

A1 Birtley to Coal House

Scheme Number: TR010031

**EXA/D4/006 Addendum to Transport
Assessment Report**



Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning
(Examination Procedure Rules) 2010**

**The A1 Birtley to Coal House
Development Consent Order 20[xx]**

Addendum to Transport Assessment Report

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1 INTRODUCTION

1.1 Purpose of this report

1.1.1 This Transport Assessment Addendum (TAA) to the Transport Assessment (APP-173) has been submitted to the Examining Authority (ExA) at Deadline 4 on 20 April 2020. It relates to an application made by Highways England (the “Applicant”) to the Secretary of State for Transport via the Planning Inspectorate (the “Inspectorate”) under the Planning Act 2008 (the “2008 Act”) for a Development Consent Order (DCO). If made, the DCO would grant consent to the Applicant to undertake the A1 Birtley to Coal House Scheme (the “Scheme”). The Applicant submitted the Application on 14 August 2019 (Reference: TR010031) (“Application”) and on 10 September 2019, the Inspectorate confirmed that the Application had been accepted for examination. Examination of the Application began on 21 January 2020.

1.1.2 The TAA has been produced to support a request to amend the Application (please see EXA/D4/002). The further design development has been undertaken by the Applicant in order to optimize the scheme being delivered by the public sector in the public interest. The proposed amendments to the DCO application are listed below:

- i. The inclusion of further design flexibility in relation to the proposed replacement of Allerdene Bridge over the East Coast Main Line (ECML). The draft DCO [APP-013] currently allows for the replacement of Allerdene Bridge by a single span integral bridge (Embankment Option) or a 6/7-span viaduct (Viaduct Option). It is further proposed to enable the construction of a 3-span viaduct design under the DCO.
- ii. Providing flexibility as to the formation and the road layout of the Scheme to enable narrower lanes to be provided between the existing narrow lanes north of junction 67 (Coal House) and approximately chainage 11150 over Kingsway Viaduct at junction 67 (Coal House). The current Scheme proposes full width lanes. The new proposal is to allow narrower lanes extending over approximately 750m of the length of the Scheme to be introduced.
- iii. The inclusion of additional land within the Application at junction 67 (Coal House) for an extension of the site compound as set out in the Application, which is to be used for material stockpiling. This land currently sits outside the proposed Order limits contained in the Application and it is proposed that powers of temporary possession are extended to this land, for use during construction of the Scheme.

1.1.3 A more detailed description of the proposed changes can be found in the “Summary of Proposed Changes to Application” [AS-009]

1.1.4 The purpose of this TAA to the TAR [APP-173] is to provide an assessment of the likely transport impacts resulting from the implementation of narrower lanes option at junction 67 (Coal House) and over Kingsway Viaduct on capacity of the A1.

1.1.5 It is not anticipated that the proposed amendment to the DCO application for the

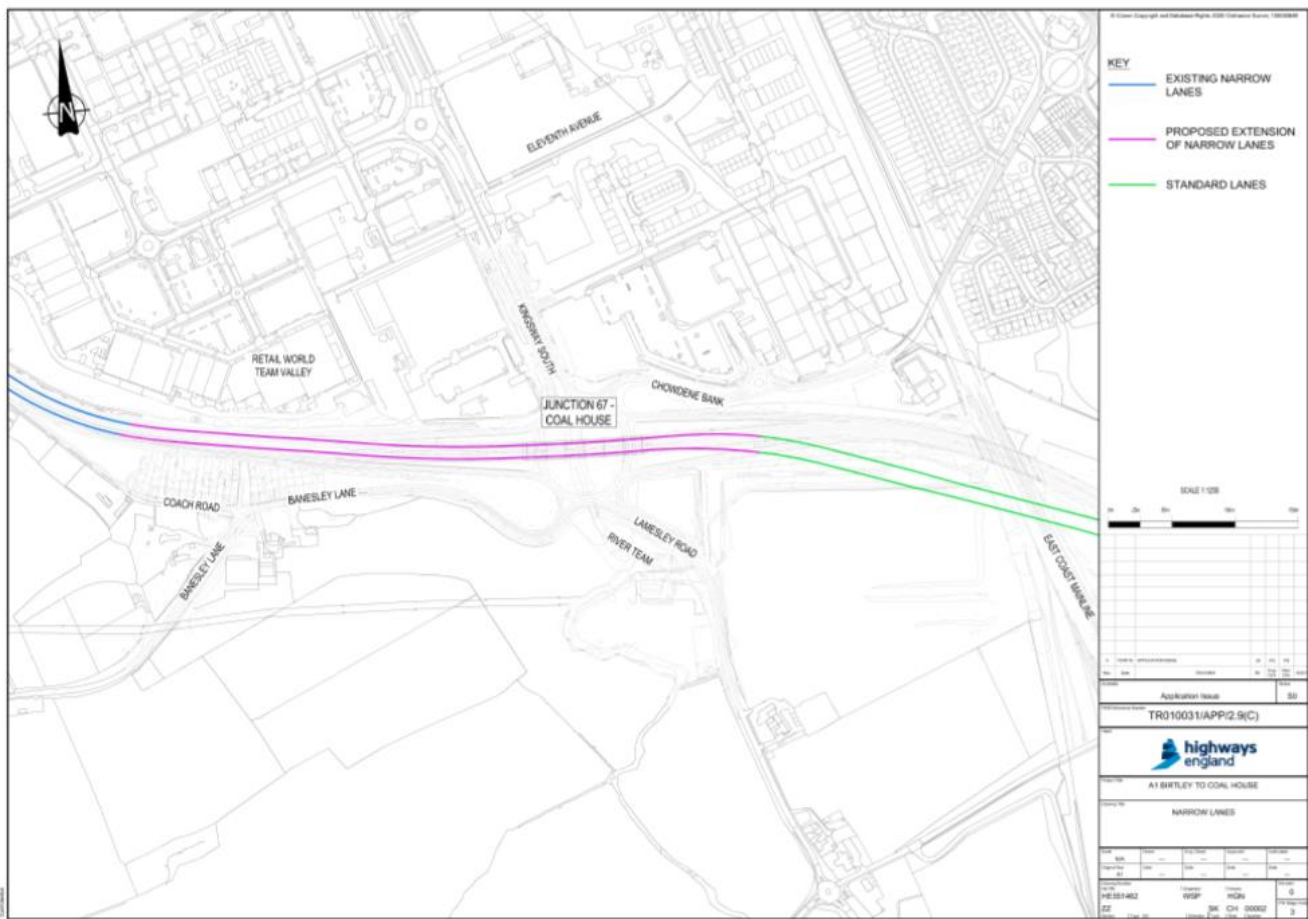
construction of a 3-span viaduct would have any likely transport impacts. The 3-span arrangement provides a more efficient option in terms of construction activities. This would reduce the construction programme by an estimated 6 months period (from 36 months for the Embankment Option within the Application to 30 months for the 3-span arrangement with the inclusion of additional land as proposed) which would result in fewer associated construction vehicle movements. Consequently, a 3-span viaduct option provides benefits in terms of road capacity, road safety and reduction in traffic delays to road users.

- 1.1.6 Similarly, the proposed amendment to the DCO application to allow inclusion of additional land for material stockpiling adjacent to the Order limits at Allerdene would reduce the number of vehicle movements on the A1 as opposed to material stockpiles placed along the corridor of the Scheme. The just-in-time delivery approach previously proposed for the Embankment Option would increase the peak vehicle movements on the A1. The use of stockpiled material from a stockpile area adjacent to the construction of the new Allerdene Bridge, would remove peak construction traffic on the A1. The availability of land for material stockpiling adjacent to the Order limits at Allerdene would allow the contractor to import materials in advance of any planned construction activities and store materials at stockpiling area before exporting to site. Therefore, deliveries can be scheduled to make use of the available hours of working and construction related traffic will be redistributed over a longer period of time thereby reducing the peak vehicle movements on the network. The additional land proposed would enable a larger material stockpile area which would allow construction plant used for earthworks operations to work more efficiently therefore producing less emissions than placing the same material at a much slower rate when relying upon the material to be transported to the deposition area at a just-in-time fashion .

2 Proposed Changes to the Application & Traffic Impacts

- 2.1.1 The Application as made proposed to provide full width lanes through the entire length of the A1 between junction 67 (Coal House) and junction 65 (Birtley). This is as shown on the General Arrangement Plan [APP-010] and Works Plans [AS-011]. Narrow lanes are already in place and operational to the north of junction 67.
- 2.1.2 The Applicant has now requested that the application is amended to allow provision for narrower lanes to be extended by up to 750m south of junction 67 (Coal House) and over the Kingsway Viaduct. The figure 2-1 below illustrates the proposed narrow lane provision.

Figure 2-1 Proposed Lane Narrowing



- 2.1.3 The Applicant has undertaken a traffic impact assessment of including the narrower lanes option at junction 67 (Coal House) and over Kingsway Viaduct and the findings are set out within this TAA.
- 2.1.4 **Table 2.1** below presents the cross-sectional widths of the carriageway proposed as part of the current application as described in the TAR [APP-173] and proposed amendment to the lane widths to allow implementation of narrower lanes.
- 2.1.5 Scenario A (Application) represents the lane widths currently proposed in the

application and Scenario B (Proposed Change) sets out the narrower lanes widths proposed in the request to amend the Application.

Table 2.1 - Cross-sectional widths of proposed Carriageway in different scenarios

| Design Scenario | Southbound Carriageway | | | | | | C/R (Central Reserve) | Northbound Carriageway | | | | Widening require to Kingsway Viaduct |
|-----------------|------------------------|-------|--------|--------|--------|--------|-----------------------|------------------------|--------|-------|------|--------------------------------------|
| | Description | Verge | Lane 1 | Lane 2 | Lane 3 | Lane 3 | | Lane 2 | Lane 1 | Verge | | |
| A | Current Application | 2.5m | 3.65m | 3.7m | 3.65m | 1.8m | 3.65m | 3.7m | 3.65m | 2.5m | 7m | |
| B | Proposed Change | 0.6m | 3.65m | 3.5m | 3.2m | 1.8m | 3.2m | 3.5m | 3.65m | 0.6m | 2.1m | |

- 2.1.6 The narrower lane widths outlined in the **Table 2-1** for Scenario B (Proposed Change) show that there would be no change in lane width for proposed Lane 1. The width of proposed Lane 2 will be amended from 3.7m to 3.5m and width of proposed Lane 3 will be amended from 3.65m to 3.2m.
- 2.1.7 The overall impact of the Scheme (with lane widths as per scenario A) and the resulting traffic flows and journey times has been derived from the Northern Regional Transport Model (NRTM). Full details of the traffic modelling, current performance and future performance of the network are provided in TAR [APP-173].
- 2.1.8 In order to predict the implications of the implementation of narrower lanes on capacity of the A1 as proposed in the requested change to the Application the traffic flows and capacity for the current Application Scenario A have been derived from NRTM.
- 2.1.9 It should be noted that Volume (V) to Capacity (C) ratio (V/C) is an indicator of the likely performance of a link (a length of road between junctions). The volume indicates total traffic demand over a link and capacity is defined as the maximum sustainable flow of traffic passing in one hour. If V/C ratio is "1" or if the traffic volume on a link becomes equal to its link capacity, any increase in demand above this threshold can lead to flow breakdown, queueing and reduced throughput. The capacity of carriageway can be affected by a wide range of factors including changes to carriageway width.
- 2.1.10 Therefore, for comparison purposes V/C ratios for standard width traffic lanes i.e. Scenario A (Current Application) and narrow width traffic lanes i.e. Scenario B (Proposed Change) have been compared to assess any impact of the proposed change.
- 2.1.11 From the traffic modelling undertaken as part of the Scheme, the forecast year link volume, capacity and V/C ratio for Scenario A (Current Application) have been assessed for design year 2038 (15 years following completion the Scheme) and results are displayed in **Table 2-2** below.

Table 2.2 - Forecast Link Volume, Capacity and (V/C) ratio for Scenario A (Current Application)

| Year | Scheme | Junction 67 (Coal House) Northbound | | | Junction 67 (Coal House) Southbound | | |
|------------|--------------------------------|-------------------------------------|---------------------|------|-------------------------------------|---------------------|------|
| | | Link Volume (V) | Capacity (C) Approx | V/C | Link Volume (V) | Capacity (C) Approx | V/C |
| AM | | | | | | | |
| 2038 | Do Something (With the Scheme) | 4143 | 6298 | 0.66 | 4093 | 6298 | 0.65 |
| Inter Peak | | | | | | | |
| 2038 | Do Something (With the Scheme) | 3781 | 6298 | 0.60 | 4064 | 6298 | 0.64 |
| PM | | | | | | | |
| 2038 | Do Something (With the Scheme) | 3563 | 6298 | 0.57 | 3999 | 6298 | 0.63 |

** Link Volume and Capacity is Passenger Car units (PCU)

- 2.1.12 The results in Table 2.2 indicates that for Scenario A (Current Application), the worst V/C in design year 2038 is 0.66 in AM peak at junction 67 (Coal House) Northbound link and 0.65 in AM and Inter Peak peaks at junction 67 (Coal House) Southbound link. The result indicates that both Northbound and Southbound links are forecast to operate approximately 35%-36% below the link's theoretical capacity.
- 2.1.13 To review the impact, upon expected traffic flows, of road narrowing from the standard widths currently proposed, research was performed which directed us to the Traffic Signs Manual Chapter 8 and DMRB volume 5 TA46/97. These two documents were reviewed for the purpose of predicting the impact of road narrowing. Traffic Signs Manual Chapter 8 and DMRB volume 5 TA46/97 provide information on the relationship between lane widths and carriageway capacity.
- 2.1.14 The information within the DMRB volume 5 TA46/97 and Traffic Signs Manual Chapter 8 suggests that reducing lane width below the value of a standard width lane may result in approximately 7% to 10% reduction in capacity.
- 2.1.15 Likewise, in Table 2.2, the forecast year link volume, capacity of link and V/C ratio for Scenario B (Proposed Change) have been assessed for design year 2038 (implementation of the Scheme) and results are displayed in **Table 2-3** below. It

should be noted that as per DMRB volume 5 TA46/97 and Traffic Signs Manual Chapter 8 , the capacity of narrow lanes in Scenario B (Proposed Change) has been adjusted and taken to be 10% less than the link capacity of standard widths (Scenario A – Current Application) displayed in **Table 2-2** above.

Table 2.3 - Forecast Link Volume, Capacity and (V/C) ratio for Scenario B (Proposed Changes)

| Year | Scheme | Junction 67 (Coal House) Northbound | | | Junction 67 (Coal House) Southbound | | |
|------------|--------------------------------|-------------------------------------|---------------------|------|-------------------------------------|---------------------|------|
| | | Link Volume (V) | Capacity (C) Approx | V/C | Link Volume (V) | Capacity (C) Approx | V/C |
| AM | | | | | | | |
| 2038 | Do Something (With the Scheme) | 4143 | 5668 | 0.73 | 4093 | 5668 | 0.72 |
| Inter Peak | | | | | | | |
| 2038 | Do Something (With the Scheme) | 3781 | 5668 | 0.67 | 4064 | 5668 | 0.71 |
| PM | | | | | | | |
| 2038 | Do Something (With the Scheme) | 3563 | 5668 | 0.63 | 3999 | 5668 | 0.70 |

** Link Volume and Capacity in Passenger Car units (PCU)

2.1.16 **Table 2.3** indicates that for Scenario C (Proposed Change), the worst V/C in the design year 2038 is 0.73 in the AM peak at junction 67 (Coal House) Northbound link and 0.72 in the AM peak at junction67 (Coal House) Southbound link. The result indicates higher V/C ratios for Scenario B (Proposed Change) as compared to Scenario A (Current Application). However, the result indicates that both Northbound and Southbound links are still forecast to operate well within their theoretical link capacities.

2.1.17 Therefore, it is concluded that even with the proposed narrower lane widths under Scenario B (Proposed Change), the forecast Scheme flows will remain the same, as sufficient spare capacity will remain on this section of the A1 15 years after the Scheme becomes operational.

3 Conclusion

- 3.1.1 This TAA has been prepared to provide an assessment of the likely transport impacts resulting from the proposals to introduce a short section of narrower lanes between the existing narrower lanes at Junction 67 (Coal House) to south of the Kingsway Viaduct.
- 3.1.2 In order to predict the implications of the implementation of narrower lanes on capacity of the A1, the advice Note DMRB volume 5 TA46/97 and Traffic Sign Manual Chapter 8 have been used. In line with the guidance in DMRB volume 5 TA46/97 and Traffic Signs Manual Chapter 8 the capacity of narrow lanes has been assessed to be 7% to 10% less than the maximum values of standard width traffic lanes (Scenario A Current Application). Therefore, link capacity of narrower lanes in Scenario B (Proposed Change) has been adjusted and taken to be 10% less than the link capacity of standard width traffic lanes.
- 3.1.3 The V/C ratios of standard width traffic lanes and narrower width traffic lanes have been compared as part of the assessment. This has shown that the narrower width lanes still operate approximately 27%-28% below the theoretical link capacities. Therefore, the assessment has concluded there should be no impact on traffic flows forecast as result of the implementation of narrower lanes.