

## 4 THE NEED FOR IMPROVEMENT

---

### 4.1 INTRODUCTION

- 4.1.1. This chapter covers Step 3 of the Transport Appraisal Process, as defined in WebTAG, to establish the need for intervention. Here we summarise the current and future problems identified in the preceding chapters and their underlying causes.

### 4.2 CURRENT TRANSPORT-RELATED PROBLEMS

- 4.2.1. The current and ongoing transport related problems, as identified in the preceding chapters, that need to be addressed are:
- i Traffic congestion in Sudbury town centre due the nature of the current road network. In the absence of an alternate route for strategic traffic, including goods vehicles, these trips are currently travelling through the constrained network in the town leading to congestion and its associated impacts. The issues related to goods vehicles are of particular concern for safety and the impact on heritage buildings located along narrow streets and tight bends around the town.
  - i Unreliable journey times and delays occurring during the peak periods, especially through key junctions along A131 and A134.
  - i Key locations around the town centre are noted to have higher than acceptable levels of NO<sub>2</sub>. Traffic congestion is the main contributor of this and needs to be addressed in light of expected increases in traffic in the future.
  - i Lack of alternate routes for strategic traffic results in low network resilience. In the case of unforeseen circumstances, including issues on M11/A11, there is the potential for impacts on the traffic volume passing through Sudbury.
- 4.2.2. If transport issues in Sudbury are not addressed it will likely lead to increased congestion through the town centre, including an increase in HGV traffic. This will cause an increase in peak hour delays, extending these over a longer peak period, both at the junctions around the town centre, and near the proposed housing and employment sites.
- 4.2.3. The resultant impacts are likely to be detrimental to safety in the town centre, impacting on walking and cycling.
- 4.2.4. Over a longer term, this would certainly impact the opportunity for growth in the area and its reliable connectivity with the neighbouring growth centres.

## 5 OBJECTIVES

---

### 5.1 INTRODUCTION

- 5.1.1. This chapter covers Step 4a of the Transport Appraisal Process, as defined in WebTAG, identification of intervention-specific objectives to address the identified need.
- 5.1.2. DfT guidance outlines how a clear set of objectives designed to address the identified problems should be set. The guidance indicates that the objectives should be consistent with the following criteria:
- ▮ Be informed by a realistic appreciation of the issues and context and informed by an appropriate level of stakeholder engagement.
  - ▮ Reflect the opportunities and constraints.
  - ▮ Reflect the underlying causes.
  - ▮ Be consistent with wider local regional and national objectives.
  - ▮ Avoid indications of preferred solutions.
  - ▮ Enable specific targets to be set in due course.
- 5.1.3. The objectives have therefore been developed in response to the problems and opportunities identified, agreed with Suffolk County Council, and presented to a range of stakeholders as part of the community forum in July 2018. In doing this, a distinction has been drawn between primary and secondary objectives:

### 5.2 PRIMARY OBJECTIVES

- 5.2.1. The **primary** objectives are to:
- ▮ Enable growth within Sudbury and surrounding areas.
  - ▮ Improve conditions in Sudbury town centre and surrounding areas.
  - ▮ Reduce congestion.
  - ▮ Address concerns relating to freight traffic (HGVs in particular).
  - ▮ Improve connectivity of Sudbury.

### 5.3 SECONDARY OBJECTIVES

- 5.3.1. The **secondary** objectives are to:
- ▮ Facilitate the delivery of new homes and jobs within Suffolk and Essex.
  - ▮ Improve the quality of life for residents, workers and shoppers by:
    - Reducing carbon emissions, air and noise pollution from road traffic.
    - Reducing severance issues due to traffic levels within the town centre.
    - Improving the historic setting of Sudbury through removal of road traffic.
  - ▮ Ensure any negative impacts outside Sudbury are minimised.
  - ▮ Improve journey times and journey time reliability for travellers in Sudbury and the surrounding area.
  - ▮ Reduce the number of freight vehicles passing through Sudbury, improving conditions in the town centre.
  - ▮ Improve attractiveness of Sudbury as a destination.
  - ▮ Improve access for businesses to wider labour markets etc.



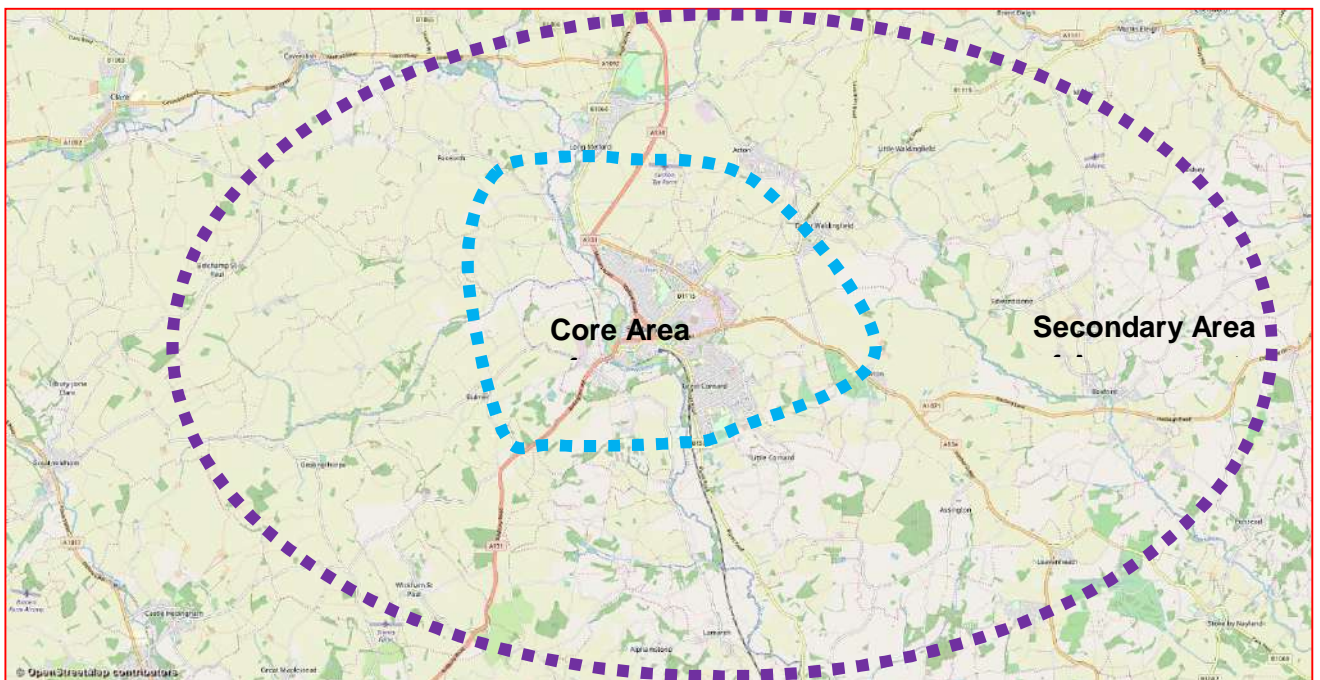
- i Reduce transport costs for businesses.

## 6 AREA OF IMPACT

### 6.1 AREA OF IMPACT

- 6.1.1. The geographical area of impact of potential options aiming to mitigate the observed and future impacts around Sudbury has been informed through the evidence reviewed in sections 2, 3 and 4. These sections have identified the key origins and destinations for trips using the network through Sudbury, the extent of current and future transport problems, as well as the extent of development proposed in the vicinity.
- 6.1.2. The expected area of impact of the options are shown in Figure 64.

**Figure 64 – Area of Impact**



- 6.1.3. The options being considered as part of Sudbury Transport Study will aim to improve connectivity for Sudbury and also reduce congestion through the town. The options considered are likely to have impacts primarily in the immediate vicinity of Sudbury. However, based on the proposed housing and employment developments as part of the local plans, there are also certain secondary impacts expected in the adjacent areas.

Another key issue for consideration is the impact of the through traffic, especially HGV trips, which are currently passing through Sudbury, using its one-way system.

## 7 OPTION GENERATION

---

### 7.1 INTRODUCTION

- 7.1.1. This chapter covers Step 4 of the Transport Appraisal Process as described in WebTAG, the generation of options reflecting a range of modes, approaches and scales of intervention. The options offer alternative ways to address the identified problems and deliver the specified scheme objectives.
- 7.1.2. In order to develop the options, all the current as well as historic options addressing the objectives identified in Chapter 5 were considered. These were discussed in a workshop which included all concerned local authorities, and combined into the following two categories of intervention:
- Non-road options: a range of measures which could reduce traffic, or reduce the growth in traffic; and
  - Road options: alternative routes for a bypass to remove through traffic from the centre of Sudbury, and improvements to existing roads and junctions within Sudbury.

- 7.1.3. The options considered in each category were:

#### **Non-road options**

- SM1 Sustainable travel initiatives.
- P1 Road pricing.
- PT1 Bus improvements.
- PT2 Rail improvements.

#### **Road options**

- W1 Western bypass (long).
- W2 Western bypass (short).
- S1 Southern bypass (long).
- S2 Southern bypass (short).
- E1 Eastern bypass (long).
- E2 Eastern bypass (short).
- L1 Ring road – a bypass on the west, south and eastern sides of Sudbury.
- J1 Junction improvements.

### 7.2 NON-ROAD OPTIONS

#### **SM1. Sustainable travel initiatives**

- 7.2.1. A package of sustainable travel initiatives, designed to encourage people to make fewer journeys by private car. If successful in reducing car use, or the growth in car use, such initiatives could help to reduce the problems associated with traffic congestion and lack of road capacity.

#### **P1. Road pricing**

- 7.2.2. Increasing the cost of car use, for example by increasing parking charges, to reduce the number of journeys by car.

## PT1. Bus improvements

- 7.2.3. Improvements to local bus services, for example by increasing frequencies, to encourage more people to use public transport to reduce the number of journeys made by car.

## PT2. Rail improvements

- 7.2.4. Improvements to the overall rail “offer”, with the aim of encouraging more rail use, to reduce the number of journeys made by car.

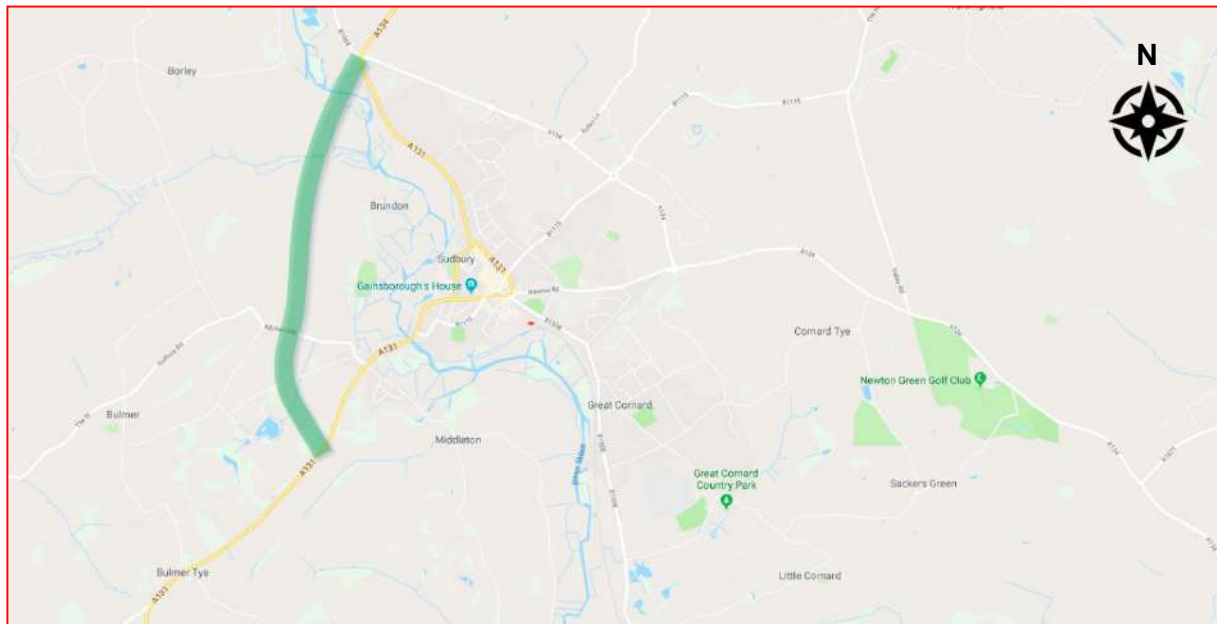
## 7.3 ROAD OPTIONS

- 7.3.1. Seven route options for a bypass were considered. These are illustrated and described below:

### W1. Western bypass (long)

- 7.3.2. A new 3.5km long single carriageway road from the A134 north of Sudbury to the A131 south of Sudbury, including a junction with Kitchen Hill.

**Figure 65 – Option W1. Western bypass (long)**

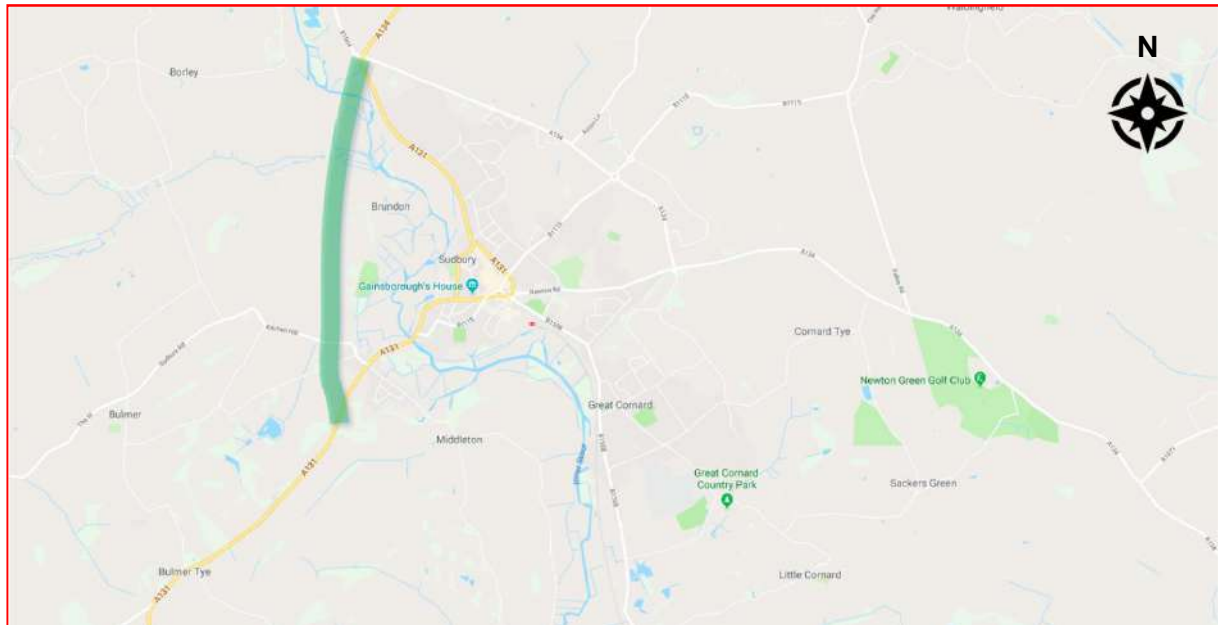




## W2. Western bypass (short)

- 7.3.3. A new 3km long single carriageway road from the A134 north of Sudbury to the A131 south of Sudbury straighter than W1, including a junction with Kitchen Hill.

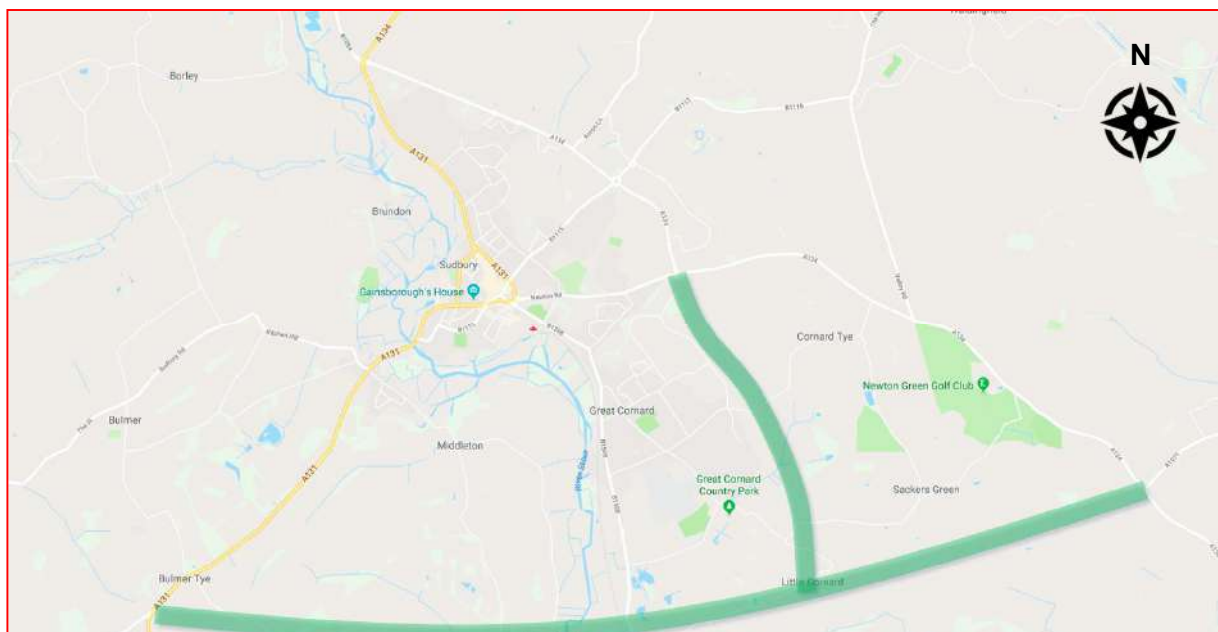
**Figure 66 – Option W2. Western bypass (short)**



## S1. Southern bypass (long)

- 7.3.4. A new 8.5km single carriageway road from Bulmer Tye to the A134/A1071. The bypass would also be connected near Little Cornard by a 3km north-south link to the Shawlands Retail Park roundabout.

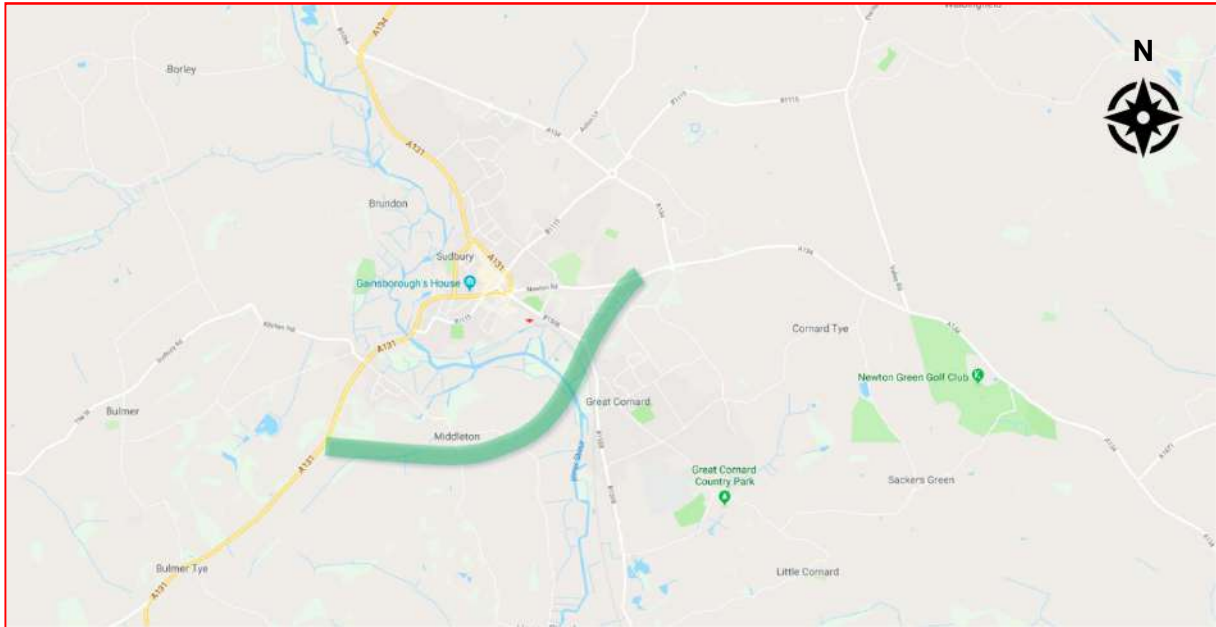
**Figure 67 – Option S1. Southern bypass (long)**



## S2. Southern bypass (short)

- 7.3.5. A new 3km long single carriageway road from the Newton Road/Cats Lane junction to the A131 south of Sudbury, including a junction with B1508.

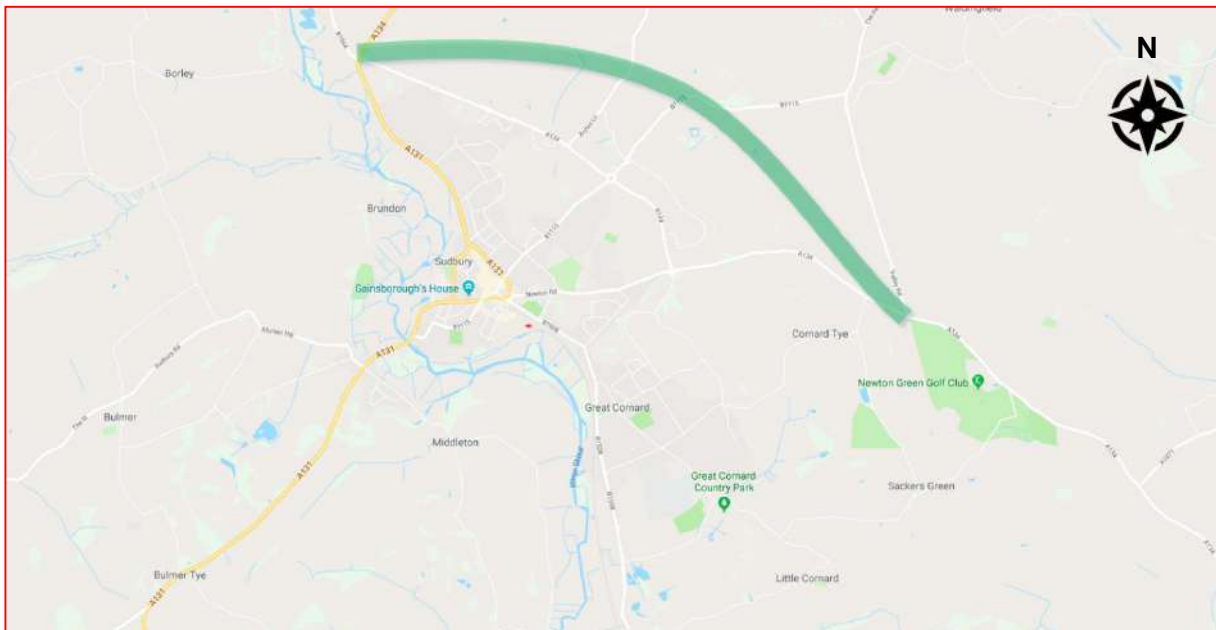
**Figure 68 – Option S2. Southern bypass (short)**



## E1. Eastern bypass (long)

- 7.3.6. A new 5.5km long single carriageway road from the A134/B1064 roundabout to the A134/Valley Road junction, including junctions with Acton Lane and B1115.

**Figure 69 – Option E1. Eastern bypass (long)**

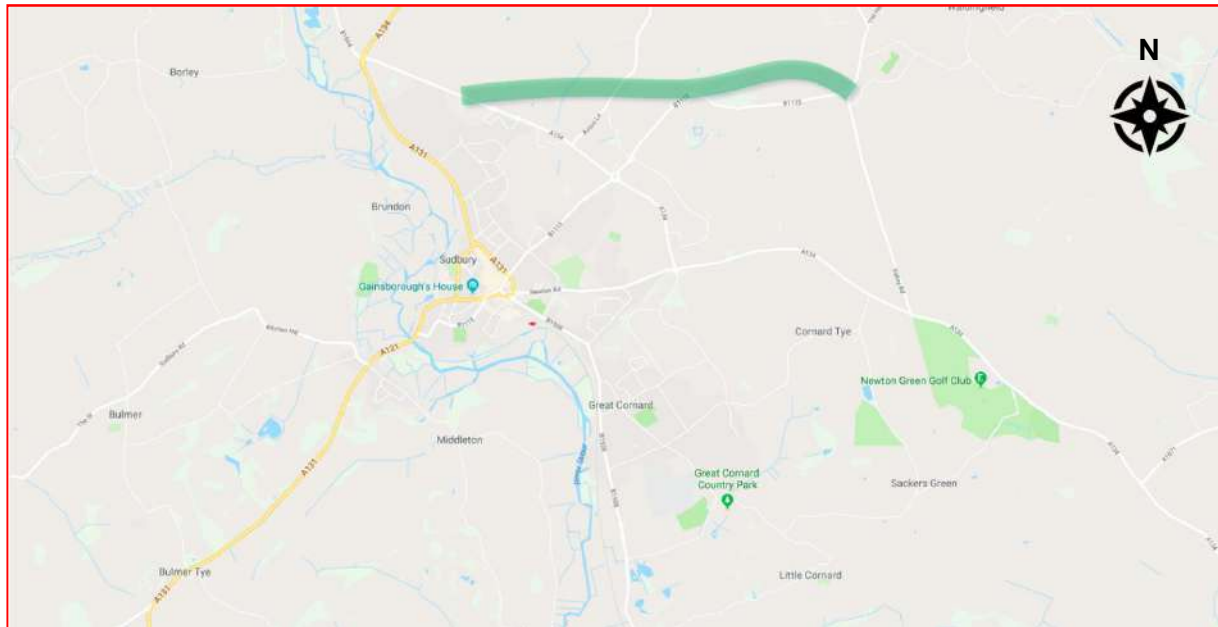




## E2. Eastern bypass (short)

- 7.3.7. A new 3km long single carriageway road from the A134 (north of the Claremont Avenue roundabout) to the B1115/Valley Road junction, including a junction with Acton Lane.

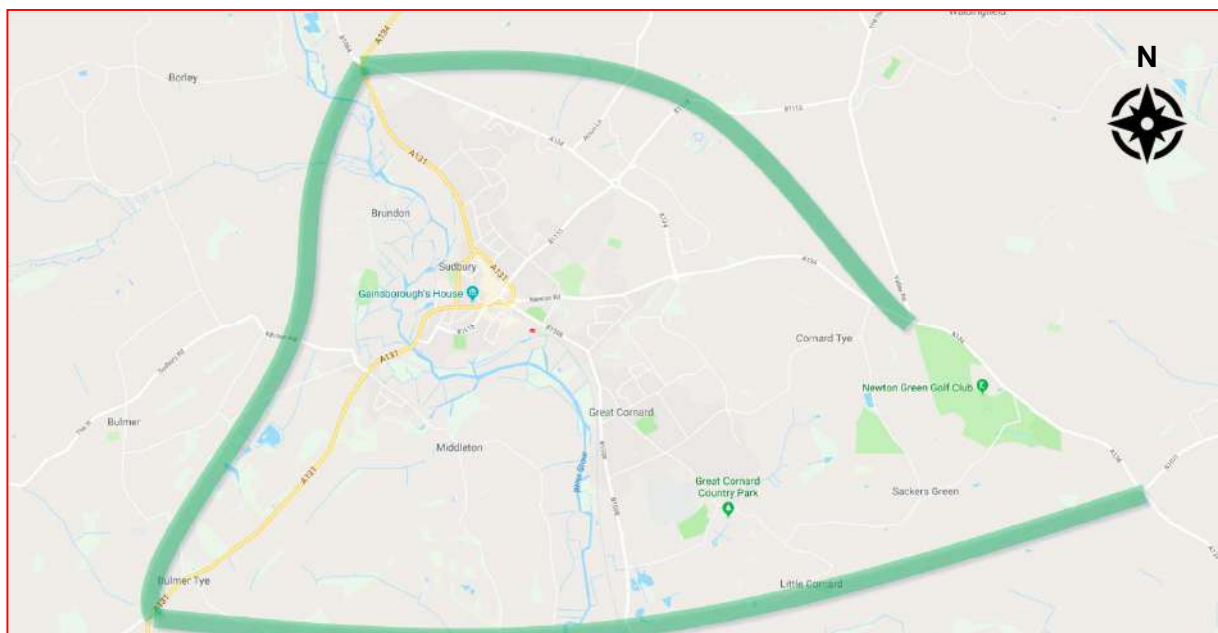
**Figure 70 – Option E2. Eastern bypass (short)**



## L1. Ring road – a bypass on the west, south and eastern sides of Sudbury

- 7.3.8. A new 22km single carriageway road. It would be a combination of option S1 (southern link only), option W1 (southern section from A131 – Hendingham Road Junction), and option E1.

**Figure 71 – Ring Road Option – L1**

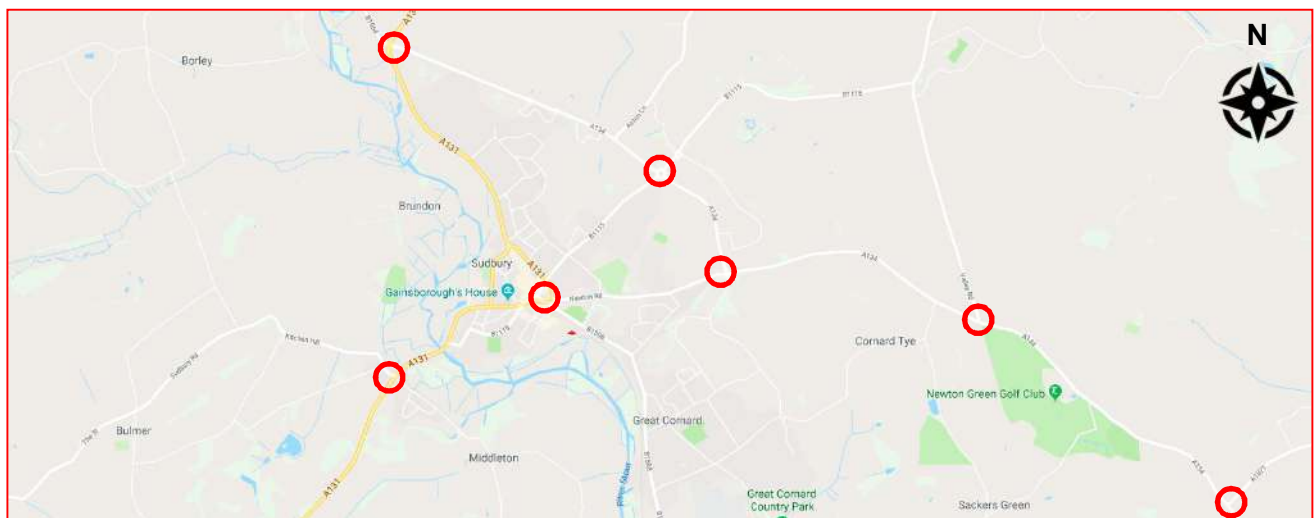


## J1. Junction improvements

7.3.9. A package of measures to increase capacity and improve traffic flow at problem junctions throughout Sudbury without a Relief Road. Based on the traffic analysis discussed earlier, and from taking feedback from SCC, initially, seven junctions were considered for improvement:

- A134 / A131 / B1064
- A134 / B1115
- A134 / Newton Road / Shawlands Avenue
- A131 / Newton Road / Cornard Road / Great Eastern Road
- A131 Ballingdon Hill / Bulmer Road
- A134 / A1071
- A134 / Valley Road

**Figure 72 – Option J1. Low cost option (junction improvements)**



7.3.10. Going forward, further analysis may be required to identify and assess the worst performing junctions.

7.3.11. Having identified twelve options, the next stage was to sift these to identify the best performing ones for further analysis. The sifting process is described in Chapter 8

## 8 INITIAL SIFT OF OPTIONS

### 8.1 INTRODUCTION

- 8.1.1. This chapter describes the process by which each identified option was assessed against defined criteria. Based on the findings from the process, options were taken forward for further, more detailed assessment.
- 8.1.2. The sifting process was undertaken using the Department for Transport's Early Assessment and Sifting Tool (EAST). The full results of the EAST assessment are set out in Appendix B.

### 8.2 CRITERIA USED IN THE EAST ASSESSMENT

- 8.2.1. The EAST assessment considers each option from six perspectives, which are aligned to the DfT Transport Business Case guidance and reporting structure (with 'environmental' identified as a specific category in light of its importance in the context of Sudbury). The six areas considered are as follows:
- Strategic;
  - Economic;
  - Managerial;
  - Commercial;
  - Financial; and
  - Environmental.
- 8.2.2. Within each category, the EAST assessment considers how well each option is likely to perform against a set of criteria (listed below) and where possible a numerical score is given against each of the criteria.

Strategic criteria			
Scale of impact	(5 point scale, low to high)	Weighting 2	The scale of impact and primary objectives have been given a higher weighting to reflect their relative importance..
Fit to primary objectives	(5 point scale, low to high)	Weighting 2	
Fit to secondary objectives	(5 point scale, low to high)	Weighting 1	
Consensus over outcomes	(5 point scale, little to majority)	Weighting 1	
Economic criteria			
Economic growth	(5 point scale, low to high)	Weighting 2	Since the detailed air quality assessment of schemes has not yet been undertaken, Carbon Emissions has a lower weighting than the other criteria. The value for money criteria, which would govern the feasibility of developing an option, has been given a higher weighting than other elements.
Carbon emissions	(5 point scale, high to low)	Weighting 1	
Well being	(5 point scale, little to majority)	Weighting 2	
Expected value for money	(5 point scale, poor to very high)	Weighting 4	
Managerial criteria			
Implementation timetable	(7 point scale)	Weighting 1	Practical feasibility looks at a number of structural, environmental and design

Public acceptability	(5 point scale, low to high)	Weighting 1	considerations for the options which impact other factors, and hence has been given a higher weighting.
Practical feasibility	(5 point scale, low to high)	Weighting 2	
Financial criteria (1)			
Affordability	(5 point scale, from not affordable to affordable)	Weighting 2	If the scheme is affordable, only then would other cost considerations become important, and hence a higher weighting has been given to that element.
Overall cost risk	(5 point scale, high to low)	Weighting 1	
Financial criteria (2)			
Capital cost	(10 point scale)	Weighting 1	
Commercial criteria			
Flexibility of the option	(5 point scale, static to dynamic)	Weighting 1	The higher weighting on Identification and securing of funding reflects the relative importance of this element.
Source of funding	(5 point scale, from 'not known' to 'from MRN')	Weighting 4	
Environmental criteria			
Air quality	(7 point scale, from large adverse to large beneficial)	Weighting 1	
Noise	(7 point scale, from large adverse to large beneficial)	Weighting 1	
Historic environment	(7 point scale, from large adverse to large beneficial)	Weighting 1	
Biodiversity	(7 point scale, from large adverse to large beneficial)	Weighting 1	
Landscape	(7 point scale, from large adverse to large beneficial)	Weighting 1	
Water Environment	(7 point scale, from large adverse to large beneficial)	Weighting 1	

## APPROACH TO ASSESSMENT AND SCORING

- 8.2.3. The evidence used to assess a number of the options was based on benchmarking from similar interventions elsewhere (e.g. the potential for mode shift due to sustainable travel interventions, and the likelihood of such changes meeting objectives), with some consideration given to the local context. For the proposed highway infrastructure interventions, the assessment included an estimate of the potential demand attracted to the new route (and subsequent relief to Sudbury), based on the latest SCTM evidence of origins and destinations of traffic in Sudbury.
- 8.2.4. Benchmarking from similar schemes was also used to assess the structural requirements, cost of schemes, cost risks, potential environmental impacts of the options, etc. For criteria such as source

of funding for the options and affordability, the assessment included an understanding of the sources of funding likely to be available for each of the options.

- 8.2.5. Inevitably, the assessment is in part subjective, either because of the lack of detailed data at this stage of the assessment, or because of the nature of the option or impact being assessed. This is especially true of the non-road options, which are less fully defined than the road options, and whose impacts will often be more difficult to quantify.
- 8.2.6. The six elements of the EAST assessment are made up of a varying number of components, and therefore just considering total scores would not provide an accurate comparison. A sum of the scores would also bias analysis to lower cost schemes which may not meet objectives.
- 8.2.7. To address this, the calculated scores for each element of EAST were converted to a 10-point scale for all options. This was undertaken using two different approaches. The approaches were:
  - i Approach 1: Score Options by giving a higher weight to options which meet the scheme objectives.
  - i Approach 2: Two-Stage Sifting approach, where:
    - Stage 1: Initial Sift to assess schemes which options meet the objectives.
    - Stage 2: Overall unweighted score for options that meet the scheme objectives.

## 8.3 RESULTS OF THE EAST ASSESSMENT

### Scoring of Options

- 8.3.1. The following approach was taken for the non-road options:

#### Option SM1. Sustainable Travel Initiatives

- 8.3.2. The scale of impact for SM1 (Sustainable Travel Initiatives) was taken from the 2017 DfT LSTF evaluation which suggests that the impact of such measures is likely to be 5% or less overall in terms of reduction in car traffic. This option is considered likely to achieve High Value for Money (VfM<sup>33</sup>) given the low costs involved and the relative benefit it would produce, though this is dependent on the local travel characteristics. However, the scale of impact from this kind of measure would be unlikely to lead to a significant reduction in traffic volumes in Sudbury town centre, nor would it specifically target HGV reduction, and therefore unlikely to deliver a number of the associated scheme objectives.

#### Option P1. Pricing Options

- 8.3.3. For Option P1 (Pricing Options), detailed case studies are not readily available, nor has the specific scheme related to this option been clearly defined, although it is likely to include, for example, changes to parking charges within the town. In terms of VfM there is significant uncertainty on this within the local context of Sudbury. The assumption has been made that such an option would produce High VfM on the basis of the likely low cost to implement and that it is a revenue raising option. However, the impact on the wider economy as a result of consumers and businesses potentially being deterred from the area due to higher travel costs could have an influence on the VfM, alongside the cost of enforcing such a scheme.



### **Option PT1. Bus improvements**

- 8.3.4. For Option PT1 (Bus), analysis was undertaken of the 2011 census Journey to Work data which shows a low bus mode share of 2% in Sudbury, compared to a national average of 7%. It is considered a bus option would be likely to achieve only Medium VfM given the relatively rural setting of Sudbury and lower levels of patronage. The likely impact of any mode shift away from car from this option is unlikely to deliver a number of associated scheme objectives, also the local authority would have limited control of bus options given it would be operator led.

### **Option PT2. Rail improvements**

- 8.3.5. For Option PT1 (Rail), it is assumed this option would focus on improving accessibility to Sudbury rail station such as improving walking and cycle provision. Extending the rail line beyond Sudbury would result in a prohibitively high cost and environmental impact and therefore this level of intervention was not included for consideration as part of the rail improvement option. There is currently a 2% mode share for rail within Sudbury based on the 2011 census Journey to Work, below the national average of 5%. It is considered that, given the limited market for rail within Sudbury, such an intervention is likely to achieve Medium VfM at best. The likely impact of any mode shift away from car from this option is unlikely to deliver a number of associated scheme objectives.

## **ROAD BASED OPTIONS**

- 8.3.6. For all the other road based options, the results were based on the estimated impacts of the road options on trips through Sudbury. For example, the western alignment is estimated to influence around 20% of the daily HGVs movements within Sudbury. These trips represent 40% of the total daily HGV movements which pass through Sudbury town centre.
- 8.3.7. Overall, approximately 12% of total traffic in Sudbury are strategic trips (i.e. not localised trips within Sudbury). The western alignment is estimated to relieve approximately 45% of strategic daily total traffic instead of passing through Sudbury town centre. This alignment is also estimated to influence around 60% of the daily HGV movements within Sudbury.
- 8.3.8. The assessment of the scale of impact of the junction improvement option is based on benchmarking of the impact of similar schemes (e.g. pinch point schemes), which often deliver high or very high value for money. Although the proposal will address to an extent some of the primary and secondary objectives, including reduced congestion and improving traffic flow through Sudbury, there are a number of objectives that will not be addressed by the scheme, including addressing the impact of HGV through-town movements.
- 8.3.9. The assumptions for the other road options are presented in Appendix B.

## **RESULTS - APPROACH1**

- 8.3.10. The full, detailed, results of the EAST analysis are set out in Appendix B. The overall results for each option are set out in Table 4.
- 8.3.11. To obtain the scores in Table 4, the weighted scores for each category were adjusted to give a score out of ten, with the financial category split into “affordability and cost risk” and “cost”. Weighting was applied as follows to represent the importance of the strategic and economic cases in identifying the best performing options and the strength of evidence for these elements:

i Strategic case      Weight 4

i Economic case Weight 3  
 i Other cases Weight 1

**Table 4 - Overall results of EAST assessment (weighted) – Approach 1**

Option	Strategic Case	Economic Case	Managerial Case	Financial Case: Affordability & Cost Risk	Financial Case: Cost	Commercial Case	Environment Case	Total Score
J1	6	9	8	9	10	7	9	94
SM1	4	10	10	9	10	8	10	93
P1	4	9	9	10	10	7	9	88
PT1	4	9	8	8	10	6	8	83
PT2	4	8	8	9	9	5	9	80
W1	9	6	8	6	6	10	7	91
W2	9	6	8	8	6	10	7	93
S1	10	6	5	5	4	8	6	86
S2	9	5	4	8	6	10	7	86
E1	6	5	7	6	7	10	8	77
E2	5	5	8	8	8	10	8	77
L1	10	6	3	4	4	2	3	74

## RESULTS - APPROACH 2

8.3.12. For Approach 2 an initial sifting exercise was undertaken to identify the options which met the scheme objectives. The financial category was again split into “affordability and cost risk” and “cost”.

**Table 5 – Initial Sifting of Options Based on Meeting Scheme Objectives**

Option	Strategic Case	Economic Case	Managerial Case	Financial Case: Affordability & Cost Risk	Financial Case: Cost	Commercial Case	Environment Case	Does the Scheme Meet the Objective?
J1	14	32	10	12	9	15	34	Y
SM1	10	36	12	12	9	16	39	N
P1	9	34	11	14	9	15	37	N
PT1	10	32	10	11	9	12	33	N
PT2	10	30	10	12	8	11	36	N
W1	23	21	9	9	5	21	28	Y

Option	Strategic Case	Economic Case	Managerial Case	Financial Case: Affordability & Cost Risk	Financial Case: Cost	Commercial Case	Environment Case	Does the Scheme Meet the Objective?
W2	23	21	9	11	5	21	28	Y
S1	24	23	6	7	4	17	24	Y
S2	23	19	5	11	5	21	27	Y
E1	15	19	8	9	6	21	33	Y
E2	13	19	10	11	7	21	32	N
L1	25	22	3	5	4	5	10	Y

- 8.3.13. Having sifted out the options that did not sufficiently meet the scheme objectives, the remaining options were scored as shown in Table 6, the scores for each category adjusted to give a score out of ten.

**Table 6 - Overall Results of EAST Assessment – Approach 2**

Option	Strategic Case	Economic Case	Managerial Case	Financial Case: Affordability & Cost Risk	Financial Case: Cost	Commercial Case	Environment Case	Total Score
J1	6	9	8	9	10	7	9	58
W1	9	6	8	6	6	10	7	52
W2	9	6	8	8	6	10	7	54
S1	10	6	5	5	4	8	6	44
S2	9	5	4	8	6	10	7	49
E1	6	5	7	6	7	10	8	49
L1	10	6	3	4	4	2	3	32

## 8.4 OPTIONS TAKEN FORWARD FOR FURTHER ASSESSMENT

- 8.4.1. Based on both the approaches outlined above, the highest scoring option is the Junction Improvement Option, although it is noted it does not address a number of objectives, especially those related to through traffic.

Amongst the options that meet the objectives in a more comprehensive manner, i.e. the relief road options, the Western Bypass (Short) is the highest scoring option, followed by the Southern (Short) option. These options taken have been taken forward for some further assessment and the findings from this is presented in the next chapter.

## 9 OPTION DEVELOPMENT AND ASSESSMENT

### 9.1 INTRODUCTION AND OVERVIEW

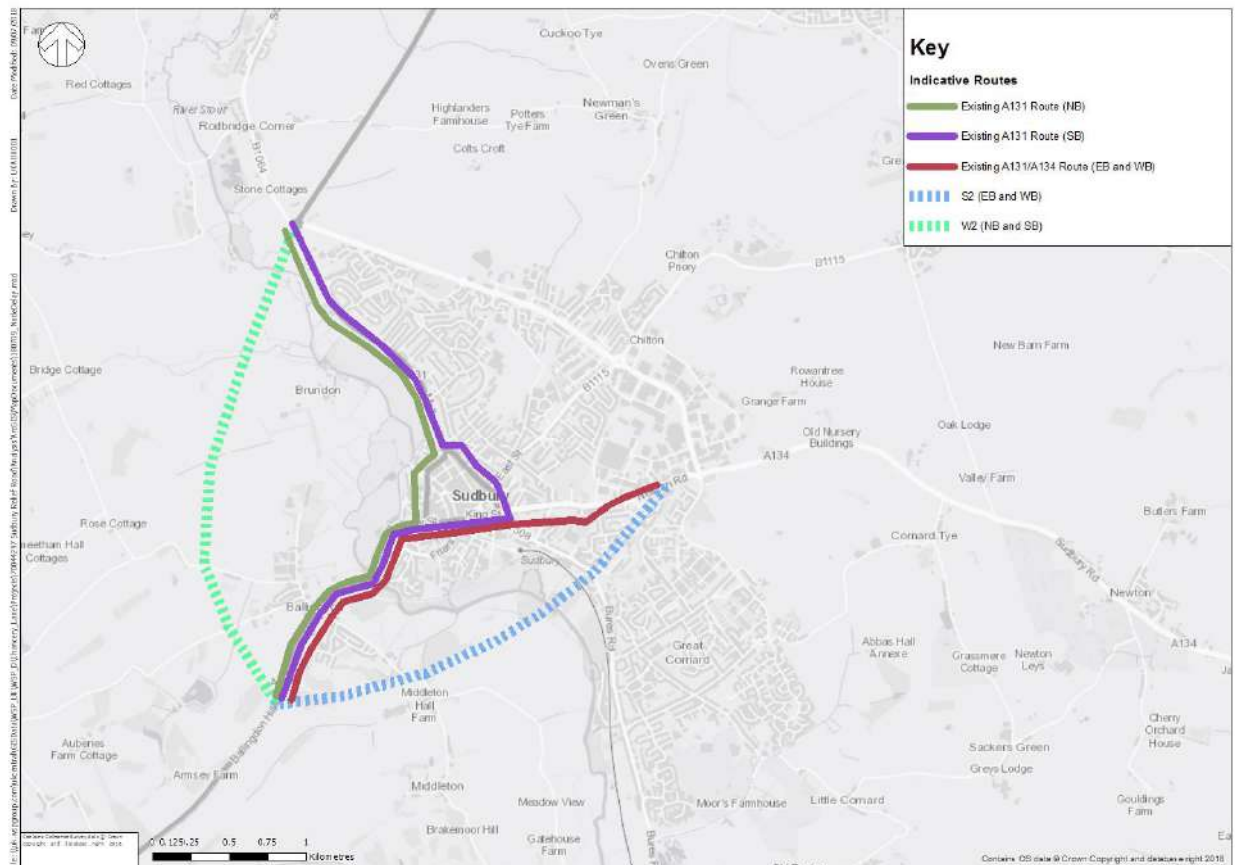
- 9.1.1. This section of the report presents the findings from the assessment of the options W2 (Western Option, short) and S2 (Southern Option, Short) in more detail to confirm the potential cost, value for money and environmental impacts.

### 9.2 TRAFFIC IMPACTS OF THE ROAD OPTIONS

#### JOURNEY TIME IMPACTS

- 9.2.1. An analysis of journey time savings was undertaken for both S2 and W2 options in order to understand the journey time improvements against competing routes through Sudbury town centre. The journey time routes that were compared are shown in Figure 73 below.

**Figure 73 - Journey Time Routes**



#### W2 Option

- 9.2.2. W2 option was compared against its competing route on the A131 northbound / southbound route in 2023 and 2038 AM, Inter Peak and PM peak. Due to the faster speed and shorter length of W2 option, there is an average journey time savings of almost three minutes, which is approximately 54% faster than the A131 northbound route.

- 9.2.3. The W2 option also showed a significant journey time savings, of almost five minutes, which is approximately 65% faster than the A131 southbound route.

### S2 Option

- 9.2.4. The S2 option was compared against its competing route on the A131/A134 eastbound / westbound route in 2023 and 2038 AM, Inter Peak and PM peak. There is an average journey time saving of almost four minutes, which is approximately 48% faster than the A131/A134 eastbound route.
- 9.2.5. The S2 option westbound showed a journey time savings of almost 2.5 minutes, which is approximately 36% faster than the A131/A134 westbound route.
- 9.2.6. Therefore, both W2 and S2 options show significant reductions in journey time due to faster speed and shorter distance of both alignments compared to existing routes on the A131 and A134. The largest journey time improvement is the southbound movement on W2, with a saving of almost five minutes or 65% compared to the A131 southbound route.

### Traffic Flow Impacts

- 9.2.7. This section looks at the impacts the journey time savings have on the route choice of trips when the traffic assignments are compared between scenarios with and without (Do-Minimum) options.
- 9.2.8. The likely amount of peak hour and daily traffic that W2 and S2 options would attract are tabulated in Table 7 below.

**Table 7 - Peak Period and Daily Traffic Attraction of S2 and W1 Options**

Option	S2 2023	W2 2023	S2 2038	W2 2038
AM Period	2,938	2,575	3,297	3,008
Inter Peak Period	4,324	4,360	5,146	4,658
PM Peak Period	3,028	2,705	3,384	3,133
Off Peak Period	1,816	1,831	2,161	1,956
Daily	12,107	11,471	13,988	12,755

- 9.2.9. The S2 scheme attracts more daily traffic than W2, with approximately 12,100 and 14,000 trips in 2023 and 2038, respectively, compared to 11,500 and 12,800 for W2. Importantly, S2, with the potential to attract up 10% more traffic than W2 in 2038, diverts traffic from A131 King Street section of Sudbury town centre gyratory.
- 9.2.10. Approximately half of W2 traffic are trips between north and south of Sudbury in AM, Inter Peak and PM peak hour. Therefore, half of the trips that use W2 are strategic routes between north and south of Sudbury and would re-route from using the existing route on A131 through Sudbury town centre.
- 9.2.11. The difference in flows between W2 and S2 options against the Do Minimum were also compared to understand how traffic re-routes between Do Minimum and Do Something in the peak hour and across the day.



## W2 Option

9.2.12. Figure 74 to Figure 81 show the impact of the W2 option would have on the traffic flow.

**Figure 74 – 2023 Flow Difference (W2 - DM) - AADT**



9.2.13. Figure 74 shows that for an average day there is expected to be significant re-routing of through trips away from A131 (and the town centre) in 2023 as a result of the proposed option. This impact is seen for 2038 and over all time periods in the figures below.

**Figure 75 – 2023 Flow Difference (W2 - DM) - AM Peak**



**Figure 76 – 2023 Flow Difference (W2 - DM) - Inter Peak**

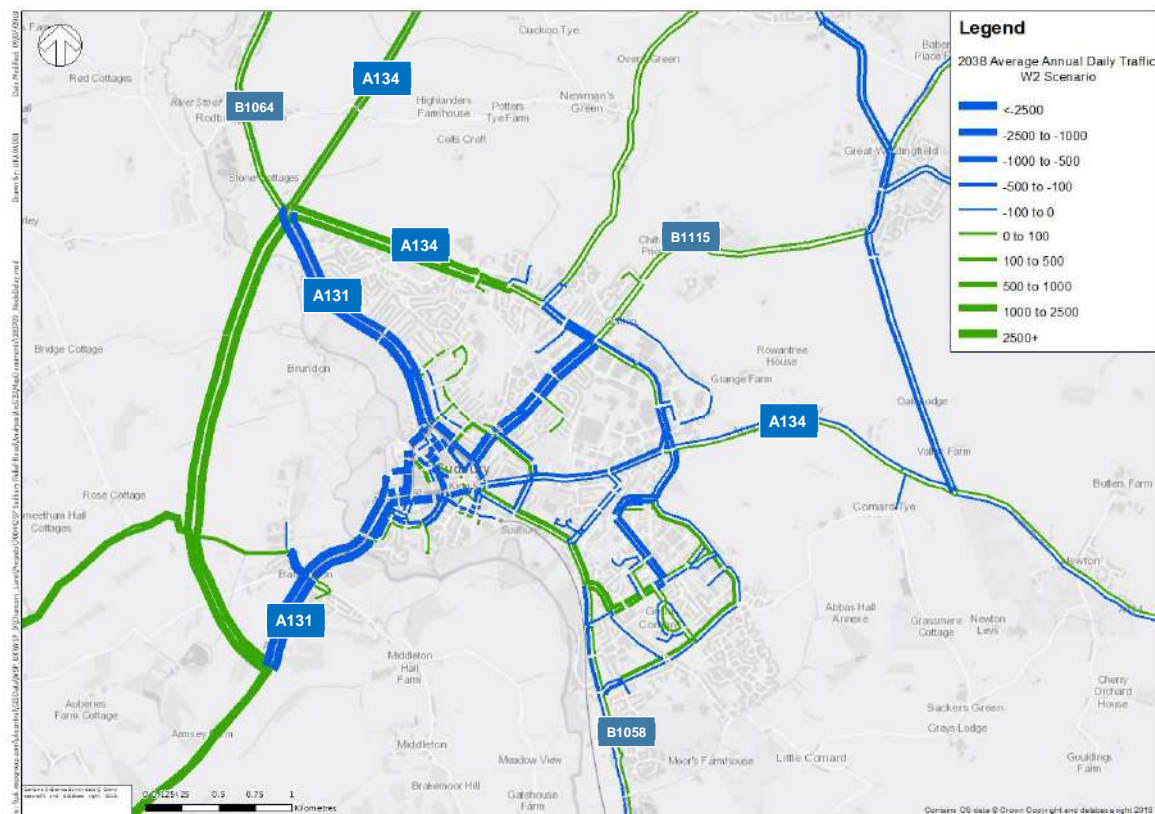




**Figure 77 – 2023 Flow Difference (W2 - DM) - PM Peak**



**Figure 78 – 2038 Flow Difference (W2 - DM) - AADT**



**Figure 79 – 2038 Flow Difference (W2 - DM) - AM Peak**



**Figure 80 – 2038 Flow Difference (W2 - DM) – Inter Peak**





**Figure 81 – 2038 Flow Difference (W2 - DM) – PM Peak**





## S2 – Short Southern Relief Road Option

9.2.14. Figure 82 to Figure 89 show the impact of the S2 option on the traffic flow.

**Figure 82 – 2023 Flow Difference (S2 - DM) – AADT**



**Figure 83 – 2023 Flow Difference (S2 - DM) - AM Peak**



**Figure 84 – 2023 Flow Difference (S2 - DM) - Inter Peak**

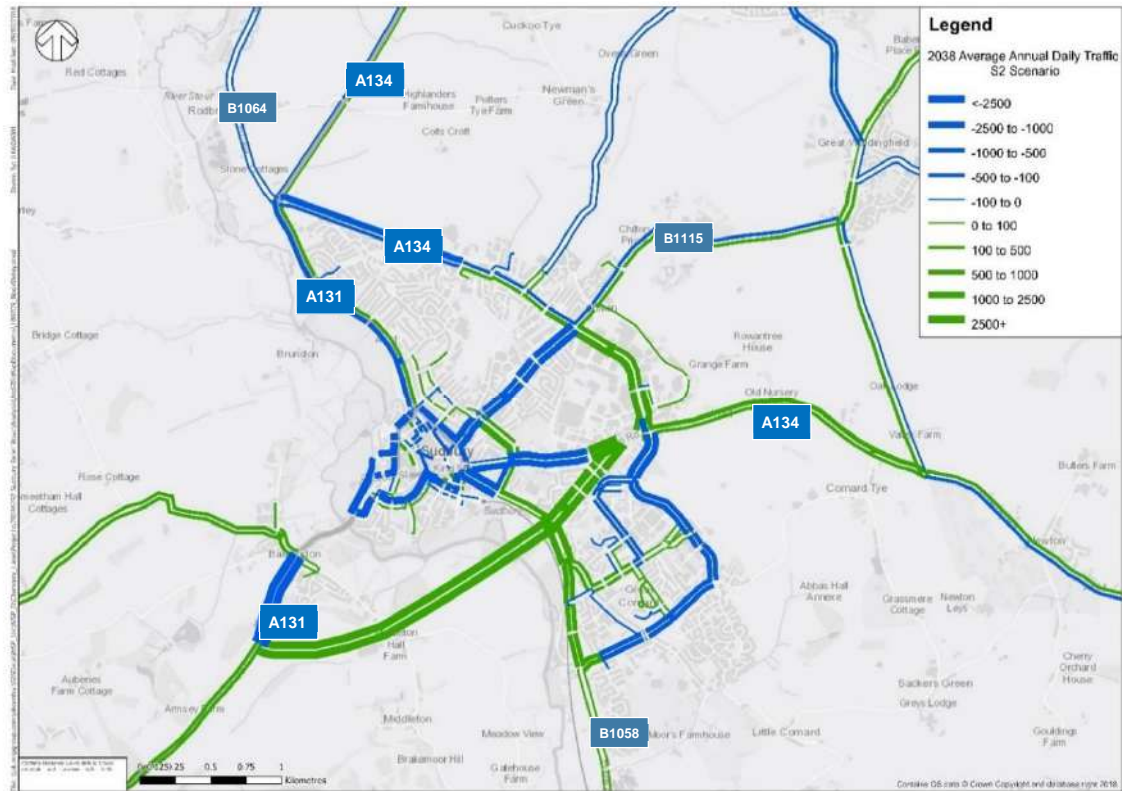


**Figure 85 – 2023 Flow Difference (S2 - DM) - PM Peak**





**Figure 86 – 2038 Flow Difference (S2 - DM) - AADT**



**Figure 87 – 2038 Flow Difference (S2 - DM) - AM Peak**



**Figure 88 – 2038 Flow Difference (S2 - DM) - Inter Peak**



**Figure 89 – 2038 Flow Difference (S2 - DM) - PM Peak**



- 9.2.15. The above figures show that majority of the east-west movement on the A131 through Sudbury town centre has re-routed to S2. Therefore, S2 has the potential to cause a significant reduction in traffic on the A131 King Street section of the town centre gyratory.
- 9.2.16. There is also a re-route in traffic to the north-east of Sudbury to now use A134 and Valley Road via S2.
- 9.2.17. Due to W2 being primarily for north-south traffic on the A131, the S2 scheme has more impact on the A131 King Street section of the town centre gyratory.

#### **Journey Time Benefits**

- 9.2.18. An analysis of the journey time saving benefits shows that the W2 scheme provides a higher benefit for long distance trips, which are currently experiencing a higher delay in the network than those trips which benefit from the S2 scheme. Also, while W2 provides a complete by-pass option for north-south movements, in case of S2 north-south trips still have to use parts of the existing network of Sudbury, especially A134 via Cats Lane. In light of this, the overall journey time benefits for W2 are higher than S2.

### **9.3 BENEFITS COST RATIO (BCR) FOR THE OPTIONS**

#### **Cost Estimation**

- 9.3.1. As part of this this assessment, a more detailed (but still preliminary) assessment was made of the potential cost for the two best performing relief road options, taking into account:
  - ┆ The scale of flood plain impacts and the necessary mitigations to build over this; and
  - ┆ The land-take required for the options.
- 9.3.2. Based on the available secondary information sources, a very preliminary flood plain assessment identified a 'best' case and 'worst' case scenario, with the 'best' case indicating lowest expected structures required to build over the flood plain.
- 9.3.3. For estimating the structures required for the 'worst' case, the assumption is that embankments can be built on only 20% of the floodplain, while for the 'best' case, the assumption is that embankments can be built over 60% of the floodplain. Note, provided the scheme is taken forward for further refinement, it would need a more robust flood plain assessment and discussions with the Environment Agency.
- 9.3.4. The proposed cross-section for the structures of the relief road are urban single carriageways, rather than rural single carriageways. This is a cross-section that has been successfully used on other schemes (but not necessarily in Suffolk). The proposed overall width of the relief road is 12.9m for Western Relief Road, and 12.3m for Southern Relief Road.
- 9.3.5. The Southern Relief Road, which would be connected to Sudbury via Cats Lane would be complicated from a land and property perspective as it would require:
  - ┆ Outright acquisition of properties;
  - ┆ Partial acquisition of properties; and
  - ┆ Compensation claims for diminution of value arising from the development.
- 9.3.6. Furthermore, while the street is predominantly residential in nature, there could well be other property types which would need to be acquired to facilitate the scheme.



- 9.3.7. At this stage, this detailed assessment has not been undertaken to estimate the land take, but an assumption has been made about the high land acquisition cost for this option.
- 9.3.8. Using the assumptions mentioned above, cost estimates were completed and are shown in Table 6 below.

**Table 8 – Cost Estimates**

Ref	Option	Cost	
		Best	Worst
1	Southern Relief Road (S2) - Short	£57,000,000	£74,000,000
2	Western Relief Road (W2) – Short	£59,000,000	£70,000,000

**The assumptions in arriving at the costs are:**

- i Base Estimates are based at 3rd Quarter 2018.
- i Estimates have been based upon preliminary sketch plans.
- i Best case /worst case based on early assessment of structures required.
- i Urban land costs for Southern Relief Road Option (S2) allowed at £5m (best Case) and at £10m (worst case).
- i Future Construction Inflation assumed at 3% per annum to calculate the outturn costs.
- i The cost currently does not include any mitigation that may be required based on the findings from the Gainsborough sightlines assessment.

- 9.3.9. As recommended by the DfT's Transport Appraisal Guidance (WebTAG) for Stage 1 road schemes (so that we can compare costs with those presented at SOBC), the costs reported above were adjusted by 44% to include optimism bias, rebased to 2010, discounted to 2010 with a market prices adjustment applied. This was applied to both the Western (W2) and Southern (S2) Relief Road options, and considered alongside the benefits to calculate the Benefit Cost Ratios (BCR).

**Benefit Cost Ratio**

- 9.3.10. The economic appraisal was undertaken using TUBA v1.9.11 to output the forecast benefits over a standard 60-year appraisal period. Benefits were only considered for a 12-hour weekday (3hrs AM, 6hrs Inter peak and 3 hrs PM). No off-peak (19:00-07:00) benefits were calculated or applied.
- 9.3.11. The peak hour flows from the traffic model were converted to the above-mentioned periods by multiplying the AM, IP and PM flows by 3, 6 and 3 respectively. An annualisation factor of 253 was used in TUBA representing the number of working days in a year – i.e. no claim is made for weekend or bank holiday periods. All monetary values are quoted in 2010 prices that form the common cost base for transport scheme economic appraisal. TUBA v1.9.11 is consistent with WebTAG Data Book (v1.10) May 2018 guidance.

9.3.12. The Benefit Cost Ratios (BCR) for the S2 and W2 options are shown in the table below.

**Table 9 – Benefit Cost Ratio (TUBA only)**

Options	Benefits (£ '000)	Cost (£ '000)		BCR	
		Best Case	Worst Case	Best Case	Worst Case
W2	42,766	50,230	59,556	0.85	0.72
S2	29,477	49,291	63,400	0.60	0.46

- 9.3.13. The above analysis is still at a high level and more refinement of the estimation of benefits and costs would be required to provide a more robust outcome. It is also the case that the above analysis only includes direct journey time and operating cost benefits and does not capture all the benefits/disbenefits related to these scheme (e.g. accidents, wider economic benefits, air, noise impacts, landscape, etc.).
- 9.3.14. Notwithstanding the point made above, the BCRs shown in Table 7 show the benefits of both schemes do not outweigh the costs, and from the evidence currently available would be likely to be categorised as 'poor' value for money as defined by the DfT Value for Money Framework<sup>33</sup>.
- 9.3.15. Based on the current evidence, the bypass options are shown the have a poor VfM, and hence are unlikely to attract DfT funding. While there are possible improvements that could be made regarding the scheme costs by undertaking more detailed costing work, based on the current results it appears that the best result these options are likely to offer are 'low' VfM.

---

<sup>33</sup> <https://www.gov.uk/government/publications/dft-value-for-money-framework>

## 10 SUMMARY AND CONCLUSIONS

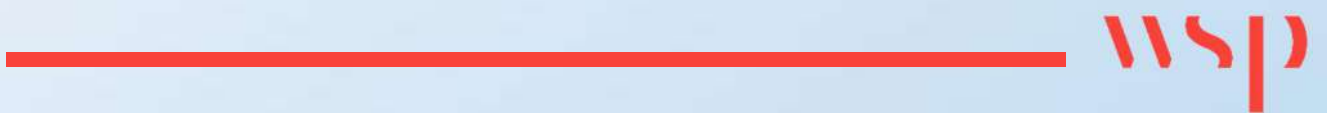
---

- 10.1.1. This OAR has reported the results of the Sudbury Transport study commissioned by Suffolk County Council to identify transport solutions to the traffic problems of Sudbury.
- 10.1.2. The report has been prepared in accordance with the Department for Transport's Transport Analysis Guidance (WebTAG), covering the following steps:
- Understand the current context and conditions in the study area;
  - Understand the future conditions in the study area;
  - Establish the need for the intervention;
  - Identify intervention-specific objectives to address the identified need;
  - Define the geographical area for the intervention to address;
  - Generate options reflecting a range of modes, approaches and scales of intervention;
  - Undertake initial sift. Discard options that would fail to address key objectives or are unlikely to pass key viability and acceptability criteria;
  - Develop and assess potential options to identify the better performing ones; and
  - Document the option development process in an Option Assessment Report (OAR) or similar.
- 10.1.3. The analysis of the current and ongoing transport related problems highlighted the following areas that needed to be addressed:
- Traffic congestion in Sudbury town centre due the nature of the current road network. In the absence of an alternate route for strategic traffic, including those for goods vehicles, these trips are currently travelling through the constrained network in the town leading to congestion and its associated impacts.
  - Unreliable journey times and delays witnessed during the peak periods, especially through key junctions such as along A131 and A134.
  - Key locations around the town centre are noted to have higher than acceptable levels of NO<sub>2</sub>. Traffic congestion is the main contributor of this and needs to be addressed in light of expected increase in traffic in the future.
  - Lack of alternate routes for strategic traffic results in low network resilience. In the case of unforeseen circumstances, including issues on M11/A11, there is the potential for impacts on the traffic volume passing through Sudbury.
- 10.1.4. To address the identified problems and help deliver the specified scheme objectives, a 'long list' of options for interventions was developed. Each of these options were assessed against defined criteria to help determine which options should be taken forward for further, more detailed assessment. The sifting process was undertaken using the Department for Transport's Early Assessment and Sifting Tool (EAST).
- 10.1.5. The highest scoring option from the EAST assessment was the Junctions Improvement Option, though it does not address a number of scheme objectives, especially those related to through traffic. Amongst the options that meet the objectives in a more comprehensive manner, i.e. the relief road options, the Western Bypass (Short) was the highest scoring option, followed by the Southern (Short) option. The area where all the above options scored well were the Strategic and Commercial cases.
- 10.1.6. These options were identified to take forward for further detailed assessment. Due to the limitation of the current traffic model, the detailed option assessments were limited to the bypass options.
-

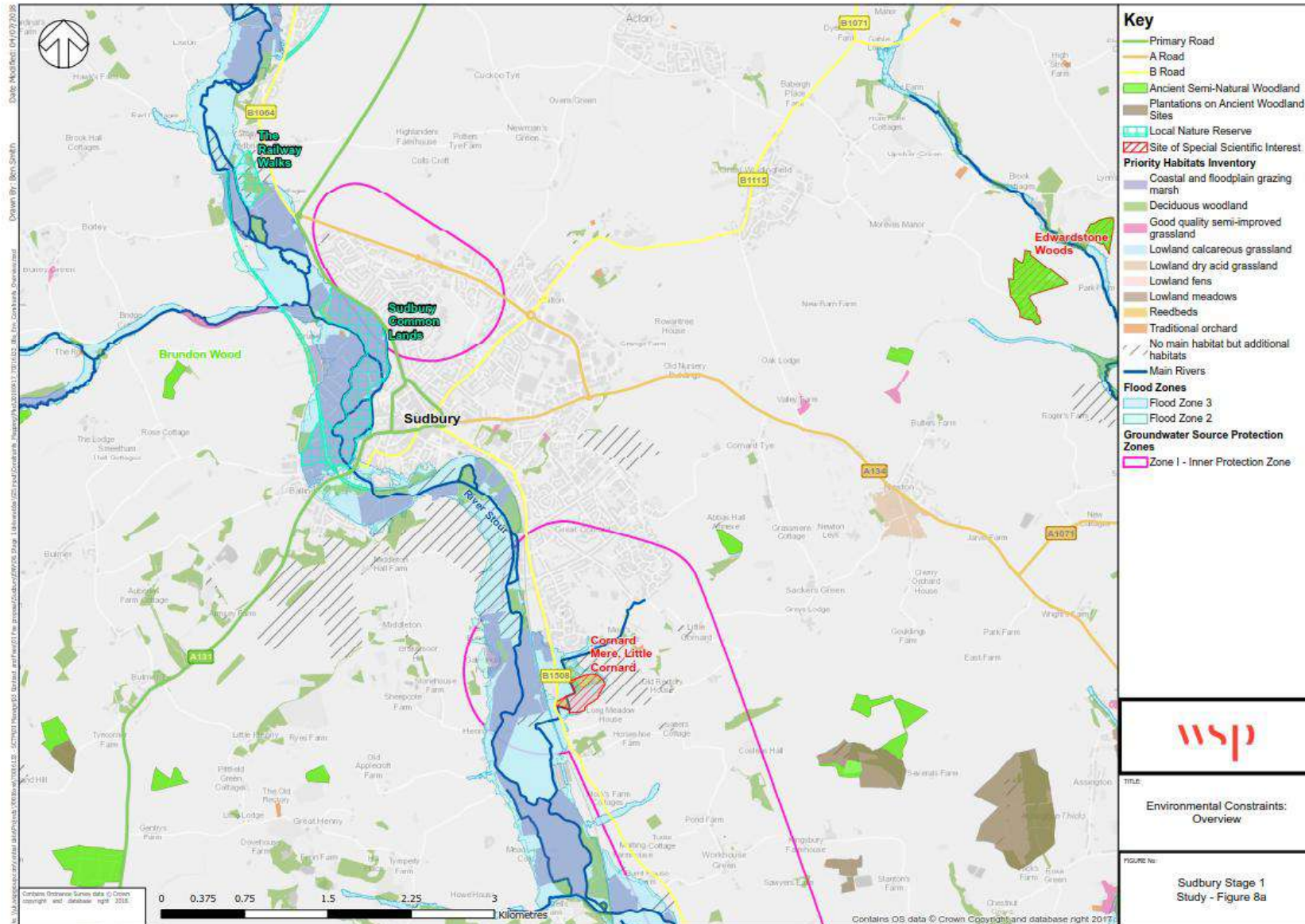
- 10.1.7. An analysis of journey time savings was undertaken for both southern and western options in order to understand the journey time improvements against competing routes through Sudbury town centre. Both the bypass options showed significant reduction in journey time due to faster speed and shorter distance of both alignments compared to existing routes on the A131 and A134. The largest journey time improvement was the southbound movement on the western option, with a saving of almost five minutes or 65% compared to the A131 southbound route. This showed that there is a clear benefit of the scheme for trips, especially those which are travelling through Sudbury.
- 10.1.8. However, the scheme cost, estimated to be between £50m-£70m, results in a low benefit cost ratio, and hence low value for money. The opportunity for funding a scheme through central government funds is therefore limited as there would be an expectation for higher VfM returns (noting the DfT would consider all 5 cases and not just the VfM).
- 10.1.9. Based on current evidence, the conclusion of the option assessment process is that the junction improvement works would be the most cost-effective way to address the transport problems of Sudbury at this time, although it is noted that this option does not address all the objectives set out in the study.
- 10.1.10. It is recommended that further analysis and design work should be undertaken to identify appropriate detailed junction improvement proposals, together with identification of potential funding streams, to support delivery of this option.

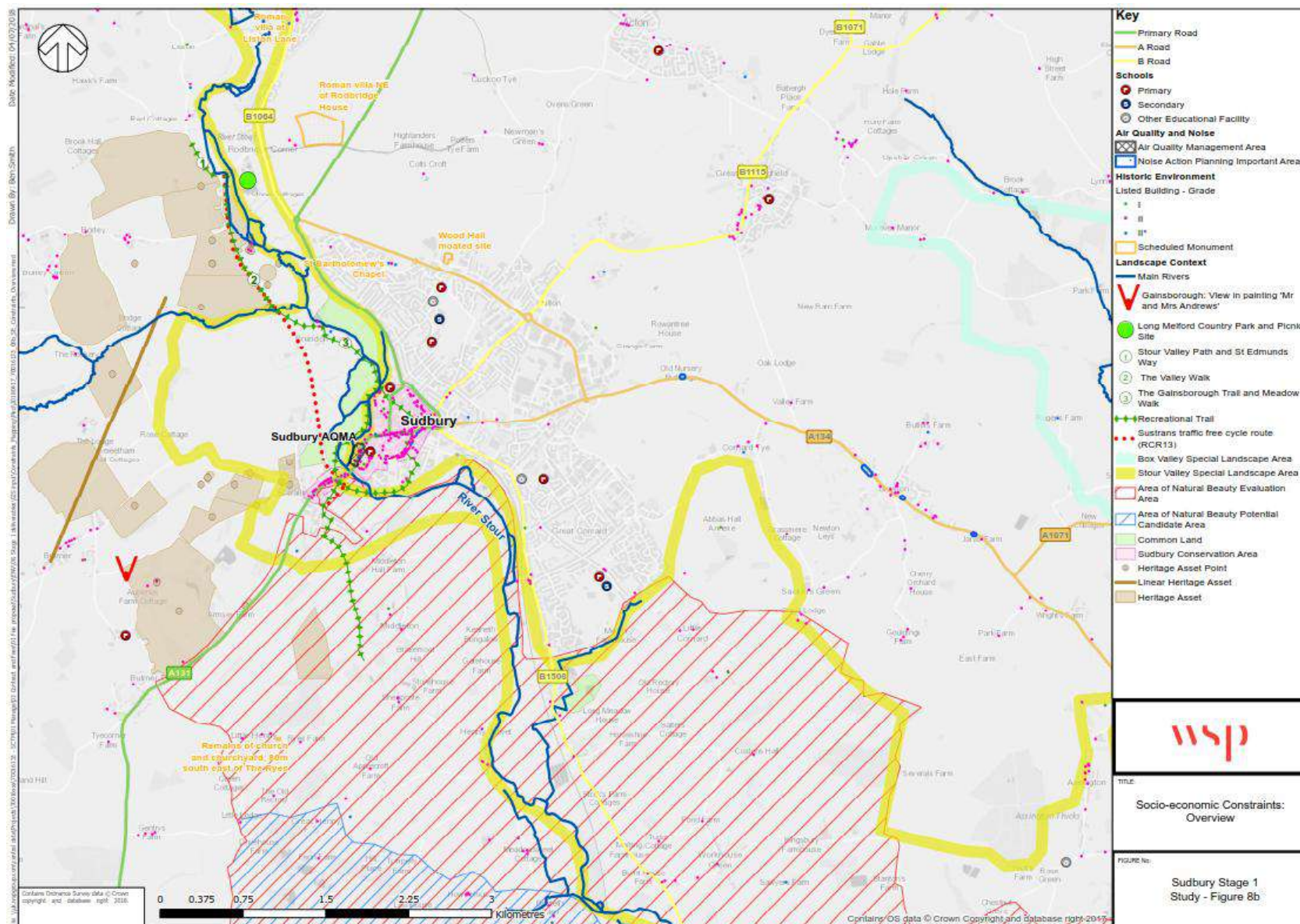
# Appendix A

ENVIRONMENT CONSTRAINT MAPS











# Appendix B

EAST ASSESSMENT







WSP House  
70 Chancery Lane  
London  
WC2A 1AF

**wsp.com**

PUBLIC