gives sufficient detail on the design, construction, operation and land requirements to assess the environmental impacts of the Scheme. The design will continue to be refined in the time leading up to construction; this will be within the parameters of the Scheme assessed by the EIA and TA.

14.4.20 Following the completion of the Scheme, the operational phase is not assuming a significant modal shift from road to rail.

14.5 Potential effects (including committed developments)

14.5.1 The ongoing design of the engineering aspects of the Scheme has been informed by the EIA and has sought to avoid predicted environmental impacts wherever possible. Where the design has been altered to mitigate a particular impact, this is considered to be embedded mitigation.

14.5.2 Examples of embedded mitigation which have been included as part of the design are summarised below and set out in more detail in Chapter 3 (Alternatives):

- Huddersfield Viaduct (Span 2-3) Underbridge (MVL3/92(2)):
  - The design has considered three options; the preferred option is considered most appropriate in terms of operation of the highway and retaining a layout which most closely resembles existing conditions;
  - The preferred option reduces the requirements for utilities works which will reduce the temporary road closure period in this regard.
- Construction methods at Huddersfield Viaduct (Span 29) Underbridge (MVL3/92(9)) were selected to reduce temporary road closure time;
- A62 Leeds Road Overbridge (MVL3/102):
  - An offline reconstruction option was selected for to reduce impact on traffic along the A62 Leeds Road;
  - The design provides benefits in the permanent case including cycle lane provision on both sides;

- An offline reconstruction option was selected at Wheatley's Overbridge (MVL3/103) to reduce closure time to PRoW users;
- B6118 Bridge Road Overbridge (MVL3/107):
  - An offline reconstruction was selected to minimise the duration of the temporary closure required;
  - The design provides benefits in the permanent case with the highway carriageway width widened;
- Thornhill Road/Fall Lane:
  - The design solution aimed to minimise the impact on Fall Lane. The option selection process considered numerous options including the permanent closure of Fall Lane was considered and a new right turn junction on to Thornhill Road.

14.5.3 The potential impacts and effects during construction and operation of the Scheme reported in the following section have taken into consideration such embedded mitigation and the assumptions presented earlier in this chapter.

Construction phase overview

14.5.4 To deliver the Scheme, extensive construction works are required over a four-year period, including temporary road closures/diversions, temporary changes to PRoW and setting up of construction compounds. Further high-level details on each of these are set out within this section.

14.5.5 To limit disruption to the rail and highway network, where possible, construction phases will be programmed to avoid unnecessary overlap. Throughout the works, temporary rail closures will be in operation when necessary.

14.5.6 Much of the construction materials and equipment for the Scheme will be transported to site by rail. Where possible, some of the construction workforce will also use rail for commuting to site for certain construction activities. This will minimise the amount of traffic generated by construction of the Scheme and, thus, mitigate the construction impacts.

Construction compounds

14.5.7 Temporary construction compounds are required to facilitate the construction of the Scheme. There are 22 compounds proposed along the Scheme, comprising strategic and satellite construction compounds.

14.5.8 Strategic construction compounds will be the main larger construction compounds from which the Scheme is managed and will have a larger welfare setup for the project management staff offices. These compounds will be in use for four years (48 months) and are situated in areas with good access to the highway network and where possible near to urban areas so that access via non-car modes can be maximised for staff. Four such locations are planned;

- Route Section 1 – Fitzwilliam Street;
- Route Section 2 – Hillhouse;
- Rouse Section 4 – Paul Lane; and
- Route Section 6 – Ravensthorpe Area.

14.5.9 Satellite construction compounds will have a smaller footprint than the strategic construction compounds and will be used to manage the works along the route. The facilities will include a small office setup with welfare facilities, so operatives do not have to travel back to the main construction compounds each time they need the facilities or are on a break.

14.5.10 An overview of the construction compounds within each Route Section are set out in Table 14-8. Strategic compounds are highlighted in bold in the table. The potential locations of these strategic and satellite compounds are illustrated in Figure 2-4, with further information on construction traffic routes to/from these compounds, operational dates and potential number of staff to operate from these locations provided within Appendix 14-8.

Table 14-8 Construction compounds along Scheme

Route Section	Location
1 – Huddersfield	**Fitzwilliam Street**
1 – Huddersfield	Cross Church Street
1 – Huddersfield	Longroyd Lane
1 – Huddersfield	Bradford Road
2 – Hillhouse and Fartown	**Hillhouse**
2 – Hillhouse and Fartown	Hillhouse Lane
2 – Hillhouse and Fartown	Red Doles Road
2 – Hillhouse and Fartown	Fieldhouse Lane
3 – Deighton and Bradley	Deighton Station and Whitacre Street
3 – Deighton and Bradley	A62
4 – Colne Bridge and Battyeford	B6118 Colne Bridge
4 – Colne Bridge and Battyeford	**Paul Lane**
4 – Colne Bridge and Battyeford	Huddersfield Broad Canal
5 - Mirfield and Lower Hopton	Woodend Road
5 - Mirfield and Lower Hopton	Mirfield Viaduct
5 - Mirfield and Lower Hopton	Mirfield Station
5 - Mirfield and Lower Hopton	Steanard Lane
6 – Ravensthorpe and Westtown	**Ravensthorpe Triangle**
6 – Ravensthorpe and Westtown	Ravensthorpe station area
6 – Ravensthorpe and Westtown	Weaving Lane
6 – Ravensthorpe and Westtown	Thornhill Road/Fall Lane
6 – Ravensthorpe and Westtown	Ming Hill
6 – Ravensthorpe and Westtown	Toad Holes
6 – Ravensthorpe and Westtown	Sands Lane

Construction routes and timing of trips

14.5.11 Whilst it is the intention to bring materials and equipment to the worksites via rail as much as possible, there will still be some materials and equipment brought to site utilising HGVs on the road network. Preliminary construction routes are proposed to and from each construction compound. Each construction compound will have a primary access route which will be used for all access and deliveries to the construction compound. An alternative secondary access route has been identified; the use of this secondary route will be limited and only used if the primary route is not available for any reason such as a temporary road closure due to an incident on the highway.

14.5.12 This assessment assumes all access will be along the primary route where possible. As noted, the likely construction routes and compound locations are illustrated in Figure 2-4. Through the development of the CTMP, appropriate mitigation/management measures will be agreed with Kirklees Council to ensure that HGVs are routed along roads of an appropriate design standard.

14.5.13 Deliveries for construction works will generally be made by road and will be in standard working hours. Where possible deliveries associated with the track works and overhead line equipment (OLE) will be made via rail. There may be occasions where there will be a requirement for abnormal load deliveries during the construction phase and these will adhere

to the procedures set out in Part A of the CoCP and the CTMP.

14.5.14 As is standard practice, where large vehicles will be reversing for the purpose of delivering to a work site, banksmen will be used as necessary.

Staff

14.5.15 All staff working at the strategic construction compounds will travel directly to the construction compound. Mitigation measures noted in Section 14.6 of this chapter notes that a CTMP will be produced to help reduce impacts of temporary road works/restrictions. The CTMP will also include a Travel Plan for Construction Staff that will seek to encourage staff to use public transport where practical and to manage transporting staff between the main construction hubs and satellite compounds. Further details on the staff to operate from these locations is provided in Appendix 14-8.

14.5.16 All office-based staff will be based at the office facilities in the strategic construction compounds. The site-based staff (engineers and delivery/construction managers) will be split across the construction compounds.

14.5.17 For staff working at the smaller satellite construction compounds, it is assumed that 80% will report to the strategic construction compounds and travel via minibus to the smaller site. The remaining 20% of staff will travel direct to the satellite construction compounds by sustainable travel modes which will be encouraged/promoted by the Travel Plan for Construction Staff. No parking is to be provided at the satellite compounds.

14.5.18 For the construction compounds, the bulk of trips arriving and departing are assumed to be workforce commuting trips. As a conservative assumption, a car for each member of staff was assumed to arrive in the morning Peak hour and depart in the evening Peak hour. The assumed distribution for these trips was derived from a collection of nearby employment zones.

14.5.19 This approach provides a robust assessment as:

- The staff are expected to travel mostly outside of the peak hours. However, by including them in the modelling undertaken using the KTM at those times, a worst-case situation has been assumed for the assessment; and
- Some staff may share cars or travel by other transport modes.

14.5.20 Information on movements between compounds, for example minibuses, was collated and coded explicitly into the traffic model matrices.

Operatives

14.5.21 All operatives working at the strategic construction compounds will travel directly to the construction compound. Again, as part of the CTMP, the Travel Plan for Construction Staff will seek to encourage staff to commute by public transport where practical and to manage transporting operatives between the strategic construction compounds and satellite compounds. Further details on the operatives that could travel to/from these locations is provided in Appendix 14-8.

14.5.22 Operatives who work at the satellite construction compounds will be encouraged to travel and report to the strategic construction compounds at the start of each shift. This will be achieved by the provision of the main welfare/canteen and clocking in facilities at the strategic construction compounds. They will then travel via minibus to the smaller satellite site. This will minimise the impact of operatives and staff trips on the local highway network within the vicinity of the satellite construction compounds.

14.5.23 There will be a requirement for a small proportion of operatives to report directly to the satellite such as security and vehicle marshals.

Operational hours for compounds

14.5.24 Standard working hours will be 08:00 to 18:00 Monday to Friday and 08:00 – 13:00 Saturday with 30 minutes for setting up and organising/ cleaning the site. Standard working hours refer to all activities where construction does not interfere with or require a closure of the operating railway. In general, this can be taken to define the majority of the works in constructing the Scheme.

14.5.25 However, subject to agreement with the Local Authority, there may be occasions that, when necessary, works outside of these hours will be required to minimise the overall length of the works programme and reduce impact on road and highway network users whenever possible.

14.5.26 The Scheme Contractor may seek to exercise extended working hours regime during longer hours of daylight in the summer months if required with the agreement of the Kirklees Council as the relevant Local Authority. During the winter months when there is less daylight, shorter working days may be used in consideration of the safety precautions for construction workers and the general public.

14.5.27 Further details on the operational hours is provided within Part A of the CoCP in Appendix 2-1.

14.5.28 The duration that these compounds will be in operation throughout the construction period is set out in Appendix 14-8.

14.5.29 Operatives will be required to clock in and out at the start and finish of each shift, starting late or finishing early will result in a reduction of their pay and therefore it is assumed that no operatives will be outside of the site hours. Generally, operatives will arrive early to use the welfare and canteen facilities.

14.5.30 Staff time will be more variable, support and administrative staff will keep more traditional office hours while delivery staff (engineers and construction managers) will be closer to the operative hours.

Temporary road closures

14.5.31 Whilst every effort has been made to avoid closures of roads, there are some cases where this is unavoidable in order to complete the required works. In total, there are 14 locations where temporary road closures have been deemed to be necessary. Table 14-9 provides a list of these temporary road closures along with likely duration and diversionary route.

14.5.32 It should be noted that, as with all of the information provided within this assessment, the identified temporary road closures are based on outline design and may be subject to change due to continuing efforts to minimise their need. Proposed diversion routes are also indicative at this stage and subject to further discussions with the Local Highway Authority. Nevertheless, current assumptions regarding temporary road closures are considered sufficiently robust for this assessment.

Table 14-9 Temporary road closures along Scheme

Route Section	Temporary road closure	Duration	Proposed Diversionary route
1 – Huddersfield	John William Street	1 month	Castlegate, Southgate and Kirkgate into the town centre (apart from Green Street)
1 – Huddersfield	Springwood Street	Two events over a 3 month period, each lasting one week	Water Street, Merton Street and Cecil Street
1 – Huddersfield	Castlegate and the Viaduct	3 months	Diversion round Castlegate to Trinity Street and Westgate then back up John William Street
1 – Huddersfield	Northgate	5 months	Bradford Road at Willow Lane East and then via Hillhouse Lane to A62, re-join the ring road via Lower Fitzwilliam Street. There is a local diversion from Bradford Road via Ray Street to Great Northern Street to Lower Fitzwilliam Street and then to the Ring road (Southgate).
2 – Hillhouse and Fartown	Hillhouse Lane	Maximum of 2 x 1no. week events assumed (to bring plant in and take away at start and end of works)	A461 to Southgate and then onto the A62
2 – Hillhouse and Fartown	Emerald Street	Overnight (may be required)	No diversion route proposed due to lack of suitable alternative.
3 – Deighton and Bradley	Whitacre Street	5 months	Deighton Road to the A62 or alternatively via Glenfield Avenue on to Deighton Road and then on to the A62; wider network diversion is likely to route traffic via Bradford Road (Huddersfield) to Bradley Road A6107).
3 – Deighton and Bradley	Lilac Court	Around 1 month (for utilities)	No diversion route proposed due to lack of suitable alternative.
3 – Deighton and Bradley	A62 Leeds Road	10 months (overnight only)	Deighton Road to Whitacre Street and then onto A62 or down Deighton Road, onto Glenfield Avenue to Whitacre Street and then onto A62; wider network diversion is likely to route traffic via Bradford Road (Huddersfield) to Bradley Road A6107) to Bradford Road (Huddersfield).
4 – Colne Bridge and Battyeford	B6118 Colne Bridge Road	7 weeks	A62 onto A644, then onto Station Road to Hopton Lane, and onto B6118 Colne Bridge Road.

Route Section	Temporary road closure	Duration	Proposed Diversionary route
5 – Mirfield and Lower Hopton	Station Road	3 months	A644, Newgate and Back Station Lane or A644 to Steanard Lane and Granny Lane (light goods vehicles only)
6 – Ravensthorpe and Westtown	Calder Road	5 months	A644 to B6117 and then onto Forge Lane
6 – Ravensthorpe and Westtown	Thornhill Road	12 weeks	Huddersfield Road, then Webster Hill to Aldams Road. Right turn into Wilton Street onto Savile Road to Station Road. Alternative diversion - via Huddersfield Road, then Webster Hill. Right turn into Mill Street West onto Savile Road to Station Road

Temporary closures of Public Rights of Way

14.5.33 Temporary closures of PRoW during construction along the Scheme are listed in Table 14-10. Details of the existing PRoW and the proposed temporary diversionary routes are provided in Figure 2-2.

Table 14-10 Temporary closures of Public Rights of Way along Scheme

Route Section	PRoW reference	Type	Temporary impacts during construction
1 – Huddersfield	HUD/327/10	Footpath	Temporary closure during construction works at Springwood Junction. Diversion route proposed.
1 – Huddersfield	HUD/327/20	Footpath	Temporary closure during construction works at Springwood Junction. Diversion route proposed.
1 – Huddersfield	HUD/328/10	Footpath	Temporary closure during construction works at Springwood Junction. Diversion route proposed.
1 – Huddersfield	HUD328/20	Footpath	Temporary closure during construction works at Springwood Junction. Diversion route proposed.
1 – Huddersfield	HUD328/30	Footpath	Temporary closure during construction works at Springwood Junction. Diversion route proposed.
1 – Huddersfield	HUD/329/10	Footpath	Temporary closure during construction works at Springwood Junction. Diversion route proposed.
1 – Huddersfield	HUD/338/10	Footpath	Temporary closure during construction works at Springwood Junction. Diversion route proposed.
2 – Hillhouse and Fartown	HUD/58/10	Byway	Temporary closure during construction works through Deighton Corridor including Red Doles Road. Diversion route proposed.
2 – Hillhouse and Fartown	HUD/57/10	Footpath	Temporary closure of footpath from Red Doles Road Underbridge (MVL3/96) to the north of the canal (canal lock bridge will be kept open) during construction works through Deighton Corridor including Red Doles Road. Diversion route proposed.
2 – Hillhouse and Fartown	HUD/56/20	Footpath	Potential for construction traffic to utilise PRoW/access road but no requirement to temporarily close the PRoW.
2 – Hillhouse and Fartown	Birkby Bradley Greenway	NCN 69	Temporary closure/diversion from Field House Overbridge (MVL3/98) to Peel's Pit Underbridge (MVL3/100) to accommodate construction works within Deighton Corridor.
2 – Hillhouse and Fartown	HUD/42/10	Footpath	Temporary closure during construction works through Deighton Corridor including Old Fieldhouse Lane. Diversion route proposed.

Route Section	PRoW reference	Type	Temporary impacts during construction
2 – Hillhouse and Fartown	HUD/41/20	Byway	Temporary closure during construction works through Deighton Corridor including Old Fieldhouse Lane. Diversion route proposed.
2 – Hillhouse and Fartown	HUD/41/30	Byway	Potential for construction traffic to utilise PRoW/access road but no required to temporarily close the PRoW.
2 – Hillhouse and Fartown	Canal Towpath to south of Fieldhouse Lane	Towpath	Potential for construction traffic to cross towpath in vicinity of canal bridge (Field House Overbridge (MVL3/98)). Crossing point to be installed during construction and other necessary mitigation measures will be employed as appropriate.
2 – Hillhouse and Fartown	HUD/44/30	Footpath	Temporary closure during construction works through Deighton Corridor including Ridings Underbridge (MVL3/99). Diversion route proposed.
2 – Hillhouse and Fartown	Canal Towpath to south of Ridings	Towpath	Potential for construction traffic to cross towpath in vicinity of canal bridge (Ridings Underbridge (MVL3/99)). Crossing point to be installed during construction and other necessary mitigation measures will be employed as appropriate.
2 – Hillhouse and Fartown	Birkby Bradley Greenway	NCN 69	Temporary closure/diversion to accommodate construction works between Ridings Underbridge (MVL3/99) and Whitacre Street. Diversion route proposed.
3 – Deighton and Bradley	Calder Valley Greenway	NCN 66	Temporary closure during construction plus diversion for construction of new Wheatley's Overbridge (MVL3/103). Diversion route proposed.
4 – Colne Bridge and Battyeford	Calder Valley Greenway	NCN 66	Potential for construction traffic to cross Greenway in vicinity of Paul Lane compound. Crossing point to be installed during construction and other necessary mitigation measures will be employed as appropriate (including for use as a bridleway).
4 – Colne Bridge and Battyeford	Canal towpath to south of B6118 Colne Bridge Road	Towpath	Temporary closure during construction works
4 – Colne Bridge and Battyeford	KIR/240/10	Footpath	Temporary closure of footpath during construction in Heaton Lodge area. No diversion proposed due to lack of suitable alternatives.
4 – Colne Bridge and Battyeford	Calder Valley Greenway MIR106/10 MIR251/10	NCN 66 Bridleway	Temporary closure of Greenway between Woodend Road Overbridge (MVN2/191) and for a distance of 200m to the west for works to Heaton Lodge Junction, Mirfield Culvert (MVN2/190A) and Mirfield No. 1 Culvert (MVN2/190B).
5 – Mirfield and Lower Hopton	MIR/50/10	Footpath	Temporary closure during works to Mirfield Station and surrounding areas. Diversion routes proposed.

Route Section	PRoW reference	Type	Temporary impacts during construction
5 – Mirfield and Lower Hopton	MIR/50/20	Footpath	Temporary closure during works to Mirfield Station and surrounding areas. Diversion routes proposed.
5 – Mirfield and Lower Hopton	MIR/75/10	Footpath	Temporary closure during construction works to Ladywood Culvert (MVN2/200C) (conflict with construction access). No diversion proposed.
5 – Mirfield and Lower Hopton	MIR/76/10	Bridleway	Temporary closure during construction works at Sands Lane Overbridge (MVN2/199) and Overhead Line Equipment (OLE) works between Sands Lane and Hunger Hill Overbridge (MVN2/201). No diversion proposed.
5 – Mirfield and Lower Hopton	MIR/76/20	Bridleway	Temporary closure during construction works at Sands Lane Overbridge (MVN2/199) and OLE works between Sands Lane and Hunger Hill Overbridge (MVN2/201). Temporary realignment may be required during construction works which will enable path to remain in use during works. No diversion proposed.
6 – Ravensthorpe and Westtown	DEW/1a/10	Bridleway	Temporary closure of bridleway over Hunger Hill Overbridge (MVN2/201) during works to the bridge. Diversion of the bridleway between Hunger Hill Overbridge (MVN2/201) and Ravensthorpe Road to facilitate the development of the new Ravensthorpe Station and associated embankment.
6 – Ravensthorpe and Westtown	DEW/3/10	Bridleway	Temporary closure of bridleway between Hunger Hill Overbridge (MVN2/201) and Ravensthorpe Road – for construction works to station and embankment.
6 – Ravensthorpe and Westtown	DEW/1/10	Bridleway	No direct impacts but temporary closure during construction works due to closure of DEW/1a/10 and DEW/3/10.
6 – Ravensthorpe and Westtown	DEW/155/10	Footpath	Temporary closure during construction of works in Ravensthorpe area as well as impacts due to access from Calder Road being affected
6 – Ravensthorpe and Westtown	Calder and Hebble towpath – from Ravensthorpe Bridge to Long Cut End Bridge	Towpath	Temporary closure during construction of works in Ravensthorpe area as well as impacts due to access from Calder Road being affected
6 – Ravensthorpe and Westtown	Calder and Hebble towpath – from Long Cut End Bridge to Schofield Railway Bridge	Towpath	Temporary closure during construction of works in Ravensthorpe area. Temporary closure during construction of works in Ravensthorpe area.
6 – Ravensthorpe and Westtown	DEW/117/20	Footpath	Temporary closure during construction of works in Ravensthorpe area. Diversion proposed.
6 – Ravensthorpe and Westtown	DEW/117/30	Footpath	Temporary closure during construction of works in Ravensthorpe area. Diversion proposed.

Route Section	PRoW reference	Type	Temporary impacts during construction
6 – Ravensthorpe and Westtown	Spen Valley Greenway	NCN Route 69	Temporary closure during construction of Baker Viaduct Underbridge (RBA/2).
6 – Ravensthorpe and Westtown	DEW/116/30	Bridleway	Temporary closure during construction of viaduct and utility works.
6 – Ravensthorpe and Westtown	DEW/116/20	Bridleway	Temporary closure during construction of viaduct and utility works.
6 – Ravensthorpe and Westtown	DEW/116/20	Bridleway	Temporary closure during works to divert overhead power lines. No reasonable diversion available.
6 – Ravensthorpe and Westtown	DEW/8/50	Footpath	Temporary closure during works to divert overhead power lines. No reasonable diversion available.
6 – Ravensthorpe and Westtown	DEW/12/10	Footpath	Temporary closure during works to divert overhead power lines. No reasonable diversion available.
6 – Ravensthorpe and Westtown	DEW/5/20	Footpath	Temporary closure during works to divert overhead power lines. No reasonable diversion available.
6 – Ravensthorpe and Westtown	DEW/6/10	Bridleway	Temporary closure during works to divert overhead power lines. Following which diversion would be available via DEW/94/10 then DEW/12/40, DEW/12/30, DEW/12/10, DEW/12/20, DEW/8/30, DEW/7/10
6 – Ravensthorpe and Westtown	DEW/6/20	Bridleway	Temporary closure during works to divert overhead power lines. Following which diversion would be available via DEW/94/10 then DEW/12/40, DEW/12/30, DEW/12/10, DEW/12/20, DEW/8/30, DEW/7/10
6 – Ravensthorpe and Westtown	DEW/6/30	Bridleway	Temporary closure during works to divert overhead power lines. Following which diversion would be available via DEW/94/10 then DEW/12/40, DEW/12/30, DEW/12/10, DEW/12/20, DEW/8/30, DEW/7/10
6 – Ravensthorpe and Westtown	DEW/6/50	Bridleway	Temporary closure during works to divert overhead power lines. Following which diversion would be available via DEW/94/10 then DEW/12/40, DEW/12/30, DEW/12/10, DEW/12/20, DEW/8/30, DEW/7/10
6 – Ravensthorpe and Westtown	DEW/15/10	Footpath	Temporary closure during works to divert overhead power lines. No reasonable diversion available.
6 – Ravensthorpe and Westtown	DEW/16/10	Footpath	Temporary closure during works to divert overhead power lines. No reasonable diversion available.
6 – Ravensthorpe and Westtown	DEW/12/30	Footpath	Temporary closure during works to divert overhead power lines. No reasonable diversion available.
6 – Ravensthorpe and Westtown	DEW/12/40	Bridleway	Temporary closure during works to divert overhead power lines. No reasonable diversion available.

Route Section	PRoW reference	Type	Temporary impacts during construction
6 – Ravensthorpe and Westtown	DEW/94/10	Bridleway	Temporary closure during works to divert overhead power lines. No reasonable diversion available.
6 – Ravensthorpe and Westtown	DEW/6/60	Bridleway	Temporary closure during works to divert overhead power lines. No reasonable diversion available.

Other temporary traffic measures

14.5.34 There are a range of other anticipated interventions (such as lane width restrictions, parking restrictions, traffic control measures, speed control measures etc) on the road network which will have a lesser impact than would be expected from a full temporary road closure but will have a minor impact nonetheless. These locations are discussed in detail within the TA in Appendix 14-1.

14.5.35 Again, this information is based on current assumptions and may be subject to change. Exact details of temporary traffic management arrangements will be discussed and agreed with Kirklees Council as Local Highways Authority as part of the CTMP prior to the works being required.

Temporary closure of the railway

14.5.36 Planning for the construction of the Scheme has sought to minimise the requirement for full closure of the railway. Nonetheless, section of the railway will need to be either partially or fully closed for a period of time to complete some of the works. This will necessitate the use of Rail Replacement Buses. For the purpose of this assessment, it is assumed that these buses will operate in the same fashion as they would when the railway has previously been closed for maintenance works, with the same passenger pick-up and drop-off locations.

14.5.37 A temporary platform is proposed at the Hillhouse Compound site, which will enable services to continue to operate to Leeds whilst works at Huddersfield Station are ongoing. Rail passengers will be required to purchase a ticket at the existing station and will be bused to the Hillhouse site in order to prevent uncontrolled access to the compound site.

Construction phase effects

14.5.38 The potential effects as a result of the construction phase impacts including temporary diversionary routes, temporary road closures and other temporary measures/interventions has been considered. Construction traffic has been added onto the base models and the worst case from each of the five modelling scenarios for each link has been used to undertake this assessment.

Driver delay, Pedestrian and cyclist delay and Accidents and safety

14.5.39 Given that the screening process has already removed a number of links for further assessment (see paragraphs 14.3.48 to 14.3.56), the Scheme's magnitude of impacts during the construction phase has been considered for all 116 links identified within the core study area and based upon the thresholds in Table 14-5.

14.5.40 The magnitude of impacts on links for Driver delay, Pedestrian and cyclist delay and Accidents and safety during the construction phase for the Scheme by Route Section is presented in Table 14-11. The full assessment for each link is provided in Appendix 14-9.

Table 14-11 Summary of magnitude of impacts for Driver delay, Pedestrian and cyclist delay and Accidents and safety

Route Section	Number of links				
	Negligible (<30% change in Total Traffic flow)	Minor (30%-60% change in Total Traffic flow)	Moderate (60%-90% change in Total Traffic flow)	Substantial (90% and above change in in Total Traffic flow)	Total
1 – Huddersfield	24	18	2	5	49
2 – Hillhouse and Fartown	6	6	1	5	18
3 – Deighton and Bradley	9	6	1	3	19
4 – Colne Bridge and Battyeford	6	1	2	2	11
5 – Mirfield and Lower Hopton	2	2	1	2	7
6 – Ravensthorpe and Westtown	6	4	0	2	12
Total	**53**	**37**	**7**	**19**	**116**

14.5.41 Based on the sensitivity of receptors and the magnitude of impact, the Scheme's significance of effect (in accordance with Table 14-6) in relation to Driver delay, Pedestrian and cyclist delay, and Accidents and safety during construction is illustrated in Figure 14-11. A summary of the significance of effects for links identified for the Scheme and for each Route Section is provided in Table 14-12. The full assessment for each link by Route Section is included in Appendix 14-9.

Table 14-12 Summary of significance of effects for Driver delay, pedestrian and cyclist delay and accidents and safety

Route Section	Number of links		
	Not significant	Significant	
	Slight	Moderate	Large
1 – Huddersfield	32	13	4
2 – Hillhouse and Fartown	9	5	4
3 – Deighton and Bradley	9	6	4
4 – Colne Bridge and Battyeford	6	3	2
5 – Mirfield and Lower Hopton	3	2	2
6 – Ravensthorpe and Westtown	9	1	2
Total	**68**	**30**	**18**

14.5.42 Table 14-12 shows that the Scheme's significance of effect in relation to Driver delay, Pedestrian and cyclist delay, and Accidents and safety during construction is:

- Temporary Slight adverse effect on 68 links (59%);
- Temporary Moderate adverse effect on 30 links (26%); and
- Temporary Large adverse effect on 18 links (15%).

14.5.43 Therefore, in total 68 links will experience no significant adverse effects and 48 links will experience temporary significant adverse effects during construction.

14.5.44 Further details, including the percentage change in traffic along all links and their associated magnitude of impact and significance of effect, are shown in Appendix 14-9.

14.5.45 Further consideration of the 48 links that experience temporary significant adverse effects during construction in terms of Driver Delay, Pedestrian and Cyclist Delay, and Accidents and Safety is presented in Table 14-13.

Table 14-13 Overview of roads/links that will experience temporary significant adverse effects during construction for Driver delay, pedestrian and cyclist delay and accidents and safety

Route Section	Number of roads/links that will experience significant adverse effects	Temporary Moderate adverse effects	Temporary Large adverse effects	Commentary
1 – Huddersfield	11 roads (comprising of 17 links)	Broad Lane, Fitzwilliam Street, Lidget Street (Lindley), New North Road, Northgate, St. Andrew's Road and Trinity Street/ Westgate	Blacker Road (Birkby), Burn Road (Birchencliffe), Somerset Road and St. Peter's Street	It is anticipated that these will occur mainly during scenario 1 of the model assessment which assumes that the Bradford Road compound is in operation. It also assumes that Castlegate and Northgate are temporarily closed along with other various temporary traffic management measures throughout Huddersfield being in operation. These measures are mainly associated with the construction works at Huddersfield Viaduct (MVL3/92) which could last 3 months and Huddersfield Viaduct (Span 29) Underbridge (MVL3/92(9)) which could last 5 months.
2 – Hillhouse and Fartown	8 roads (comprising 9 links)	Alder Street, Hillhouse Lane, Leeds Road and Netheroyd Hill Road	Bradley Mill Road, Fartown Green Road, Spaines Road and Woodhouse Hill	It is anticipated that these impacts will occur mainly during scenarios 1 or 2 of the model assessment which assumes that the Hillhouse and Hillhouse Lane compounds are in operation. These scenarios assume that there will be temporary traffic management on Hillhouse Lane, Alder Street, Willow Lane, Emerald Street and Great Northern Street and therefore these impacts are only likely to occur for a maximum of 7 months.
3 – Deighton and Bradley	6 roads (comprising 10 links)	Bradley Road, Leeds Road and Thornhill Road (Brighouse)	Crowtrees Lane, Deighton Road and Whitacre Street	Model assessment indicates that significant impacts occur mainly during scenarios 1 and 2 which assumes that the A62 compound is in operation and that the temporary closures of the A62 Leeds Road and other restrictions are in place (lane, parking etc.). These impacts are therefore only likely to occur for a maximum of 10 months. Furthermore, the temporary road closures are likely to only occur at night during works to A62 Leeds Road Overbridge (MVL3/102) and therefore some of these reported impacts during construction may not be less than reported.
4 – Colne Bridge and Battyeford	5 roads (comprising 5 links)	Hollin Lane, Leeds Road, St. Mary's Lane	Blake Law Lane, Stocks Bank Road	It is anticipated that these impacts will occur during scenario 2 of the model assessment when the B6118 Colne Bridge Road compound is in operation. It also includes the temporary road

Route Section	Number of roads/links that will experience significant adverse effects	Temporary Moderate adverse effects	Temporary Large adverse effects	Commentary
				closure on B6118 Colne Bridge Road and therefore these impacts are likely to occur for a maximum of 9 months.
5 – Mirfield and Lower Hopton	4 roads (comprising 4 links)	Huddersfield Road, Station Road	Hopton New Road, Newgate (Mirfield)	It is anticipated that these impacts will occur during scenario 2 of the model assessment when the Mirfield Station and Mirfield Viaduct compounds are in operation. It also includes the temporary traffic management (lane and parking restriction) in and around Mirfield Station and Mirfield Viaduct Underbridge (MVN2/192). These impacts are therefore only likely to occur for a maximum of 13-18 months. Newgate is likely to experience significant impacts during scenario 3 when the temporary road closure is in place on Station Road to facilitate works at Mirfield Station, although this is expected to occur for a maximum of 3 months.
6 – Ravensthorpe and Westtown	3 roads (comprising 3 links)	Thornhill Road (Ravensthorpe)	Fall Lane, Savile Road	The impacts are likely to occur during scenario 4 of the model assessment when Ravensthorpe and Thornhill Road/Fall Lane compounds are in operation. However, the impacts appear to be associated with the temporary closure of Calder Road within the assessment model and therefore these impacts are only likely to occur for a maximum of 5 months. The impacts on Savile Road occur during scenario 5 which assumes that there is a temporary closure of Thornhill Road which is likely to last 12 weeks.

Pedestrian and cyclist amenity

14.5.46 Given that the screening process has already removed a number of links for further assessment (see paragraphs 14.3.48 to 14.3.56), the Scheme's magnitude of impacts for pedestrian and cyclist amenity during the construction phase has been considered for all 116 links identified within the core study area and based upon the thresholds in Table 14-5.

14.5.47 The magnitude of impacts on links for Pedestrian and cyclist amenity during the construction phase for the Scheme and detailed each Route Section is presented in Table 14-14. The full assessment for each link is provided in Appendix 14-10.

Table 14-14 Summary of magnitude of impacts for Pedestrian and cyclist amenity

Route Section	Number of links				
	Negligible (less than 50% change in Total Traffic flow)	Minor (50%-60% change in Total Traffic flow)	Moderate (60%-90% change in Total Traffic flow)	(Substantial 90% and above change in Total Traffic flow)	Total
1 – Huddersfield	39	3	2	5	49
2 – Hillhouse and Fartown	12	0	1	5	18
3 – Deighton and Bradley	14	1	1	3	19
4 – Colne Bridge and Battyeford	7	0	2	2	11
5 – Mirfield and Lower Hopton	4	0	1	2	7
6 – Ravensthorpe and Westtown	10	0	0	2	12
Total	**86**	**4**	**7**	**19**	**116**

14.5.48 Based on the sensitivity of receptors and the magnitude of impact, the Scheme's significance of effect (in accordance with Table 14-6) on Pedestrian and cyclist amenity during construction is illustrated in Figure 14-12. A summary of the significance of effects for links identified for the Scheme and detailed for each Route Section is provided in Table 14-15. The full assessment for each link by Route Section is included in Appendix 14-10.

Table 14-15 Summary of significance of effects for Pedestrian and cyclist amenity

Route Section	Number of links		
	Not significant	Significant	
	Slight	Moderate	Large
1 – Huddersfield	40	5	4
2 – Hillhouse and Fartown	13	1	4
3 – Deighton and Bradley	14	1	4
4 – Colne Bridge and Battyeford	7	2	2
5 – Mirfield and Lower Hopton	4	1	2
6 – Ravensthorpe and Westtown	10	0	2
Total	**88**	**10**	**18**

14.5.49 Table 14-15 shows that the Scheme's significance of effect in relation to Pedestrian and cyclist delay amenity during construction is:

- Temporary Slight adverse effect on 88 links (76%);
- Temporary Moderate adverse effect on 10 links (9%); and
- Temporary Large adverse effect on 18 links (15%).

14.5.50 Therefore, in total 88 links will experience no significant adverse effects and 28 links will experience temporary significant adverse effects during construction.

14.5.51 Further consideration of the 28 links that experience temporary significant adverse effects during construction in terms of Pedestrian and cyclist amenity is presented in Table 14-16.

14.5.52 Further details, including the percentage change in traffic along all links and their associated magnitude of impact and significance of effect, are shown in Appendix 14-10.

Table 14-16 Overview of roads/links that will experience temporary significant adverse effects during construction for Pedestrian and cyclist amenity

Route Section	No of roads/links that will experience significant adverse effects	Temporary Moderate adverse effects	Temporary Large adverse effects	Commentary
1 – Huddersfield	9 roads (comprising 9 links)	Fitzwilliam Street, New North Road, Northgate, a section of St. Andrew's Road, Trinity Street/ Westgate	Blacker Road, Burn Road, Somerset Road, St. Peter's Street	Model assessment indicates that significant impacts occur mainly during scenario 1 which assumes that the Bradford Road compound is in operation. It also assumes that there will be temporary closures to Castlegate and Northgate as well as various other traffic management throughout Huddersfield. These measures are mainly associated with the construction works at Huddersfield Viaduct (MVL3/92) which could last 3 months and Huddersfield Viaduct (Span 29) Underbridge (MVL3/92(9)) which could last 5 months. Model assessment indicates that significant impacts occur on Somerset Road during scenario 2 and 5 which assess either Bradford Road or the Fitzwilliam Street Compound being in operation and therefore Somerset Road will be affected throughout the construction period.
2 – Hillhouse and Fartown	5 roads (comprising 5 links)	Alder Street	Bradley Mills Road, Fartown Green Road, Spaines Road, Woodhouse Hill	It is anticipated that these impacts will occur mainly during scenarios 1 and 2 in the model assessment. As previously noted, the temporary traffic management measures assessed in these scenarios are only likely to occur for a maximum of 7 months.
3 – Deighton and Bradley	4 roads (comprising 5 links)	Leeds Road	Crowtrees Lane, Deighton Road, Whitacre Street	Model assessment indicates that significant impacts occur mainly during scenarios 1 and 2. As previously noted, the temporary traffic management measures assessed in these scenarios are likely to last a maximum of 10 months. However, temporary road closures will only occur at night during works to A62 Leeds Road Overbridge (MVL3/102) and therefore some of these reported impacts during construction may be less than reported.

Route Section	No of roads/links that will experience significant adverse effects	Temporary Moderate adverse effects	Temporary Large adverse effects	Commentary
4 – Colne Bridge and Battyeford	4 roads (comprising 4 links)	Hollin Hall Lane, St. Mary's Lane	Blake Law Lane, Stocks Banks Road	It is anticipated that these impacts will occur mainly during scenario 2 of the model assessment. As previously noted, the temporary traffic management measures assessed in this scenario is likely to occur for a maximum of 9 months.
5 – Mirfield and Lower Hopton	3 roads (comprising 3 links)	Station Road	Hopton New Road, Newgate (Mirfield)	Model assessment indicates that significant impacts occur during scenario 2 and 3. As previously noted, the temporary traffic management measures assessed in these scenarios are likely to last between 13 and 18 months.
6 – Ravensthorpe and Westtown	2 roads (comprising 2 links)		Fall Lane, Savile Road	Model assessment indicates that significant impacts occur on Fall Lane during scenario 4. As previously noted, the temporary traffic management measures assessed in this scenario is likely to last a maximum of 5 months. The impacts on Savile Road occur during scenario 5 which assumes that there is a temporary closure of Thornhill Road; this is likely to last 12 weeks.

Fear and intimidation

14.5.53 Given that the screening process has already removed a number of links for further assessment (see paragraphs 14.3.48 to 14.3.56), the Scheme's magnitude of impacts for Fear and Intimidation has been considered for all 116 links identified within the core study area and based upon the thresholds in Table 14-5.

14.5.54 The magnitude of impacts on links for fear and intimidation during the construction phase for the Scheme and detailed for each Route Section is presented in Table 14-17. The full assessment for each link is provided in Appendix 14-11.

Table 14-17 Summary of magnitude of impacts for Fear and intimidation

Route Section	Number of links				
	Negligible (Average 18hr Traffic flows <600 and HGVs <1000)	Minor (Average 18hr Traffic flows 600-1200 and HGVs 1000-2000)	Moderate (Average 18hr Traffic flows 1200-1800 and HGVs 2000-3000)	Substantial (Average 18hr Traffic flows >1800 and HGVs >3000)	Total
1 – Huddersfield	24	18	2	5	49
2 – Hillhouse and Fartown	6	6	1	5	18
3 – Deighton and Bradley	9	6	1	3	19
4 – Colne Bridge and Battyeford	6	1	2	2	11
5 – Mirfield and Lower Hopton	2	2	1	2	7
6 – Ravensthorpe and Westtown	6	4	0	2	12
Total	**53**	**37**	**7**	**19**	**116**

14.5.55 The Scheme's magnitude of impacts on links for fear and intimidation are predicted to be Substantial on all 116 links.

14.5.56 Based on the sensitivity of receptors and the magnitude of impact, the Scheme's significance of effect (in accordance with Table 14-6) in relation to fear and intimidation is illustrated in Figure 14-13. A summary of the significance of effects for links identified for the Scheme and for each Route Section is provided in Table 14-18. The full assessment for each link is included in Appendix 14-11.

Table 14-18 Summary of significance of effects for Fear and intimidation

Route Section	Number of links		
	Not significant	Significant	
	Slight	Moderate	Large
1 – Huddersfield	32	13	4
2 – Hillhouse and Fartown	9	5	4
3 – Deighton and Bradley	9	6	4
4 – Colne Bridge and Battyeford	6	3	2
5 – Mirfield and Lower Hopton	3	2	2
6 – Ravensthorpe and Westtown	9	1	2
Total	**68**	**30**	**18**

14.5.1 Table 14-18 shows that the Scheme's significance of effect in relation to fear and intimidation during construction is:

- Temporary Slight adverse effect on 68 links (57%);
- Temporary Moderate adverse effect on 30 links (26%); and
- Temporary Large adverse effect on 18 links (17%).

14.5.2 Therefore, in total 68 links will experience no significant adverse effects and 48 links will experience temporary significant adverse effects during construction.

14.5.3 Further consideration of the 48 links that experience temporary significant adverse effects during construction in terms of Fear and intimidation is presented in Table 14-19.

14.5.4 Further details, including the percentage change in traffic along all links and their associated magnitude of impact and significance of effect, are shown in Appendix 14-11.

Table 14-19 Overview of roads/links that will experience temporary significant adverse effects during construction for Fear and intimidation

Route Section	Number of roads/links that will experience significant adverse effects	Temporary Moderate adverse effects	Temporary Large adverse effects	Commentary
1 – Huddersfield	11 roads (comprising 17 links)	Broad Lane; Burn Road; Fitzwilliam Street; Lidget Street; New North Road; Northgate; St Andrew's Road; Trinity Street/ Westgate	Blacker Road, Burn Road, Somerset Road, St. Peter's Street	It is anticipated that these impacts will occur mainly during scenarios 1 and 2 the model assessment. As previously noted, the temporary traffic management measures assessed in these scenarios are only likely to last between 3 and 5 months. Trinity/Westgate also experience significant impacts during Scenario 3 which assumes that there will be temporary closures to Fitzwilliam Street, John William Street and St. John's Road as well as other temporary traffic measures in the vicinity. These roads are therefore likely to experience these impacts during the construction works at Huddersfield Viaduct (Span 1) Underbridge (MVL3/92(1)) that could last approximately 1 month.
2 – Hillhouse and Fartown	8 roads (comprising 9 links)	Alder Street; Hillhouse Lane; Leeds Road; Netheroyd Hill Road	Bradley Mills Road; Fartown Green Road; Spaines Road, Woodhouse Hill	It is anticipated that these impacts will occur mainly during scenarios 1 and 2 the model assessment. As previously noted, the temporary traffic management measures assessed in these scenarios are only likely to occur for a maximum of 7 months.
3 – Deighton and Bradley	6 roads (comprising 10 links)	Bradley Road, Leeds Road, Thornhill Road (Brighouse)	Crowtrees Lane, Deighton Road, Whitacre Street	Model assessment indicates that significant impacts occur mainly during scenarios 1 and 2. As previously noted, the temporary traffic management measures assessed in these scenarios are likely to last a maximum of 10 months. However, temporary road closures will only occur at night during works to A62 Leeds Road Overbridge (MVL3/102) and therefore some of these reported impacts during construction may be less than reported. Bradley Road and Halifax Road are shown to experience impacts that are significant during Scenario 4 which assumes that Deighton Station and Whitacre Street compound is in operation and there is a temporary closure to Whitacre Street. Whitacre Street closures could last up to 5 months and the construction compounds will be in operation for 24 months. These impacts could therefore last between 5 and 24 months.
4 – Colne Bridge and Battyeford	5 roads (comprising 5 links)	Holin Hall Lane, Leeds Road, St Mary's Lane	Blake Law Lane, Stocks Bank Road	It is anticipated that these impacts will occur mainly during scenario 2 of the model assessment. As previously noted, the temporary traffic management measures assessed in this scenario is likely to occur for a maximum of 9 months.
5 – Mirfield and Lower Hopton	4 roads (comprising 4 links)	Huddersfield Road, Station Road	Hopton New Road, Newgate (Mirfield)	Model assessment indicates that significant impacts occur mainly during scenario 2. As previously noted, the temporary traffic management measures assessed in this scenario is likely to between 13-18 months.
6 – Ravensthorpe and Westtown	3 roads (comprising 3 links)	Thornhill Road	Fall Lane, Savile Road	Model assessment indicates that significant impacts occur on Fall Lane and Thornhill Road during scenario 4. As previously noted, the temporary traffic management measures assessed in this scenario is likely to last a maximum of 5 months. The impacts on Savile Road occur during scenario 5 which assumes that there is a temporary closure of Thornhill Road; this is likely to last 12 weeks.

Severance

14.5.5 Given that the screening process has already removed a number of links for further assessment (see paragraphs 14.3.48 to 14.3.56), the Scheme's magnitude of impacts for Severance has been considered for all 116 links identified within the core study area and based upon the thresholds in Table 14-5.

14.5.6 The magnitude of impacts on links for Severance during the construction phase for the Scheme and for each Route Section is presented in Table 14-20. The full assessment for each link is provided in Appendix 14-12.

Table 14-20 Summary of magnitude of impacts for Severance

Route Section	Number of links				
	Negligible (8000 AADT (and less than 30% change in Traffic Flow or 10% in sensitive areas)	Minor (<8000 AADT)	Moderate (8000-16000 AADT)	Substantial (>16000 AADT)	Total
1 – Huddersfield	18	0	19	12	49
2 – Hillhouse and Fartown	10	0	7	1	18
3 – Deighton and Bradley	1	0	15	3	19
4 – Colne Bridge and Battyeford	4	0	6	1	11
5 – Mirfield and Lower Hopton	4	0	3	0	7
6 – Ravensthorpe and Westtown	5	0	6	1	12
Total	**42**	**0**	**56**	**18**	**116**

14.5.7 Based on the sensitivity of receptors and the magnitude of impact, the Scheme's significance of effect (in accordance with Table 14-6) in relation to Severance is illustrated in Figure 14-14. A summary of the significance of effects for links identified for the Scheme and for each Route Section is provided in Table 14-21. The full assessment for each link is included in Appendix 14-12.

Table 14-21 Summary of significance of effects for Severance

Route Section	Number of links		
	Not significant	Significant	
	Slight	Moderate	Large
1 – Huddersfield	20	3	26
2 – Hillhouse and Fartown	11	0	7
3 – Deighton and Bradley	1	0	18
4 – Colne Bridge and Battyeford	6	1	4
5 – Mirfield and Lower Hopton	4	1	2
6 – Ravensthorpe and Westtown	7	2	3
Total	**49**	**7**	**60**

14.5.8 Table 14-21 shows that the Scheme's significance of effect in relation to Severance during construction is:

- Temporary Slight adverse effect on 49 links (42%);
- Temporary Moderate adverse effect on 7 links (6%); and

- Temporary Large adverse effect on 60 links (52%).

14.5.9 Therefore, in total 49 links will experience no significant adverse effects and 67 links will experience temporary significant adverse effects during construction.

14.5.10 Further consideration of the 67 links that experience temporary significant adverse effects during construction in terms of Severance is presented in Table 14-22.

14.5.11 Further details, including the percentage change in traffic along all links and their associated magnitude of impact and significance of effect, are shown in Appendix 14-12.

Table 14-22 Overview of roads/links that will experience temporary significant adverse effects during construction for Severance

Route Section	No of roads/links that will experience significant adverse effects	Temporary Moderate adverse effects	Temporary Large adverse effects	Commentary
1 – Huddersfield	19 roads (comprising 29 links)	Fitzwilliam Street, Lowergate, Northgate	Blacker Road, Burn Road, Castlegate, Chapel Hill, Church Street, Edgerton Road, Firth Street, Fitzwilliam Street, Lidget Street, Longwood Road, New Hey Road, New North Road, Queensgate, Somerset Road, St Andrew's Road, Wakefield Road, Westbourne Road	Model assessment indicates that most roads/links experience significant impacts during scenario 1. As previously noted, the temporary traffic management measures assessed in this scenario are likely to last a between 3 and 5 months. Roads/links which experience significant impacts during scenarios 2 which assumes that Bradford Road compound is in operation and minimal temporary traffic management in places, are likely to be affected for 12 months. Queensgate and Castlegate experience significant impacts during scenarios 3 and as previously noted, the temporary traffic management measures assessed in this scenario is only likely to occur for approximately 1 month.
2 – Hillhouse and Fartown	4 roads (comprising 7 links)	None	Bradford Road, Bradley Mills Road, Leeds Road, Woodhouse Hill	It is anticipated that these impacts will occur mainly during scenarios 1 and 2 of the model assessment. As previously noted, the temporary traffic management measures assessed in these scenarios are only likely to occur for a maximum of 7 months.
3 – Deighton and Bradley	8 roads (comprising 18 links)	None	Bradley Road, Bramston Street Crowtrees Lane, Deighton Road, Halifax Road, Leeds Road, Thornhill Road (Brighouse), Whitacre Street,	Model assessment indicates that significant impacts occur mainly during scenarios 1 and 2. As previously noted, the temporary traffic management measures assessed in these scenarios are likely to last a maximum of 10 months. However, temporary road closures will only occur at night during works to MVL3/102 A62 Leeds Road Overbridge and therefore some of these reported impacts during construction may be less than reported.
4 – Colne Bridge and Battyeford	4 roads (comprising 5 links)	St Mary's Lane	Cooper Bridge Road, Leeds Road, Towngate	It is anticipated that these impacts will occur mainly during scenario 2 the model assessment. As previously noted, the temporary traffic management measures assessed in this scenario are likely to occur for a maximum of 9 months.
5 – Mirfield and Lower Hopton	3 roads (comprising 3 links)	Hopton New Road	Dunbottle Lane, Huddersfield Road	Model assessment indicates that significant impacts occur mainly during scenario 2. As previously noted, the temporary traffic management measures assessed in this scenario is likely to between 13 and 18 months.
6 – Ravensthorpe and Westtown	4 roads (comprising 5 links)	Mill Street West	North Road, Savile Road, Webster Hill	The impacts on Savile Road and Webster Hill occur during scenario 5 which assumes that there is a temporary closure of Thornhill Road; this is likely to last 12 weeks. Model assessment indicates that significant impacts occur on North Road during Scenario 2. As previously noted, the temporary traffic management measures assessed in this scenario is likely to last a throughout the four-year construction period.

Operation phase

14.5.12 The permanent changes to stations, PRoW and the road network once the Scheme is operational is set out in Table 14-23.

Table 14-23 Permanent changes during operation

Route Section	Permanent changes		
	Station	PRoW	Road network
1 – Huddersfield	**Huddersfield Station** Additional footbridge with lifts for step-free access	No changes	No changes
2 – Hillhouse and Fartown	No changes	No changes	No changes
3 – Deighton and Bradley	**Deighton Station** New drop-off point, footbridge for step-free access and disabled parking	**Birkby Bradley Greenway NCN 69** Permanent diversion/realignment of Greenway (due to embankment works on the approach to Deighton Station) **HUD/51/10 Footpath** Permanent diversion of footpath to the A62 Permanent realignment of NCN over Wheatley's Overbridge (MVL3/103)	Realignment of Whitacre Street Overbridge (MVL3/101) and A62 Leeds Road Overbridge (MVL3/102)
4 – Colne Bridge and Battyeford	No changes	**KIR/240/10 Footpath** Permanent diversion/ realignment of PRoW over new footbridge and through new underpass	Realignment of B6118 Bridge Road Overbridge (MVL3/107)
5 – Mirfield and Lower Hopton	**Mirfield Station** New footbridge for step-free access and disabled parking	No changes	No changes
6 – Ravensthorpe and Westtown	**Ravensthorpe Station** New drop-off point via a new junction, new footbridge for step-free access and disabled parking.	**DEW/3/10 Bridleway** Permanent diversion of the bridleway between Hunger Hill Overbridge (MVN2/201) and Ravensthorpe Road	Permanent realignment of Calder Road New roundabout access – Calder Road/Ravensthorpe Road/Proposed Station forecourt Permanent realignment of Thornhill Road and works at Thornhill Road/Fall Lane Junction

14.5.13 As highlighted within the supporting TA, the proposed permanent changes to the various stations are unlikely to result in notable increases in traffic flows. Instead, these changes are expected to improve circulation, ease of access for non-motorised and disabled users. The Scheme will therefore have Negligible effect on road users and Beneficial effects on non-motorised users in and around the stations. Furthermore, it is likely to have a beneficial impact on rail users as the Scheme will improve the reliability of services, provide more seating for passengers and improve the speed of trains/services.

14.5.14 In terms of permanent changes to PRoW, although some changes could marginally increase journey distances along a few of the PRoW, there will also be beneficial changes with increased footway widths and the improved conditions of those routes at certain locations. The Scheme is likely to have a permanent Negligible impact of Neutral to Slight significance, which is not significant in terms of impact on PRoW.

14.5.15 The supporting TA also assessed the operational capacity of the new roundabout on Calder Road (Calder Road/Ravensthorpe Road/proposed station forecourt) in future years. That assessment demonstrated that the new roundabout would operate within capacity during the weekday morning, inter and evening peak periods for the future assessment years of 2026 and 2041. This included additional traffic for committed developments (agreed with Kirklees – see Table 14-3), estimated future forecast flows (NTEM/TEMPro) and operational traffic flows.

14.5.16 The proposed permanent changes in the road network is unlikely to increase journey distances along these routes. A few of the permanent changes will provide new junctions that will be subject to a road safety audit process and are unlikely to create road safety concerns. Furthermore, the Scheme is likely to result in marginal increases in traffic levels at these locations and new pedestrian/cycle provision are provided where possible to assist pedestrians/cyclists along likely desire lines/routes. In most cases, these road network changes should provide improved facilities and experience for road users (vehicles and non-motorised users). In terms of permanent changes to the road network, the Scheme is considered to have permanent Negligible impact resulting in effects of Neutral to Slight significance, which is not significant.

14.5.17 Overall, the Scheme is considered to have a permanent Negligible impact with effects of Neutral to Slight significance, which is not significant.

14.6 Mitigation measures

14.6.1 Additional mitigation measures are identified in the following section in order to manage any significant effects identified by the assessment. Mitigation measures include those relating to operational and construction activities.

Construction phase

14.6.2 To help minimise disruption caused by construction traffic, temporary road works/restrictions/ diversionary routes etc., mitigation measures will be incorporated into the CoCP and CTMP, detailed as follows.

14.6.3 Part A of CoCP can be found in Appendix 2-1 in Volume 3 of this ES and will set out measures to reduce impacts of construction traffic. Part B of the CoCP will incorporate an External Communications Programme which will set out how works to the road and PRoW network will be communicated to residents and businesses. The content of the External Communications Programme will be submitted to and agreed by the Local Authority pursuant

to a condition to be attached to the deemed planning permission[8] before construction works commence.

14.6.4 A CTMP, which will be submitted to and approved by the Local Authority pursuant to a condition attached to the deemed planning permission, will include measures to reduce impacts of temporary traffic management arrangements. The measures will comprise:

- Diversion routes to be proposed for the road network during temporary road closures; discussions are ongoing with Kirklees Council's Highways Network team to ensure the most appropriate routes are proposed;
- Planning of works in phases such that neighbouring major links are not carried out simultaneously to ensure suitable alternative routes are available;
- Access to properties and businesses will be maintained as far as reasonably practicable during construction; and
- Detailed arrangements for construction compounds including:
  - Traffic route signage;
  - Signing and security of compound access and egress;
  - Co-ordination of temporary road closures; and
  - The need for diversions as well as any route timing or volume restrictions.

14.6.5 The CTMP will also include the following:

- A Rail Replacement Strategy to help reduce impact of replacement bus services during rail closures; and
- A Travel Plan for Construction Staff to reduce the impacts from workforce commuting, as well as travel between the strategic construction compounds and satellite compounds through the promotion of sustainable modes of transport as an alternative to the private car.

Operational phase

14.6.6 No mitigation measures are deemed to be necessary for the operational phase given the very limited impact of the permanent changes and the identification that the permanent changes are generally either Neutral or beneficial to the transport network.

14.7 Residual effects

14.7.1 Residual effects are those that remain after the mitigation measures (including embedded mitigation) have been implemented and these are discussed in the remainder of this section.

Construction

14.7.2 The detail of the measures to be included in the CTMP and the Travel Plan for Construction Staff (included in the CTMP) and the extent of the beneficial effect they will have cannot be quantified at this stage. Consequently, the residual significant adverse effects during construction are, for the purpose of this assessment, assumed to be the same as the pre-mitigation effects.

[8] On making an order under the Transport and Works Act 1992, the Secretary of State may direct that planning permission shall be deemed to be granted, subject to such conditions (if any) as may be specified in the direction.

Operation

14.7.3 As noted, the permanent changes resulting from the Scheme are likely to have an overall of Neutral to Slight beneficial effect, which is not significant. No mitigation measures are proposed during operation and therefore the residual effects will be the same as the permanent beneficial effects, i.e. Neutral to Slight, but not significant.

14.8 Summary of effects

14.8.1 Table 14-24 presents a summary of the significant traffic and transport effects. Further details of the effects for each Route Section is provided in Appendix 14-13.

Table 14-24 Summary of traffic and transport effects

Phase	Impact	Sensitivity of receptors	Magnitude of impact criteria applied (See Table 14-3)	Potential effects (Base + committed developments + Scheme)	Mitigation measures	Residual effect
Construction	Driver delay Pedestrian and cyclist delay Accidents and safety	18% of links low, 11% medium and 71% High	Changes in Traffic Volumes and HGVs, and V/C	59% of links are Slight, 26% are Moderate and 15% are Large. Temporary adverse effects of **Slight** significance on 68 links, which is not significant. Temporary adverse effects of **Moderate to Large** significance on 48 links, which is significant.	• Part A and B of the CoCP • CTMP including a Rail Replacement Strategy and Travel Plan for Construction Plan	Temporary adverse effects of **Slight** significance on 68 links, which is not significant. Temporary adverse effects of **Moderate to Large** significance on 48 links, which is significant.
	Pedestrian and cyclist amenity		Change in Total Traffic Flow or HGV Flows	76% of links are Slight, 9% are Moderate and 15% are Large. Temporary adverse effects of **Slight** significance on 88 links, which is not significant. Temporary adverse effects of **Moderate to Large** significance on 28 links, which is significant.		Temporary adverse effects of **Slight** significance on 88 links, which is not significant. Temporary adverse effects of **Moderate to Large** significance on 28 links, which is significant.
	Fear and intimidation		Average 18hr Traffic flow Levels	59% of links are Slight, 26% are Moderate and 15% are Large. Temporary adverse effects of **Slight** significance on 68 links, which is not significant. Temporary adverse effects of **Moderate to Large** significance on 48 links, which is significant.		Temporary adverse effects of **Slight** significance on 68 links, which is not significant. Temporary adverse effects of **Moderate to Large** significance on 48 links, which is significant.
	Severance		Levels of AADT and Changes in Traffic Flows	42% of links are Slight, 6% are Moderate and 52% are Large. Temporary adverse effects of **Slight** significance on 49 links, which is not significant. Temporary adverse effects of M**oderate to Large** significance on 67 links, which is significant.		Temporary adverse effects of **Slight** significance on 49 links, which is not significant. Temporary adverse effects of **Moderate to Large** significance on 67 links, which is significant.
Operation	Driver delay Pedestrian and cyclist delay Accidents and safety	18% of links Low, 11% Medium and 71% High	Changes in Traffic Volumes and HGVs, and V/C	Permanent **Negligible** beneficial effect of Neutral to Slight significance, which is not significant.	N/A	Permanent **Negligible** beneficial effect of Neutral to Slight significance, which is not significant.
	Pedestrian and cyclist amenity		Change in Total Traffic Flow or HGV Flows			
	Fear and intimidation		Average 18hr Traffic flow Levels			
	Severance		Levels of AADT and Changes in Traffic Flows			