

## 7 Traffic and transport

### 7.1 Introduction

7.1.1 This section provides a summary of the traffic conditions and traffic flows on the existing A14 trunk road between Cambridge and Huntingdon. It provides a high-level summary of the traffic modelling that has been carried out to date, and provides an indication of how the A14 Cambridge to Huntingdon improvement scheme (the scheme) is forecast to impact on future traffic flows. More detail is provided in the *Transport Assessment* (Development Consent Order (DCO) submission document number 7.2). The assessment of impacts on non-motorised users and public transport is covered in *Chapter 15*.

### 7.2 The current situation

7.2.1 The A14 trunk road forms part of the trans-European transport network and provides a vital east-west corridor between the Midlands and East Anglia and joins north-south routes via the A1(M) and M11 motorways. It also serves as an important commuter route in the Greater Cambridge area.

7.2.2 Traffic demand in the East of England region is predicted to increase by 26 per cent between 2020 and 2035 as a result of long distance freight traffic, economic development in the region and localised population growth, as referred to in *Chapter 2*.

7.2.3 The section of the A14 trunk road between Cambridge and Huntingdon is well known for congestion and delays. Built more than three decades ago, the road was not designed to accommodate the daily volume of traffic that now uses it and is in need of improvement. Up to 85,000 vehicles currently use the road every day and an exceptionally large number of heavy goods vehicles (HGVs) rely on this important strategic route. Road users regularly experience long delays and unpredictable journey times on this section of road and there are safety concerns due to the volume and density of traffic.

7.2.4 The effective capacity of the existing A14 is limited by a number of factors, including:

- the high percentage of HGVs (up to 26% compared against a national average of 13%), which take up more road space than other vehicles;
- the number of roads with direct access to the A14, which results in conflicts as traffic enters and leaves the main carriageway; and
- major junctions along the route with significant volumes of joining and exiting traffic which result in weaving between lanes, reducing effective capacity and causing knock-on delays.

- 7.2.5 Congestion on the A14 trunk road has already become a constraint to housing and employment growth in the Cambridge and Huntingdon area. Local and regional businesses need access to a large and diverse labour market, requiring many people to commute into and out of the area each day. The quality of life for those who live in and between Cambridge and Huntingdon is diminished by congestion, primarily on the A14, which can cause driver stress and can contribute to other factors affecting wellbeing, safety and health. Without improvement, the situation is expected to get worse.
- 7.2.6 The lack of capacity and resilience on the A14 trunk road between Cambridge and Huntingdon has a number of impacts which are described in more detail in *Chapter 2*.

### 7.3 Traffic modelling

- 7.3.1 The traffic modelling process requires the production of a 'core scenario'. The core scenario is based on the most unbiased and realistic set of assumptions that form the central case for the scheme. This includes assumptions on local uncertainty, which is typically dependant on whether developments or other planned transport schemes go ahead in the vicinity of the scheme being built.
- 7.3.2 In order to determine which developments are included in the traffic model, proposed developments were classified into four categories according to the level of certainty of the proposals which ranged from 'near certain' to 'hypothetical'.
- 7.3.3 This categorisation was undertaken in accordance with WebTAG guidance<sup>1</sup> and in agreement with representatives of Cambridge City Council, South Cambridgeshire District Council and Huntingdonshire District Council, who agreed which developments were in each category, and therefore which developments were to be included explicitly.
- 7.3.4 The categorisation is entirely on the basis of likelihood at the time of categorisation, and there is a possibility that developments will not be completed or will change as they proceed through the planning process.
- 7.3.5 Consequently, those developments for which there was significant uncertainty, and which were categorised by local authority representatives as being in the two lowest categories of confidence, were not included in the traffic model. Conversely, those developments for which there was significant certainty and which were categorised by local authority representatives as being in the two highest categories of confidence were included in the traffic model.
- 7.3.6 In order to assess the potential benefits of the scheme, a suite of traffic models has been used to forecast the expected travel demand for scenarios with and without the scheme in place. The 'with scheme' scenario is referred to as the 'Do-something' scenario and the 'without scheme' scenario is referred to as the 'Do-minimum' scenario.

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<sup>1</sup> Department for Transport transport analysis guidance: WebTAG Unit M4 §3.2.

- 7.3.7 The 'Do-minimum' scenario represents the baseline against which the proposed scheme is assessed and its impacts determined. Subsequently, the 'Do-minimum' scenario is simply the existing road network with the following modifications:
- inclusion of works that would be carried out regardless of whether or not the scheme is built e.g. improvements to the network, such as the Highway Agency's Girton to Histon pinch-point scheme; and
  - committed and proposed housing and employment developments, such as Alconbury Weald and Northstowe Phase 1<sup>2</sup>.
- 7.3.8 The 'Do-something' scenario is identical to the 'Do-minimum' scenario, but with the following modifications:
- inclusion of the scheme; and
  - inclusion of any development that has been determined to be dependent on construction of the scheme, such as Northstowe Phase 2.
- 7.3.9 Further detail on traffic modelling methodology is provided in the *Transport Assessment* (DCO submission document number 7.2).

### Model history

- 7.3.10 The road traffic model used to inform previous improvement proposals was developed to represent conditions in 2006. The data underpinning this model is now approximately 7 or 8 years old, which exceeds Department for Transport guidance. Consequently, a data collection exercise was undertaken in 2011 to collect up-to-date traffic information. This data was then used to review model performance against conditions in 2011. A number of enhancements were also made to the model to improve the representation of traffic movements on the strategic road network<sup>3</sup>. This model, known as the Cambridge to Huntingdon A14 Roads Model, or CHARM, was used as the basis for producing interim traffic forecasts for the road network around Huntingdon and Cambridge, both with and without the proposed scheme. This was used to inform the formal pre-consultation exercise held between April and June 2014.
- 7.3.11 To provide a traffic model that represents conditions in 2014, further development has been undertaken using contemporary traffic data, including mobile phone data, collected in 2014. This updated model is known as CHARM (2) which has been used to inform the assessment of the scheme submitted as part of the DCO application.

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<sup>2</sup> Housing and employment developments to be included in the traffic models were agreed with the relevant local authorities in April 2014.

<sup>3</sup> The strategic road network is the network of motorways and trunk roads in England for which the Highways Agency is responsible.

## 7.4 Scheme proposals and forecast impact on traffic flows

7.4.1 Scheme proposals, baseline traffic flows (2014), and forecast impact on traffic flows, the year the scheme opens (2020) and a future assessment year (2035) are shown in *Figure 7.1* and outlined below. The forecast impact on traffic flow is based on annual average daily traffic (AADT).

### Section 1: A1 Alconbury to Brampton Hut

7.4.2 The scheme includes widening of the A1 from the existing two lane dual carriageway to a three lane dual carriageway between the existing A1/A14 junction at Brampton Hut (Junction 21 Brampton Hut interchange) and Alconbury.

7.4.3 Without the scheme, traffic on the A1 north of Brampton Hut is forecast to increase by 22% between 2014 and 2020, and by an additional 34% between 2020 and 2035 (*Figure 7.1*).

7.4.4 Widening of the A1 north of Brampton Hut, in conjunction with the re-routing of traffic from the existing A14 to the Huntingdon Southern Bypass, is forecast to increase traffic on this part of the road network by 94% in 2020 and by an additional 32% between 2020 and 2035 (*Figure 7.1*). This shift of traffic onto the A1 fulfils a key objective of the scheme to reduce traffic and congestion on the existing A14.

### Section 2: A1/A14 Brampton Hut to East Coast mainline railway

7.4.5 Between the existing A1/A14 junction at Brampton Hut and the proposed new interchange with the A14 at Brampton the scheme includes the construction of a three lane dual carriageway parallel to and to the west of the existing A1. This would become the new A1, while the existing two lane dual carriageway would form part of the new A14 Huntingdon Southern Bypass.

7.4.6 Without the scheme, traffic on the A1 south of Brampton Hut is forecast to increase by 12% between 2014 and 2020, and by an additional 29% between 2020 and 2035 (*Figure 7.1*).

7.4.7 Widening of the A1 south of Brampton Hut, in conjunction with the re-routing of traffic from the existing A14 to the Huntingdon Southern Bypass, is forecast to increase traffic on this part of the road network by 109% in 2020 and by an additional 27% between 2020 and 2035 (*Figure 7.1*). Again, this shift of traffic onto the A1 fulfils a key objective of the scheme to reduce traffic and congestion on the existing A14.

### Section 3: East Coast mainline railway to Swavesey

7.4.8 Between the A1 and Swavesey the scheme includes the construction of a new bypass, referred to as the Huntingdon Southern Bypass, which would remove a large proportion of traffic from the existing A14 between Huntingdon and Swavesey. The bypass would be a three lane dual carriageway from the junction with the A1 at Brampton to where it joins the existing A14 at Swavesey.

7.4.9 There would be a new junction with the A1198 south of Godmanchester. This junction would have west facing slip roads to allow traffic from the west to access Godmanchester, Papworth Everard and places to the south such

as Cambourne and vice versa. East facing slip roads would be provided for emergency use only.

- 7.4.10 Without the Huntingdon Southern Bypass, traffic on the A14 between Godmanchester and Fen Drayton is forecast to increase by 9% between 2014 and 2020, and by an additional 11% between 2020 and 2035 (*Figure 7.1*).
- 7.4.11 With the scheme, due to the re-routing of traffic from the existing A14 to the Huntingdon Southern Bypass, traffic on the existing A14 between Godmanchester and Fen Drayton is forecast to decrease by 62% by 2020 compared against a scenario in which the scheme was not built (*Figure 7.1*).
- 7.4.12 South of the A14, on the A1198 west of Hilton, traffic is forecast to increase by 20% without the scheme between 2014 and 2020, and by an additional 46% between 2020 and 2035.
- 7.4.13 With the scheme, traffic on the A1198 west of Hilton is forecast to increase by 36% between 2014 and 2020, and by an additional 34% between 2020 and 2035. Overall, this represents a 4% increase in traffic at this location by 2035.

#### **Section 4: A14 Swavesey to Girton**

- 7.4.14 The existing A14 two lane dual carriageway would be widened to a three lane dual carriageway from Swavesey to an improved junction at Bar Hill. Between Bar Hill and an improved junction with the M11 at Girton, the existing three lane dual carriageway would be widened to four lanes in each direction.
- 7.4.15 Without the scheme traffic on the A14 between Swavesey and Bar Hill is forecast to increase by 7% between 2014 and 2020, and by an additional 8% between 2020 and 2035.
- 7.4.16 Between Bar Hill and Girton traffic is forecast to increase by 10% without the scheme between 2014 and 2020, and by an additional 10% between 2020 and 2035.
- 7.4.17 With the scheme, traffic on the A14 between Swavesey and Bar Hill is forecast to increase by 12% between 2014 and 2020, and by an additional 25% between 2020 and 2035.
- 7.4.18 Between Bar Hill and Girton traffic is forecast to increase by 16% with the scheme between 2014 and 2020, and by an additional 28% between 2020 and 2035 (*Figure 7.1*).
- 7.4.19 Without the scheme, traffic to the south of the A14, on the A428 near Croxton, is forecast to increase by 13% between 2014 and 2020, and by an additional 12% between 2020 and 2035.
- 7.4.20 With the scheme, traffic on the A428 near Croxton is forecast to increase by 12% between 2014 and 2020, and by an additional 13% between 2020 and 2035. This represents an overall slight decrease (2%) by 2035, compared against a scenario in which the scheme was not built, as a result of traffic transferring back onto the A14.

### Section 5: A14 Cambridge Northern Bypass - Histon to Milton

- 7.4.21 The scheme includes widening of the existing A14 Cambridge Northern Bypass from two lane dual carriageway to three lane dual carriageway between Histon junction and Milton junction.
- 7.4.22 Widening of the existing A14 between Girton junction and Histon junction is currently being carried out as part of a separate scheme and is expected to be complete by the end of 2014.
- 7.4.23 Without the scheme traffic on the Cambridge Northern Bypass is forecast to increase by 19% between 2014 and 2020, and by an additional 14 % between 2020 and 2035 (*Figure 7.1*).
- 7.4.24 With the scheme and, due to widening from two to three lanes in both directions, traffic on the Cambridge Northern Bypass is forecast to increase by 31% between 2014 and 2020, and by an additional 25% between 2020 and 2035.
- 7.4.25 When compared with a scenario in which the scheme was not built, this represents an overall increase in traffic on the Cambridge Northern Bypass of 21% by 2035.

### Section 6: Huntingdon A14 viaduct demolition and A14 de-trunking

- 7.4.26 As part of the scheme the existing A14 would be de-trunked between Ellington and Swavesey and between Alconbury and Spittals interchange. This de-trunked section would continue to be used by local traffic to gain access into and out of Huntingdon and would enable traffic from St Ives and other surrounding villages to gain access to the new Huntingdon Southern Bypass.
- 7.4.27 De-trunking of the A14 would include the demolition of the A14 viaduct over the East Coast Main Line railway and Brampton Road in Huntingdon. New local road connections would improve accessibility into Huntingdon from the south and east by connecting the eastern section of the existing A14 directly with Huntingdon Ring Road near the bus station and with the railway station, and from the north and west by connecting a new link road from Brampton Road with the A14 to the west. A through route for light vehicles would be maintained.
- 7.4.28 Without the scheme, traffic on the existing A14 through Huntingdon is forecast to increase by 8% between 2014 and 2020, and by an additional 15% between 2020 and 2035 (*Figure 7.1*).
- 7.4.29 With the scheme, the demolition of the A14 viaduct over the East Coast mainline railway, and due to the re-routing of traffic from the existing A14 to the Huntingdon southern bypass, traffic on the existing A14 through Huntingdon is forecast to decrease by 62% by 2020. By 2035 traffic is forecast to decrease by 69% compared against a scenario in which the scheme was not built (*Figure 7.1*).

### *Cambridge City*

- 7.4.30 The scheme is forecast to have limited impact on total traffic flows on the radial routes into Cambridge. Some transfer of traffic is expected from Madingley Road to Huntingdon Road and from Histon Road to Milton Road as a result of the additional capacity on the improved Cambridge Northern Bypass.
- 7.4.31 Further details on how the scheme impacts on future traffic are provided in the *Transport Assessment* (DCO submission document 7.2).

## **7.5 Traffic management during construction**

- 7.5.1 Traffic management would be in place during construction of the scheme to reduce road-user delays through the works and inconvenience to local properties and businesses. The safety of vulnerable road-user groups such as pedestrians and cyclists would be a particular consideration.
- 7.5.2 Existing dual carriageways would be widened asymmetrically in order to simplify traffic management arrangements and to minimise disruption to motorists and other road users. Reduced speed limits would be introduced through roadwork sections to protect both road users and road-workers. The length and duration of roadworks sections would be kept to a practicable minimum within the constraints of the construction programme.
- 7.5.3 Detail on traffic management proposals is provided in *Appendix 3.2*. A summary of anticipated traffic management measures are outlined below:
- Lane restrictions: some sections (mainly those sections which involve widening of existing roads) would see lane restrictions and/or closures (predominantly night closures) during construction.
  - Speed limits: temporary speed limits would be enforced through the use of speed cameras.
  - Road closures: road closures would take place during widening and upgrading works. However traffic management would be designed to allow other parts of the A14 (either new or existing) to be utilised, thereby maintaining the existing number of operational lanes.
  - Diversion measures: temporary diversions would be provided for access whilst works on the existing carriageway are conducted.
  - Slip road closures: slip roads at certain online junctions (in particular those at Swavesey and Bar Hill) would need to be closed during construction.