



# **Kendal Inner Northern Orbital Access Route**

Strategic Outline Business Case

June 2017



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# 1 Introduction

The Kendal Strategic Transport Infrastructure Study was commissioned by Cumbria County Council (in partnership with South Lakeland District Council and Kendal Town Council) in August 2016 to investigate the feasibility of strategic transport improvements in Kendal. This Strategic Outline Business Case (SOBC) represents the final deliverable for the study. The purpose of this document is to demonstrate the case for investment in a scheme to deliver strategic transport improvements, and to support future development in Kendal and across the wider area.

## 1.1 Study Background

In addition to longstanding issues of town centre congestion, and the impact of M6 closures and subsequent traffic diversions through the town, the need for greater network resilience in the Kendal area was demonstrated by the significant and prolonged road closures following flooding associated with Storm Desmond in December 2015. The impacts of the flood event on route availability, journey times and town centre accessibility harnessed momentum and support amongst members and officers at County, District and Town Council level for a strategic transport infrastructure study for Kendal. This momentum in turn led to the commissioning of this study to examine options for strategic transport improvements, and to potentially demonstrate the case for investment in a preferred transport scheme.

To support the appraisal of options considered during this study, the primary objectives for new strategic transport infrastructure for Kendal were defined within the study scope as follows:

1. Deliver the future strategic growth of the town;
2. Reduce congestion and increase network resilience within the town centre;
3. Improve resilience and accessibility to existing employment areas; and
4. Ensure that, when the M6 is closed, diverted traffic is not reliant on single-lane bridges in Kendal therefore improving the resilience of the M6 corridor in the Kendal area.

## 1.2 Study Scope

The study comprised a series of phases and key tasks which can be summarised as follows:

- **Phase 1: Context** – Establishing options for the scale, character and locations of future growth in Kendal and transport network implications of recent flood events and M6 diversions. This phase of the study concluded in October 2016 and confirmed key issues in Kendal within a range of contexts including strategic access, local access, and environmental issues. The output for this phase of the study is the '*Phase 1: Context – Baseline Report*'.
- **Phase 2: Feasibility Assessment** – Consideration of highway capacity constraints in the Kendal area up to the end of the next Local Plan Period (2036), making use of the Kendal SATURN model. This phase of the study concluded in November 2016 and included development of potential strategic scenarios to enable Members and Officers to identify their aspirations for strategic transport infrastructure in Kendal and potential investment options during consultation.
- **Phase 3: Options Identification and Appraisal**



- Part 1: Strategic Scenario Optioneering – Identification of a preferred scenario using transport appraisal tools.
- Part 2: Option Identification – Review of the updated SATURN model to guide optioneering of infrastructure improvements and identification of a shortlist of three broad infrastructure packages for further consultation and assessment.
- Part 3: Consultation & Costing – Second round of consultation with Members and Officers to present the shortlisted infrastructure packages and subsequent cost preparation of the preferred option.
- **Phase 4: Delivery Plan** – Further development of the preferred option including production of an Appraisal Specification Report (ASR) and indicative costs to signpost further development and appraisal. Preparation of SOBC documentation to a standard required for potential Department for Transport (DfT) assessment. This document represents the output for the preparation of the SOBC documentation.

### 1.3 Document Structure

The remainder of this SOBC is set out as follows:

- **Chapter 2** – Scheme Summary;
- **Chapter 3** – The Strategic Case;
- **Chapter 4** – The Economic Case;
- **Chapter 5** – The Financial Case;
- **Chapter 6** – The Commercial Case; and
- **Chapter 7** – The Management Case.

## 2 Scheme Summary

This section provides a summary of the proposed scheme selected for Strategic Outline Business Case development, including an overview of the strategic need for the scheme and the anticipated benefits that will result from scheme delivery.

### 2.1 Strategic Need

The need for investment in strategic transport infrastructure and key contextual issues in Kendal are defined as:

- Strategic Access:
  - When the M6 Emergency Diversion Route (EDR) is activated, diverted traffic adds to congestion within Kendal;
  - There is a lack of route choice for HGVs accessing industrial areas to the north of the town centre from the south of the town, increasing through traffic levels in the town centre; and
  - The hilly topography surrounding Kendal necessitates that principal routes serving Kendal have a number of sharp bends and steep sections of carriageway, adversely impacting on the safety of these routes and their suitability to carry large volumes of traffic.
- Local Access:
  - Narrow, low capacity streets in Kendal town centre increase both levels of congestion and journey times;
  - There is no direct through route for north-south movements; and
  - Victoria Bridge is the only river crossing within the town that supports west-to-east movements.
- Economic Development and Growth:
  - There is a shortage of well-connected housing and employment sites in Kendal; and
  - Forecast development in the next Local Plan Period will contribute to a significant increase in demand on the transport network across all modes.
- Environment:
  - Routes in the north of the town centre became impassable to traffic after Storm Desmond and future flooding could again cause road closures, diversions and congestion; and
  - Infrastructure to enable cars, buses and HGVs to avoid routing via Lowther Street could offer significant air quality benefits in an area where levels of nitrogen dioxide are currently failing to meet government targets.

### 2.2 Scheme Objectives

The objectives for investment in enhanced strategic transport infrastructure for Kendal were therefore defined as being to:

- Deliver the future strategic growth of the town and ensure that high levels of growth and investment can be achieved across Kendal;
- Reduce levels of through traffic and congestion within Kendal town centre;

- Improve the resilience of Kendal's transport network so that connectivity to, from and within the town is retained during potential future flood events;
- Improve accessibility to existing as well as proposed employment areas; and
- Enhance the resilience of the M6 corridor in the Kendal area, so that traffic is not reliant on single lane bridges and narrow town centre streets through Kendal when the M6 EDR is activated.

## 2.3 Proposed Scheme

A total of four scheme options and a 'Do Minimum' option have been assessed. Within this SOBC, the preferred scheme is referred to as the Northern Orbital Access Route 1 or Inner Northern Orbital Access Route and the indicative alignment of this route is shown in **Appendix A**. Beyond this SOBC, the option is however likely to be taken forward as the 'Northern Access Route' or similar and more detailed considerations will be taken as to the alignment of the route. The headline details of the route can be summarised as follows:

- Approximate 3km single carriageway route with a footway on one side of the carriageway;
- Interface with the existing Plumgarths Roundabout at the westernmost point, with a new arm from Plumgarths to the east towards Burneside Road;
- Junctions with Burneside Road to the west of Carus Green Golf Club and the A6 to the north of the Shap Road Industrial Estate; and
- Interface with the A685 at the easternmost point of the route, immediately north of the South Lakes Retail Park.

## 2.4 Scheme Benefits

The Inner Northern Orbital Access Route will meet the fundamental objectives of the study including delivering future strategic growth in Kendal and improving access to current and future employment sites, reducing town centre congestion and improving the resilience for both Kendal and the wider M6 corridor when the Emergency Diversion Route (EDR) is activated. It will connect potential development sites to the north of Kendal with the strategic road network south of Burneside. Delivery of the route will also enable South Lakeland District Council to deliver employment and residential development within the next Local Plan Period, which is currently scheduled for adoption by July 2021 and is intended to cover the period 2021 to 2036.

The route will directly link the A591, A6 and A685, improving strategic access to and from Kendal, in addition to providing an additional crossing of the River Kent. Accessibility to existing businesses at Mintsfeet and within the Shap Road corridor will be significantly improved, in addition to enhanced accessibility between Windermere and Ambleside to the M6.

The Kendal Transport Model is a SATURN model which has been used to assess the likely impacts of the scheme options including consideration of the number of overcapacity junctions and overall network journey time and distance for the future year of 2036, in line with the next potential South Lakeland Local Plan period of 2025-2036. Network journey time has been monetised to provide an estimate of the journey time benefits for the scheme. Under the 2036 Base scenario, the Inner Northern Orbital Access Route provides monetised transport benefits of £112.2m; under the 2036 Local Plan scenario, this increases to £531.6m. Further information on the quantitative benefits of the scheme are outlined within the Economic Case of this report.

By providing an additional crossing of the River Kent, there are also opportunities to engineer the new route so that it contributes to flood water storage, helping to reduce the scale of the impacts of potential future flood events.

## 3 The Strategic Case

This Strategic Case analyses the key local transport network issues in Kendal, as well as wider development pressures and environmental issues. It reflects upon the role that improved strategic transport infrastructure can play in delivering local, regional and national aspirations, ranging from improved flood resilience at the local level, to improved strategic routing when the M6 is closed at the national level. Collated evidence has been used to generate a total of 8 investment options and drive an initial assessment to arrive at a shortlist of 4 options. The Economic Case that follows this chapter outlines how the preferred option has been selected from the shortlist of 4 options.

### 3.1 Background

Kendal is the largest settlement within South Lakeland, with a population in excess of 28,000, equating to around 40% of the district's total population. The town is located on the south-east border of the Lake District National Park and both the M6 and West Coast Mainline railway are located in close proximity to the town, linking Kendal to regional and national destinations. Kendal's position within the valley of the River Kent as well as the historic character of the town centre afford the town a highly attractive setting, supporting a strong visitor offer.

The town is a significant attractor of people from across the South Lakeland District and beyond, serving as the district's principal retail and employment destination. Kendal's catchment population of 137,000 is also the largest of any settlement across South Lakeland, as noted by the South Lakeland Retail Study Update<sup>1</sup>. The town supports a wide range of retail, financial and professional service jobs as well as major advanced manufacturing and warehousing, particularly to the north of the town in the Shap Road corridor including Lakeland Limited in the Westmorland Business Park and the James Cropper PLC site at Burneside. Advanced manufacturing is recognised as a key sectoral strength for the North within the Northern Powerhouse agenda and access improvements for these sites are essential to supporting their long-term growth and economic viability and relieving the existing logistical pressures they face. Educational and health facilities within the town including Kendal College and the Westmorland General Hospital also serve the population of Kendal as well as those from surrounding rural areas within South Lakeland, increasing trip demand to and from Kendal during both peak and off-peak periods

Kendal acts as a focal point for local employment, with notable travel to work flows to Kendal from Ambleside, Grange-over-Sands, Milnthorpe and Windermere, adding to the number of trips completed to and from the town in the morning and afternoon weekday peak periods. Kendal also has significantly lower levels of worklessness (7.2%) than the county (9.7%) and national (10.6%) averages respectively<sup>2</sup>.

### 3.2 The Need for Investment

This section outlines the need for investment in improved strategic transport infrastructure for Kendal through analysis of both current and forecast challenges and opportunities relating to environmental contexts, strategic infrastructure and wider economic and social impacts.

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<sup>1</sup> South Lakeland District Council (2012) *South Lakeland Retail Study Update 2012*. Available at: [https://www.southlakeland.gov.uk/media/1475/excil\\_es1a-retail-study-update-2012.pdf](https://www.southlakeland.gov.uk/media/1475/excil_es1a-retail-study-update-2012.pdf)

<sup>2</sup> Cumbria Intelligence Observatory (2014) *Kendal Economic Profile*. Available at: <https://www.southlakeland.gov.uk/media/1075/kendal-economic-review-1-june-2014.pdf>

### 3.2.1 Flooding

The impacts of Storm Desmond (which occurred in the first week of December 2015) in Kendal served as a key catalyst for a study into Kendal's strategic transport infrastructure. Flooding associated with the event was the largest ever to be recorded in Kendal, with over 2,000 homes and premises affected by flood water<sup>3</sup>. The flood event led to a number of key routes in the town centre becoming impassable to traffic including the A6 Shap Road (**Figure 1**) and the A685 Appleby Road (**Figure 2**), with flood depth reaching 1.2m above the surface of the carriageway. Victoria Bridge, the only town centre bridge which supports cross river movement from west to east was also subject to ongoing closures and restrictions for over 3 months between early December and early March, significantly reducing town centre network resilience. In addition to town centre closures, the A591 was also closed to traffic between Kendal and the Brettargh Holt roundabout, reducing strategic connectivity between Kendal and the M6 and increasing traffic demand and congestion on the A65 corridor through Oxenholme.

**Figure 1: Impact of Storm Desmond flooding at Shap Road**



Source: Mercury Press (2015)

**Figure 2: Impact of Storm Desmond flooding at the A685 and across Kendal**



Source: Mercury Press (2015)

Significant investment is being made by both local and national bodies to help repair damage resulting from Storm Desmond as well as to help reduce the impacts of potential future flood events. Cumbria County Council is delivering over £25 million investment to help repair over 350 damaged roads and bridges across the county, including upgrades to the carriageway at Stramongate Bridge within Kendal town centre to provide a flood resistant surface<sup>4</sup>. The Environment Agency also confirmed in discussions with the study team that £24m of capital funding has been allocated for Kendal, Burneside and Staveley from the 'Flood and Coastal Erosion Risk Management Programme' in order to repair flood defences and complement the repair works being completed by Cumbria County Council.

Following Storm Desmond, Cumbria County Council and partners began considering the role the local highway network could play in mitigating the impact of future flooding events. Investment in a scheme to provide an east-west bypass of Kendal town centre away from the floodplain would provide further route choice for vehicles in the Kendal area and add further resilience to the network in the event of further major flood events. New strategic transport infrastructure could also be engineered so that it provides additional flood protection and can provide a flood storage mechanism in the event of further major flooding. This will help to

<sup>3</sup> Environment Agency (2016) *Flood Investigation Report: Flood Event 5<sup>th</sup>-6<sup>th</sup> December*. Available at: <http://www.cumbria.gov.uk/eLibrary/Content/Internet/536/6181/42557103755.pdf>

<sup>4</sup> Cumbria County Council (2016) *Flood Recovery work continues with award of contracts worth over £25million*. Available at: [http://www.cumbria.gov.uk/news/2016/august/18\\_08\\_2016-122929.asp](http://www.cumbria.gov.uk/news/2016/august/18_08_2016-122929.asp)

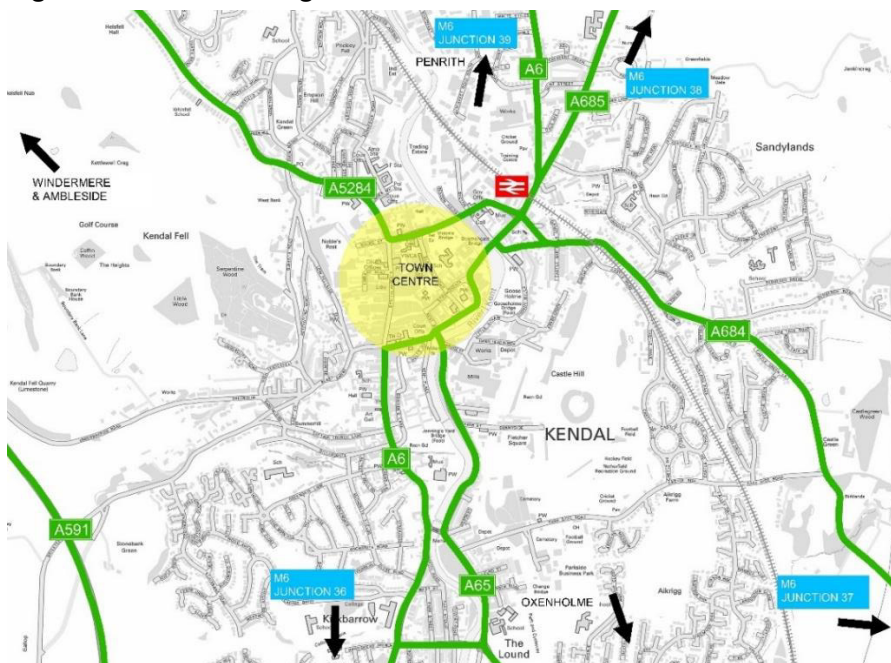


ensure that connectivity is retained for residents and businesses across the area in the event of a future flood, increasing the attractiveness of the town as a place to work and live and to investors. Following Storm Desmond, Kendal Town Council also highlighted that a new bypass to the north of Kendal would be required to reduce traffic problems in the town in the case of future major flood events<sup>5</sup>. Investment in new or upgraded flood-resilient bridges within the town centre could also help to retain town centre connectivity and route choice in the event of further flooding, as further outlined in **Section 3.2.3**. This insight has been captured within this Strategic Outline Business Case.

### 3.2.2 Strategic Access

An overview of key routes to and from Kendal town centre is indicated in **Figure 3**. Junction 36 of the M6 is accessed within a 15-minute drive to the south-east of Kendal town centre via the A6, A591 and A590. As highlighted within Cumbria’s Strategic Economic Plan (SEP), the M6 plays a crucial role in supporting connectivity between key regional centres in the region including Kendal, Carlisle, Lancaster and Preston. Whilst Carlisle, Lancaster and Preston can be accessed within a one-hour drive from Kendal town centre, there are poor linkages between the main employment areas in Kendal and the M6 to the north and south, leaving vehicles including HGVs reliant on narrow, low-capacity routes for access between Kendal and the motorway. From residential and employment areas to the north, west and east of Kendal, the M6 can also be directly reached at Junctions 37, 38 and 39 via the A684, A685 and A6 respectively. To the west of the town, the A591 provides the primary north-south access route for Kendal, supporting direct connectivity to destinations throughout South Lakeland and into the central Lake District towards Ambleside, Windermere and Keswick. The A591 meets the A590 approximately 4 miles south of the town, with the A590 linking Kendal towards destinations in the west of Cumbria including Ulverston, Barrow-in-Furness and Sellafield.

**Figure 3: Kendal Strategic Access Routes**



Source: Mott MacDonald

<sup>5</sup> ITV News (2016) *Kendal Town Council are calling for a bypass to solve traffic problems after Storm Desmond*. Available at: <http://www.itv.com/news/border/2016-02-03/kendal-town-council-are-calling-for-a-bypass-to-solve-traffic-problems-after-storm-desmond/>

The hilly topography surrounding Kendal, particularly to the north and west of the town, necessitates that the principal 'A' routes to and from Kendal have a number of sharp bends and steep sections of carriageway, adversely impacting upon the safety of these routes and their suitability to carry large volumes of traffic. Outside of Wales, Cumbria has the highest proportion of all road casualties in the 17-19 age group in the UK at 15.8%, indicating that the network in the area is particularly unsuited to inexperienced drivers<sup>6</sup>. In addition, the most recent Annual Road Safety Plan for Cumbria highlights that the total number of casualties on the county's roads is increasing, with a 175 casualty increase between 2013 and 2014, the most recent years for which verified data is available<sup>7</sup>. More specifically, using information from the Crashmap road traffic accident portal, it can be observed that both the A685 and A6 to the north of the town are notable accident hotspots in the area<sup>8</sup>. In summary, these statistics reinforce safety concerns on key routes to and from Kendal and on the wider Cumbrian network, highlighting the urgent need for investment to deliver safer routes.

### 3.2.2.1 HGV Routes

To the north of the town, the A6 supports connectivity to a number of key retail and industrial areas including the Lake District Business Park, Mintsfeet Industrial Estate and Shap Road Industrial Estate, increasing the demand for HGV movements on this corridor. CCC published a series of HGV Network Maps for Cumbria in February 2010 to assist drivers of HGVs and Large Goods Vehicles to navigate through the county with 'a minimum disruption or delay' to the highway network<sup>9</sup>. Identified routes for HGV drivers were selected according to their suitability to carry large vehicles. However, these routes still pass through Kendal town centre, as denoted by the routes highlighted in red in the map included as **Appendix B**.

Both north and southbound recommended routes take HGVs through Kendal town centre along the A6, A5284 and A684, increasing town centre traffic levels and reducing accessibility for residents and businesses. HGVs are also unable to use Dunmail Raise to go north, leading to more convoluted routing into the Lake District. Current access routes for HGVs through the town centre is also unsatisfactory for drivers and the wider town as a whole, both because the narrow turn drivers need to make into Lowther Street, as well as the impact of HGVs on the wider town centre environment. High volumes of HGVs in the town reduce the attractiveness of walking and cycling, increasing the propensity for users to travel by car in the town, which in turn adds to network congestion.

Future investment in improved access between key business and employment sites at Mintsfeet and the Strategic Highway Network at the M6 will ensure that Kendal remains attractive for existing and potential businesses, supporting growth and employment within the town.

### 3.2.2.2 M6 Emergency Diversion Route (EDR)

When a major incident occurs on the M6 and the north and/or southbound carriageway is shut between Junctions 36-39, the Emergency Diversion Route (EDR) is activated. Motorway traffic is then routed through Kendal town centre (**Appendix C**). Sections of the diversion routes restrict vehicles to speeds of 40mph or less, significantly reducing door-to-door journey times for motorway traffic as well as impacting upon journey times for vehicles travelling to, from and

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<sup>6</sup> RAC Foundation (2016) *Road Safety*. Available at: <http://www.racfoundation.org/motoring-faqs/safety#a11>

<sup>7</sup> Cumbria County Council (2016) *Annual Road Safety Plan 2015/16*. Available at: <http://www.crsp.co.uk/images/final%20road%20safety%20plan.pdf>

<sup>8</sup> <http://www.crashmap.co.uk/search>

<sup>9</sup> Cumbria County Council (2010) *HGV Guide*. Available at: <http://www.cumbria.gov.uk/roads-transport/public-transport-road-safety/transport/hgv/hgv.asp>

within Kendal. The north and southbound diversions also route vehicles on sections of single carriageway with steep gradients and bends, particularly to the north of Kendal on the A6 towards Junction 39 of the M6. Consequently, when the EDR is in place during adverse weather conditions, journey times and the safety and suitability of the route to carry high volumes of traffic is further reduced. Moreover, the northbound M6 diversion routes vehicles via the A5284 Windermere Road and then towards the A6 Shap Road. Increased traffic on Windermere Road significantly reduces network resilience in the Kendal area, increasing journey times for vehicles accessing the town centre from residential areas to the north of the town. Local accessibility to schools, employment, leisure and retail opportunities are all reduced.

Whilst full closures of the M6 are typically infrequent events, they can be in place for up to 24 hours, significantly worsening town centre journey times and increasing air pollution levels. For example, when the EDR was activated on Sunday 21 February 2016 as a result of two serious collisions on the motorway, the M6 was closed southbound for almost 9 hours between Junctions 39 and 37. Highways England's report of the incident highlighted that "the A6 and local roads through Kendal and the A590 were heavily congested resulting in substantial delays to road users"<sup>10</sup>. The objectives for new strategic transport infrastructure for Kendal should therefore consider how investment could be used to avoid the need for through and diverted motorway traffic to be routed through Kendal town centre, helping to improve journey times for through traffic as well as for vehicles completing regular journeys within the town.

### 3.2.3 Local Access

As indicated in **Appendix D**, Kendal town centre is characterised by a number of one-way streets. For vehicles bound for Kendal town centre from the south of the town, the A6 Milnthorpe Road and A65 Burton Road converge at Nether Bridge, as shown in **Appendix E**, and from here; the one-way system connects vehicles into the centre of the town via Highgate. The A65 also provides the principal connection between Kendal town centre and Westmorland General Hospital and Oxenholme. No direct through route for north-south movements is available through Kendal along the A6 due to the semi-pedestrianisation of the high street. Within the town centre, northbound traffic is routed via Highgate, Lowther Street and Blackhall Road, with southbound traffic routed via New Road and Aynam Road. The number of narrow roads and tight bends within the town centre, as well as the lack of pavements in some places, can increase the difficulty with which all users navigate the town centre.

#### 3.2.3.1 Congestion

As highlighted within the Cumbria Transport Plan Strategy 2011-2026, Kendal suffers from regular localised traffic congestion and a strategic priority at both county and district level is to overcome the adverse effects of this congestion on the economy and environment of the town. Congestion increases levels of poor air quality within the town, particularly related to the AQMA at Lowther Street (see **3.2.4**), decreasing the attractiveness of walking and cycling within the town, further enforcing high levels of car use and congestion within Kendal. The SLDC Core Strategy also highlights that whilst shopping in the town centre is 'crucial' to Kendal's future, retail vacancy rates have increased in recent years and the town lacks suitable sites for new businesses.

Congestion at peak times and in the inter-peak period reduces both the attractiveness of Kendal as a retail destination and contributes to the relative lack of new business locating in the town. A

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<sup>10</sup> Highways England (2016) *M6 Closure Southbound Between J39 and J37, Cumbria. Sunday 21 February 2016*. Available at: <http://www.highways.gov.uk/traffic-information/traffic-information-services/highways-england-post-incident-bulletin/january-2016-post-incident-bulletins/february-2016-post-incident-bulletins/m6-closure-southbound-between-j39-and-j37-cumbria-sunday-21-february-2016/>

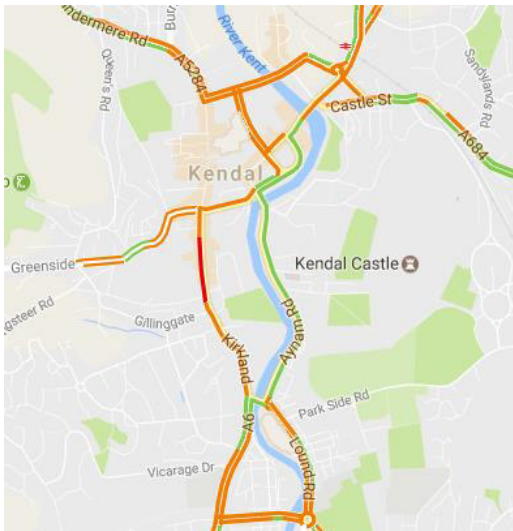


review of traffic data from Google Maps' traffic interface demonstrates that the town centre road network suffers from congestion throughout the day on a typical weekday as well as at the weekend, as shown between **Figure 4** and **Figure 7**. The orange and red routes demonstrate congested routes, with uncongested routes highlighted in green.

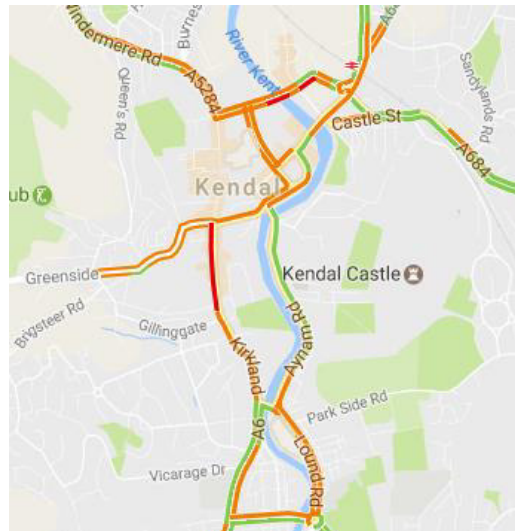
Moreover, to avoid town centre congestion and the need to travel on the one-way system, anecdotal evidence suggests that a number of vehicles use residential and minor roads to make north-south and east-west movements within Kendal. Sandylands Road, Glebe Road/Anchorite Fields and Queen's Road in particular are known as local town centre 'rat runs'. Routes from Burneside to the A6 and Greenside/Underbarrow Road have also been identified as being used by a number of vehicles to make east-west movements despite their unsuitability for carrying large volumes of traffic.

Without investment in Kendal's highway network to help relieve town centre congestion, and thus make the town centre a more attractive and viable retail destination for both businesses and shoppers, the town will struggle to support economic growth and new employment.

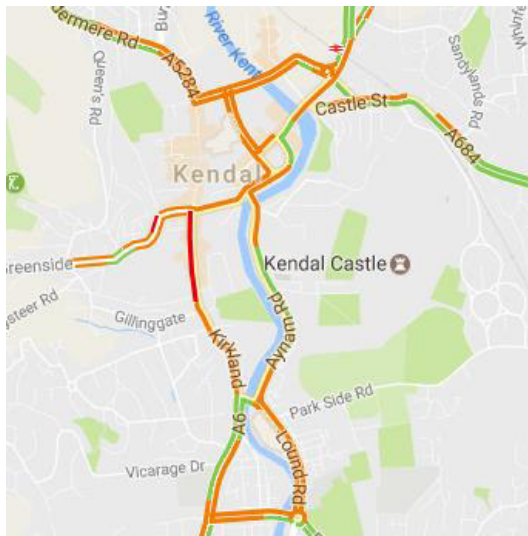
**Figure 4: Typical weekday peak congestion levels (9AM)**



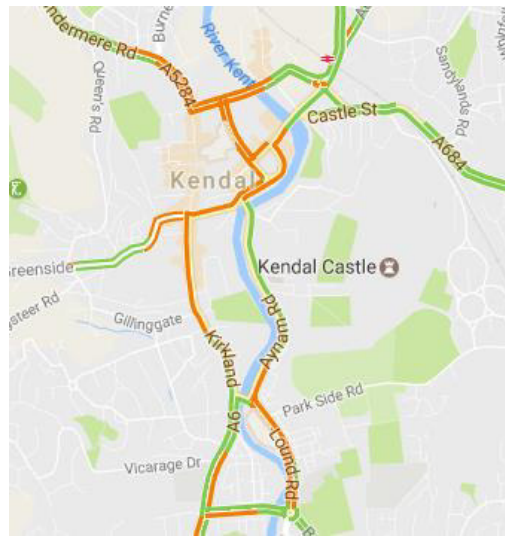
**Figure 5: Typical weekend peak congestion levels (12PM)**



**Figure 6: Typical weekday off-peak congestion levels (2PM)**



**Figure 7: Typical weekend off-peak congestion levels (4PM)**



Transport modelling assessments completed by Cumbria County Council have also highlighted that a number of junctions within the town centre are currently operating over capacity, with further junctions forecast to be operating over capacity by 2022 if committed developments and Local Development Framework proposals in Kendal, Burneside, Natland and Oxenholme are brought forward as expected. The modelling assessments have made use of the Kendal Transport (SATURN) model and assumes that modelled junctions with an RFC (Ratio of Flow to Capacity) greater or equal to 90% have limited capacity and are congested. The *Kendal LDF Transport Improvements Study* completed in 2012 notes that junction improvements are required by 2022 at the following junctions so that capacity can be increased and congestion reduced, thereby allowing committed development to come forward without having an adverse impact on the network:

- A5284 Sandes Avenue/Blackhall Road;
- A6 Wildman Street/Ann Street;
- A6 Longpool/Station Road;
- A6 Milnthorpe Road/Romney Road;
- Parkside Road/Valley Drive;
- A684 Sedbergh Road/Sandylands Road; and
- A6 Highgate/Lowther Street (completed).

Improvements at these junctions totalling an estimated £694,000 are forecast to be successful in mitigating the transport impacts of the committed and LDF developments and reducing RFC at the junctions to  $\leq 90\%$ . These junction improvements have only been tested with the impacts of growth up to 2022, despite further development expected to be completed to the end of the current Plan Period in 2025, and significant further growth is planned for the next Local Plan Period, as explored in **Section 3.2.5.2**. In addition to these short term proposals to upgrade town centre junctions, investment in strategic transport infrastructure will therefore be required to mitigate the transport impacts of further development.

### 3.2.3.2 Victoria Bridge

Victoria Bridge is the only bridge within Kendal that supports west to east movements over the River Kent for vehicles within the town centre and it therefore provides a crucial link from Kendal town centre towards the rail station, employment areas to the north of the town and the M6. However, as a result of the impacts of Storm Desmond in the winter of 2015/16, after closures in December in the immediate aftermath of the flood, the bridge was closed for a month across January and February 2016, adding to local congestion levels and reducing connectivity for all town centre vehicle users. If the M6 EDR had been triggered in this period, the congestion impacts of the bridge closure are likely to have been felt across Cumbria. Options for strategic transport improvements for Kendal should therefore consider the viability of providing new river crossings to help improve the resilience of the town centre transport network in the event of major flood events, a key objective for new strategic infrastructure in Kendal as per the study objectives outlined in **Section 1.1**.

### 3.2.3.3 Travel to Work

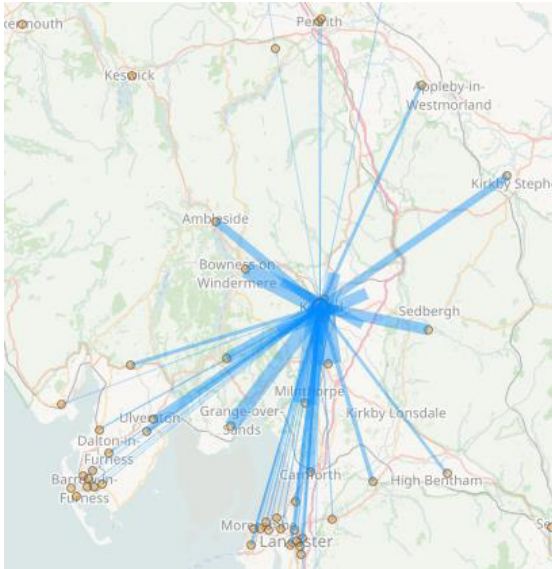
Kendal has a population density of 1,855 people/km<sup>2</sup>. Comparison of census data for 2001 and 2011 suggests that unlike most of Cumbria and the rest of South Lakeland, for Kendal residents, commuting by car has remained steady or fallen whilst walking to work has increased. Kendal's high population density makes the town particularly suitable for the promotion of active travel and the attractiveness of walking and cycling for local journeys will be increased if congestion and air quality issues in the town can be improved and the existing town centre highway network is used more efficiently.

Kendal is also a key trip attractor on the M6 corridor through the county, with over 1,000 journeys to work made to the town every day<sup>11</sup>. As also demonstrated in the Travel to Work diagrams in **Figure 8** and **Figure 9**, Kendal is an attractor of people, with more journeys to work made into Kendal rather than out of the town on a typical day. In order to better support commuter movements to Kendal and stimulate economic and job growth in the area as per the strategic objectives of CCC and SLDC, further investment in the strategic transport network will be required. Without this investment, given the existing traffic and congestion issues within Kendal, the town centre will be an unattractive location for potential new investors bringing further economic prosperity and jobs to the town.

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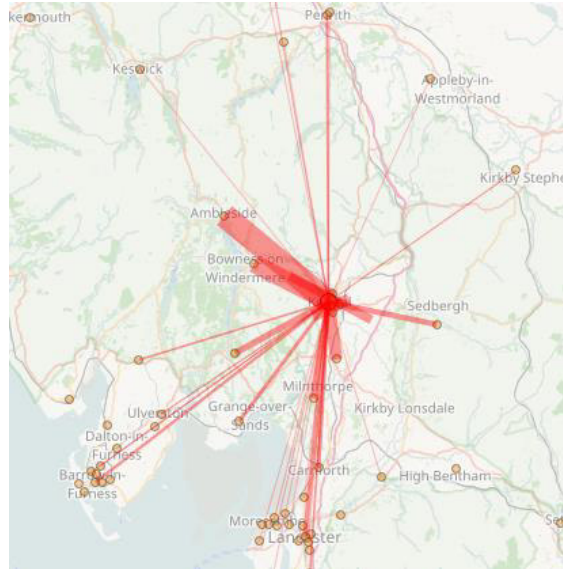
<sup>11</sup> Cumbria LEP (2015) *West of M6 Strategic Connectivity Study: Option Appraisal Report*. Available at: [http://www.cumbrialep.co.uk/wp-content/uploads/2015/09/West-of-M6-Strategic-Connectivity-Study-Report\\_FINAL2.pdf](http://www.cumbrialep.co.uk/wp-content/uploads/2015/09/West-of-M6-Strategic-Connectivity-Study-Report_FINAL2.pdf)

**Figure 8: Inbound Travel to Work flows to Kendal**



Source: ONS 2011 census via Datashine commute

**Figure 9: Outbound Travel to Work flows from Kendal**



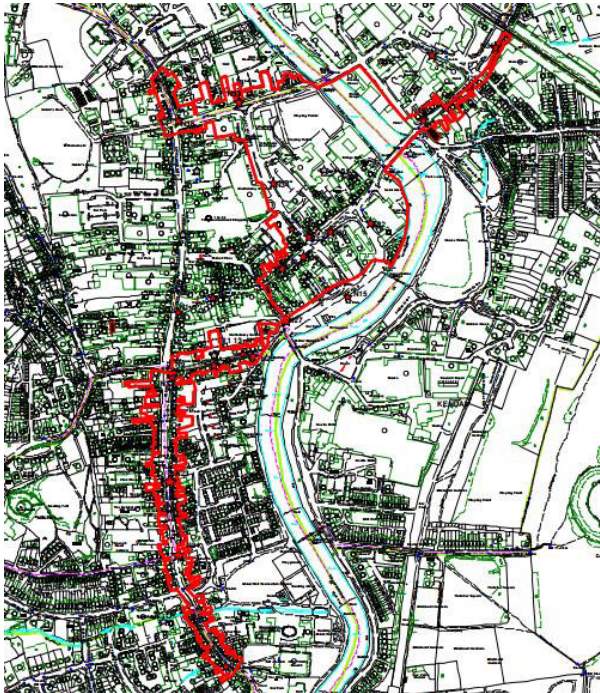
Source: ONS 2011 census via Datashine commute

### 3.2.4 Air Quality

An Air Quality Management Area (AQMA) was declared for Kendal in 2000 when levels of nitrogen dioxide (NO<sub>2</sub>) at Lowther Street were found to be above the government's annual mean objective for the pollutant. The nitrogen dioxide is from exhaust emissions from road traffic and the AQMA was extended in 2010 to cover other roads in the town centre, with the full extent of the revised AQMA indicated in **Figure 10**.



**Figure 10: Kendal Air Quality Management Area**



Source: South Lakeland District Council

As noted within South Lakeland's most recent Air Quality Annual Status Report, levels of NO<sub>2</sub> at Lowther Street still fail to meet government objectives<sup>12</sup>. As Lowther Street forms part of the main northbound route through Kendal, a number of cars, buses bound for the Kendal Bus Station at Blackhall Road and HGVs accessing industrial estates in the Shap Road corridor from the south of the town, are all routed via Lowther Street, contributing to issues of poor air quality. Buses and HGVs are identified within the Annual Status Report as a major contributor to high NO<sub>2</sub> levels within the area. Therefore, in order to improve environmental quality at Lowther Street, investment in strategic transport infrastructure to remove the need for northbound through traffic to travel through the town centre should be delivered.

Reductions in both traffic levels and emissions in this area will help to increase the safety and desirability of the area for the residents and employees within the town, in addition to helping to promote Kendal as an attractive location for investment.

### 3.2.5 Economic Development and Growth

As highlighted within the *Kendal Economic Profile*, the population in Kendal is growing at a faster rate than for South Lakeland and Cumbria as a whole, and Kendal's housing stock grew by a total of 3,074 dwellings between 1991 and 2009, an average of 171 per annum<sup>13</sup>. Growth has been most notable in the arts, recreation and health sectors. The *Kendal Economic Profile* also notes that at county level between 2002 and 2012, Cumbria was the 4<sup>th</sup> fastest growing economy in the UK with an overall Gross Value Added (GVA) growth rate of 46.1% compared to the national average of 43.6%.

<sup>12</sup> South Lakeland District Council (2016) *2016 Air Quality Annual Status Report (ASR)*. Available at: <http://www.southlakeland.gov.uk/EasySiteWeb/GatewayLink.aspx?allid=55031>

<sup>13</sup> Cumbria Intelligence Observatory (2014) *Kendal Economic Profile*. Available at: <https://www.southlakeland.gov.uk/media/1075/kendal-economic-review-1-june-2014.pdf>

SLDC's Core Strategy outlines targets for growth in the district in terms of both housing and economic developments as well as targets for strategic access, the environment and health up to 2025. The strategy for Kendal certifies the aim to:

- Make provision for **3,080 new residential dwellings** between 2003 and 2025, prioritising previously developed land and sites within urban areas; and
- Accommodate in the region of **21 hectares of employment land** between 2010 and 2025, including:
  - 9 hectares aimed at strategic employment needs.
  - 9 hectares aimed at offices and high tech industry.
  - 2 hectares aimed at general employment needs.

More specifically, the Core Strategy seeks to locate new employment uses where they are easily accessible by walking, cycling and public transport from residential areas and where good connections can be provided to the strategic transport network without having a detrimental impact on town centre circulation. However as a result of the current high levels of congestion within the town as described in **Section 3.2.3**, and a relative lack of connectivity to potential development sites outside of the town centre, further investment in Kendal's transport network is crucial in enabling proposed new development to come forward, driving long-term economic growth and employment opportunities.

#### 3.2.5.1 Land Allocations

The *South Lakeland Local Plan Land Allocations: Development Plan Document (DPD)* allocates land within the district for housing, employment, mixed-use and other uses, certifying the aim to accommodate around 60% of South Lakeland's new homes and workplaces in Kendal and the surrounding area<sup>14</sup>.

As of 2013 when the Land Allocations were adopted, 2,373 dwellings are proposed in Kendal to meet a District wide requirement of 6,756 between 2013 and 2025. In order to meet this contribution, by 2025, an average of 215 dwellings will need to be delivered per annum, a rate of growth which far exceeds the 171 p/a growth in new dwellings achieved between 1991 and 2009. However, as noted within the DPD, Kendal is the key area within the district where existing infrastructure is under stress and "particular areas of stress are the town centre transport network, which is suffering significant congestion at peak times".

A key mixed-use regeneration site being promoted by SLDC is the Kendal Canal Head area to the east of Aynam Road, a key town centre route, however in order to bring forward the proposed 200 dwellings and employment development here, it will be crucial to increase the capacity of Kendal's network to help mitigate the traffic impacts of the development. Moreover, the Scroggs Wood site to the south of Kendal town centre at Milnthorpe Road is identified as one of seven Strategic Employment Sites across the Cumbria LEP area; however it is noted within Cumbria's SEP that local highway infrastructure improvements are required to ensure that the site is deliverable. It is therefore clear that strategic transport infrastructure improvements for Kendal, in order to deliver both improvements to the town centre network as well as to the network surrounding the town will be required to deliver both residential and employment growth at key sites within Kendal.

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<sup>14</sup> South Lakeland District Council (2013) *South Lakeland Local Plan Land Allocations: Development Plan Document*. Available at: <http://applications.southlakeland.gov.uk/documentbrowser/DocumentBrowserFiles/local%20plan/land%20allocations/00%20Adoption/01%20Local%20Plan%20-%20Land%20Allocations%20Adopted%20Dec%202013.pdf>

### 3.2.5.2 Growth beyond the current Local Plan Period

The next SLDC Local Plan will supersede the current Core Strategy and is scheduled for adoption by July 2021. It is intended to cover the period 2021-2036. SLDC is currently in the process of commissioning an Objective Assessment of Need which will provide an evidence based assessment of development needs for the next Local Plan.

Whilst development needs beyond 2025 have therefore not yet been assessed, in order to enable further stages of the study to evaluate the implications of beyond current Local Plan Period growth in Kendal on strategic transport infrastructure, working assumptions have been made about the capacity of areas north and south of the town to accommodate growth in the long term in the event of transport infrastructure interventions being made.

If the annual growth rate in the current plan is projected forward, there would be a need for 6,000 new homes across the whole of the South Lakeland Local Plan area between 2021 and 2036, of which 1,600 would be delivered in the period 2021-5. Initial estimates suggest that there may be potential capacity of 3,500 dwellings in the area north of Kendal and around 1,700 dwellings to the south. If a future Local Plan were to propose land allocations in these areas, it is likely that around 90ha of employment land could also be accommodated around Kendal.

The realisation of this development will contribute to a significant increase in demand on the transport network across all modes, reinforcing the need for investment in the town's strategic transport network. Furthermore, the initial estimations of future housing and employment growth across Kendal are dependent upon both deliverability and infrastructure constraints being overcome, a number of which relate to access afforded by the strategic transport network. There is therefore a clear need to invest in improved strategic infrastructure in Kendal to bring forward growth of new housing and employment in Kendal and ensure long term growth in South Lakeland's principal residential, employment and service destination.

## 3.3 Policy Context and Strategy

This section of the Strategic Case shows how investment in strategic transport infrastructure in Kendal aligns with wider policies and strategies at national, regional and local level.

### 3.3.1 Kendal and the Northern Powerhouse

The Northern Powerhouse represents the shared vision of the Government, Northern city regions and Local Enterprise Partnerships for "joining up the North's great towns, cities and counties, pooling their strengths, and tackling major barriers to productivity to unleash the full economic potential of the North", as highlighted within the new Northern Powerhouse strategy<sup>15</sup>. The Northern Powerhouse represents a fresh opportunity to drive improvements in connectivity across the North of England and the government has committed to investing £13 billion in transport across the North over the course of the current Parliament, as also outlined within the Northern Powerhouse strategy.

The Northern Powerhouse strategy affirms that improving connectivity both within and between towns, counties and city regions lies at the heart of the Government's plans to build a true Northern Powerhouse. This ongoing investment is necessary to support the economy across the North of England and ensure that businesses within the Northern Powerhouse remain competitive with wider domestic and international markets. Investment in improved strategic

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<sup>15</sup> HM Government Northern Powerhouse (2016) *Northern Powerhouse strategy*. Available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/571562/NPH\\_strategy\\_web.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/571562/NPH_strategy_web.pdf)

connectivity for Kendal will help deliver a step change in strategic access for businesses and residents in the North West who are reliant on the connectivity provided by the M6.

Specifically, the Northern Powerhouse Independent Economic Review<sup>16</sup> highlights that ‘Advanced Manufacturing’ including production of high quality materials is one of the North’s four ‘prime’ economic capabilities. Kendal is very well positioned to support this growth sector, including through the James Cropper PLC paper manufacturing site to the north of the town at Burneside, one of the district’s most significant employers. Improved strategic connectivity in the area will support the proposed expansion of the Croppers site over 1.5ha of land adjacent to the existing site which has been earmarked for such expansion within the South Lakeland Local Plan. This expansion will support new jobs and enhanced economic productivity within Kendal, helping to close the North’s productivity gap with the wider economy.

Furthermore, a £2.2m Engineering, Science and Technology Centre opened at Kendal College in 2014, helping to assist in skills development for the future workforce in the Advanced Manufacturing sector in Cumbria. Kendal College attracts students from across South Lakeland as well as from locations further afield including Morecambe and Lancaster. Improved strategic connectivity for Kendal will help to enhance access to the college and ensure that study at the Engineering, Science and Technology Centre is an attractive proposition for students, in turn helping to ensure that large employers in the area have access to a skilled workforce.

### 3.3.2 Cumbria Local Enterprise Partnership (LEP)

The Cumbria Local Enterprise Partnership (LEP) is one of the UK’s 39 LEPs. As outlined within the ‘Four Pronged Attack’ Strategic Economic Plan (SEP), the vision for the Cumbria LEP is to unleash Cumbria’s full economic potential and make a significant contribution to UK growth<sup>17</sup>. This demonstrates that the regional economic strategy for Cumbria aligns to the priorities for the Northern Powerhouse, and more specifically, the LEP aims to **deliver 15,000 additional jobs and increase GVA by £600m by 2024** compared to the 2014 baseline. The priority themes and key interventions of the SEP are indicated within **Figure 11** below.

**Figure 11: Cumbria LEP Priority Themes**



Source: Cumbria LEP (2014)

<sup>16</sup> SQW (2016) *The Northern Powerhouse Independent Economic Review: Final Executive Summary Report*.

<sup>17</sup> Cumbria LEP (2014) *The Four Pronged Attack: Cumbria Strategic Economic Plan 2014-2024*. Available at: <http://www.cumbrialep.co.uk/wp-content/uploads/2014/03/Cumbria-LEP-final-report-1-April-2014.pdf>



The four priority themes of the Cumbria LEP would all be further supported by improved strategic connectivity in the Kendal area. Advanced Manufacturing is supported at the James Cropper paper manufacturing whilst the aforementioned new Engineering, Science and Technology Centre at Kendal College in 2014 will support students to develop the skills required to support the Advanced Manufacturing sector throughout Cumbria, which also includes sites further afield including the BAE site in Barrow-in-Furness. Investment in strategic transport infrastructure for Kendal will enhance access within Kendal and for travel across Cumbria, ensuring that traffic is not reliant on Kendal town centre routes when the M6 is closed.

Improvements to strategic connectivity in the Kendal area will also support access to nationally significant nuclear and energy opportunities on the Cumbrian Coast including the proposed Moorside nuclear new build and ongoing decommissioning at Sellafield. This will be achieved through improving connectivity between the M6 and the A591 through the Lake District towards Cockermouth and the coast. Furthermore, the SEP also highlights that a number of potential employment sites in the M6 corridor, including at Kendal, could be brought forward if investment in enhanced strategic transport infrastructure is delivered.

A further priority theme for the Cumbria LEP is supporting a vibrant visitor economy. SLDC, KTC and the Kendal Business Improvement District's commitment to supporting Kendal's tourist offer is demonstrated by their February 2017 investment in a new destination website for Kendal, available at <https://visit-kendal.co.uk>.

**Figure 12: Visit Kendal website**



Source: Visit Kendal (2017)

Kendal's attractive town centre streets and buildings, the Kendal Castle, Brewery Arts Centre and the Kendal Museum contribute to Kendal's significant visitor offer and the improved access to and from the town that would be afforded by investment in strategic infrastructure will further stimulate Kendal's visitor economy.

### 3.3.3 Cumbria County Council Plan 2014-17

CCC has developed a number of priorities for the county through analysis of evidence of need and available resources as well as wider public engagement. These priorities are outlined within the Council's 2014-17 Plan and include the need to 'provide safe and well maintained roads and

an effective transport network'<sup>18</sup>. The County Council are committed to providing a well-maintained highway and transport network as well as maximising new investment in addition to working with communities to develop sustainable community transport solutions. Investment in new strategic transport infrastructure for Kendal will enable the County Council to work towards its target of maintaining an effective transport network as well as further objectives including securing investment in economic opportunities to drive sustainable economic growth and create jobs.

Notably, Cumbria County Council have previously undertaken high-level assessments of strategic transport improvements within the town to test their impact on supporting development in the town. These improvements have included a Kendal Northern Development Route/Bypass as well as a Kendal Southern Link Road, both of which were tested within the *Kendal LDF Transport Study: Revised Modelling Results* (2012).

### 3.3.4 Moving Cumbria Forward: Cumbria Transport Plan Strategy 2011-2026

The third Local Transport Plan (LTP) for Cumbria represents a 15-year strategy to provide a safe, reliable, available, accessible and affordable transport system and highway network in Cumbria, as well as supporting a number of local priorities:

- Safe, strong and inclusive communities;
- Health and well-being throughout life;
- A sustainable and prosperous economy;
- Effective connections between people and places; and
- World class environmental quality and in doing so minimises carbon emissions.

Priorities specific for South Lakeland include supporting further employment and housing growth in Kendal, and the ability for the town to support such growth will be supported by investment in strategic infrastructure to enhance network capacity and connectivity. The LTP also recognises that it will be essential to tackle traffic growth in Kendal town centre to enable these developments to come forward and to improve air quality, as could be achieved through investment in strategic transport infrastructure for the town. Finally, the LTP highlights that good road and rail connections must be in place in order to strengthen the role of Kendal as a service centre within South Lakeland.

### 3.3.5 South Lakeland District Council (SLDC) Core Strategy

SLDC's Core Strategy sets out the district's long-term development strategy up to the end of the current Plan Period to 2025, drawing upon strategies of the council and other organisations whose activities have implications upon development and use of land. With regard to the overall development strategy for South Lakeland, the Core Strategy affirms that around 35% of new housing and employment growth will be in Kendal. The viability of development land is however dependent on the premise of strong accessibility to and from the sites and the Strategy highlights that there is an undersupply of readily available development land in the Kendal area.

The Core Strategy also notes that new housing must be both affordable in order to help the town to retain a greater number of young people, and meet the housing needs for over 30,000 residents in South Lakeland aged over 60. Within the Local Plan period it is expected that the number of children and young people will decrease in the district, with an increase in the

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<sup>18</sup> Cumbria County Council (2014) *Council Plan 2014-17*. Available at:  
<http://www.cumbria.gov.uk/elibrary/Content/Internet/535/41684153924.pdf>

proportion of retired people. This will directly influence the requirements for both local services and housing.

In order to deliver a step-change in the local economy and contribute towards the sustainable economic growth of the wider Cumbrian economy, a key strategic objective for SLDC is to increase the viability of town centre through addressing barriers to growth such as town centre congestion, as could be delivered by investment in strategic transport infrastructure.

With respect to transport, the Core Strategy anticipates that by 2025, “a solution to traffic issues in the town centre has been found, with no increase in congestion in the town centre as future development has taken place”<sup>19</sup>. This increases the need to consider options for investment in strategic transport infrastructure in Kendal in the short term to deliver both improvements to current high congestion levels and improve the resilience of the network to accommodate further demand as development takes place. The Core Strategy also envisages that a number of connectivity improvements will have been made between Kendal and surrounding settlements including Natland, Oxeholme and Burneside by 2025, whilst protecting the character of these areas through the retention of green spaces. In particular, the need to explore the options and benefits of improving road access between the A591 Windermere Road (**Figure 13**) and the A6 Shap Road (**Figure 14**) is highlighted within the strategy for Kendal within the document.

**Figure 13: A591 Windermere Road**



**Figure 14: A6 Shap Road**



### 3.3.6 Kendal Town Council: Action Plan for Kendal

The Kendal Town Council *Action Plan for Kendal (2015)* outlines a vision for the town to help inform future actions and to give the residents of Kendal a guide of what councillors hope to achieve over the coming years. To retain and enhance a ‘vibrant and successful market town’, the Action Plan identifies that Kendal Town Council need to “advocate the Northern development route and possibly a Southern relief road”, highlighting how a scheme to improve strategic transport infrastructure to the north of Kendal in particular has been previously identified and is already within the public domain.

## 3.4 Strategic Scenario Development

Using the issues and opportunities identified in **Section 3.2**, a number of potential strategic scenarios were developed by the Kendal Strategic Transport Infrastructure Study team as well as elected members and officers from CCC, SLDC and KTC during formal consultation

<sup>19</sup> South Lakeland District Council (2010) *South Lakeland Local Development Framework – Core Strategy*. Available at: <https://www.southlakeland.gov.uk/media/1403/cs01-core-strategy-october-2010.pdf>

workshop events. The scenarios were developed to enable the members and officers to identify both their aspirations for strategic transport infrastructure in Kendal and potential investment options. There was agreement from members and officers consulted that a total of seven strategic scenarios should be tested using transport appraisal tools in Phase 3 of the study:

1. Flood Resilience;
2. Strategic Connectivity;
3. Town Centre;
4. Sustainable Access;
5. Development Support;
6. Strategic Transport & Development Support (Combined 2 & 5); and
7. Strategic Sustainable Development (Combined 4 & 6).

Following use of the transport appraisal tools, the 'Strategic Transport & Development Support' infrastructure development scenario was identified as the preferred development scenario against which transport infrastructure options for Kendal should align. In order for this scenario to be successfully realised, through traffic in Kendal would be reduced and access between Kendal and surrounding areas would be improved, with high levels of growth and investment achieved in the area. The objectives of this scenario directly align to the issues identified under the strategic access, local access and economic development and growth headings and will also contribute to overcoming identified environmental issues by reducing the need for through traffic to travel through the town centre, helping to reduce issues of poor town centre air quality.

### 3.5 Scheme Objectives & Monitoring

The objectives for investment in a scheme to enhance strategic transport infrastructure for Kendal have been derived using both the issues and opportunities identified within **Section 3.2** and the objectives of the Strategic Transport & Development Support scenario.

The objectives for the scheme are to:

- Deliver the future strategic growth of the town and ensure that high levels of growth and investment can be achieved across Kendal by opening up development land in the vicinity of the town;
- Reduce levels of through traffic and congestion within Kendal town centre by providing increased route choice for through traffic which does not need to call at destinations within the town;
- Improve the resilience of Kendal's transport network so that connectivity to, from and within the town is retained during potential future flood events;
- Improve accessibility to existing as well as proposed employment areas; and
- Enhance the resilience of the M6 corridor in the Kendal area so that traffic is not reliant on single lane bridges and narrow town centre streets through Kendal when the M6 EDR is activated.

#### 3.5.1 Measuring Success

To monitor progress towards the completion of the objectives, a Monitoring and Evaluation Strategy will be developed as part of the development of a potential future Outline Business Case. The Monitoring and Evaluation Strategy will set out a logic map of how the investment will deliver outputs leading to outcomes that support the objectives. The plan will identify data



sources to be captured, the frequency of data capture and resources responsible for monitoring progress. It is envisaged that progress will be reported on a yearly basis.

Data to be collected will include journey times, air pollution levels and numbers of new houses and hectares of employment land delivered. Success of the scheme to improve strategic access for Kendal will be determined by a number of factors:

- Delivery to time, budget and specification;
- Reduction in queuing and delays in Kendal town centre at peak and off-peak times as well as when the M6 EDR is activated;
- Improved journey time reliability for businesses in the Mintsfeet/Shap Road area accessing the M6 and other parts of the town as well as improved journey times between the M6 and Windermere, the North Lakes and the Energy Coast;
- Improvements to air pollution levels in Kendal town centre, particularly within the AQMA area at Lowther Street;
- Facilitation of new employment and housing development in key areas surrounding the town; and
- Access to, from and within Kendal being retained during future flood events.

## 3.6 The Emerging Scheme

### 3.6.1 Scheme History

A scheme to deliver improved strategic access for Kendal has been debated by various parties for over 30 years, as highlighted within previous documentation of the Kendal Futures regeneration partnership which includes a number of public and private sector stakeholders in the town<sup>20</sup>.

Consideration was given to a 'Kendal Northern Relief Road' within the *Major Transport Scheme for Cumbria – Kendal* report from March 2003, a report which also recognised the need for investment in a scheme to remove 'inappropriate traffic from the town centre' and to help 'facilitate sustainable economic development in Kendal and the surrounding area'<sup>21</sup>. As summarised below, two potential route options were analysed in detail within the study, both incorporating a mini roundabout at the intersection of the new carriageway with Burneside Road:

- Option 1 - From the junction of the A591 with Sharps Lane to the A6 east of Lowgroves; and
- Option 3 - From the A591 at Plumgarth roundabout to the A6 at Shap Road and the access point to Gilthwaiteirigg Farm

The study also highlighted that HGV restrictions could be introduced within the town centre and whilst they would remove significant numbers of HGVs from the town, flows would be increased on other unsuitable routes for HGVs, namely Windermere Road and Romney Road, thereby increasing the need for a scheme to enable all through traffic to bypass the town completely.

Further reports including the *Kendal LDF Transport Study: Revised Modelling Results* (2012) have also tested the likely impacts of potential new strategic transport links including link roads to both the north and south of the town, recommending that more detailed assessments are undertaken to confirm the scale and nature of investment required to reduce town centre

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<sup>20</sup> Kendal Futures Board Meeting Minutes (Wednesday 8<sup>th</sup> July 2015) Available at: <https://www.southlakeland.gov.uk/media/3198/kfb-minutes-july-2015.pdf>

<sup>21</sup> Cumbria County Council (2003) *A Major Transport Scheme for Cumbria - Kendal: Non-Technical Summary*. Available at: [http://councilportal.cumbria.gov.uk/Data/County%20Council%20Local%20Committee%20for%20South%20Lakeland/20030410/Agenda/\(item%205\)%20Appendix%20-%20Cumbria's%20Next%20Major%20Transport%20Scheme.pdf?nobdr=2](http://councilportal.cumbria.gov.uk/Data/County%20Council%20Local%20Committee%20for%20South%20Lakeland/20030410/Agenda/(item%205)%20Appendix%20-%20Cumbria's%20Next%20Major%20Transport%20Scheme.pdf?nobdr=2)

congestion and mitigate the transport impacts of further development in the town. Due to significant growth of B1 and B2 employment uses in the north-east of the town as well as the impacts of the Storm Desmond flood event on town centre movement and circulation, the need for investment in the scheme has become even more relevant and a greater local priority.

### 3.6.2 Option Identification

Based upon the objectives agreed for the scheme, a number of scheme options have been developed. Initial options development was undertaken by Mott MacDonald in October 2016 based on two separate workshops held with Officer and Member groups from CCC, SLDC and KTC. Discussions were informed by the content and findings of previous studies including the 2003 Major Transport Scheme and the 2012 LDF Modelling Reports. Wider stakeholders including the Environment Agency, currently undertaking extensive flood repair work in Kendal, as well as AECOM, who are currently completing a Master Plan for Kendal town centre, have also been consulted. A total of 8 options were initially identified in this consultation, with the name and a brief overview of each of the options shown below.

1. Northern Orbital Access Route 1	• Link between the A591 and A685 south of Burneside
2. Northern Orbital Access Route 2	• Link between the A591 and A685 north of Burneside
3. Eastern Orbital Access Route 1	• Link between A6 at Queen Katherines Avenue to the A65 at Helm Lane
4. Eastern Orbital Access Route 2	• Link between the A6 at Queen Katherines Avenue to the A65 at Low Barrows Green/A590
5. Southern Orbital Access Route 1	• Link between A591/A6 junction and the A65 Low Barrow Road, north of Natland
6. Southern Orbital Access Route 2	• Link between the A590/A591 junction and the A65 Low Barrow Road, south of Natland
7. Western Town Centre Access Route	• Link between A591 in the vicinity of Brigsteer Road and Highgate in the vicinity of Beast Banks
8. Cross River Access	• New or wider bridges at Lound Road and Aynam Road to facilitate a change in the gyratory to the south of the town centre

### 3.6.3 Initial Assessment

The Investment Sifting and Evaluation Tool (INSET) has been used by the study team to undertake an initial assessment of each of the 8 scheme options. INSET is multi-criteria analysis process and toolkit, based on Green Book principles and DCLG guidance, which enables multiple options and ideas to be appraised to determine their benefits and deliverability. INSET is designed to be simple, flexible, replicable and transparent. It looks at complex, multi-faceted decision-making problems by breaking them down into more manageable pieces, and then reassembling the pieces into a coherent whole. Mott MacDonald has developed INSET as an enhancement of DfT's EAST (Early Assessment and Sifting Tool) to support the evaluation of different options for large-scale investments and investment programmes.

### 3.6.3.1 Assessment Process

The assessment needed to assess a number of proposed schemes at a very early stage of development and consequently it needed to be proportionate to the level of detail available to allow the interventions to be rated against one another quickly and efficiently. To structure the process, the INSET assessment asked a series of questions based around four key themes:

- **A** - Overview (quality of information);
- **B** - Option length (proxy for cost);
- **C** - Benefits; and
- **D** - Deliverability.

In order to inform the appraisal of the scheme options using INSET and to increase understanding of the relative benefits and deliverability of the options, discussions were held with officers from Cumbria County Council and South Lakeland District Council in January 2017.

### 3.6.3.2 Theme A: Overview

Theme A assessed the quality of information that was available for the proposed intervention, and acted as a pass/fail gateway for the rest of the information process. The decision on whether enough information was available was based upon two sub-criteria, location/geographical scope of the scheme and the proposed output. As enough information was deemed available on both location and the anticipated output for each of the 8 options when the assessment was undertaken, all options could be appraised against the criteria under the remaining themes of the assessment tool.

### 3.6.3.3 Theme B: Option Length

Theme B assigned the approximate route length for each of the proposed schemes, measured to the nearest kilometre and based upon the understanding of the proposed location and geographical scope of the options. This was used to compare the relative lengths of each of the proposals and therefore gauge an early understanding of which of the schemes would be likely to have a higher overall cost and which would be likely to have a lower overall cost. Option 8 (Cross River Access) could not be assessed under this theme as new bridges and potential changes to town centre circulation, rather than a new stretch of carriageway, are proposed.

### 3.6.3.4 Theme C: Benefits

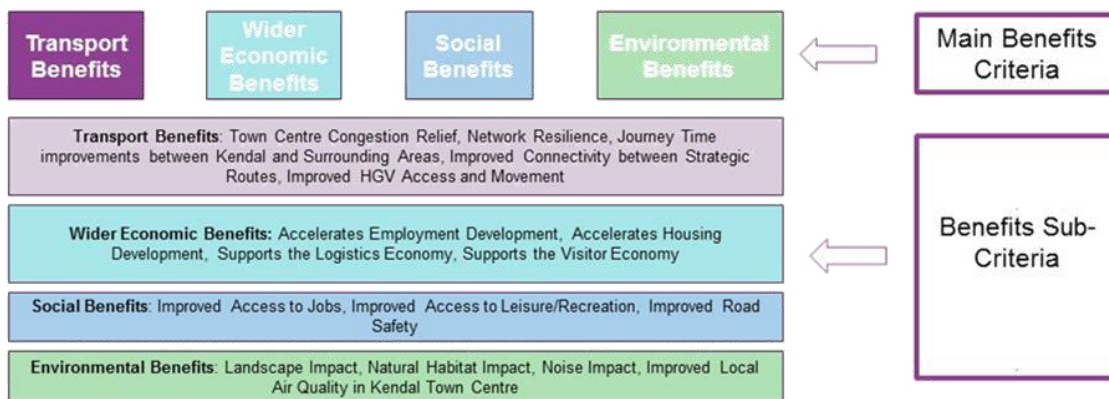
Theme C assessed the benefits that the proposed interventions would be expected to deliver. As the proposals cover a range of lengths and locations and were in a very early stage of development, this theme again took the form of an initial qualitative assessment. This helped to obtain an easily understandable 'snapshot' of how the interventions could be expected to perform. The 'benefits' for each of the options were defined as all the benefits that would result from the proposed intervention, irrespective of location where the benefits would be experienced.

The theme was assessed using a worksheet where the proposed interventions were scored against four main criteria, as shown below:

- Transport Benefits;
- Wider Economic Benefits;
- Social Benefits; and
- Environmental Benefits.

These four main criteria were broken down into a number of sub-criteria, each of which were scored individually. An overview of these criteria is displayed within **Figure 15** below.

**Figure 15: INSET Appraisal Criteria for Scheme Benefits**



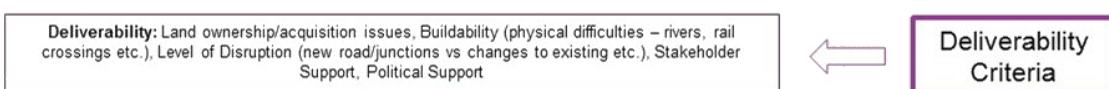
Source: Mott MacDonald

Theme C used a 5-point scoring system for each criterion, ranging from -2 through 0 to +2, with -2 being highly negative and +2 being highly positive. The overall score for the expected benefits associated with the proposed intervention was calculated by taking the average of the four main criteria combined. The score for the main criteria was in turn made up of the average of the sub-criteria scores. Therefore, the maximum final benefits score that could theoretically be achieved was 2.

### 3.6.3.5 Theme D: Deliverability

Theme D provided a high-level qualitative assessment of the deliverability of the proposed intervention. Within the Assessment Tool, scheme deliverability was broken down into five sub-criteria, as indicated in **Figure 16**.

**Figure 16: INSET Appraisal Criteria for Scheme Deliverability**



Source: Mott MacDonald

The sub-criteria were scored on a 3-point scale as follows:

- Negative;
- Neutral;
- Positive.

Each of the five scores were then averaged to create a combined deliverability score for each option.



### 3.6.3.6 Weighting

As a default, the Assessment Tool assumed that each of the main and sub-criteria within Theme C (Benefits) and Theme D (Deliverability) were deemed to be equally important. The assessment framework however permits the weightings to be changed to reflect differing priorities and therefore in consultation with Cumbria County Council, the weightings for the sub-criteria and main criteria were amended (as indicated in **Figure 17**) to reflect the relative importance of each.

**Figure 17: Weightings Applied to Kendal Strategic Transport Infrastructure options**

2A. WEIGHTING - BENEFITS (MAIN ASSESSMENT CRITERIA)					
Transport Benefits	Wider Economic Benefits	Social Benefits	Environmental Benefits	Total	
2	2	1	1	6	

Transport Benefits					
Town Centre Congestion Relief	Network Resilience	Journey Time Improvements between Kendal and Surrounding Areas	Improved Connectivity between Strategic Routes	Improved HGV Access and Movement	Total
2	2	1	1.5	1.5	8

Wider Economic Benefits					
Accelerates Employment Development	Accelerates Housing Development	Supports the Logistics Economy	Supports the Visitor Economy	Total	
2	2	1	1	6	

Social Benefits					
Improved Access to Jobs	Improved Access to Education	Improved Access to Leisure/ Recreation	Improved Road Safety	Total	
1.5	1	1	1.5	5	

Environmental Benefits					
Landscape Impact	Natural Habitat Impact	Noise Impact	Improved Local Air Quality in Kendal Town Centre	Total	
1	1	1	1.5	4.5	

2A. WEIGHTING - DELIVERABILITY					
Land ownership / acquisition issues	Buildability (physical difficulties - rivers/rail x'ings etc.)	Level of Disruption (new road/ junction vs changes to existing etc.)	Stakeholder Support	Political Support	Total
2	2	1	1	2	8

Source: Mott MacDonald

### 3.6.3.7 Appraisal Results

Following the weighting changes to Themes C and D, a total quantitative score could be derived for each of the options, based on the benefits and deliverability criteria scores. An overview of the results of the completed INSET appraisal process, with the results for each of the schemes against the four themes, is displayed in **Figure 18**.

**Figure 18: INSET Appraisal Results: Shortlisted Options**

2A. MULTI-CRITERIA ANALYSIS - SUMMARY								
No	Name	0A. Overview of Options	0B. Option length (proxy for cost)	1A. Multi-Criteria Analysis (Benefits)	1B. Multi-Criteria Analysis (Deliverability score)	1B. Multi-Criteria Analysis (Deliverability- Description)		Total Quantitative Score
		<i>Is enough information available to assess the proposed option?</i>	<i>Approximate length:</i>	<i>Final weighted score (-2 to 2 scale):</i>	<i>Final weighted score (0-3 scale):</i>	<i>Deliverability score (low / medium / high):</i>	<i>Dependencies on other options:</i>	<i>Based on benefits and deliverability criteria</i>
1	Northern Orbital Access Route 1	YES	all options 2-3km	1.25	1.88	Medium deliverability		3.13
2	Northern Orbital Access Route 2	YES	all options 4-7km	1.11	0.75	Low deliverability		1.86
3	Eastern Orbital Access Route 1	YES	5-7km	0.86	0.56	Low deliverability		1.43
4	Eastern Orbital Access Route 2	YES	all options 8-10km+	0.91	0.38	Low deliverability		1.28
5	Southern Orbital Access Route 1	YES	all options 2-3km	1.07	2.63	High deliverability		3.70
6	Southern Orbital Access Route 2	YES	2-3km	0.19	0.38	Low deliverability		0.57
7	Western Town Centre Access Route	YES	2-3km	-0.10	1.50	Medium deliverability		1.40
8	Cross River Access	YES	N/A	0.75	2.63	High deliverability	Dependant on the outcome of the Environmental Agency Flood Report	3.38

Source: Mott MacDonald

A total of 4 options were subsequently shortlisted for further assessment on the highway network using the Kendal Transport Model. This included Options 1, 5 and 8 as well as a combined Option 9, which was included following consultation with officer and member groups:

- Option 1 – Northern Orbital Access Route 1 (Inner Northern Orbital Access Route);
- Option 5 – Southern Orbital Access Route 1 (Inner Southern Orbital Access Route);
- Option 8 – Cross River Access; and
- Option 9 – A combined package incorporating both Option 1 and Option 8.

### 3.6.4 Shortlisted Scheme Options

For each of the 4 shortlisted scheme options to deliver enhanced strategic access for Kendal, a summary of the nature of the scheme, estimated cost, benefits and risks/disbenefits are provided in the table below. The overview of benefits, risks and disbenefits also reflect some of the underlying considerations that went into deriving the assessment scores within the qualitative appraisal of the options using INSET.

**It should be noted that the high-level scheme costs presented within the summary boxes were initial estimates that were used to complete the initial sift only. These figures exclude costs associated with the following key factors and therefore the final costs are likely to be significantly higher than those presented against each of the investment options:**

- Signage;
- Transportation of excavated materials;
- Excavation/Fill & cut;
- Traffic Management;
- Labour;
- Land ownership;

- **Inflation;**
  - **Ground remediation; and**
  - **Utilities.**
- Further detail on refined costs is provided in the Financial Case.**

### 3.6.4.1 Option 1 – Northern Orbital Access Route 1

<p style="text-align: center;"><b><u>Description</u></b></p> <ul style="list-style-type: none"> <li>● A new link between the A591 at Plumgarths roundabout and the A685 in the vicinity of the South Lakes Retail Park</li> <li>● Approximately 3km in length</li> <li>● Assumed that the route is single-carriageway with a footway provided on 1 side</li> </ul>	<p style="text-align: center;"><b><u>Cost</u></b></p> <ul style="list-style-type: none"> <li>● The estimated scheme cost of <b>£16,314,582</b> includes costs associated with the scheme, design team fees, risk and optimism bias</li> <li>● This figure excludes costs associated with further factors including land ownership &amp; purchase, utilities and excavation</li> <li>● In the case of this route, additional costs could potentially be incurred to relocate existing employment development to the north of the town and mitigation measures for construction work on the River Kent.</li> </ul>
<p style="text-align: center;"><b><u>Benefits</u></b></p> <ul style="list-style-type: none"> <li>● Environment Agency/Cumbria LEP are already committed to improving flood defences in the north of the town and a new strategic link will further improve the economic viability for businesses located in the Mintsfeet/Shap Road area</li> <li>● Provides an additional river crossing and the route could be engineered to incorporate flood water storage mechanisms, increasing the flood resilience of the town, potentially forming part of a wider package of flood management measures for the town.</li> <li>● Connects potential development sites for new housing and employment land with the strategic road network to the south of Burneside</li> <li>● Connects the A6 and A591 without needing to travel through the town centre, improving town centre resilience when the M6 EDR is activated</li> <li>● Improved accessibility between the M6 and Windermere and the North Lakes towards the Energy Coast</li> </ul>	<p style="text-align: center;"><b><u>Risks/Disbenefits</u></b></p> <ul style="list-style-type: none"> <li>● Potential land ownership constraints related to the land between Windermere Road and the railway and the need for a rail crossing which can accommodate future electrification of the line</li> <li>● Alignment passing immediately north of Laurel Gardens (critical part of the local plan housing allocation and a sensitive location for surface water management)</li> <li>● Route proposed to cross Carus Green Golf Course - protected in the local plan as recreational open space and compensatory provision would therefore be necessary</li> <li>● Impact on the Kendal Rugby Club site, employment allocation in the north of the town and both the River Kent floodplain and Natura 2000 site</li> </ul>

### 3.6.4.2 Option 5 – Southern Orbital Access Route 1

<p style="text-align: center;"><b><u>Description</u></b></p> <ul style="list-style-type: none"> <li>• New link between the junction of the A6 and the A591 to the south and west of Kendal and Oxenholme Rail Station to the east</li> <li>• Route length of approximately 2.4km</li> <li>• Assumed that the route is single-carriageway with a footway provided on 1 side</li> </ul>	<p style="text-align: center;"><b><u>Cost</u></b></p> <ul style="list-style-type: none"> <li>• The estimated scheme cost of <b>£12,002,461</b> includes costs associated with the scheme, design team fees, risk and optimism bias</li> <li>• This figure excludes costs associated with further factors including land ownership &amp; purchase, utilities and excavation</li> </ul>
<p style="text-align: center;"><b><u>Benefits</u></b></p> <ul style="list-style-type: none"> <li>• Improved access to Oxenholme Station</li> <li>• Provides an additional crossing of the River Kent</li> <li>• Opens up significant area of development land to the south of Kendal town centre</li> </ul>	<p style="text-align: center;"><b><u>Risks/Disbenefits</u></b></p> <ul style="list-style-type: none"> <li>• Potential constraints relating to the Oxenholme Station housing allocation (currently under construction)</li> <li>• Fails to address the issue of improving access to and from the M6</li> <li>• Residential and employment development may be able to come forward without investment in strategic infrastructure</li> <li>• Disbenefits associated with the landscape impact of the route on a key approach to the town, impact on the Natura 2000, impact on heritage assets (Helsington Mill Listed Buildings) and the site of a Roman Fort as well as the need to cross the safeguarded alignment of the Lancaster Canal.</li> </ul>

### 3.6.4.3 Option 8 – Cross River Access

<p style="text-align: center;"><b><u>Description</u></b></p> <ul style="list-style-type: none"> <li>• New or wider bridges at Aynam Road and Lound Road to facilitate a change in the gyratory to the south of the town centre and 2-way working on Aynam Road</li> <li>• Adding new bridges is likely to be much easier to achieve from a planning perspective than removing the existing bridges</li> <li>• To be considered in line with the Environment Agency's flood defence proposals for Kendal</li> </ul>	<p style="text-align: center;"><b><u>Cost</u></b></p> <ul style="list-style-type: none"> <li>• The estimated scheme cost of <b>£7,473,249</b> includes costs associated with the scheme, design team fees, risk and optimism bias.</li> <li>• This cost accounts for the delivery of two upgraded, reinforced concrete bridges.</li> <li>• This figure excludes costs associated with further factors including land ownership &amp; purchase, utilities and excavation.</li> <li>• Both existing bridges are scheduled ancient monuments which may have a bearing on the feasibility or desirability of widening them</li> </ul>
<p style="text-align: center;"><b><u>Benefits</u></b></p>	<p style="text-align: center;"><b><u>Risks/Disbenefits</u></b></p>

<ul style="list-style-type: none"> <li>• Anticipated that two way flows on Aynam Road will offer significant benefits for town centre journey times and routing – changes to the bridges alone would be likely to only move congestion to another area of Kendal, adding to the need for wider strategic improvements such as 2-way working on Aynam Road</li> <li>• Improvements to air quality at the critical area of Lowther Street where the confined space and heavy traffic combine to create Kendal's highest exceedances of the Kendal AQMA nitrogen dioxide target</li> <li>• Benefits for the high proportion of travel to work trips which originate and are completed within the Kendal area</li> <li>• Will bring forward development at Canal Head to the east of Aynam Road</li> </ul>	<ul style="list-style-type: none"> <li>• Sandes Avenue/Blackhall Road and Kendal Station junctions already heavily congested and likely to require significant investment in order to increase capacity to be able to deliver the investment</li> <li>• Impacts on Natura 2000 sites and heritage assets including the existing bridges and Kendal Conservation Area</li> <li>• Potentially adverse impacts on congestion on the network further north of the bridges</li> </ul>
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#### 3.6.4.4 Option 9 – Combined Option 1 and Option 8 Package

<p style="text-align: center;"><b><u>Description</u></b></p> <ul style="list-style-type: none"> <li>• A combined package incorporating both the Northern Orbital Access Route 1 (Option 1) and the investment to provide new or wider bridges within the town as well as changes to the town centre gyratory (Option 8)</li> </ul>	<p style="text-align: center;"><b><u>Cost</u></b></p> <ul style="list-style-type: none"> <li>• The estimated scheme cost of <b>£23,787,831</b> includes costs associated with the scheme, design team fees, risk and optimism bias.</li> <li>• This figure excludes costs associated with further factors including land ownership &amp; purchase, utilities and excavation.</li> <li>• In the case of this route, additional costs could potentially be incurred to relocate existing employment development to the north of the town and mitigation measures for construction work on the River Kent.</li> </ul>
<p style="text-align: center;"><b><u>Benefits</u></b></p> <ul style="list-style-type: none"> <li>• Opportunity to improve strategic access to current and potential future businesses in north Kendal as well as directly address traffic routing issues within the town centre</li> <li>• Helping to improve the resilience of the town in the event of major flood events, activation of the M6 EDR and daily congestion at peak and off-peak times within the town centre</li> </ul>	<p style="text-align: center;"><b><u>Risks/Disbenefits</u></b></p> <ul style="list-style-type: none"> <li>• Significantly higher cost than any of the other potential investment options</li> <li>• Land constraints relating to Option 1 and the location of the Carus Green Golf Course as well as a housing allocation at Laurel Gardens</li> <li>• For Option 8, investment is required at specific town centre junctions in order to increase capacity and enable the investment to come forward</li> <li>• Both existing bridges are scheduled ancient monuments which may have a</li> </ul>

	bearing on the feasibility or desirability of widening them
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### 3.6.5 Scope

The realisation of Options 1 or 5 will deliver:

- New single carriageway route between 2.4km and 3km length with a pedestrian footway on 1 side;
- Lighting columns every 30m on both sides of the road;
- New bridge over the River Kent, with an additional bridge of the Lakes Line for Option 1; and
- A link between the A591 and the A6 (Option 1) or the A65 (Option 5).

The standalone delivery of Option 8 or in addition to Option 1 will incorporate:

- New or wider bridges at Lound Road and Aynam Road;
- 2-way working on Aynam Road;
- Localised widening and changes to signage and road markings within the town centre; and
- New lighting columns for each bridge.

Further quantitative assessment of the 4 shortlisted options was then undertaken (as outlined within the Economic Case of this SOBC) to identify the preferred option for investment.

## 3.7 Dependencies and Constraints

A summary of key project dependencies and how successful delivery of the scheme will be ensured is outlined within **Table 1** below.

**Table 1: Key Project Dependencies**

Description	How successful delivery of the scheme will be ensured
Environment Agency Flood Modelling	Ensure the scheme aligns with the Environment Agency's ongoing modelling in the Kendal area as the scheme progresses to Outline Business Case. Maintain regular dialogue with the Environment Agency and keep abreast of any new developments
Consents and Legal Agreements	Ensure ongoing liaison with planning officers, landowners and local businesses/employers to ensure buy-in to the scheme
Scheme Funding	Ensure early and consistent lobbying with the Cumbria LEP and other partners to inform them of the need for and benefits of the scheme
Planning Permission	Ensure South Lakeland District Council as the relevant planning authority is closely involved in the development of the scheme

## 3.8 Stakeholders

As a result of the Kendal Strategic Transport Infrastructure Study and previous discussions at county, district and town council level as well as public calls for a bypass of Kendal from local councillors following Storm Desmond, a scheme to improve strategic infrastructure in Kendal has a number of different internal and stakeholder groups who will have an interest in supporting Cumbria County Council as relevant Highway Authority and scheme promoter. A selection of key stakeholder groups and their contribution to the project are outlined in **Table 2**, with further information on the interest and influence of the stakeholders indicated in **Section 7.5** within the Management Case.

**Table 2: Key Stakeholder Groups**

Key Stakeholder	Role/Interests
Department for Transport (DfT)	The DfT works with partners to support the national transport to improve the movement of people and goods round the country; the DfT may be a crucial funding partner for the project
Environment Agency (EA)	The Environment Agency is responsible for the protection and enhancement of the UK's environment and have a particular interest in Kendal as a result of their ongoing flood work in the area following Storm Desmond
Cumbria Local Enterprise Partnership (LEP)	The Cumbria LEP works in partnership with local government, businesses and other public and private organisations to drive economic growth and deliver new homes and jobs across the area; they will be interested in how the scheme will provide strategic benefits for the area and may provide a crucial source of funding for the scheme
South Lakeland District Council (SLDC)	SLDC are responsible for the Local Plan that covers Kendal and the rest of the district and outline ambitions for growth of employment and housing in Kendal; they have already been engaged within the Kendal Strategic Transport Infrastructure Study investment in improved strategic infrastructure will help to unlock potential development land in the area
Kendal Town Council (KTC)	KTC provide a significant role in representing the interests of different groups within the community and representatives have already been consulted within the Kendal Strategic Transport Infrastructure Study
AECOM	Responsible for the ongoing development of the Kendal Town Centre Master Plan; representatives from AECOM have already been consulted within the Kendal Strategic Transport Infrastructure Study to ensure that the two projects are coordinated and consistent in their messaging on a future for Kendal
Local landowners	As it has been identified that potential route options for new strategic infrastructure pass through land held under private ownership, cooperation from local landowners will be essential in ensuring the success of the scheme

It is considered that the scope for conflict between the stakeholder groups is limited as there is generally widespread support for the project, as has been harnessed and communicated through the workshop events held so far with a number of the key stakeholder groups including the EA, SLDC, KTC and AECOM. Cumbria County Council will however lead early engagement with local landowners to help reduce the risk of failing to secure necessary land purchases to deliver the scheme. The use of compulsory purchase orders (CPO) could delay the programme if not properly planned and whilst this possibility should be planned for, CPO should only be used as a 'last resort'.



## 4 The Economic Case

The Economic Case assesses the shortlisted options quantitatively to identify their impacts and the resulting benefits. An appraisal of the transport benefits for the four scheme options and a Do Minimum option has been carried out by Cumbria County Council using the Kendal Transport (SATURN) Model. This has been used to inform a further appraisal of the schemes using the INSET process, resulting in the selection of a preferred option from the shortlist of four options.

### 4.1 Overview

As outlined within the Strategic Case, the following shortlist of schemes has been assessed using transport appraisal tools and the INSET multi-criteria analysis process:

- **Northern Orbital Access Route 1 (Inner Northern Orbital Access Route)** – A new link between the A591 at Plumgarths roundabout and the A685 in the vicinity of the South Lakes Retail Park;
- **Southern Orbital Access Route 1 (Inner Southern Orbital Access Route)**– New link between the junction of the A6 and the A591 to the south and west of Kendal and Oxenholme Rail Station to the east;
- **Cross River Access** – New or wider bridges at Aynam Road and Lound Road to facilitate a change in the gyratory to the south of the town centre and 2-way working on Aynam Road;
- **Northern Orbital & Cross River Access** – A combined package incorporating both the Northern Orbital Access Route 1 and Cross River Access Scheme;
- **Do Minimum Option** – Representation of future demand on the current transport network, against which the benefits and disbenefits of shortlisted options can be compared.

### 4.2 Transport Forecasting and Appraisal of the Shortlisted Options

#### 4.2.1 Methodology

The transport forecasting and appraisal of the four shortlisted options was completed by Cumbria County Council officers using the Kendal Transport Model, a strategic SATURN traffic model of the Kendal urban area and surrounding district. The model covers the morning and evening weekday peak periods of 8-9am and 5-6pm. The model considers car, light goods vehicle (van) and heavy goods vehicle (lorry) trips. The car trips are segmented by trip purpose. The model was validated to a base year of 2011. Further information on the Kendal transport model is provided in the Kendal Transport Model Local Model Validation Report (Cumbria County Council, February 2015).

The assessment of potential infrastructure schemes in Kendal was undertaken by creating new forecast scenarios with each of the potential schemes. The traffic demand for the forecast scenarios was based on known developments that are likely to open in the future, background traffic growth and local plan proposals.

The output from the model scenarios was then compared to analyse the traffic impact of the scheme. This included considering the number of overcapacity junctions, and overall network journey time and distance. The network journey time was then monetised to provide an estimate of the journey time benefits that could be expected for each scheme.



Further information on the transport forecasting and appraisal methodology can be found in the Transport Forecasting and Economics Report (Cumbria County Council, March 2017), which is included as **Appendix G**.

#### 4.2.2 Demand assumptions

The forecasting has considered the future year of 2036, in line with the next potential South Lakeland Local Plan period of 2025–36. The following two modelling scenarios were assessed in SATURN:

- 2036 Base scenario; and
- 2036 Local Plan scenario.

The 2036 Base scenario is the reference case. It includes development which is considered more than likely to occur by 2036.

The 2036 Local Plan scenario includes all developments in the 2036 Base scenario; all development sites identified within the 2012–2025 South Lakeland Local Plan; an estimate of potential development which could be included in the 2025–36 South Lakeland Local Plan, and a number of potential town centre development sites identified as part of the ongoing Kendal town centre masterplan study.

The trips generated by these developments in both scenarios were estimated using the TRICS database, and these trips were distributed using a gravity model. Background traffic growth was also considered using the TEMPro software.

These two scenarios follow a fixed demand approach and do not consider the potential for changes in demand due to the scheme. The scenarios form the basis of the forecast demand when testing the proposed schemes in the Kendal Strategic Transport Infrastructure Study.

More information on the demand forecasting scenarios is provided in the Kendal Strategic Transport Infrastructure transport modelling technical note (Capita, December 2016).

#### 4.2.3 Results

The journey time benefits for each of the proposed schemes were used as the basis for an indicative economic appraisal of transport benefits. Whilst the appraisal is limited, it forms a guide to the likely scale of the scheme benefits. A full appraisal at a later stage of scheme development would include both monetised and non-monetised benefits from a number of other areas, including air quality, carbon savings, flooding and safety improvements. The appraisal followed guidance on the principles of cost-benefit analysis and user and provider impacts in TAG Units A1.1 and A1.3 respectively.

The appraisal was completed separately for each scheme and for each forecast scenario. In terms of scheme appraisal, the core or central scenario for the value for money assessment only considers development that is more than likely to occur. This means that the *2036 Base scenario* should be considered the 'core' scenario for this assessment, and would form the basis for a future scheme appraisal. The *2036 Local Plan scenario* gives an indication on how successfully the scheme could support wider long-term development in Kendal.

The forecast demand scenarios consider a future year of 2036. A 60-year appraisal period was assumed. As only one modelled year was considered, it was assumed that the journey time benefits were constant for all years in the appraisal period. For each year in the appraisal period, the journey time benefits were monetised based on forecast values of time in 2010 prices from the TAG data book (summer 2016). As the journey time benefits are reported for all

vehicles, the journey times were disaggregated into vehicle types using overall proportions from the forecast trip matrices. This process also converted the model outputs from PCUs to vehicles.

The future year benefits were then discounted to a base year of 2010. This produced monetised benefits for the morning and evening peak periods for one average weekday per year in the base year equivalent. The final step was to factor these benefits to cover other days and time periods. For this indicative appraisal, data on other time periods was not available, so it was assumed that the non-modelled benefits were equal to twice the sum of the modelled peak benefits. The benefits were then factored by 253 to allow for all the working days in a year, giving a total factor of 506.

The monetised journey time benefits for each scheme compared to the Do Minimum scenario are summarised in Table 3 and Table 4.

**Table 3: Monetised journey time benefits for the 2036 Base scenario**

Improvement scheme	Modelled benefits per year (pcu-hrs)	Total modelled monetised benefits (£m)	Annualisation and non-modelled time periods factor	Total monetised benefits (£m)
Northern Orbital Access Route 1	742	£0.22	506	£112.2
Southern Orbital Access Route 1	369	£0.11	506	£55.5
Cross River Access	56	£0.02	506	£8.6
Northern Orbital & Cross River Access	763	£0.23	506	£115.5

Source: Cumbria County Council, 2017

The results in Table 3 for the base scenario show that the northern route alongside the cross river access scheme could be expected to provide the largest journey time benefits. The journey time benefits of the southern route are around half that of the northern route. The journey time benefits of the town centre improvements are minor; this is partially due to the new signalised junctions that have been assumed at key junctions where there would be an increase in available traffic movements. However, despite the low modelled transport benefits, the realisation of improved cross river access would likely deliver significant wider benefits to the town centre including bringing forward new economic development at Aynam Road. The combined north and town option shows slightly higher journey time benefits compared to the northern route alone.

**Table 4: Monetised journey time benefits for the 2036 Local Plan scenario**

Improvement scheme	Modelled benefits per year (pcu-hrs)	Total modelled monetised benefits (£m)	Annualisation and non-modelled time periods factor	Total monetised benefits (£m)
Northern Orbital Access Route 1	3,502	£1.05	506	£531.6
Southern Orbital Access Route 1	1,603	£0.48	506	£243.4
Cross River Access	-688	-£0.20	506	-£101.9
Northern Orbital & Cross River Access	3,365	£1.01	506	£511.4

Source: Cumbria County Council, 2017

The results in Table 4 for the local plan scenario follow a similar pattern to the base scenario. The results show the northern route could provide the greatest journey time benefits, and the

southern route could provide roughly half of the benefits of the northern route. The results also show that the town centre improvements could increase journey times. This suggests the town centre improvements could not support long-term development in Kendal on their own without further careful consideration of the town centre as a whole. Finally, the combined north and town option also shows a high level of benefits, greater than the sum of the two separate options.

The results of the journey time benefits appraisal show that the northern route provides the highest level of journey time benefits, and suggest that the northern route could provide a high value for money. Conversely, the results suggest that the town centre improvements as tested would not support the objectives of the study. However, it should be highlighted that this appraisal excludes benefits from a number of areas, and in particular environmental criteria such as air quality, carbon emissions and flooding.

Further details on the transport modelling and appraisal results can be found in the Transport Forecasting and Economics Report (Cumbria County Council, March 2017), which is included as **Appendix G**.

### 4.3 Identification of Preferred Scheme

Using the results of the transport appraisal conducted by Cumbria County Council as well as the high-level scheme costs outlined within the Strategic Case, a further round of appraisal for the four scheme options was conducted using INSET.

This analysis built upon the initial INSET assessment of the long list of schemes outlined in **3.6.3**, though the previous qualitative appraisal of transport benefits was replaced with quantitative inputs from the appraisal of the scheme options by Cumbria County Council using the Kendal Transport Model. The scheme which indicated the highest calculated transport user benefits (Northern Orbital & Cross River Access) was awarded the maximum score of 2 as per the INSET scoring system outlined in the Strategic Case. The other schemes were then scored as a proportion of 2, relative to the transport benefit of the scheme compared to the highest scoring scheme (Table 5). Assessments of the wider economic benefits of each scheme as well as social and environmental benefits remained unchanged compared to the initial INSET assessment for the long list of 8 options.

**Table 5: Scoring of transport benefits in the final INSET assessment**

Option	Total monetised transport benefits (£m)	Transport benefits score
Northern Orbital Access Route 1	£112.2	1.94
Southern Orbital Access Route 1	£55.5	0.96
Cross River Access	£8.6	0.15
Northern Orbital & Cross River Access	£115.5	2.00

A similar logic was followed to represent the costs in the final INSET assessment

The least expensive option (as per the scheme costs outlined within the Financial Case) gained the maximum score of 2, with the other three options scored as a proportion of 2 based on their costs. This is shown in Table 6. This replaced the use of route length as a qualitative proxy, which was used in the earlier assessment of the long list of 8 options.

**Table 6: Scoring of indicative construction costs in the final INSET assessment**

Option	Total indicative construction costs (£m)	Costs score
Northern Orbital Access Route 1	£16,314,582	0.92
Southern Orbital Access Route 1	£12,002,461	1.25
Cross River Access	£7,473,249	2.00
Northern Orbital & Cross River Access	£23,787,831	0.63

To arrive at a total quantitative score for each of the four scheme options, the assessment scores for benefits, deliverability and costs were weighted as follows:

- Benefits – 4
- Deliverability – 2
- Costs – 1
- Total = 7

The rationale behind these weighting is that in principle, benefits on the one hand and deliverability / costs on the other should ideally be weighted equally, following the principles of cost-benefit analysis. However, at this early stage the costs still include a large number of exclusions and assumptions. The weighting of the costs was therefore reduced to account for these uncertainties.

The weighted scores for benefits, costs and deliverability were combined to identify the preferred scheme option. The final scores for each of the four options are outlined within **Figure 19**. The Northern Orbital Access Route 1 (Inner Northern Orbital) scored highest and therefore emerged as the preferred option. It should however be noted that the Cross River Access option has a dependency on the Environment Agency’s flood defence proposals for Kendal.

**Figure 19: INSET Appraisal – Final Monetised Benefits**

3. MULTI-CRITERIA ANALYSIS - SUMMARY							
Name	0. Overview of Options	1A. Multi-Criteria Analysis (Benefits)	1B. Multi-Criteria Analysis (Deliverability score)	1B. Multi-Criteria Analysis (Deliverability- Description)		1C. Costs	Total Quantitative Score
	Is enough information available to assess the proposed option?	Final score (-2 to 2 scale):	Final score (-2 to 2 scale):	Deliverability score (low/medium / high):	Dependencies on other options:	Final score (-2 to 2 scale):	Final weighted score (-2 to 2 scale):
Northern Orbital Access Route 1	YES	1.37	0.50	Medium deliverability		0.92	1.06
Northern Orbital Access Route 1 Plus Cross River Access	YES	1.40	0.00	Medium deliverability		0.63	0.89
Southern Orbital Access Route 1	YES	0.87	1.00	High deliverability		1.25	0.96
Cross River Access	YES	0.35	1.00	High deliverability	Dependent on the outcome of the Environmental Agency Flood Report	2.00	0.77

Source: Mott MacDonald

#### 4.4 Wider Benefits

The short report included as **Appendix F** explains the wider economic benefits which may arise as a result of the recommendations for a new Northern Orbital Access Route for Kendal. Mott MacDonald’s economic appraisal team have undertaken a calculation of the gross number of number of jobs on proposed employment sites (as per SLDC’s Local Plan Land Allocations - 2013) that are potentially supported by the Northern Orbital Route.

In summary, adding the hectareage for the sites located close to the scheme gives a total of 17.18ha of employment land adjacent or very close to the scheme, a further 28.76ha within 500m and 6.31ha between 500m and 1km. A broad assumption is that approximately half of this hectareage is actually used for employment purposes, with a further standard conversion applied to look at an estimate of the Net Internal Area on these sites. The appraisal has assumed that 40% of the total floorspace is used for Industrial & Manufacturing (B2) purposes, 40% for Warehousing (B8) and 20% for Retail/ sui generis use<sup>22</sup>. Assuming an occupancy rate of 75%, this means that there could be 870 gross jobs being potentially be supported on sites very close or adjacent to the scheme, a further 1,456 jobs within 500m and, finally, 320 jobs between 500m and 1km. This has been calculated using data from the HCA Employment Density Guide 2015.

At Outline Business Case stage, a more detailed review of the wider benefits of the scheme will be undertaken. This will include assessments of how new (beyond current Local Plan) sites could be developed alongside the scheme and how this will impact the commercial and industrial structure in Kendal. An assessment of the net additional GVA that could be generated from the additional employment of the town will also be produced and could also include an assessment of the welfare savings to the Exchequer by estimating the number of unemployed residents that may take up some of the jobs that are supported in future.

---

<sup>22</sup> This is based on a recent review of employment sites undertaken by Mott MacDonald in the North Kendal area; see Appendix F for details.

## 5 The Financial Case

The Financial Case concentrates on the affordability of the proposal and presents the financial profile of the preferred option, the Kendal Inner Northern Orbital Access Route.

### 5.1 Background

As outlined in the Strategic Case, upon deriving the shortlist of four potential investment options, high level costs were derived for each of the schemes. These costs were as follows:

**Table 7: High Level Costs for Shortlisted Schemes**

Option	Scheme Costs	Design Team fees incl. supervision (16%)	Risk (21%)	Scheme Cost (excluding Optimism Bias)	Optimism Bias (44%)	Total
<b>Northern Orbital Access Route 1</b>	£8,269,760	£1,323,162	£1,736,650	£11,329,571	£4,985,011	<b>£16,314,582</b>
<b>Southern Orbital Access Route 1</b>	£6,083,973	£973,436	£1,277,634	£8,335,042	£3,667,419	<b>£12,002,461</b>
<b>Cross River Access</b>	£3,788,143	£606,103	£795,510	£5,189,756	£2,283,493	<b>£7,473,249</b>
<b>Northern Orbital &amp; Cross River Access</b>	£12,057,903	£1,929,264	£2,532,160	£16,519,327	£7,268,504	<b>£23,787,831</b>

Source: Mott MacDonald

However it should be noted that these costs have a number of exclusions as follows:

- Signage;
- Transportation of excavated materials;
- Excavation/Fill & cut;
- Traffic Management;
- Labour;
- Land ownership;
- Inflation;
- Ground remediation; and
- Utilities.

### 5.2 Refined Costs for Preferred Option

Since preparing high-level costs for the shortlist of 4 schemes, the Kendal Northern Bypass/Kendal Inner Northern Orbital Access Route has been identified as the preferred scheme option within the Economic Case. Costs for the preferred option have therefore been



refined to reduce the number of exclusions associated with the headline cost. The refined costs are broken down as follows:

**Table 8: Preferred Option costs**

Description	Cost
New carriageway	£3,506,600
New vehicle bridges	£9,825,000
Earth embankments	£750,000
Excavate existing roads	£591,000
Street lighting columns	£267,000
Trees	£100,000
Footway – standard	£969,600
Traffic signals per arm	£245,000
Bus stop including basic shelter	£60,000
Directional map-type sign	£30,000
Directional chevron-type sign	£15,000
Traffic orders	£20,000
<b>Sub-total</b>	<b>£16,379,200</b>
Main contractor preliminaries	£2,456,880
Overheads and profit	£1,310,336
Construction works sub-total	£20,146,416
Project/design team fees (incl. supervision)	£3,223,426
Risk	£4,230,747
Inflation	£2,014,641
Project on-costs sub-total	£9,468,815
<b>Total project cost</b>	<b>£29,615,231</b>
Optimism bias (44%)	£13,030,702
<b>TOTAL COST</b>	<b>£42,645,933</b>

Source: Mott MacDonald

### 5.3 Exclusions

The costs presented above for the preferred option still do not account for costs associated with:

- Utilities;
- Land acquisition; and
- Abnormal ground conditions (remediation etc.).

As a result, the actual costs for the Kendal Inner Northern Orbital Access Route will likely be higher than the initial costs presented here. These exclusions will need to be considered if the scheme is progressed to Outline Business Case (OBC) stage.

## 6 The Commercial Case

The Commercial Case determines whether the scheme is commercially viable, presenting evidence on risk allocations and transfer, contract timescales and implementation timescales.

The main purpose of the Strategic Outline Business Case is to set out the need for intervention and define a preferred way forward. At SOBC stage, the Commercial Case is presented as a high-level outline, which will be further developed as the scheme becomes more defined and the decision-making process reaches the Outline Business Case Stage.

### 6.1 Outputs Based Specification

As discussed in the preceding chapters, the preferred option for the scheme is option 1: Northern Orbital Access Route 1. In broad terms, this option will create a new link road from the A591 at or near Plumgarths Roundabout, to the A685 on the other side of the River Kent. This means that the following outputs will have to be sourced from the market:

- Highway design and construction, including the construction of the new link road and changes to the existing infrastructure where the new link roads meets the A591, Burnside Road, A6 and A685;
- Design and construction of a bridge over the Windermere Branch Line;
- Design and construction of a bridge over the River Kent;
- Design and construction of other bridges and structures necessary to overcome level differences along the route; and
- Other professional and technical services in support of the above, including specialist quantity surveying, legal, public consultation, project management and other services.

### 6.2 Outline Procurement Strategy

#### 6.2.1 Initial preferred procurement option

Cumbria County Council have a number of different options for procuring the above services on the commercial market.

At this stage, it is envisaged that the scheme will most likely be procured through the Council's Capital Works Framework – Lot 2 (Highways). The current Capital Works Framework runs from 2016 to 2020, and provides the Council with a strong, sustainable supply chain with a healthy level of competition between suppliers. Lot 2 (Highways) of the Framework includes 12 suppliers for the delivery of services over a value of £750,000. These suppliers could be engaged through a mini-competition to determine the most economically advantageous tenderer, as follows:

- Issue an Expression of Interest to all 12 suppliers;
- Review submissions and create a shortlist of the 4 most suitable suppliers;
- Issue the full tender to the 4 shortlisted suppliers; and
- Assess the returns and reward the contract to the most suitable bidder.

The criteria for awarding the contract will be further considered at Outline Business Case and Major Scheme Business Case stage. It is a requirement of the Capital Works Framework that at

least 50% of the assessment is based on price; assessment of quality can make up anywhere between 0% and 50% of the total score.

The Capital Works Framework also leaves Cumbria County Council the freedom to determine whether to go down the traditional procurement route (i.e. procure a designer, and then once the scheme is fully designed, procure the contractor); or alternatively, the Council may go down the Design and Build route, where the Contractor is both the Principal Designer and Principal Contractor. In either case, all contracts under the Framework are managed through the industry-standard NEC form of contract.

### 6.2.2 Alternative procurement options

Aside from the Council's own Capital Works Framework, a number of alternative procurement options have been identified:

- Open invitation to tender (OJEU procurement) to select a single contractor for the works from the open market;
- Creation of a bespoke framework for the scheme, enabling the works to be split into separate elements and then awarded to multiple contractors on the framework;
- Mini competition among suppliers on the North West Construction Hub Framework; or
- Use of the single-supplier National Civil Engineering and Infrastructure Framework.

The advantages and disadvantages of these different procurement options will be considered in more detail in the Outline Business Case.

### 6.2.3 Issues to be considered at Outline Business Case stage

Should the scheme progress to Outline Business Case, the procurement strategy will be developed in more detail and the Commercial Case expanded to include the following topics:

- Risk allocation and transfer between the Council and contractor;
- Timescales for procurement;
- Contractor management strategy; and
- Payment mechanisms and arrangements for potential cost overruns.

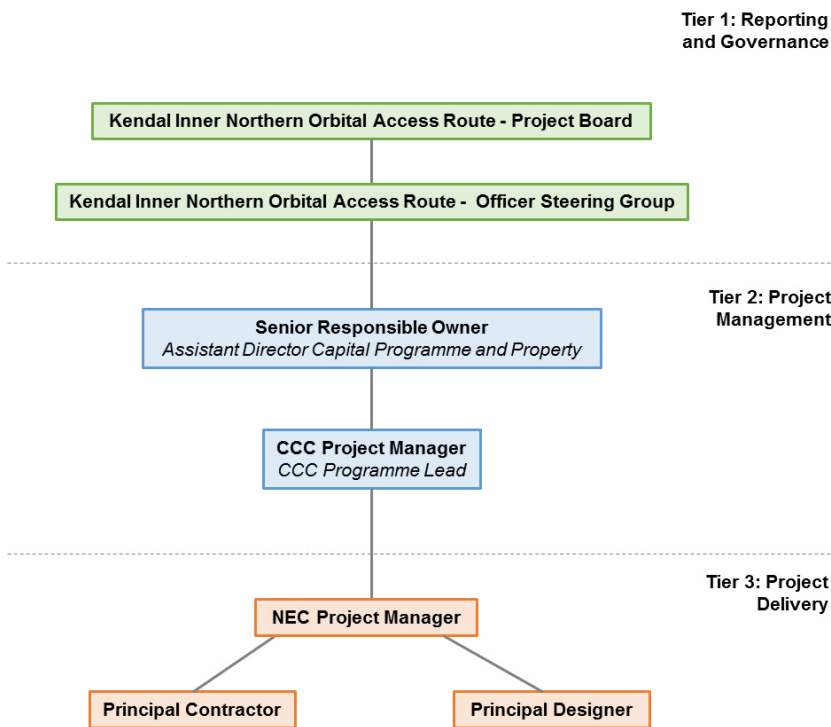
# 7 The Management Case

The Management Case provides assurance that Cumbria County Council have the capacity and capability to deliver the project as proposed. It also outlines the indicative programme for the delivery of the scheme including details of risk management mechanisms.

## 7.1 Governance and Project Management

The overall structure for the governance, management and delivery of the Kendal Inner Northern Orbital Access Route is shown in **Figure 20**. It is again noted that further to this, ongoing dialogue should be maintained with the Environment Agency in relation to their forthcoming flood modelling and proposals report.

**Figure 20: Governance and project management organogram**



### Tier 1: Reporting and Governance

This tier will provide the strategic direction to the project, provide the necessary approvals for the project to proceed at key stages, and hold the project management and delivery tiers to account. High-level governance will be provided by the Cumbria LEP and its Transport Infrastructure & Advisory group, which has replaced the former Cumbria Local Transport Body. Given the size of the scheme, it is proposed that a dedicated Steering Group be set up to oversee the development and delivery of the project. The Steering Group could include key political and senior officer representatives from Cumbria County Council, as well as third-party stakeholders. This will be considered further at Outline Business Case.

## Tier 2: Project Management

This tier will provide ongoing management of the project. Cumbria County Council will act as the scheme sponsor and manage the scheme through its existing management arrangements for Capital Programmes. A dedicated Senior Responsible Owner and Project Manager will be appointed, who will be responsible for the implementation of the scheme. The Senior Responsible Owner and Project Manager will report back to the Steering Group at regular intervals, and seek approvals from the Steering Group at key decision points within the programme.

## Tier 3: Project Delivery

Members of the project delivery team will be responsible for the delivery of the scheme on a day-to-day basis. It is currently envisaged that most of the day-to-day running of the project will be outsourced to an external contractor. As explained in the Commercial Case, this could be through separate contracts for design services and construction services, or through a combined Design & Build contract. Whilst the design and construction of the scheme will be outsourced, Cumbria County Council officers will assist with the delivery of the project in a number of support roles, including procurement, financial control, legal and communications.

Table 9 provides more detail on the responsibilities of each role within the governance structure.

**Table 9: Roles and responsibilities**

Role	Responsibilities
Cumbria LEP	<ul style="list-style-type: none"> <li>Strategic decision-making and oversight of transport investment in Cumbria</li> <li>Provides accountability to Government</li> </ul>
Cumbria LEP Transport Infrastructure & Advisory Group	<ul style="list-style-type: none"> <li>Manages transport investment in Cumbria on behalf of the LEP</li> <li>Ensures funding secured by the LEP is put to best use</li> <li>Reports to the LEP Board</li> </ul>
Cumbria County Council Cabinet	<ul style="list-style-type: none"> <li>Provides leadership and democratic accountability on strategic transport projects</li> <li>Advises the Cumbria LEP</li> <li>Provides approval at major decision points, such as submission of the Major Scheme Business Case and the start of construction</li> </ul>
Steering Group	<ul style="list-style-type: none"> <li>Provides strategic direction to the Senior Responsible Owner</li> <li>Provides approval at key decision points, within the limits of delegated authority from the Cabinet</li> <li>Provides opportunity for key stakeholders to shape the project</li> </ul>
Senior Responsible Owner	<ul style="list-style-type: none"> <li>Provides direction to the project team</li> <li>Monitors and controls project progress at regular intervals</li> <li>Reports back to the Steering Group</li> </ul>
Project Manager	<ul style="list-style-type: none"> <li>Provides day-to-day management of the project team</li> <li>Prepares and monitors the delivery of work streams</li> <li>Manages allocated funding</li> <li>Monitors progress against project programme</li> <li>Reports back to the Senior Responsible Owner and escalates decisions as required</li> </ul>
Contractor Delivery Team	<ul style="list-style-type: none"> <li>Design and construction of the works</li> </ul>
CCC Support Team	<ul style="list-style-type: none"> <li>Support to the Project Manager in areas such as procurement, financial control, legal and communications</li> </ul>

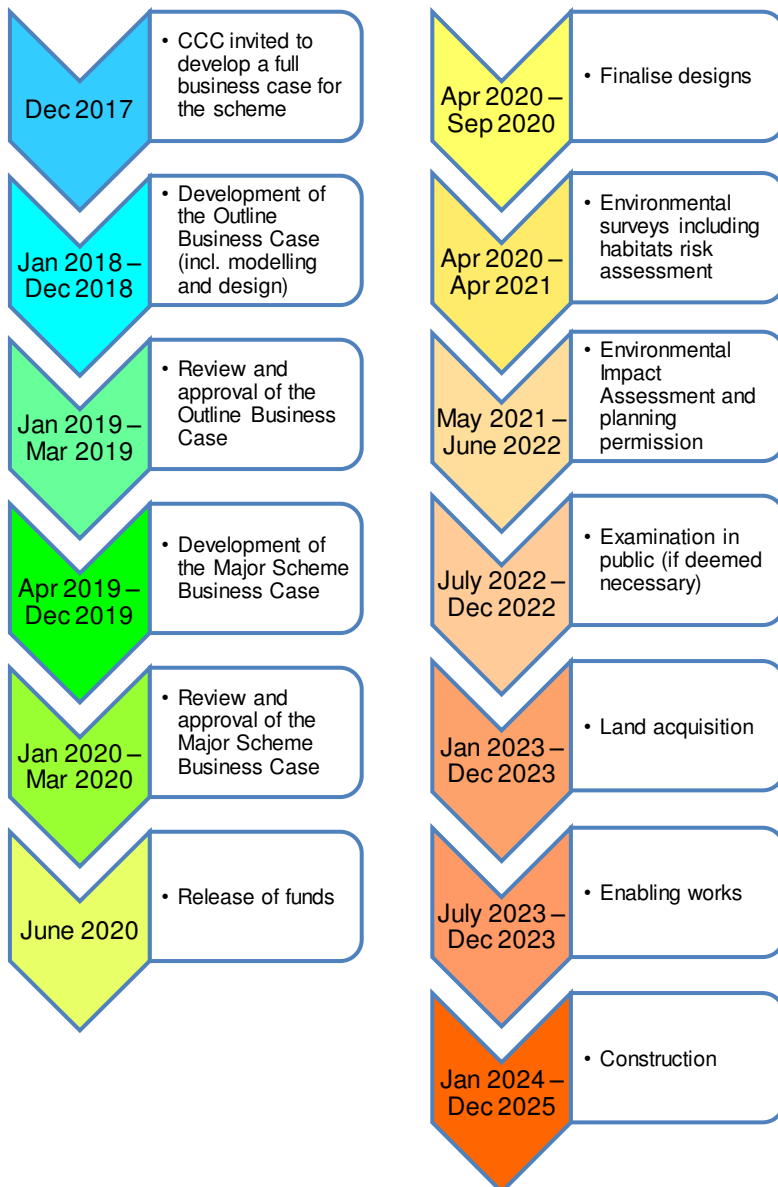
## 7.2 Scheme Programme

An indicative programme for delivery of the scheme is shown in **Figure 21**. This programme is based on the assumption that Cumbria County Council will be invited to develop a full business case for the scheme by the end of 2017, so work on the Outline Business Case can start by

early 2018. Given the size of the scheme, this is likely to require support from DfT, such as through future rounds of the Large Local Major Schemes Fund.

This indicative programme will be developed further at Outline Business Case stage.

**Figure 21: Indicative delivery programme**



### 7.3 Assurance, approvals and reporting

As shown in the indicative programme in section 7.2, there are a number of key decision-making points at which the scheme will be formally reviewed before it can proceed further. These decision-making points include:

- Approval of the Outline Business Case;
- Approval of the Major Scheme Business Case; and
- Approval of the planning application.



The exact assurance and approvals process to be followed will depend on the type of funding that is used to deliver the scheme. Given the potential cost of the scheme, it is considered likely that the Outline Business Case and Major Scheme Business Case would need to be submitted directly to DfT, with scrutiny of the business case provided by DfT officers and the final investment decision taken by a Minister.

If the scheme is funded locally (i.e. the final decision to invest is taken by the Cumbria LEP), a detailed assurance and approvals plan for the scheme will be developed using the existing Cumbria LEP Central Assurance Framework (February 2017). The Assurance Framework describes the Cumbria LEP's robust processes for ensuring that investments provide value for money, based on best practice guidelines. This includes the requirement for the appraisal of transport schemes to be undertaken in line with DfT's WebTAG guidance (section 5.3 of the Assurance Framework).

In addition to these formal decision-making points, Cumbria County Council as the scheme sponsor will also undertake regular operational reviews. The operational reviews will form part of project monitoring meetings conducted every month by the Project Manager and Senior Responsible Owner. These outcomes of the operational reviews will be reported to the Project Steering Group, using the Council's internal BRAG (Black, Red, Amber, Green) process. Costs or timescales which are not on target will be identified by the Steering Group to look at ways to remedy the situation. In case of major overspends or programme delays, the Steering Group will escalate decisions to the Council's Cabinet.

## 7.4 Evidence of Similar Projects

Cumbria County Council has successfully delivered a number of similar major multi-million pound projects across the county in recent years.

The *Carlisle Northern Development Route* (CNDR) Network is a 156km highway network in Cumbria, with the new 8.25km single-carriageway CNDR providing a western link between the A595 to the west of Carlisle and the M6 to the north of Carlisle. As in the case of the Kendal Inner Northern Orbital Access Route, objectives of this scheme included to improve strategic network links for Cumbria and the North West of England as well as to maximise development opportunities at key employment sites. Forecast cost for delivery of the new road was just under £3.2 million, with the total cost required to complete the new road build standing at just over £3.9 million. Work was forecast to be completed on site by March 2011 but as a result of delays in awarding the preferred bidder, the actual works completion date was February 2012. Nevertheless, the total time between bid award and works completion was forecast to take over 3.5 years but was completed in just over 3 years.

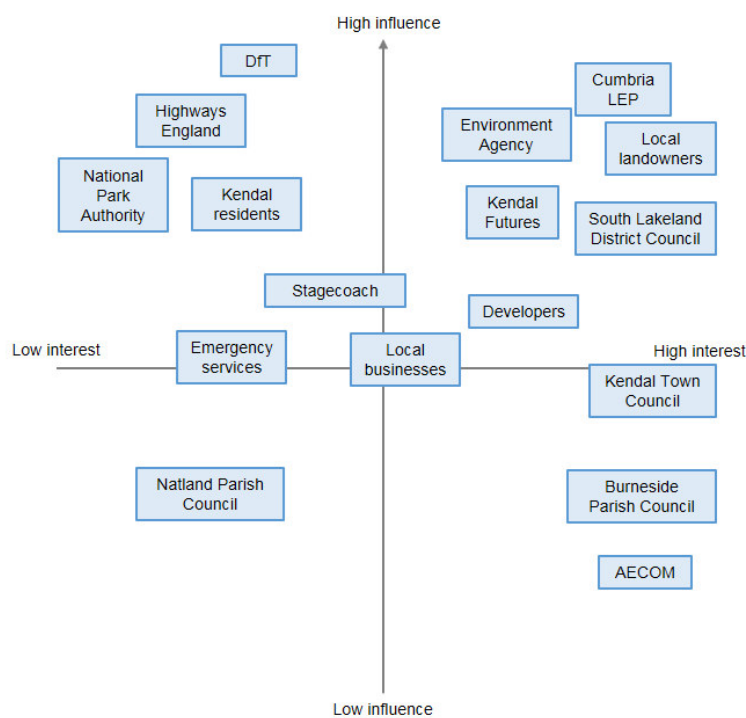
Similarly, the *Northside Bridge* scheme was undertaken to reconnect the Northside area of Workington to the main town following major flooding in 2009. This project incorporated the construction of a replacement bridge to replace the collapsed original bridge. Tendered price for the construction was c£6.4 million, with additional costs attributed for factors including service diversion, land take and design fees. Total costs for the scheme, including construction and all additional costs, were just over £8.2 million, whilst there was only slight delay in terms of the forecast timescale to deliver the project. The project was completed over a 15-month period compared to the forecast 11 months. The scheme also won the top prize in the Builder and Engineer Awards 2013 in the Public-Sector Project category.

## 7.5 Stakeholder Management and Communications

At present, the scheme is in the early stages of development, so it is expected that the stakeholders to be involved and the communication methods used to engage with them will evolve as the scheme progresses. In addition to the overview of key stakeholder groups outlined within the Strategic Case, an initial ‘stakeholder mapping’ exercise has been undertaken to understand the potential levels of interest in and influence over the scheme that various stakeholders have (Figure 22).

At Outline Business Case stage, this initial stakeholder mapping will be used to develop a full Stakeholder Management and Communications Plan, which will include full details of who will be consulted, for what purpose, when, how and how often.

**Figure 22: Initial stakeholder analysis**



## 7.6 Dependencies on Other Projects

The delivery of a new Inner Northern Orbital Access Route around Kendal is not dependent on any other current or future schemes. Cumbria County Council are currently delivering a series of cycleway improvements in the Burton Road and Shap Road area within Kendal, but there is no direct dependency between these improvements and the current scheme.

Through consultation conducted as part of the Kendal Strategic Transport Infrastructure Study, the Environment Agency have confirmed that hydrological modelling for the period to 2080 is also underway for the River Kent catchment to help inform options for future flood mitigation. Further development of the preferred option beyond this SOBC will consider the implications of this modelling work as results become available.

## 7.7 Risk Management

### 7.7.1 Risk management processes

The production of a Risk Management Strategy is an integral component of the standard project management procedures that are used by Cumbria County Council on major capital projects. During the scheme development stage, a thorough and detailed examination of risks will be incorporated into a project risk register. The risk register will be reviewed regularly throughout the detailed design, procurement, construction and post-construction phases as a standing item in progress meetings.

The Project Manager will have day to day responsibility for managing risks and will escalate any issues to the Senior Responsible Owner. In case of any urgent risk events, the Project Manager will initially seek guidance from the Senior Responsible Owner on behalf of the Project Board. In case of major issues where the risk response would exceed the authority of the Project Board, the Senior Responsible Owner will produce a Cabinet Report to seek guidance and approval from the Cumbria County Council Cabinet.

### 7.7.2 Initial risk identification

Table 10 provides a high-level overview of the key project risks that have been identified at this stage. At Outline Business Case, a risk workshop will be held to develop a comprehensive risk register, which will in turn feed into a Quantified Risk Assessment (QRA).

**Table 10: Initial risks identified**

Risk	Likelihood	Impact	Mitigation measures to be used
Funding for the scheme cannot be secured.	High	High	Engage in early and consistent 'lobbying' with the Cumbria LEP and, potentially, DfT, to secure funding for the scheme. In addition, start conversations with potential developers to investigate the potential for private-sector contributions through Section 106 agreements.
Planning permission for the scheme is refused.	Medium	High	Ensure South Lakeland District Council as the relevant planning authority is closely involved in the development of the scheme. Undertake regular meetings with landowners, developers and other stakeholders to reduce the risk of challenge at planning application stage.
Third party land cannot be secured.	Medium	High	Cumbria County Council to lead early engagement with landowners. Scheme may require the use of compulsory purchase orders (CPO), which could delay programme if not properly planned. This possibility should be planned for, although CPO should only be used as a 'last resort'.
Lack of support for the scheme from key stakeholders and the local community.	Medium	High	Develop a detailed Stakeholder Management and Communications Plan. Use dedicated consultation teams and press office to facilitate communication with key stakeholders and the local community.
Scheme does not align with Environment Agency's flood modelling and/or increases flood risk in the area.	Low	High	Ensure the scheme aligns with the Environment Agency's ongoing work in the Kendal area as the scheme progresses to Outline Business Case. Maintain regular dialogue with the Environment Agency and keep abreast of any new developments.
Unforeseen engineering issues, such as conflicts between the scheme and underground utilities.	Medium	Medium	Detailed design will include thorough review of existing issues and cost these risks appropriately to prevent any unforeseen cost increases.

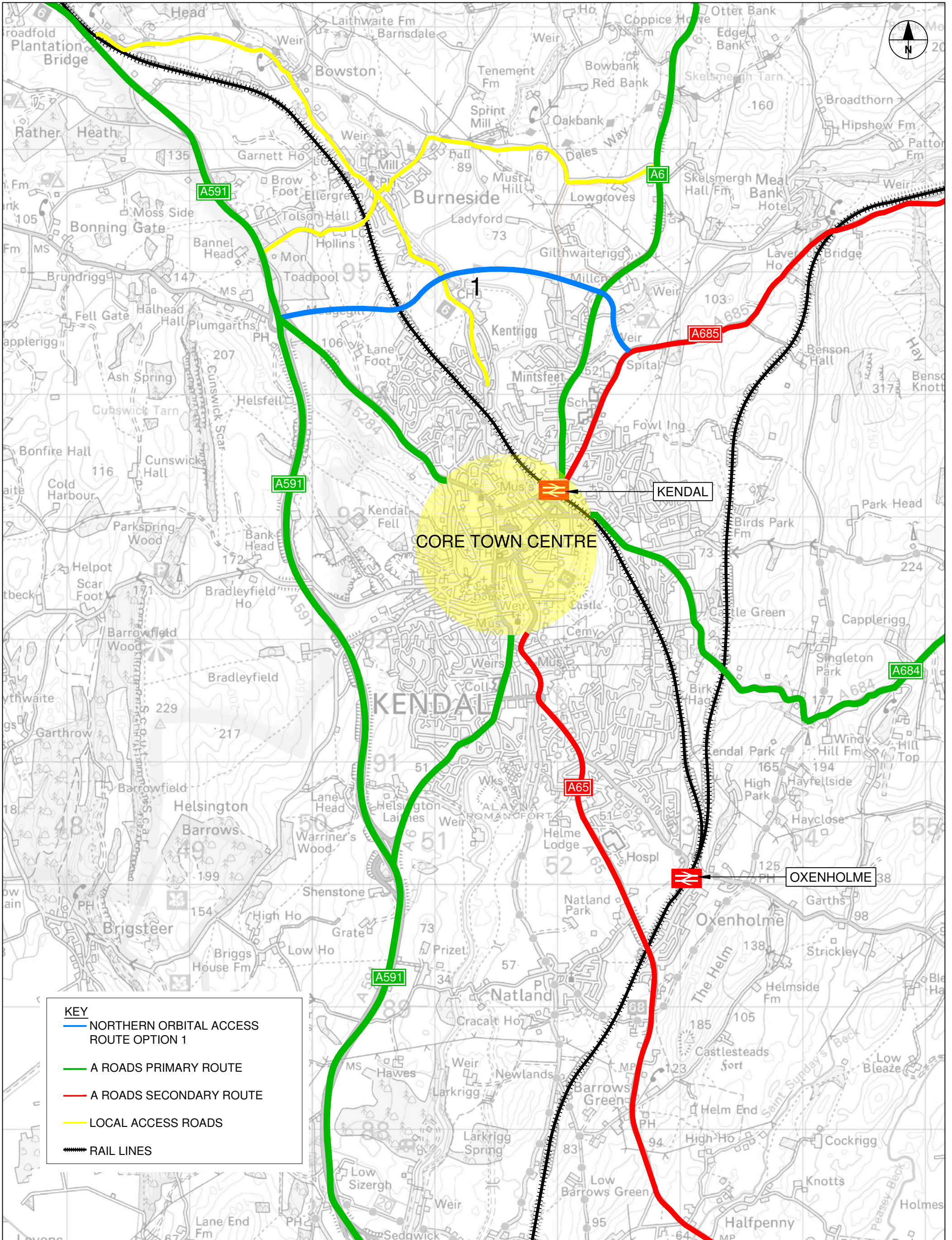
Risk	Likelihood	Impact	Mitigation measures to be used
Insufficient resources to manage and deliver the scheme.	Medium	Medium	Appoint specialist consultants to assist with scheme design, project management and construction.
Procurement of services is not successful or is delayed or challenged.	Low	Medium	Due diligence during the appointment process; multiple procurement options are available (see Commercial Case).
Project costs exceed the available project budget.	Low	Medium	Keep forecasts under review and adjust to account for any predicted rate of change and reflect change in the scheme delivery programme.






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# A. Northern Orbital Access Route – Scheme Plan

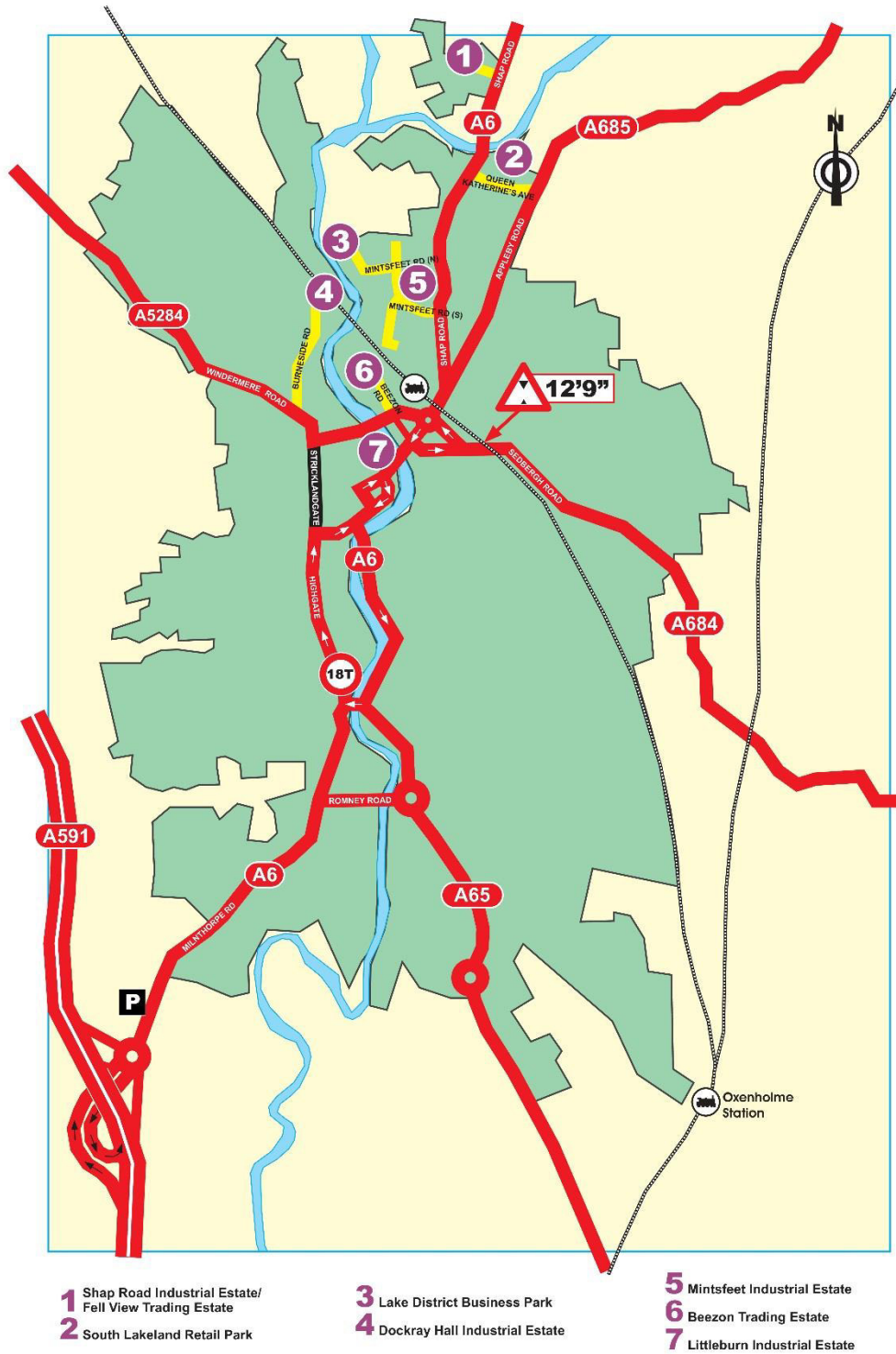




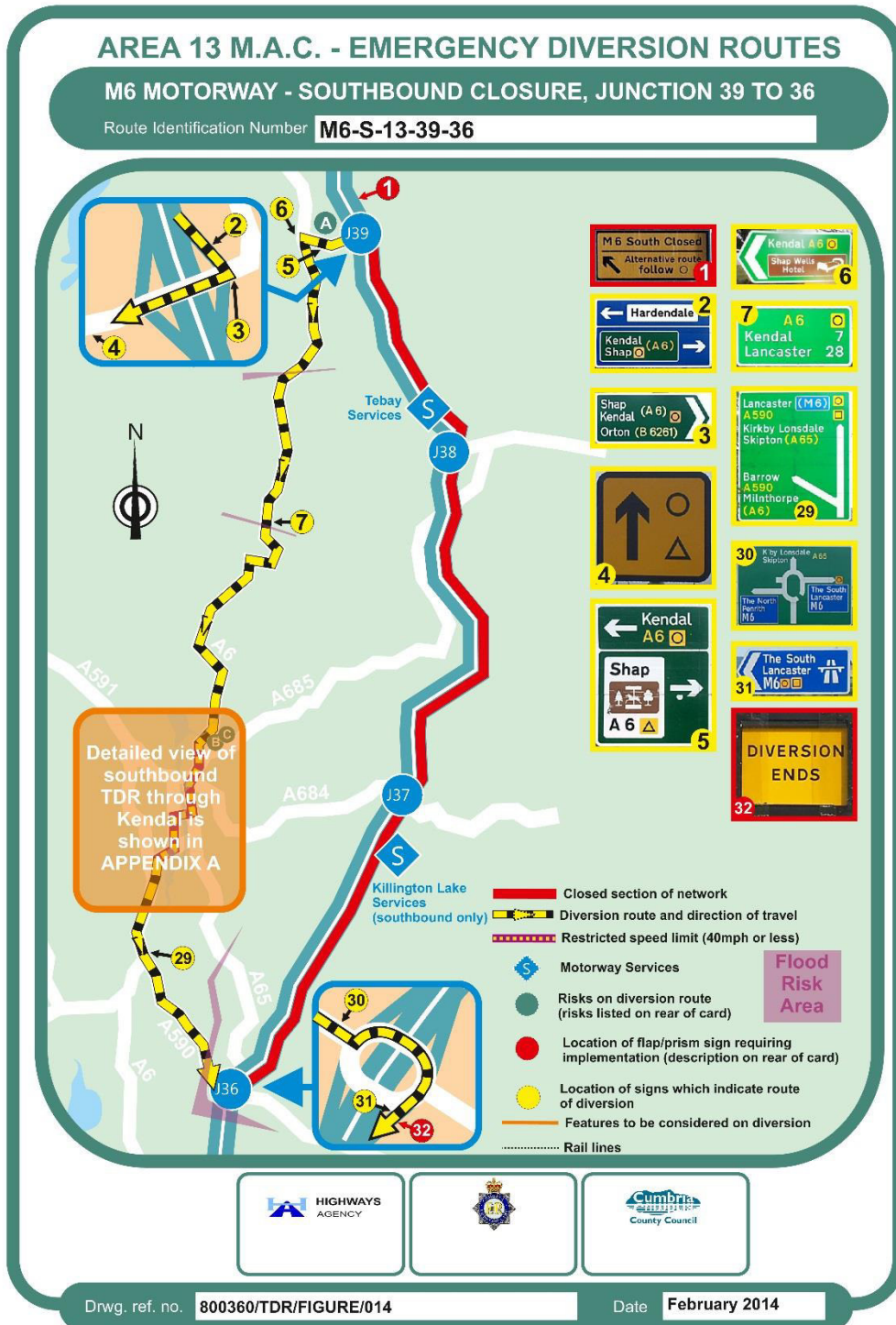
KEY	
	NORTHERN ORBITAL ACCESS ROUTE OPTION 1
	A ROADS PRIMARY ROUTE
	A ROADS SECONDARY ROUTE
	LOCAL ACCESS ROADS
	RAIL LINES



## B. Kendal HGV Network Map



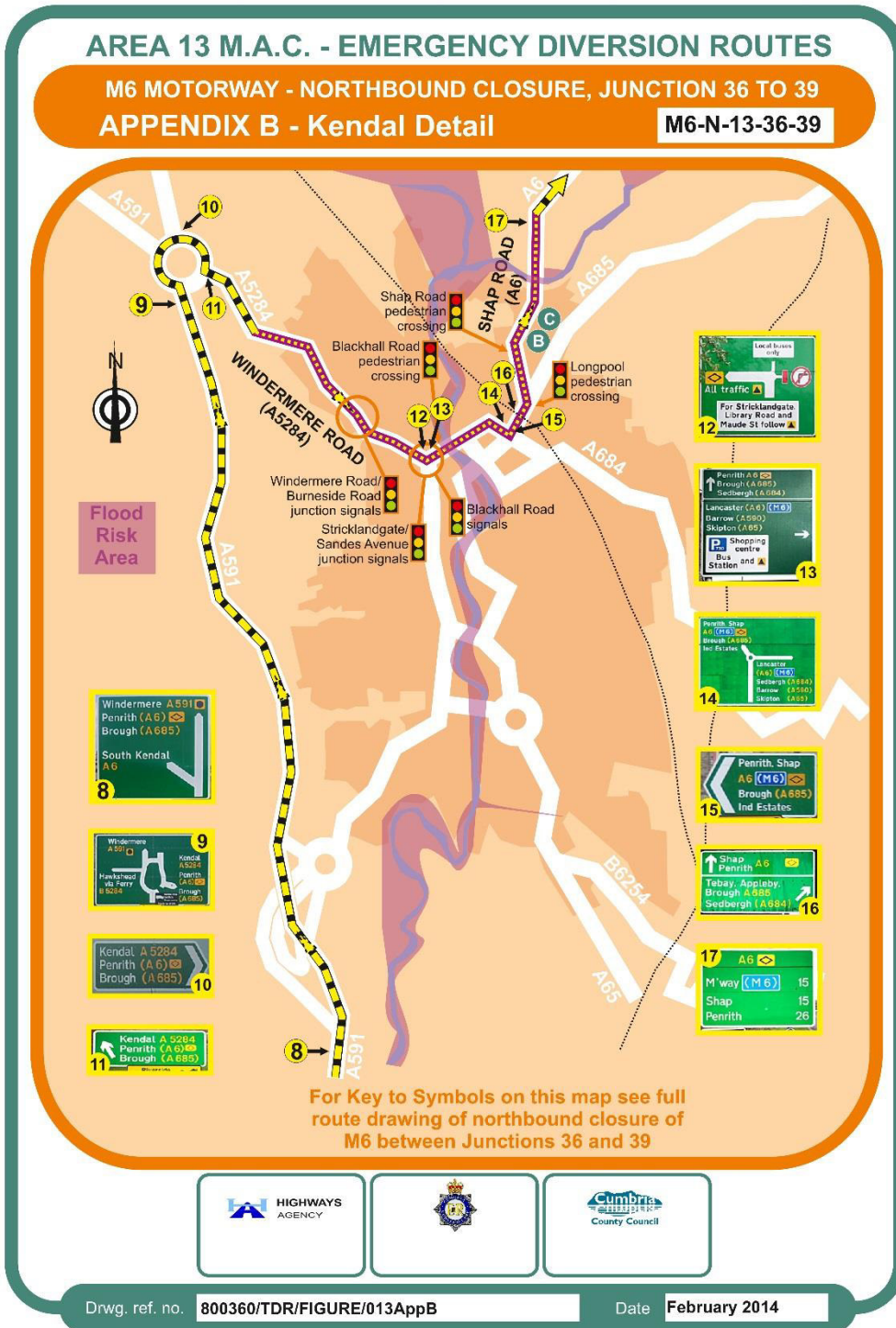
# C. M6 Emergency Diversion Route



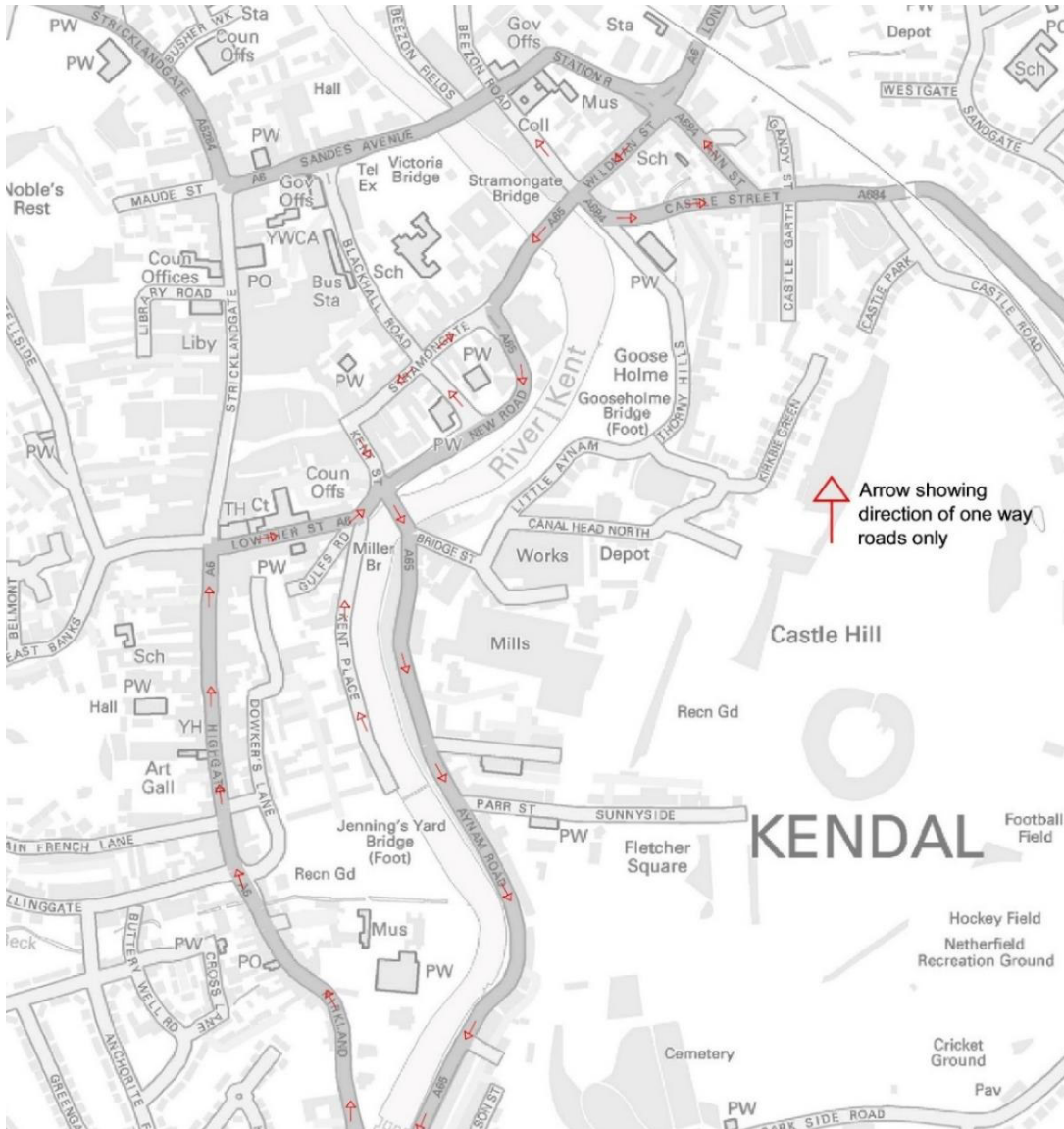








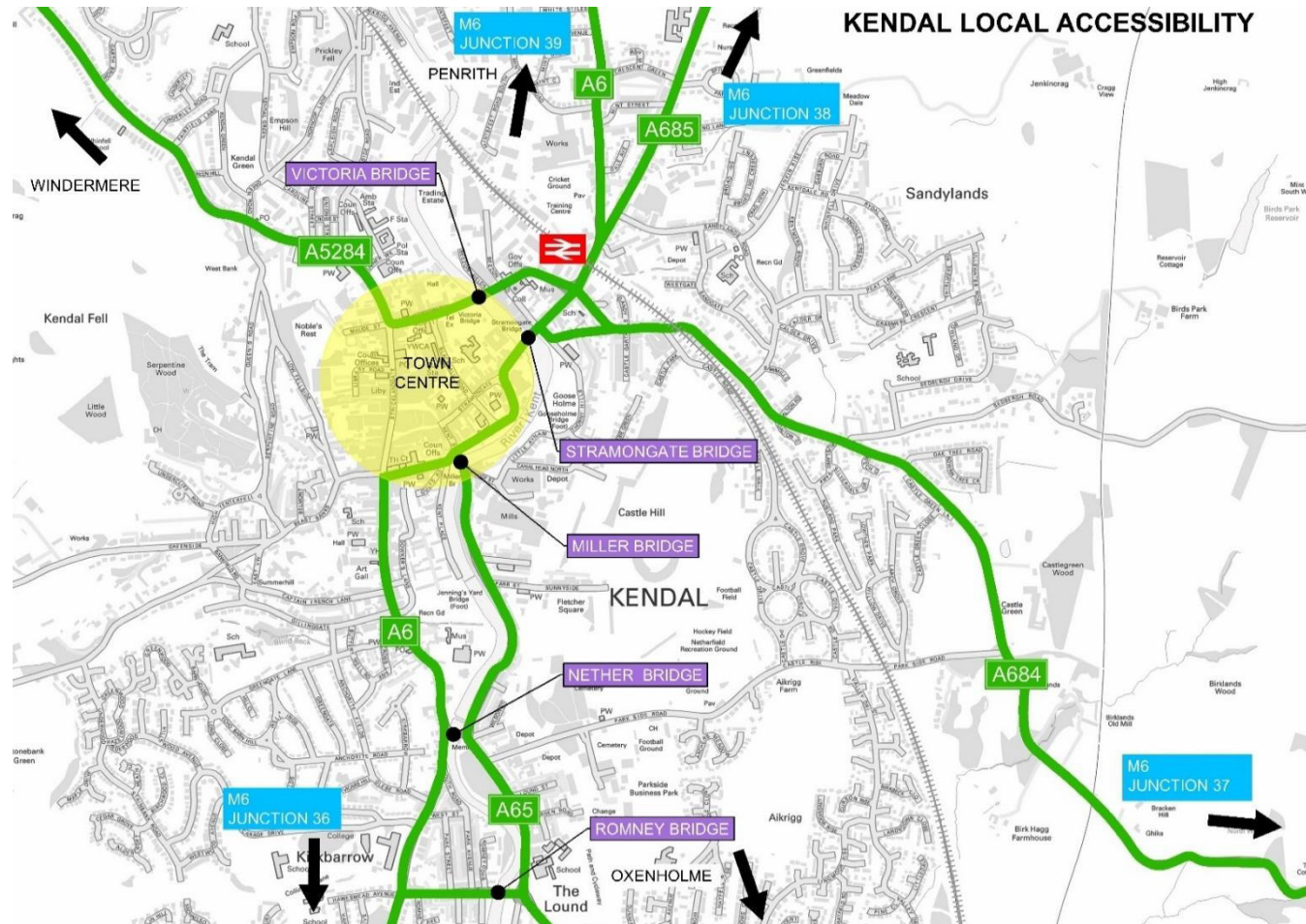
## D. Kendal Town Centre Gyratory



Source: Mott MacDonald



## E. Kendal Local Accessibility Context



Source: Mott MacDonald

## F. Wider Economic Benefits Study



# **Kendal Strategic Transport Infrastructure Study**

Wider Economic Benefits Report

May 2017



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# **Kendal Strategic Transport Infrastructure Study**

## **Wider Economic Benefits Report**

May 2017



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# 1 Introduction

This document explains the wider economic benefits which may arise as a result of the Kendal Strategic Transport Infrastructure Study recommendations. The preferred road option – at this stage referred to as the Kendal Inner Northern Orbital Access Route - will have an impact on local property markets, land values and employment in Kendal. The scheme could also influence visitor numbers and their expenditures in and around Kendal town centre. These benefits are considered in the specific context of how they might be calculated.

In putting this note together a telephone conversation was held with a client team. This conversation emphasised the following points:

- The existing employment sites along the A6 corridor to the north of Kendal are key to the local economy, as this is Kendal's main connection to the M6. The M6 is identified in various strategies, including *One Agenda*, *One Economy*, *One North* (published in 2015) as a key strategic opportunity for the north.
- Local businesses have highlighted that they are restricted by the road network, particularly around the A591.
- Improving the road network around the A6 will allow businesses to move further north, freeing up the areas immediately adjacent to Kendal to revert to floodplain.
- The priority for this area is therefore not to expand current business parks, but to try and relocate businesses to more advantageous locations.
- This strategic placing of employment will benefit the local economy in future years.
- Several manufacturing firms have indicated that they would benefit from the preferred option.

The remainder of this document is structured as follows:

- Wider economic benefits of improving the road network – a discussion on the broader benefits of investment in the road network which would not necessarily be captured by a single model such as WebTAG. These are benefits which add to the narrative and could have an economic value attached. This section also considers the road in terms of Kendal's emerging flood defence strategy.
- Calculation of economic benefits – a brief description of the concepts and approach when calculating economic benefits.
- Review of the development pipeline – tabulations of the known major proposals in the development pipeline and how they relate to the road scheme options. This will also provide some narrative of how the preferred option may impact upon the sites identified
- Case studies – three examples of similar road schemes in rural areas where the local economy has been supported and employment and housing land brought forward.

## 2 Wider economic benefits of improving the road network

The Kendal road scheme is planned to have a broad range of economic benefits, including:

- Improving the resilience of the M6 corridor in the Kendal area.
- Supporting the future growth of Kendal.
- Reducing congestion within the town centre.
- Improving accessibility to its existing employment areas.

The need for greater resilience in the Kendal area is widely recognised, with this need being further demonstrated by the significant and prolonged road closures following serious flooding in December 2015. The town also becomes congested due to the impact of M6 closures and subsequent traffic diversions through the town.

### 2.1 Improving resilience and accessibility

Many of the business parks and industrial estates in the north of Kendal rely on access from the A6 Shap Road corridor. The A6 is an essential piece of infrastructure enabling businesses to move stock and goods to and from customers as well as enabling workers to get to work. As such, the delivery of strategic improvements to Kendal's road network to enhance access to the A6 corridor is a priority for Cumbria County Council.

The emerging flood defence strategy for Kendal seeks to: (i) help safeguard existing jobs in flood damaged areas; (ii) ensure successful companies have the confidence to grow in their present location; and, (iii) ensure several proposals further down the development pipeline which will create new employment opportunities and generate GVA are completed. The Kendal road scheme will support increased confidence in the area and allow the town to fulfil its potential.

There is £24m investment committed to flood defence schemes in Kendal<sup>1</sup>, one of the aims of which is to increase confidence in the area for businesses and new investment. Increased flood protection will be an incentive for more businesses to remain in, and locate to, Kendal.

As outlined within the Strategic Outline Business Case for the preferred scheme option, by providing an additional crossing of the River Kent, there are opportunities to engineer the new route so that it provides additional flood protection and serves as a flood storage mechanism in the event of further major flooding. This could provide significant benefits to homes and businesses in Kendal downstream of the new scheme that are currently at risk of flooding in the town.

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<sup>1</sup> BBC News (2014) 'Flood-hit Kendal given £24m defences cash' available at:  
<http://www.bbc.com/news/uk-england-cumbria-36043165>

## 2.2 Supporting the economy and future growth

According to ONS estimates, the population of Kendal stood at 29,495 persons in mid-2012<sup>2</sup>. Overall, whilst strong growth was witnessed in terms of the town's population between 2002 and 2007, this has slowed significantly since. South Lakeland District Council (SLDC) are now planning for significant new housing and employment development in the region to rebalance its ageing population. Kendal is identified by SLDC as one of the main focal points for growth and to support this growth, the South Lakeland Core Strategy<sup>3</sup> has allocated a number of housing and employment development sites in Kendal. Furthermore, the strategy identifies the need for significant highway infrastructure improvements and lower traffic generation to support this growth.

As discussed within the Strategic Case, Cumbria's Strategic Economic Plan (SEP) – the Four Pronged Attack – is based on four strategic priorities:

- **Advanced Manufacturing** – the world leading switchgear company Mardix has its headquarters at Westmorland Business Park. More traditional manufacturing such as the long established Kendal Metal Works, and Bennett Engineering are also present and are significant local employers.
- **Nuclear & Energy** – Furmanite Engineering, a key partner for global oil and nuclear energy companies (including BNFL) companies has a base in Mintsfeet. Furmanite provide high-end engineering support throughout the United Kingdom from its regional base in Kendal.
- **Rural and Visitor economy** – Kendal town centre is closely associated with tourism, whilst the business parks to the north of Kendal are associated with the *industry* of both tourism and the food and drink sector. The area includes the English Headquarters of Irish based food and drink giant Dale Farm. Other food manufacturing companies can be found throughout the area including Kendal Nutricare (formerly Heinz), Momma's Foods and Romney George, manufacturers of Kendal Mint Cake. Global company Berendsen support the sub regional visitor sector through their laundry services, gaining a competitive advantage through their strength in logistics.
- **Strategic connectivity of the M6 Corridor** – Connectivity to the M6 is seen as a major factor in the future of Cumbria. The SEP highlights that “this connectivity makes the key settlements of Carlisle, Penrith and Kendal easily accessible and attractive locations for investment<sup>4</sup>”. Whilst Kendal has a strong link to the M6 via the A591 to the south of the town, most key employment sites are located in the town centre or in the Shap Road corridor to the north of the town, from where links to the M6 are comparatively poor. The proposed route will connect will better connect north Kendal to the M6 corridor, delivering better linkages both north and south of Kendal.

## 2.3 Employment & Tourism

Increasing the supply of employment and housing land is important to the future of Kendal and the wider South Lakeland economy, as identified within SLDC's Council Plan<sup>5</sup>. SLDC's plan seeks to create 1,000 new jobs and 1,000 affordable homes for rent by 2025. Central to the

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<sup>2</sup> Cumbria Intelligence Observatory (2014) Kendal Economic Profile

<sup>3</sup> South Lakeland District Council (2010) South Lakeland Core Strategy

<sup>4</sup> Cumbria LEP (2014) Cumbria Strategic Economic Plan

<sup>5</sup> South Lakeland District Council (2017) Council Plan

ambition for new employment is to provide high quality jobs in sectors such as advanced manufacturing, providing attractive careers opportunities to young people in the area.

Increasing the supply of land must be balanced against maintaining and increasing the strength of the local tourism sector. Tourism is key to the Kendal economy, and the town has a significant tourism offer, including shopping arcades, two castles, two museums, a host of historical buildings and bridges, fine restaurants and a multitude of public houses and hotels.

The increased congestion brought by tourism, particularly around school holidays and in the summer months, is recognised as a major issue in the town. Kendal's 2009 Transport Assessment highlights that tourism in Cumbria is primarily car-based, with 77% of visitors travelling by private vehicle in 2009<sup>6</sup>. Thus, road infrastructure is vital to ensuring tourists have a positive experience when visiting the town.

## 2.4 New business

The South Lakeland Core Strategy notes that while the economy of Kendal currently appears to be quite buoyant, there are relatively few new firms starting up and the town lacks suitable sites for new business. New businesses in and around the town centre will be crucial to Kendal's future (particularly due to Kendal's position as a local shopping destination), but congestion at both peak and off-peak-times remains a problem, as outlined within the Strategic Case of this SONC. As such, improved transport infrastructure will encourage more businesses to locate to Kendal.

The present South Lakeland Core Strategy is committed to provide 4 hectares of employment land per year until 2025. It identifies a relative lack of suitable land and sites in the district and the local authority is committed to "safeguard and maintain" employment sites from redevelopment for other uses. For Kendal the target is to deliver 9ha of land for strategic employment use over the plan period and a further 9ha for business/science park use. The town also has to deliver employment land for local use.

The SLDC Employment Land Review conducted by Lambert Smith Hampton in February 2012 noted "Kendal's industrial market remains focused to the north of the town and is generally dated, with older units attracting around £4.50psf and more modern units attracting £6psf. Agents report some limited pent up demand for industrial space across Kendal and South Lakeland but a shortage of available premises and a lack of new development."

The inference is that:

- Businesses located in the North Kendal area would simply find themselves with nowhere to go locally if business owners decided the risk of further flood meant they had to move.
- With labour being highly localised, any business relocations would mean job losses in the local economy.

## 2.5 Major employers

It is also important to consider how improved connectivity can affect businesses located in South Lakeland and Cumbria as a whole. Major employers such as GSK, Mardix and BAE Systems continue to make large investments across the region and are key players in the local economy. BAE Systems in particular has a significant supply chain in South Lakeland and an

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<sup>6</sup> Lake District National Park (2012) State of the Lake District National Park Report

improved road network in Kendal would help make the wider supply chain, as well as key local employers more efficient, and place Kendal at the heart of supporting this growth.

## 2.6 Developing skills and retaining talent

Furthermore, the improved access to Kendal will support the development of skills and careers in the long-term. Kendal College has recently started to offer a BA Honours course on-campus. This is in response to the 'brain drain' which is taking many young people away from Kendal to towns such as Preston<sup>7</sup>. As the skills provision in Kendal increases, the infrastructure to allow access to educational facilities to grow is vital.

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<sup>7</sup> The Westmoreland Gazette (2015) 'Kendal college takes step to stop the brain drain' available at:  
[http://www.thewestmorlandgazette.co.uk/news/education/news/12880823.Kendal\\_college\\_takes\\_step\\_to\\_stop\\_the\\_brain\\_drain/](http://www.thewestmorlandgazette.co.uk/news/education/news/12880823.Kendal_college_takes_step_to_stop_the_brain_drain/)

### 3 Calculating wider economic benefits

It is anticipated that at OBC stage, there will be a need to quantify the major economic benefits which the road scheme may unlock. These economic benefits will help make the case for funding the proposed road scheme, linking wider impact to the road’s construction.

Though such calculations are not required at this stage, this section provides a discussion of the fundamentals on which such an assessment would be based.

A quantitative economic analysis of land utilisation can be undertaken to assess economic impacts. Using principles set out in key guidance documents such as HM Treasury Green Book<sup>8</sup>, the Employment Densities Guide<sup>9</sup> and the Homes & Communities Agency’s Additionality Guide<sup>10</sup>, it is possible to forecast the economic impact of proposed infrastructure intervention and policy measures on potential development sites located in proximity of that investment.

WebTAG Supplementary Guidance module M5.3 is an example of where additionality models provide local level analysis in addition to standard DfT modelling.

The potential economic benefits of the development sites identified can be assessed using the following steps:

- Identification of the development sites and knowledge of their use.
- For employment sites, calculation of floorspace (net internal area) for each site.
  - Using data from the Employment Densities Guide, calculating the gross direct effects of the sites in terms of employment and economic output (measured by GVA) of the sites being developed and occupied as per their guidance.
  - Moving from the gross to net additional case through introducing assumptions on deadweight, leakage, displacement and substitution effects. These assumptions are calibrated based on knowledge of the sites and of the local area.
- For housing sites, calculation of the total number of units planned for each site. With information about the capital costs and timeframe, construction impacts can be calculated.
- For both housing and employment it is possible to look at the overall impact on local tax changes and receipts, subject to specific agreements and government exemptions.

Indirect and induced effects of the sites being developed can be calculated using data from those activities supported further down the supply chain. The table below highlights some of the key factors to consider when calculating wider economic benefits.

**Table 1: Factors to consider when calculating wider economic impacts**

Factor	Description
Gross impacts	Gross impacts are the aggregate impacts anticipated to be achieved through development. This is based on a simple calculation based on the ratio between floorspace and employment or number of units built
Net impacts	Net impacts are the overall additional impacts within the study area which can be attributed to the completion of the infrastructure project.

<sup>8</sup> HM Treasury (2011) Green Book Appraisal and Evaluation in Central Government

<sup>9</sup> Homes & Communities Agency (2015) *Employment Density Guide*

<sup>10</sup> Homes & Communities Agency (2014) *Additionality Guide*



Factor	Description
Multiplier impacts	Additional workers in the local economy will receive wages and so boost the local economy by spending those wages. The employing businesses also have their supply chain which in term benefits from the increased trade, and they employ more workers who spend their wages, further boosting the economy. The multiplier is the term given to the aggregate of these additional benefits the development generates.
Displacement	The number or proportion of intervention outputs accounted for by reduced activity elsewhere in the target area. Building a new industrial estate may simply lower demand in a neighbouring estate. HCA Additionality Guide (2014 <sup>11</sup> ) advises a standard level of displacement, local research enables more specific estimates to be made.
Leakage	The proportion of outputs that benefit those outside of the intervention's target area or group. In this case, the jobs or GVA which people/businesses outside of Kendal or Cumbria (depending on the study geography) benefit from.
Deadweight	The proportion of outputs/outcomes which would have happened anyway, even if the infrastructure was not built. As with displacement & leakage, guidance exists which can be improved upon with locally specific research.
Substitution	This effect arises where a firm substitutes one activity for a similar one (such as recruiting a jobless person via an incentive scheme while another employee loses a job) to take advantage of public sector assistance. It can be thought of as "within firm" displacement.
Attribution	The proportion of calculated net impacts which can be directly attributed to an intervention. Unlike other elements of the calculation described above, there is little guidance on attribution. Case studies, past experience and specific guidance is often used instead.
GVA per worker	Gross value added (GVA) is the measure of the value of goods and services produced in an area, industry or sector of an economy. GVA per worker is the average output per worker.
Employment density	The estimation of employment generated by property development based on 'employment density' ratios. Ratios are generally expressed as the number of square metres per employee. Assumptions are set out in the HCA Employment Density Guide 2015 <sup>12</sup> . Knowledge of the planned developments enable more accurate modelling of the net impacts.

<sup>11</sup> Homes & Communities Agency (2014) *Additionality Guide*

<sup>12</sup> Homes & Communities Agency (2015) *Employment Density Guide*

## 4 The development pipeline

SLDC's Local Plan Land Allocations (2013) sets out a number of key housing and employment development sites in Kendal. These include business park expansions in and around industrial areas of Kendal, and housing sites to support a growing population.

The table below sets out how the sites identified in the plan relate to the various road scheme options:

- A score of 3 indicates that the site is very close or adjacent to the proposed scheme.
- A score of 2 indicates that it is within approximately 500m of the scheme.
- A score of 1 indicates that it is within approximately 1km of the scheme.
- Finally, a score of 0 indicates that it is further than 1km

It should also be noted that the identified housing sites West of High Garth, Eskdale House, South of Natland Mill Beck and at Vicarage Drive are all either completed or construction is well advanced and therefore impacts of the new route (beyond changes to house prices) would be neutral.

**Table 2: Employment Sites**

	<b>Scheme</b>		<b>1. Northern Orbital Access Route 1</b>	<b>2. Northern Orbital Access Route 2</b>	<b>3. Eastern Orbital Access Route 1</b>	<b>4. Eastern Orbital Access Route 2</b>	<b>5. Southern Orbital Access Route 1</b>	<b>6. Southern Orbital Access Route 2</b>	<b>7. Western Town Centre Access Route</b>	<b>8. Cross River Access</b>	<b>9. Option 1, Northern Orbital Access Route and Cross River Access</b>
<b>Key development sites</b>	Type	Size (ha)									
<b>DOCKRAY HALL INDUSTRIAL ESTATE</b>	Employment	2.04	1	1	1	1	0	0	1	1	1
<b>BEEZON ROAD AREA</b>	Employment	3.52	1	1	1	1	0	0	1	2	2
<b>MINTSFEEET INDUSTRIAL ESTATE</b>	Employment	15.4 4	2	1	3	3	0	0	0	1	2
<b>SUNLIGHT LAUNDRY, SHAP RD</b>	Employment	0.75	1	1	3	3	0	0	0	0	1
<b>LAKE DISTRICT BUSINESS PARK AND SURROUNDING AREA</b>	Employment	6.83	2	1	2	2	0	0	0	0	2
<b>WESTMORLAND BUSINESS PARK AND SURROUNDING AREA</b>	Employment	11.5 2	3	1	2	2	0	0	0	0	3
<b>SHAP RD INDUSTRIAL ESTATE AND SURROUNDING AREA</b>	Employment	5.1	2	1	2	2	0	0	0	0	2
<b>MEADOW BANK BUSINESS PARK &amp; ADJACENT AREA</b>	Employment	0.51	3	1	0	0	0	0	0	0	3
<b>KENDAL BUSINESS PARK, APPLEBY RD</b>	Employment	1.05	2	1	1	1	0	0	1	1	2
<b>MURLEY MOSS BUSINESS VILLAGE</b>	Employment	1.66	0	0	2	2	2	0	0	1	1
<b>RIVERSIDE BUSINESS PARK (incl. vacant sites)</b>	Employment	3.07	0	0	1	1	1	0	0	2	2
<b>KENDAL FELL BUSINESS PARK</b>	Employment	1.04	0	0	0	0	0	0	2	1	1
<b>LAND AT SCROGGS WOOD, MILNTHORPE ROAD</b>	Employment	17.9	0	0	0	0	3	0	0	1	1

	<b>Scheme</b>		<b>1. Northern Orbital Access Route 1</b>	<b>2. Northern Orbital Access Route 2</b>	<b>3. Eastern Orbital Access Route 1</b>	<b>4. Eastern Orbital Access Route 2</b>	<b>5. Southern Orbital Access Route 1</b>	<b>6. Southern Orbital Access Route 2</b>	<b>7. Western Town Centre Access Route</b>	<b>8. Cross River Access</b>	<b>9. Option 1, Northern Orbital Access Route and Cross River Access</b>
<b>LAND EAST OF BURTON ROAD</b>	Employment	6.52	0	0	3	3	3	0	0	0	0
<b>LAND SOUTH OF K SHOES, NATLAND ROAD</b>	Employment	1	0	0	0	0	3	0	0	1	1
<b>LAND AT SHAP ROAD INDUSTRIAL ESTATE</b>	Employment	0.34	2	1	2	2	0	0	0	0	2
<b>LAND NORTH OF MEADOWBANK BUSINESS PARK</b>	Employment	5.15	3	1	2	2	0	0	0	0	3
<b>JAMES CROPPER PAPER MANUFACTURING SITE</b>	Employment	9.28	1	1	0	0	0	0	0	0	1
<b>LAND ADJACENT TO JAMES CROPPER SITE</b>	Employment	1.2	1	1	0	0	0	0	0	0	1
<b>MEAL BANK</b>	Employment	2.09	0	1	0	0	0	0	0	0	0
<b>HALL HOUSE, NEW HUTTON</b>	Employment	0.94	0	0	0	0	0	0	0	0	0

Source: Mott MacDonald

**Table 3: Housing Sites**

	<b>Scheme</b>		<b>1. Northern Orbital Access Route 1</b>	<b>2. Northern Orbital Access Route 2</b>	<b>3. Eastern Orbital Access Route 1</b>	<b>4. Eastern Orbital Access Route 2</b>	<b>5. Southern Orbital Access Route 1</b>	<b>6. Southern Orbital Access Route 2</b>	<b>7. Western Town Centre Access Route</b>	<b>8. Cross River Access</b>	<b>9. Option 1, Northern Orbital Access Route and Cross River Access</b>
Key development sites	Type	Size (ha) / dwellings (where specified)									
<b>WEST OF HIGH SPARROWMIRE</b>	Housing	8.55	3	3	1	1	0	0	0	0	3

Scheme			1. Northern Orbital Access Route 1	2. Northern Orbital Access Route 2	3. Eastern Orbital Access Route 1	4. Eastern Orbital Access Route 2	5. Southern Orbital Access Route 1	6. Southern Orbital Access Route 2	7. Western Town Centre Access Route	8. Cross River Access	9. Option 1, Northern Orbital Access Route and Cross River Access	
<b>WEST OF HIGH GARTH</b>	Housing	0.74	3	3	1	1	0	0	0	0	0	3
<b>NORTH OF HIGH SPARROWMIRE</b>	Housing	0.77	3	3	1	1	0	0	0	0	0	3
<b>NORTH OF LAUREL GARDENS</b>	Housing	7.85	3	3	2	2	0	0	0	0	0	3
<b>ESKDALE HOUSE</b>	Housing	0.31	2	1	2	2	0	0	0	0	1	2
<b>EAST OF CASTLE GREEN ROAD</b>	Housing	4.05	1	1	2	2	0	0	0	0	1	1
<b>WEST OF VALLEY DRIVE</b>	Housing	1.9	0	0	2	2	1	0	0	0	1	1
<b>KENDAL PARKS</b>	Housing	10.1	0	0	3	3	2	0	0	0	1	1
<b>WEST OF OXENHOLME ROAD</b>	Housing	5.97	0	0	2	2	2	0	0	0	1	1
<b>SOUTH OF NATLAND MILL BECK FARM</b>	Housing	3.79	0	0	1	1	2	0	0	0	1	1
<b>SOUTH OF LUMLEY ROAD</b>	Housing	4.64	0	0	0	0	2	0	0	0	1	1
<b>STAINBANK GREEN</b>	Housing	10.8	0	0	0	0	1	0	3	0	1	1
<b>LAND AT VICARAGE DRIVE</b>	Housing	0.43	0	0	0	0	1	0	3	0	1	1
<b>SOUTH OF UNDERBARROW ROAD</b>	Housing	6.78	0	0	0	0	0	0	3	0	1	1
<b>KENDAL CANAL HEAD ACTION AREA</b>	Housing	200 dwellings	0	0	0	0	0	0	2	0	3	3
<b>BURTON ROAD</b>	Housing	200 dwellings	0	0	2	0	3	0	0	0	0	0
<b>APPLEBY ROAD</b>	Housing	400 dwellings	3	3	3	3	0	0	0	0	0	3

Scheme			1. Northern Orbital Access Route 1	2. Northern Orbital Access Route 2	3. Eastern Orbital Access Route 1	4. Eastern Orbital Access Route 2	5. Southern Orbital Access Route 1	6. Southern Orbital Access Route 2	7. Western Town Centre Access Route	8. Cross River Access	9. Option 1, Northern Orbital Access Route and Cross River Access
<b>LAND ADJACENT TO HALL PARK, BURNESIDE</b>	Housing	3.68	2	3	0	0	0	0	0	0	2
<b>VILLAGE RECREATION FIELD, BURNESIDE</b>	Housing	0.85	2	3	0	0	0	0	0	0	2
<b>LAND EAST OF BURTON ROAD, OXENHOLME</b>	Housing	0.88	0	0	3	2	3	0	0	0	0
<b>LAND SOUTH OF FELL CLOSE, OXENHOLME</b>	Housing	2.71	0	0	3	2	2	0	0	0	0
<b>LAND WEST OF SEDGWICK ROAD, NATLAND</b>	Housing	0.98	0	0	0	0	3	0	0	0	0

Source: Mott MacDonald

It is important to note that even if a site is located further than 1km away from the road, that is not to say that it will not experience any benefit from the new road. Reducing congestion across Kendal will benefit all sites, whether they are near the road or not.

When comparing the four short-listed options, the following can be observed.

- Option 1: Northern Orbital Access Route 1 runs along the north of Kendal, connecting the A591 with the A6 and A685. As such, the road is near many of the business parks and key employment sites on the northern side of Kendal. This option is also near many of the proposed housing sites in the town.
- Option 5: Southern Orbital Access Route 1 runs along the south side of Kendal, connecting the A591 with the A65 and Oxenholme railway station. While this option is also located close to several potential housing and employment sites, it does connect to as many sites as Option 1.
- Option 8: Cross River Access aims to improve access in Kendal town centre by widening two bridges across the river Kent. This option would improve traffic flow in the town centre, but is not located very close to any of the housing and employment sites identified.
- Option 9: Option 1 and Cross River Access is a combination of the northern access route and improving two bridges in the centre of Kendal.

We understand that the preferred option is Option 1: Northern Orbital Access Route 1. We have undertaken a calculation of the gross number of jobs on the employment sites that are potentially supported by this option through the following method (it should be noted that this is a high level and rapid assessment so these figures should not be relied upon beyond the purposes of this short note):

- By adding the hectareage for the sites located close to the scheme gives a total of 17.18ha of employment land adjacent or very close to the scheme, a further 28.76ha within 500m and 6.31ha between 500m and 1km.
- A broad assumption is that approximately half of this hectareage is actually used for employment purposes.
- We then applied a further standard conversion to look at an estimate of the Net Internal Area on these sites.
- We assumed that 40% of the total floorspace is used for Industrial & Manufacturing (B2) purposes, 40% for Warehousing (B8) and 20% for Retail/ sui generis use<sup>13</sup>.
- Assuming an occupancy rate of 75%, this means that there could be 870 gross jobs being potentially be supported on sites very close or adjacent to the scheme, a further 1,456 jobs within 500m and, finally, 320 jobs between 500m and 1km. This has been calculated using data from the HCA Employment Density Guide 2015.

A more detailed review would:

- Build up a more detailed profile of the local commercial and industrial structure. which would be affected by the scheme – possibly giving more weight to the town centre economy.
- Look at how new sites could be developed alongside any agreed scheme and how this could affect the long term economic structure of Kendal.
- Look at the additional benefits of the scheme by opening up new land for employment and housing purposes and how this land could realistically be used.

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<sup>13</sup> This is based on a recent review of employment sites undertaken by Mott MacDonald in the North Kendal area



- Move from gross to net additional jobs on these sites using the steps outlined in Section 3 above; and consider the type of job that would be supported.
- Consider the attribution of impact between the road scheme and employment/housing sites.
- Produce an assessment of the net additional GVA that could be generated from the additional employment in the town. This can include an assessment of the welfare savings to the Exchequer by estimating the number of unemployed residents that may take up some of the jobs that are supported in future.

## 5 Case studies

This section discusses a number of similar schemes to the Kendal Road Scheme (these schemes are all in rural areas). We have included these case studies because they highlight how schemes can unlock, or be expected to unlock, wider economic benefits.

The three case studies selected are at different points of completion, with BHLR having recently been opened, NDR currently under construction and the A303 still in the planning phase.

### 5.1 Bexhill-Hastings Link Road

The recently completed £124 million Bexhill Hastings Link Road (BHLR) is a 5.6km single-carriageway road that links the outskirts of Bexhill and Hastings, easing traffic congestion along rural roads to the north of the towns and improving the road network in the area. The DfT contributed over £56m of the total scheme cost, with scheme promoter East Sussex County Council providing the rest of the funding.

An important part in the development of the road was that it had to be environmentally sensitive to its surroundings. The route of the road avoids the Area of Outstanding Natural Beauty (AONB) and Sites of Special Scientific Interest (SSSI) close by. The scheme was also carefully designed to minimise impact on the countryside and protected areas. Close to the road, a 'greenway' allows cyclists, walkers and horse riders to travel separately from motor traffic and enjoy the surrounding countryside.

The road is expected to become a key strategic asset for regeneration - an important issue in the area, as the towns of Hastings and Bexhill both face significant economic challenges with their local economies being over-dependent on the public sector. They are both towns characterised by low value-low wage activities, poor economic participation levels and severe pockets of deprivation.

Employment and housing land unlocked for development by the road has now been integrated into the South East LEP's Strategic Economic Plan as a key growth corridor of regional importance. A new 25,000 sq ft business centre has already been built on land opened up by BHLR. It is expected that the road will also unlock development land for the construction of 1,200-2,000 new homes and support jobs and regeneration amounting to £1 billion over 25 years.

*Lessons for Kendal: A demonstration that designing and constructing a road in a rural area which is sensitive to its local environment, and at the same time unlocks land for housing and employment development to support the local economy is possible.*

### 5.2 Norwich Northern Distributor Road

The Norwich Northern Distributor Road (NDR) is a 20km road currently under construction to run from the A47 at Postwick, east of Norwich, to the A1067 Fakenham Road north of Taverham. The £178m scheme is being paid for by the Department for Transport (contributing over £85m), Norfolk County Council and the New Anglia LEP, with smaller contributions from the Community Infrastructure Levy and Growth Point funds.

The NDR scheme is a dual carriageway, all-purpose, strategic distributor road. While NDR is bigger than the Kendal road scheme, it has been used as a comparable case study as it also relieves traffic congestion on the existing road network (particularly in the centre of the nearby urban area) and provides better access to key development sites.

The NDR scheme is a key piece of infrastructure necessary to enable the overall delivery of the local authority's Joint Core Strategy (JCS) housing and jobs targets. It forms part of a package aimed to deliver sustainable transport measures, including bus rapid transit, walking and cycling measures, as well as a comprehensive transport plan aimed to boost and sustain the city centre economy.

NDR will unlock new business sites, particularly in north-east Norwich and Broadland, improve access to existing industrial and commercial estates and make some of the most attractive parts of Norfolk more accessible to tourists. NDR has the potential to bring over £1bn of economic benefits to Norfolk, providing jobs and helping businesses in Norwich, Broadland and North Norfolk thus making a significant contribution to the national economy.

*Lessons for Kendal: The NDR scheme is based on reducing congestion and easing access to the major visitor destination for tourists and avoids the need to drive through the centre of Norwich - a similar problem experienced by Kendal - particularly at peak time. The solution linked road enhancements to public transport measures.*

### **5.3 A303 Sparkford to Ilchester**

The dualling of the A303 from Sparkford to Ilchester is identified as a key aim of the Heart of the South West Local Enterprise Partnership (LEP) and is being delivered as part of a £2bn government investment to improve the capacity of roads in the South West. Public consultation for the scheme was completed in February and March of 2017 and it is planned that the £100-250m scheme will be on site in 2020.

The scheme will support growth in productivity and jobs in the area through increased accessibility and reduced journey times. The scheme links existing sections of dual carriageway and is likely to include grade separated interchanges and the removal of at-grade junctions and direct accesses.

This scheme will have economic benefits for the local economy through contributing to the wider Expressway Corridor and the development of strategic sites within South Somerset directly linked to the corridor. These development sites have the potential to accommodate up to 8,600 gross jobs (3,900 in net terms). Given the importance of the A303 route to local growth areas, especially sites around Yeovil and Market Towns of Wincanton and Ilminster, it is reasonable to assume that a proportion of the economic outputs from the employment sites linked to the scheme improvements can be deemed directly attributable to the infrastructure works.

There are also many wider economic benefits from the scheme proposals, as it contributes to the visitor economy, sustainable housing development, enhancing prospects in the manufacturing sector and the military base at Yeovil.

*Lessons for Kendal: Improving the A303 will support the local visitor economy which is key to the area (allowing for comparisons with Kendal). The road will also help unlock strategic housing and employment sites needed to support a growing need in attractive market towns.*



# G. Transport Forecasting and Economics Report



**Kendal Strategic Transport  
Infrastructure Study**

**Transport Forecasting and  
Economics Report**

**March 2017**



### Report details

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## 1 Introduction

### 1.1 Kendal Strategic Transport Infrastructure Study

- 1.1.1 The Kendal Strategic Transport Improvements Study is currently being undertaken by Mott MacDonald on behalf of Cumbria County Council. The study is assessing potential options for major infrastructure improvements in and around Kendal to reduce congestion, increase resilience of the transport network and support the delivery of future growth in the town both for the current local plan period to 2025 and beyond.
- 1.1.2 The study has considered the key objectives for strategic transport infrastructure in Kendal, and has also considered indicative forecast traffic demand. The study has also proposed infrastructure schemes which could help meet the objectives of the study.
- 1.1.3 This report feeds in to the wider study and assesses the impact of the potential infrastructure schemes on the highway network using the Kendal transport model.

### 1.2 Kendal transport model

- 1.2.1 The Kendal transport model is a strategic SATURN traffic model of the Kendal urban area and surrounding district. The model covers the morning and evening weekday peak periods of 8–9am and 5–6pm. The model considers car, light goods vehicle (van) and heavy goods vehicle (lorry) trips. The car trips are segmented by trip purpose. The model was validated to a base year of 2011.
- 1.2.2 Further information on the Kendal transport model is provided in the *Kendal Transport Model Local Model Validation Report* (Cumbria County Council, February 2015).

### 1.3 Methodology

- 1.3.1 The assessment of potential infrastructure schemes in Kendal was undertaken by creating new forecast scenarios with each of the potential schemes. The traffic demand for the forecast scenarios was based on known developments that are likely to open in the future, background traffic growth and local plan proposals.
- 1.3.2 The output from the model scenarios was then compared to analyse the traffic impact of the scheme. This included considering the number of overcapacity junctions, and overall network journey time and distance.
- 1.3.3 The network journey time was then monetised to provide an estimate of the journey time benefits that could be expected for each scheme. An estimate of the expected value for money for each scheme was also provided.

## 2 Forecasting

### 2.1 Demand assumptions

- 2.1.1 The forecasting has considered the future year of 2036, in line with the next potential South Lakeland Local Plan period of 2025–36. The following two scenarios were assessed:
1. 2036 Base scenario
  2. 2036 Local Plan scenario
- 2.1.2 Scenario 1, *2036 Base*, is the reference case. It includes development which is considered more than likely to occur by 2036.
- 2.1.3 Scenario 2, *2036 Local Plan*, includes all developments in Scenario 1; all development sites identified within the 2012–2025 South Lakeland Local Plan; an estimate of potential development which could be included in the 2025–36 South Lakeland Local Plan, and a number of potential town centre development sites identified as part of the ongoing Kendal town centre masterplan study.
- 2.1.4 The trips generated by these developments in both scenarios were estimated using the TRICS database, and these trips were distributed using a gravity model. Background traffic growth was also considered using the TEMPro software.
- 2.1.5 These two scenarios follow a fixed demand approach and do not consider the potential for changes in demand due to the scheme. The scenarios form the basis of the forecast demand when testing the proposed schemes in the Kendal Strategic Transport Infrastructure Study.
- 2.1.6 More information on the demand forecasting scenarios is provided in the *Kendal Strategic Transport Infrastructure transport modelling technical note* (Capita, December 2016).

### **3 Potential schemes**

#### **3.1 Overview**

3.1.1 A number of potential schemes have been identified by Mott MacDonald as part of the infrastructure study. The potential schemes were identified as those which could meet the strategic objectives of the study.

3.1.2 Three schemes were identified to be assessed as part of this study:

- Northern route
- Southern route
- Town centre improvements

3.1.3 It was also decided that the northern and town centre improvements would also be assessed together as a single scenario.

3.1.4 The schemes being considered as part of this study are at a very early stage of development, and as such precise alignments or details are not yet available. The descriptions below represent rough assumptions on the potential routes to allow them to be tested in the transport model without prejudice to the future development of these schemes.

#### **3.2 Northern route**

3.2.1 The northern route connects the A591 at Plumgarths roundabout to the A685 north of Queen Katherine's Avenue. The route intersects Burneside Road north of Kentrigg, and the A6 north of Gilthwaiterigg Lane. It is assumed that the route forms a new arm at the existing Plumgarths roundabout, and new roundabout junctions are present at all other road crossings.

3.2.2 The roundabouts were coded with a maximum circulatory flow of 2,600 PCUs and a circulatory time of 12 seconds. Saturation flows were set at 2,200 PCUs for new links, 1,800 PCUs for major roads and 1,600 PCUs for minor roads.

#### **3.3 Southern route**

3.3.1 The southern route connects the A6 at Shenstone roundabout to the B6254 close to Oxenholme rail station. The route intersects Burton Road south of the Westmorland General Hospital. It is assumed that the route forms a new arm at the existing Shenstone roundabout, and new roundabout junctions are present at all other road crossings.

3.3.2 The roundabouts were coded with a maximum circulatory flow of 2,600 PCUs and a circulatory time of 12 seconds. Saturation flows were set at 2,200 PCUs for new links, 1,800 PCUs for major roads and 1,600 PCUs for minor roads.

### **3.4 Town centre improvements**

3.4.1 The town centre improvements assume either widened or new bridges at Miller Bridge and Nether Bridge, at both ends of Aynam Road. The bridges would permit two-way traffic, which would also allow two-way traffic on Aynam Road. The junctions at either end of Aynam Road would be reconfigured to permit new movements, with the following assumptions used in the model:

- Milnthorpe Road/Lound Road: a three-arm roundabout, allowing ahead and right turn movements from Milnthorpe Road (south), and left and right turn movements from Lound Road. Kirkland would remain one-way northbound.
- Lound Road/Aynam Road: a three-arm roundabout with all movements permitted.
- Lowther Street/New Road/Miller Bridge: a three-arm roundabout, allowing left turn movements from New Road, right turn movements from Miller Bridge and ahead movements from Lowther Street. Lowther Street would remain one-way eastbound.

3.4.2 The Lound Road roundabouts were coded with a maximum circulatory flow of 2,600 PCUs and a circulatory time of 12 seconds. Saturation flows were set at 2,200 PCUs for all links. The Miller Bridge roundabout was coded with a maximum circulatory flow of 2,200 PCUs and a circulatory time of 10 seconds. Saturation flows were set at 1,800 PCUs for all links.

### **3.5 Northern and town centre route**

3.5.1 A final option was also assessed, which considered the impacts of the northern route and town centre improvements together.

## 4 Model outputs

### 4.1 Flows and delays

4.1.1 Firstly, the impact of the schemes on overall junction capacity was considered by analysing the number of junctions operating close to or over capacity from the model outputs. This method gives a broad overview of network performance, although it does not provide information on the ‘importance’ of a junction to the network in terms of congestion or delay; for example, a town centre junction with high flows on all arms may be more critical to network performance than a minor access to a residential estate.

*Table 4.1: Scenario 1: 2036 Base junction capacity results*

Demand scenario	Improvement scenario	No. junctions approaching capacity		No. junctions over capacity	
		Morning	Evening	Morning	Evening
2011 Base	Do min	6	5	4	3
2036 Base	Do min	11	18	18	20
2036 Base	North	16	18	13	14
2036 Base	South	11	22	12	11
2036 Base	Town	15	16	17	16
2036 Base	North and Town	15	13	11	11

*Table 4.2: Scenario 2: 2036 Local Plan junction capacity results*

Demand scenario	Improvement scenario	No. junctions approaching capacity		No. junctions over capacity	
		Morning	Evening	Morning	Evening
2011 Base	Do min	6	5	4	3
2036 Local Plan	Do min	18	15	53	59
2036 Local Plan	North	9	15	45	42
2036 Local Plan	South	13	19	43	43
2036 Local Plan	Town	12	13	48	51
2036 Local Plan	North and Town	14	13	43	38

4.1.2 The results in Table 4.1 and Table 4.2 show that all options can be seen to have the positive effect of reducing the number of junctions close to or over capacity. The southern route reduces the highest number of overcapacity junctions, followed by the northern route.



4.1.3 It is also possible to consider network performance by analysing the overall journey time and journey distance travelled from the model outputs. These values are summed across all trips made in the model, and the difference in journey time and distance can provide insights in how traffic patterns change due to the schemes. The journey time changes are presented in Passenger Car Unit<sup>1</sup> (PCU) hours, and the distance changes in PCU-kilometres.

*Table 4.3: Scenario 1: 2036 Base total journey time and distance results*

Demand scenario	Improvement scheme	Total journey time (pcu-hours)		Total journey distance (pcu-km)	
		Morning	Evening	Morning	Evening
2011 Base	Do min	10,053	10,635	929,440	997,029
2036 Base	Do min	14,694	15,364	1,250,708	1,328,766
2036 Base	North	14,334	14,981	1,249,612	1,327,374
2036 Base	South	14,546	15,143	1,250,720	1,328,308
2036 Base	Town	14,652	15,350	1,250,392	1,328,334
2036 Base	North and Town	14,310	14,985	1,249,202	1,326,898

*Table 4.4: Scenario 2: 2036 Local Plan total journey time and distance results*

Demand scenario	Improvement scheme	Total journey time (pcu-hours)		Total journey distance (pcu-km)	
		Morning	Evening	Morning	Evening
2011 Base	Do min	10,053	10,635	929,440	997,029
2036 Local Plan	Do min	20,689	20,567	1,383,077	1,432,513
2036 Local Plan	North	18,730	19,024	1,374,792	1,427,795
2036 Local Plan	South	19,790	19,863	1,378,634	1,428,428
2036 Local Plan	Town	20,778	21,116	1,384,331	1,433,026
2036 Local Plan	North and Town	18,744	19,147	1,372,691	1,425,998

4.1.4 The results in Table 4.3 and Table 4.4 show that the northern route is expected to have the greatest impact on network performance, with the largest reductions in journey time and journey distance across the whole network. The southern route has the next greatest impact, with the town centre improvements having only a small impact on journey times, and showing an increase in journey times in the local plan scenario.

<sup>1</sup> A Passenger Car Unit is a standardised unit of traffic flow that allows for different sized vehicles. A car has a PCU value of one, while a heavy goods vehicle or coach would have a PCU value of around two, depending on the size of the vehicle.

## 5 Economic appraisal

### 5.1 Scheme benefits

- 5.1.1 The journey time benefits for each of the proposed schemes were used as the basis for an indicative economic appraisal. Whilst the appraisal is limited, it forms a guide to the likely scale of the scheme benefits. A full appraisal at a later stage of scheme development would include both monetised and non-monetised benefits from a number of other areas, including air quality, carbon savings, flooding and safety improvements.
- 5.1.2 The appraisal followed guidance on the principles of cost-benefit analysis and user and provider impacts in TAG Units A1.1 and A1.3 respectively.
- 5.1.3 The appraisal was completed separately for each scheme and for each forecast scenario. In terms of scheme appraisal, the core or central scenario for the value for money assessment only considers development that is more than likely to occur. This means that the *2036 Base scenario* should be considered the 'core' scenario for this assessment, and would form the basis for a future scheme appraisal. The *2036 Local Plan scenario* gives an indication on how successfully the scheme could support wider long-term development in Kendal.
- 5.1.4 The forecast demand scenarios consider a future year of 2036. A 60 year appraisal period was assumed. As only one modelled year was considered, it was assumed that the journey time benefits were constant for all years in the appraisal period.
- 5.1.5 For each year in the appraisal period, the journey time benefits were monetised based on forecast values of time in 2010 prices from the TAG data book (summer 2016). As the journey time benefits are reported for all vehicles, the journey times were disaggregated into vehicle types using overall proportions from the forecast trip matrices. This process also converted the model outputs from PCUs to vehicles.
- 5.1.6 The future year benefits were then discounted to a base year of 2010. This produced monetised benefits for the morning and evening peak periods for one average weekday per year in the base year equivalent. The final step was to factor these benefits to cover other days and time periods. For this indicative appraisal, data on other time periods was not available, so it was assumed that the non-modelled benefits were equal to twice the sum of the modelled peak benefits. The benefits were then factored by 253 to allow for all the working days in a year, giving a total factor of 506.
- 5.1.7 The monetised journey time benefits for each scheme are summarised in Table 5.1 and Table 5.2.

*Table 5.1: Monetised journey time benefits for the 2036 Base scenario*

<b>Improvement scheme</b>	<b>Modelled benefits per year (pcu-hrs)</b>	<b>Total modelled monetised benefits (£m)</b>	<b>Annualisation and non-modelled time periods factor</b>	<b>Total monetised benefits (£m)</b>
North	742	£0.22	506	£112.2
South	369	£0.11	506	£55.5
Town	56	£0.02	506	£8.6
North and Town	763	£0.23	506	£115.5

5.1.8 The results in Table 5.1 for the base scenario show that the northern route could be expected to provide the largest journey time benefits. The journey time benefits of the southern route are around half that of the northern route. The journey time benefits of the town centre improvements are minor; this is partially due to the new junctions that would be required at key junctions where there would be an increase in available traffic movements. The combined north and town option shows a similar level of journey time benefits as the northern route.

*Table 5.2: Monetised journey time benefits for the 2036 Local Plan scenario*

<b>Improvement scheme</b>	<b>Modelled benefits per year (pcu-hrs)</b>	<b>Total modelled monetised benefits (£m)</b>	<b>Annualisation and non-modelled time periods factor</b>	<b>Total monetised benefits (£m)</b>
North	3,502	£1.05	506	£531.6
South	1,603	£0.48	506	£243.4
Town	-688	-£0.20	506	-£101.9
North and Town	3,365	£1.01	506	£511.4

5.1.9 The results in Table 5.2 for the local plan scenario follow a similar pattern to the base scenario. The results show the northern route could provide the greatest journey time benefits, and the southern route could provide roughly half of the benefits of the northern route. The results also show that the town centre improvements could increase journey times. This suggests the improvements tested in this study could not support long-term development in Kendal in isolation without further careful consideration of the town centre as a whole. Finally, the combined north and town option also shows a high level of benefits, greater than the sum of the two separate options.

5.1.10 The results of the journey time benefits appraisal show that the northern route provides the highest level of journey time benefits, and suggest that the northern route could provide a high value for money. Conversely, the results suggest that the town centre improvements as tested would not support the objectives of the study. However, it should be highlighted that this appraisal excludes benefits from a number of areas, and in particular environmental criteria such as air quality, carbon emissions and flooding.

