In Parliament – Session 2022 - 2023

HS2

High Speed Rail (Crewe – Manchester)

Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement

Volume 5: Appendix TR-001-00000

Traffic and transport

Transport Assessment Part 1 Addendum

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Transport Assessment Part 1 Addendum

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Department for Transport

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1 Introduction

1.1 Structure of this appendix

1.1.1 This appendix is the SES2 and AP2 ES Transport Assessment (TA) Addendum which forms part of Volume 5 of the Supplementary Environmental Statement 2 (SES2) and Additional Provision 2 Environmental Statement (AP2 ES); referred to hereafter as the SES2 and AP2 ES TA.

1.1.2 This report provides an update to the TA (the main TA)[1] presented in the High Speed Two (HS2) High Speed Rail (Crewe – Manchester) Environmental Statement (ES) published in 2022 (the main ES)[2], and the TA Addendum (the SES1 and AP1 ES TA)[3] set out in the Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement (SES1 and AP1 ES)[4] also published in 2022. These were accompanied by the Background Information and Data (BID) reports - Transport Assessment policy and data[5,6] referred to as the main TA BID report, and the SES1 and AP1 ES TA BID report.

[1] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Transport Assessment Parts 1-4,* Volume 5, Appendices: TR-001 to TR-003 and TR-005. Available online at: https://www.gov.uk/government/collections/hs2-phase2b-crewe-manchester-environmental-statement.

[2] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester)*, Environmental Statement.* Available online at: https://www.gov.uk/government/collections/hs2-phase2b-crewe-manchester-environmental-statement.

[3] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement, Transport Assessment Parts 1-4,* Volume 5, Appendices: TR-001 to TR-003 and TR-005. Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-1-and-additional-provision-1-environmental-statement.

[4] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement*. Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-1-and-additional-provision-1-environmental-statement.

[5] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Background Information and Data, Transport Assessment policy and data*, BID TR-004-00001. Available online at: https://www.gov.uk/government/collections/hs2-phase2b-crewe-manchester-environmental-statement.

[6] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement, Transport Assessment policy and data*, BID TR-004-00001 SES1 and AP1 ES. Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-1-and-additional-provision-1-environmental-statement.

1.1.3 This SES2 and AP2 ES TA is also accompanied by a BID report - Transport Assessment policy and data (see BID TR-004-00001 SES2 and AP2 ES)[7] referred to as the SES2 and AP2 ES TA BID report.

1.1.4 This SES2 and AP2 ES TA is structured into four Parts covering the community areas (CA), and the route-wide and off-route assessments:

- Part 1: (this document) sets out changes to the context, methodology and mitigation;
- Part 2: sets out changes to the baseline and future baseline conditions;
- Part 3: set out the changes to impacts as a result of the SES2 changes and AP2 amendments for each of the community areas either individually or in combination in station areas; and
- Part 4: sets out changes to the route-wide and off-route impacts.

1.1.5 There are five annexes to the SES2 and AP2 ES TA (Annexes C to G) comprising Model Performance Reports, these have been updated to assess the AP2 revised scheme and are attached to SES2 and AP2 ES TA Part 4.

1.1.6 This update should be read in conjunction with the following:

- the main TA Parts 1-4[1];
- the SES1 and AP1 ES TA[3] Parts 1-4[3,8];
- the main TA survey data for the original scheme which is set out in the main TA BID report[5];
- the SES1 and AP1 ES TA survey data for the AP1 revised scheme which is set out in the SES1 and AP1 ES TA BID report[6,8]; and
- the transport assessment policy and survey data for the SES2 and AP2 revised scheme which is set out in the SES2 and AP2 ES TA BID report[7].

1.1.7 The need for a number of corrections to the contents of the main TA and the SES1 and AP1 ES TA have been identified. These are set out in the report: Corrections to Volume 5 of the January 2022 Environmental Statement and the July 2022 Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement, see SES2 and AP2 ES Volume 5, Appendix: CT-009-00000.

1.1.8 In order to differentiate between the original scheme and subsequent changes, the following terms are used:

[7] High Speed Two Ltd (2023), High Speed Rail (Crewe – Manchester), *Background Information and Data accompanying Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement, Transport Assessment policy and data*, BID TR-004-00001 SES2 and AP2 ES. Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-2-and-additional-provision-2-environmental-statement.

[8] Note that there were changes only to MA01- MA05 in the SES1 and AP1 ES TA.

- 'the original scheme' – the Bill scheme submitted to Parliament in 2022, which was assessed in the main ES;
- 'the SES1 scheme' – the original scheme with any changes described in SES1 that are within the existing powers of the Bill;
- 'the AP1 revised scheme' – the original scheme as amended by SES1 changes and AP1 amendments;
- 'the SES2 scheme' – the original scheme with any changes described in SES1 (submitted in July 2022) and the SES2; and
- 'the AP2 revised scheme' – the original scheme as amended by SES1 and SES2 changes (as relevant) and AP2 amendments. For the traffic and transport assessment, this also includes all AP1 amendments as relevant.

1.1.9 This SES2 and AP2 ES TA covers the following community areas (CA), as well as the route-wide and off-route assessment:

- Hough to Walley's Green (MA01);
- Wimboldsley to Lostock Gralam (MA02);
- Pickmere to Agden and Hulseheath (MA03);
- Hulseheath to Manchester Airport (MA06);
- Davenport Green to Ardwick (MA07); and
- Manchester Piccadilly Station (MA08).

1.1.10 Note that because there are no SES2 design changes or AP2 amendments in the Broomedge to Glazebrook (MA04) or Risley to Bamfurlong (MA05) areas, traffic and transport information relating to these community areas is reported with the assessment for the Hulseheath to Manchester Airport area (MA06).

1.1.11 Maps relating to the SES2 and AP2 ES TA are set out in the Volume 5, Traffic and transport Map Book: Map Series TR-08 – Construction Routes to the Strategic Network.

Reporting of changes to traffic and transport impacts

1.1.12 This SES2 and AP2 ES TA sets out the traffic and transport impacts resulting from changes to the original scheme as reported in the main TA or the AP1 revised scheme reported in the SES1 and AP1 ES TA. Unless otherwise stated, the main TA remains unchanged.

1.1.13 If a table or figure in the main TA or the SES1 and AP1 ES TA is completely replaced by a new table or figure in the SES2 and AP2 ES TA, the same table or figure number is used. This is irrespective of the section number in which the SES2 and AP2 ES TA table sits.

1.1.14 However, if additional supplementary information is included in a table in the SES2 and AP2 ES TA, the table number matches the table number in the main TA or SES1 and AP1 ES TA but is suffixed with an 'a'.

1.1.15 If additional supplementary information is included in a table in the SES2 and AP2 ES TA, which is in addition to a supplementary table provided in the SES1 and AP1 ES TA, the table is allocated the next sequential letter, namely 'b', 'c' and so on.

1.1.16 For completely new tables in the SES2 and AP2 ES TA, for which there is no equivalent in the main TA or the SES1 and AP1 ES TA, the SES2 and AP2 ES TA table is allocated the nearest table number in sequence within the main TA or SES1 and AP1 ES TA followed by a '.1' (effectively indicating where the SES2 and AP2 ES TA table would sit in the main TA or SES1 and AP1 ES TA if it was inserted there). If additional new tables are provided before the next main TA or SES1 and AP1 ES TA table, they are allocated the next sequential number, namely '.2', '.3' and so on.

1.2 Background

1.2.1 The background to the original scheme is reported in Section 1.2 of the main TA Part 1, and Section 1.2 of the SES1 and AP1 ES TA Part 1. This section is unchanged.

1.3 The purpose of this report

1.3.1 This SES2 and AP2 ES TA provides updates to the main TA and the SES1 and AP1 ES TA and includes, as necessary:

- changes to methodology;
- changes to national, regional and local policy and guidance;
- changes to future baseline traffic forecasts;
- updates to transport models;
- a change in the future baseline years from 2030, 2038 and 2046 to 2031, 2039 and 2051 respectively;
- a summary of scheme changes relevant to traffic and transport; and
- the assessment of impacts in all community areas, route-wide and off-route, including the impact of changes in adjacent areas together with any other changes and corrections.

1.3.2 Where not specifically stated all paragraph, table and figure references here are references to the main TA Part 1 (Volume 5, Appendix: TR-001-00000 of the main ES) or the SES1 and AP1 ES TA Part 1 (Volume 5, Appendix: TR-001-00000 of the SES1 and AP1 ES).

2 Policy and guidance

2.1 Introduction

2.1.1 Section 2.1 of the main TA sets out how the transport assessment for the main TA was developed in the context of national and local policy priorities and requirements. This section of the main TA is unchanged.

2.1.2 National and local policy priorities and requirements are reported in the main TA BID report (see BID TR-004-00001[5]) and the SES1 and AP1 ES TA BID report (see BID TR-004-00001 SES1 and AP1 ES[6]) which provide an overview of the relevant transport aspects of policy documents and guidance that have been considered in the design of the original scheme and preparation of the main ES and SES1 and AP1 ES and the supporting TA and BID reports.

2.2 National policy

2.2.1 All national policies reported in Section 2.1 of the main TA and Section 2.1 of the SES1 and AP1 ES TA remain valid for the SES2 and AP2 ES TA. This section of the main TA and SES1 and AP1 ES TA is unchanged.

2.3 Regional and local planning and transport policy

2.3.1 This section lists the relevant planning and policy proposals of regional and local planning authorities and other key stakeholders that have been updated since the publication of the main TA and the SES1 and AP1 ES TA. Details of the updates to these documents are provided in BID TR-004-00001 SES2 and AP2 ES[7].

2.3.2 The revisions to these policies are not considered to have a material impact on the approach to or conclusions of this TA. Those regional and local policy documents that have been updated since the main TA and the SES1 and AP1 ES TA are as follows (see BID TR-004-00001 SES2 and AP2 ES[7] for further details):

- Greater Manchester Combined Authority (2021), Places for Everyone, Joint Development Plan Document;
- Liverpool City Region Combined Authority (2022), Local Transport Plan, Developing a vision for local transport to 2040, 1st Stage Consultation;
- Warrington Borough Council (2021), Warrington Local Plan 2021 to 2038, Updated Proposed Submission Version;
- Manchester City Council (2021), City Centre Transport Strategy to 2040; and
- Carlisle City Council (2021), Carlisle Plan 2021-2023.

3 Methodology

3.1 Introduction

3.1.1 The background to the methodology adopted to undertake the transport assessment for the main TA, together with how strategic and local models were used is set out in Section 3.1 of the main TA. This section of the main TA was unchanged for the SES1 and AP1 ES TA with the exception of the updating of the 2046 future baseline in the main TA from 2046 to 2051.

3.2 Areas of consideration and key impacts

3.2.1 Areas of consideration and key impacts are reported in Section 3.2 of the main TA. This section of the main TA is unchanged.

3.3 Assessment years

3.3.1 In the main TA, future baseline traffic volumes were calculated for 2030, 2038 and 2046. For the assessment of the AP1 revised scheme, future baseline traffic volumes were calculated for 2030 and 2038; however, the 2046 future baseline in the main TA was updated to 2051 for the AP1 revised scheme in order to give greater resilience to long term growth in travel demand. Consequently, the operational assessment of the AP1 revised scheme was undertaken for 2038 and 2051.

3.3.2 For the assessment of the AP2 revised scheme, the assessment years have been updated from 2030 to 2031 for construction and from 2038 to 2039 for the first operation assessment year to reflect the revised programme presented in Section 6 of the Volume 2 Community Area reports of the SES2 and AP2 ES; 2051 is retained as the final assessment year.

Baseline

3.3.3 The baseline assessment year is reported in Section 3.3 of the main TA. This section of the main TA and SES1 and AP1 ES TA is unchanged with the exception of changes to the forecast years.

Future baseline

3.3.4 Future baseline scenarios for 2031, 2039 and 2051 were determined either from local authority models or using growth factors for population and development forecasts based on recognised good practice sources that are generally used for this purpose by planning and transport authorities. The approach set out in the main TA is unchanged although the transport models and committed and planned developments and committed transport schemes have been updated for this SES2 and AP2 ES TA.

3.3.5 The extent and nature of changes to travel behaviour following the changes seen during COVID-19 are not yet clear and consequently are not reflected in the assessment. However, the impacts of COVID-19 on economic growth are reflected in the HS2 travel forecasts. The February 2023 release of the Department for Transport's (DfT) national travel forecasts (NTEM8)[9] indicate that local travel forecasts used in the assessment generally reflect the impact of COVID-19 on economic growth, although longer term traffic forecasts for the Greater Manchester area show a reduction compared to those assessed. The impact of COVID-19 on travel behaviour is not yet known, although it is considered likely to result in lower travel demand in the medium term than the forecasts used in the assessment. Consequently, the assessment is considered to overstate travel demand for both construction and operation scenarios and therefore to present a robust case for traffic and transport.

Construction

3.3.6 The construction assessment year is reported in Section 3.3 of the main TA. This section of the main TA and SES1 and AP1 ES TA is unchanged with the exception of a change in construction year from 2030 to 2031.

Operation

3.3.7 The operational assessment years are 2039 and 2051. Both operational assessments consider the expected changes to travel patterns at and near to Phase 2b stations and the consequential impacts on public transport and traffic together with the impacts of changes to the transport network across the route of the SES2 scheme and AP2 revised scheme. The changes resulting from the SES2 scheme and AP2 revised scheme have been overlaid on the future baseline flows.

3.3.8 With the exception of the updates to the forecast years, the approach set out in the main TA and SES1 and AP1 ES TA is unchanged.

3.4 Data collection

3.4.1 Since the production of main TA, additional traffic information has been used in the development of updated baseline and future baseline models for the SES2 scheme and AP2 revised scheme. This includes traffic data from National Highways and Transport for Greater Manchester (TfGM) and Trafficmaster journey time data from the DfT.

[9] Department for Transport (2022), *National Trip End Model (NTEM), Version 8, August 2022*. Available online at: https://www.data.gov.uk/dataset/11bc7aaf-ddf6-4133-a91d-84e6f20a663e/national-trip-end-model-ntem.

3.5 Background traffic growth

3.5.1 Background traffic growth for the 2031, 2039 and 2051 future baselines has been derived from either TEMPro version 7.2, which uses the National Trip End Model (NTEM 7.2) dataset and the National Transport Model (NTM) 2015, or, where robust network traffic models exist and the impacts of HS2 are expected to require network modelling, from transport models[10].

3.6 Trip generation and distribution

Construction

3.6.1 The methodology used to assess construction related trips include worker trips to and from construction compounds, together with construction vehicles transporting excavated and construction materials was reported in Section 3.6 of the main TA and was unchanged for the SES1 and AP1 ES TA. This section of the main TA is unchanged.

Operation

3.6.2 The methodology used to assess operation was reported in Section 3.6 of the main TA and was unchanged for the SES1 and AP1 ES TA. This section of the main TA is unchanged.

3.7 Construction assessment assumptions

Construction vehicles

3.7.1 Assumptions relating to construction vehicles were reported in Section 3.7 of the main TA and was unchanged for the SES1 and AP1 ES TA. This section of the main TA is unchanged.

Construction workforce

3.7.2 The assessment of construction workforce was reported in Section 3.7 of the main TA and was updated in Section 3.7 of the SES1 and AP1 ES TA. This section is unchanged from the SES1 and AP1 ES TA.

[10] These models comprise the Greater Manchester highway Model; the Winsford and Middlewich Model the A500 Crewe Model; the Northwich Traffic Model Highways England's M6 J19 Model; and the Warrington Western Link Road Model.

Excavated materials

3.7.3 The methodology used to assess excavated material was reported in Section 3.7 of the main TA and was unchanged for the SES1 and AP1 ES TA. This section of the main TA is unchanged.

Borrow pits

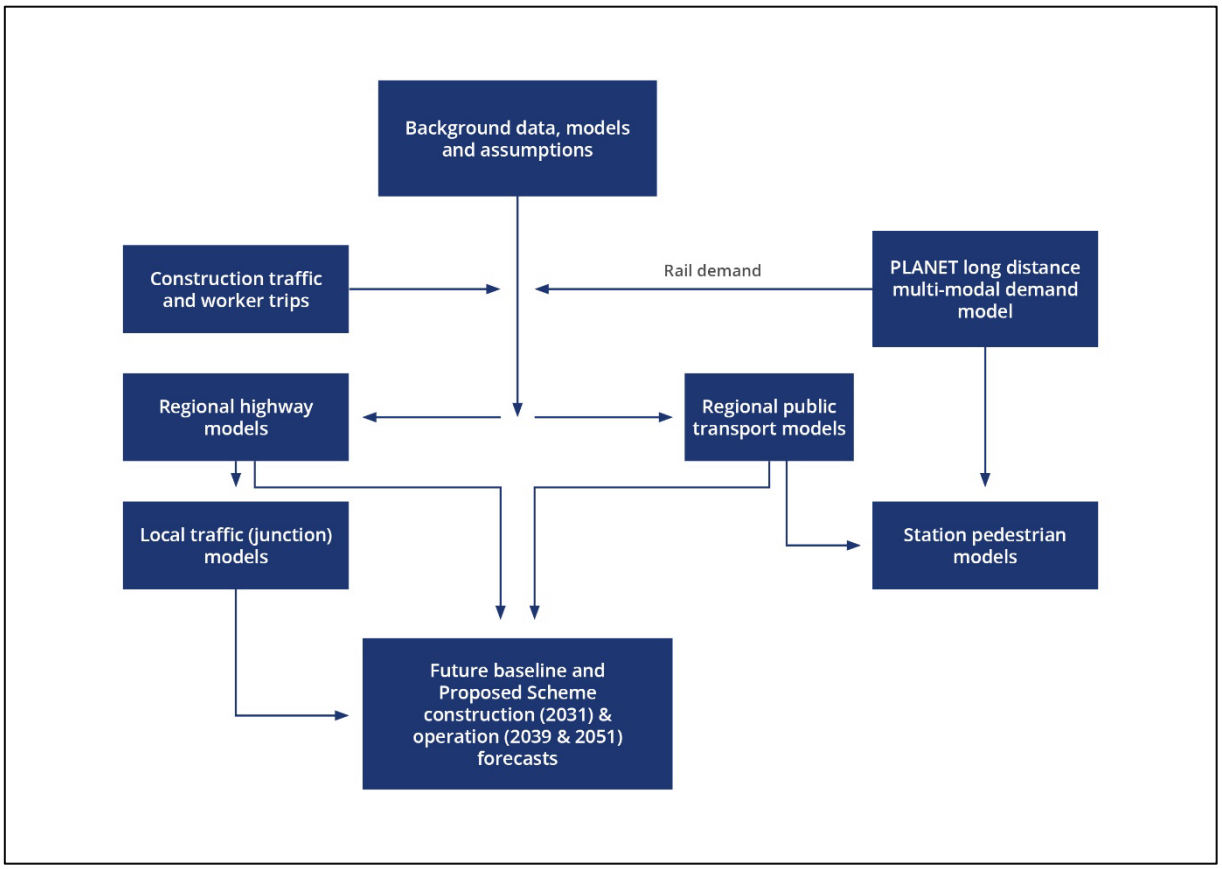
3.7.4 The methodology used to assess borrow pits was reported in Section 3.7 of the main TA and was updated in Section 3.6 of the SES1 and AP1 ES TA. This section is unchanged from the SES1 and AP1 ES TA.

3.8 Modelling approach

Modelling framework

3.8.1 The modelling framework for the SES2 scheme and AP2 revised scheme is shown in Figure 3-1. The key forecasting elements have not changed from the main TA or SES1 and AP1 ES TA with the exception of updates to regional highway and public transport modelling tools and updates from a 2030 construction baseline to 2031 and from 2038 and 2046 operational baselines to 2039 and 2051 respectively.

Figure 3-1: Modelling framework for the AP2 revised scheme



PLANET

3.8.2 The background to the Planet Framework Model (PFM) is set out in Section 3.8 of the main TA. For the SES2 and AP2 ES TA, PFM has been updated from PFM9.6 to PFM10A. Changes from PFM9.6 to PMF10A reflect the re-estimation of the long-distance demand model using more recent survey data from the National Travel Survey (NTS) and updated values of travel time savings from the DfT 2015 study[11].

Strategic transport models

3.8.3 The strategic transport models used to assess the impacts of the SES2 scheme and AP2 revised scheme are:

- Greater Manchester SATURN Model (GMSM);
- M6 Junction 19 Model;
- Winsford and Middlewich Model;
- A500 Crewe Model; and
- Northwich Traffic Model.

3.8.4 For the assessment of the AP1 revised scheme, the performance of these models with the exception of the GMSM, were reported in Annexes D to G in the SES1 and AP1 ES TA Part 4.

3.8.5 These models have been updated for the AP2 revised scheme and are reported in a series of model performance reports in Annexes C to G of this SES2 and AP2 ES TA Part 4. The model updates for the SES2 and AP2 ES TA reflect:

- the refinement of network coding and generalised cost parameters to improve validation;
- updates to count dataset for matrix estimation;
- inclusion of recently committed transport schemes and development proposals;
- a review of the accessibility to compound by public transport and the availability of walking and cycling connections;
- refinements to the approach to developing future year baseline demand matrices; and
- updates to the future baseline demand from 2030 to 2031 and from 2038 to 2039. In addition, the GMSM has been updated from 2046 to 2051.

[11] Department for Transport (2015), *Values of travel time savings and reliability: final reports.* Available online at: https://www.gov.uk/government/publications/values-of-travel-time-savings-and-reliability-final-reports.

Overview of strategic models

Greater Manchester suite of models (MA06, MA07 and MA08)

General approach

3.8.6 The general approach to the use of regional multi-modal modelling for the Greater Manchester area is set out in Section 3.8 of the main TA. This section of the main TA is unchanged.

Greater Manchester Model

3.8.7 The Greater Manchester Transport Model comprises a demand model (GMVDM), a highway assignment model (GMSM) and a public transport model (GMPTM). For the SES2 and AP2 ES TA, only the highway assignment model has been updated.

3.8.8 The Greater Manchester highway assignment model has been updated for the SES2 and AP2 revised scheme by including network refinements, the inclusion of additional count data and journey time validation against the DfT Trafficmaster journey time data. Model performance is reported separately below for the Manchester Piccadilly area, the Manchester Airport area and the wider Greater Manchester area, in line with the reporting in the main TA, see main ES, Volume 5, Appendix: TR-001-00000.

Manchester Piccadilly area

3.8.9 The SES2 and AP2 ES TA model shows a good correlation between observed and modelled traffic flows with comparisons undertaken for link flows, a Piccadilly area cordon and a comparison of supplementary counts.

3.8.10 Both the AM and PM peak hour time periods exceed the DfT TAG guideline of greater than 85% of link flow comparisons achieving a flow range or GEH[12] less than five, with values of 97% and 90% for all vehicles in the AM and PM peak hours respectively.

3.8.11 In addition, traffic flow validation has been undertaken inbound and outbound over a Piccadilly area cordon with both directions meeting the DfT TAG guidelines. Finally, the comparison of supplementary counts achieved values of 85% and 80% for all vehicles in the AM and PM peak hours respectively.

Manchester Airport area

3.8.12 The SES2 and AP2 ES TA model shows a good correlation between observed and modelled traffic flows with comparisons undertaken for link flows, a series of Manchester Airport area screenlines and a comparison of supplementary counts.

[12] The GEH Statistic is a formula used in traffic engineering, traffic forecasting, and traffic modelling to compare two sets of traffic volumes.

3.8.13 The AM and PM peak hour time periods exceed the DfT TAG guidelines of greater than 85% of link flow comparisons achieving a flow range or GEH less than five, with values of 96% and 91% for all vehicles in the AM and PM peak hours respectively.

3.8.14 In addition, traffic flow validation for the Manchester Airport area screenlines are close to or meet the DfT TAG guidelines. Finally, the comparison of supplementary counts achieved values of 91% and 86% for all vehicles in the AM and PM peak hours respectively, exceeding the DfT TAG guidelines.

Wider Greater Manchester area

3.8.15 The SES2 and AP2 ES TA model shows a good correlation between observed and modelled traffic flows with comparisons undertaken for link flows, a series of wider Greater Manchester area screenlines and a comparison of supplementary counts.

3.8.16 The AM and PM peak hour time periods exceed the DfT TAG guidelines of greater than 85% of link flow comparisons achieving a flow range or GEH less than five, with values of 94% and 93% for all vehicles in the AM and PM peak hours respectively.

3.8.17 In addition, traffic flow validation for the wider Greater Manchester area screenlines meet the DfT TAG guidelines. Finally, the comparison of supplementary counts achieved values of 90% for both the AM and PM peak hours, exceeding the DfT TAG guidelines.

Journey time validation – all areas

3.8.18 The journey time validation for the SES2 and AP2 ES TA model has been undertaken for the Manchester Piccadilly and Manchester Airport areas, together with a number of radial routes. The validation shows that 77% of journey time routes in the AM model and 50% of journey time routes in the PM model meet the DfT TAG individual route guidelines of model journey times being within 15% of the observed times (or one minute, if higher than 15%). Whilst this falls outside the TAG guidelines of 85% of model route times being within 15% of the observed times, this is considered to be due to the limiting nature of the strategic model in its ability to replicate both flow and speed for a highly congested urban area such as Manchester. There is a balance between achieving both model flow and journey time performance, and despite some routes not having met the TAG journey time criteria, it is important to note that the link flow results presented above show a good standard has been achieved.

Conclusion

3.8.19 Based on the model performance, it is considered that the updated model provides an appropriate basis for forecasting to support the assessment of the impacts of the AP2 revised scheme within the local study area.

3.8.20 Future year baseline models have been developed to represent forecast traffic conditions for the assessment years of 2031, 2039 and 2051.

3.8.21 The future year models have been reviewed to check that committed (near certain or more than likely) developments and highway schemes are appropriately represented.

A500 Crewe Model (MA01)

3.8.22 The A500 Crewe Model has been updated for the AP2 revised scheme by including further network refinements and validation against the DfT Trafficmaster journey time data. The SES2 and AP2 model shows a good correlation between observed and modelled traffic flows. Both the AM and PM peak hour time periods exceed the DfT TAG guidelines of greater than 85% of link flow comparisons achieving a flow range or GEH less than five, with values of 96% and 99% for all vehicles in the AM and PM peak hours respectively.

3.8.23 The journey time validation for the SES2 and AP2 ES TA model shows that 81% of journey time routes in the AM model and 75% of journey time routes in the PM model meet the DfT TAG individual route criteria of model journey times being within 15% of the observed times (or one minute, if higher than 15%). Whilst this falls outside the TAG guidelines of 85% of model route times being within 15% of the observed times, this is considered to be due to the limiting nature of the strategic model in its ability to replicate both flow and speed in highly congested urban areas. There is a balance between achieving both model flow and journey time performance, and despite some routes not having met the TAG journey time criteria, it is important to note that the link flow results presented above show a good standard has been achieved.

3.8.24 Based on the model performance, it is considered that the updated model provides an appropriate basis for forecasting to support the assessment of the impacts of the AP2 revised scheme within the local study area.

3.8.25 Future year baseline models have been developed to represent forecast traffic conditions for the assessment years of 2031, 2039 and 2051.

3.8.26 The future year models have been reviewed to check that committed (near certain or more than likely) developments and highway schemes are appropriately represented.

Winsford and Middlewich Model (MA02)

3.8.27 The Winsford and Middlewich Model has been updated for the AP2 revised scheme by including further network refinements and validation against the DfT Trafficmaster journey time data. The SES2 and AP2 ES TA model shows a good correlation between observed and modelled traffic flows. Both the AM and PM peak hour time periods exceed the DfT TAG guidelines of greater than 85% of link flow comparisons achieving a flow range or GEH less than five, with values of 89% and 93% for all vehicles in the AM and PM peak hours respectively.

3.8.28 The journey time validation for the SES2 and AP2 ES TA model shows that 58% of journey time routes in the AM model and 67% of journey time routes in the PM model meet the DfT TAG individual route criteria of model journey times being within 15% of the observed times (or one minute, if higher than 15%). Whilst this falls outside the TAG guidelines of 85% of

model route times being within 15% of the observed times, this is considered to be due to the limiting nature of the strategic model in its ability to replicate both flow and speed in highly congested urban areas. There is a balance between achieving both model flow and journey time performance, and despite some routes not having met the TAG journey time criteria, it is important to note that the link flow results presented above show a good standard has been achieved.

3.8.29 Based on the model performance, it is considered that the updated model provides an appropriate basis for forecasting to support the assessment of the impacts of the AP2 revised scheme within the local study area.

3.8.30 Future year baseline models have been developed to represent forecast traffic conditions for the assessment years of 2031, 2039 and 2051.

3.8.31 The future year highway networks have been updated to take account of the base year network coding updates. The future year models have been reviewed to check that committed (near certain or more than likely) developments and highway schemes are appropriately represented.

Northwich Traffic Model (MA03)

3.8.32 The Northwich Traffic Model has been updated for the AP2 revised scheme by including further network refinements and validation against the DfT Trafficmaster journey time data. The SES2 and AP2 ES TA model shows a good correlation between observed and modelled traffic flows. Both the AM and PM peak hour time periods exceed the DfT TAG guidelines of greater than 85% of link flow comparisons achieving a flow range or GEH less than five, with values of 92% and 95% for all vehicles in the AM and PM peak hour time periods respectively.

3.8.33 The journey time validation for the SES2 and AP2 ES TA model shows that 90% of journey time routes in the AM model and 100% of journey time routes in the PM model meet the DfT TAG individual route criteria of model journey times being within 15% of the observed times (or one minute, if higher than 15%). This exceeds the TAG guidelines of 85% of model route times being within 15% of the observed times.

3.8.34 Based on the model performance, it is considered that the updated model provides an appropriate basis for forecasting to support the assessment of the impacts of the AP2 revised scheme within the local study area.

3.8.35 The future year highway networks have been updated to take account of base year network coding updates. The future year models have been reviewed to check that committed (near certain or more than likely) developments and highway schemes are appropriately represented.

M6 Junction 19 Highway Model (MA03 and MA06)

3.8.36 The M6 Junction 19 Highway Model has been updated for the AP2 revised scheme by including further network refinements and validation against the DfT Trafficmaster journey

time data. In addition, the model has been extended from north of M6 J20 up to M6 J21a, with additional counts used to support model performance in this area.

3.8.37 The SES2 and AP2 ES TA model shows a good correlation between observed and modelled traffic flows. Both the AM and PM peak hour time periods exceed the DfT TAG[13] guidelines of greater than 85% of link flow comparisons achieving a flow range or GEH less than five, with values of 87% and 86% for all vehicles in the AM and PM peak hours respectively.

3.8.38 The journey time validation for the SES2 and AP2 ES TA model shows that 89% of journey time routes in the AM model and 94% of journey time routes in the PM model meet the DfT TAG individual route criteria of model journey times being within 15% of the observed times (or one minute, if higher than 15%).

3.8.39 Based on the model performance, it is considered that the updated model provides an appropriate basis for forecasting to support the assessment of the impacts of the AP2 revised scheme within the local study area.

3.8.40 The future year models have been reviewed to check that committed (near certain or more than likely) developments and highway schemes are appropriately represented.

Local junction models

3.8.41 The methodology used for local junction modelling is described in Section 3.8 of the main TA. The approach is that local models are developed for locations which will be substantially impacted by the AP2 revised scheme that are not included within strategic models and where there are proposals for physical changes to a junction or a new junction is proposed. This section of the main TA is unchanged.

[13] Department for Transport (2022), *Transport analysis guidance*. Available online at: https://www.gov.uk/guidance/transport-analysis-guidance-tag.

4 Mitigation measures

4.1.1 The mitigation strategy is set out in Section 4 of the main TA and was unchanged for the SES1 and AP1 ES TA. This section of the main TA is unchanged.

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