

<b>Author Details</b>	
Name	<b>Dr Andrew Boswell</b>
Position	<b>Independent Scientist &amp; Consultant</b>
A47NTE Registration	<b>20028338</b>
Organisation	<b>Climate Emergency Policy and Planning (CEPP)</b>
Examination Principle Issues	<ul style="list-style-type: none"> <li>• <b>Climate Change</b></li> <li>• <b>Scope of Development and Environmental Impact Assessment</b></li> <li>• <b>Others as indicated in text</b></li> </ul>

**DfT Consultation 2: 8<sup>th</sup> July 2022**

I am an independent scientist and environmental consultant, working at the intersection of science, policy, and law, particularly relating to ecology and climate change. I work as a consultancy called Climate Emergency Policy and Planning (CEPP).

**In so far as the facts in this statement are within my knowledge, they are true. In so far as the facts in this statement are not within my direct knowledge, they are true to the best of my knowledge and belief.**

---

**Contents**

Contents .....	2	
1 INTRODUCTION .....	3	
1.1 Response to consultation, 8th July 2022 .....	3	
1.2 Scope .....	3	
1.3 Acronyms .....	3	
1.4 Definitions .....	4	
1.5 Overview of consultation submissions .....	4	
2 UPDATE SINCE FIRST CONSULTATION .....	6	
3 MAJOR ERRORS IN TRAFFIC MODELLING ON A47 SCHEMES .....	8	
3.1 Background: cumulative carbon assessment and requirement for consistent modelling .....	8	
3.2 Calibration and inconsistency errors in traffic modelling .....	9	
3.3 EIA Regulation 14(2) and Schedule 4 (6) .....	11	
4 ASSESSMENT AGAINST LOCAL TRANSPORT PLAN 4 (LTP4) CARBON TARGETS .....	13	
4.1 Context in national policy .....	13	
4.2 The LTP4 IP carbon targets – context within, and alignment with, national policy .....	13	
4.3 The Applicant’s carbon data .....	15	
4.4 Assessment against LTP4 IP at the Norfolk level .....	17	
4.5 Assessment against LTP4 IP scaled to the A47NTE traffic model study area .....	18	
4.6 Comparison over the 2025-2037 LTP4 IP carbon budget .....	20	
4.7 Construction emissions .....	21	
4.8 Emission factors – little impact on assessment .....	22	
4.9 TDP Sensitivity test – unproven and inconsistent with traffic modelling assumptions and the case for the scheme .....	23	
5 CONCLUSIONS .....	25	

## 1 INTRODUCTION

### 1.1 *Response to consultation, 8th July 2022*

1 The Secretary of State (SoS) issued a second consultation letter on 27<sup>th</sup> June 2022. This submission responds to:

- Item 5 as reproduced below:

#### **THE NORFOLK LOCAL TRANSPORT PLAN 4**

The Secretary of State received responses from two Interested Parties, Dr Andrew Boswell and Bryan Robinson, in relation to the Norfolk Local Transport Plan 4 ("the Plan"), which is due to be adopted in July 2022. In the light of those concerns, the Secretary of State invites the Applicant to provide an assessment against the carbon targets contained within the Plan.

### 1.2 *Scope*

2 I refer to these documents from the PINS website for this scheme and other schemes:

<b>Reference in document</b>	
DERBY-EXP-REP-1	My first expert report on the A38 Derby scheme, referenced on the PINS A38 Derby website as " <i>Derby Climate Coalition, Response to the Secretary of State's Consultation of 23 September 2021 - Expert Report of Dr Boswell, published 27/10/2021</i> ".
A47NTE/CEPP_CONS_1	My submission on June 15 <sup>th</sup> 2022 to the SoS's first A47NTE consultation.
A47NTE/REP3-014	Environmental Statement, Chapter 14 – Climate
A47NTE/REP10-005	"9.35 <i>Applicant's Response to the Rule 17 Request in February 2022</i> " submitted on the final day of the examination
A47NTE/ APP-140	"7.1 Case for the Scheme"

### 1.3 *Acronyms*

AST	Appraisal Summary Table
EFT	Emissions Factor Toolkit
NDC	Nationally Determined Contribution
NPSNN	National Policy Statement for National Networks
NZS	Net Zero Strategy

TDP	Transport Decarbonisation Plan
LTP4 (Strategy)	The Local Transport Plan 4 adopted in part in November 2021 by Norfolk County Council (NCC)
LTP4 IP	The Local Transport Plan IP proposed to be adopted by NCC on July 19 <sup>th</sup> 2022, and containing local transport carbon reduction targets
NWL	Norwich Western Link
LSB	Long Stratton Bypass
A47BNB	A47 Blofield to North Burlingham
A47NTE	This scheme. “A47 North Tuddenham to Easton”
A47THI	A47 - A11 Thickthorn Junction

#### 1.4 Definitions

3 For scientific precision, I use the following additional definitions:

- **Absolute emissions** – carbon emissions which are expressed in terms of **an absolute quantity** of emissions. The value of the absolute emissions, as released into the atmosphere, quantifies the real measure of the impact of greenhouse gases as an environmental factor (or receptor).
- **Differential emissions** – carbon emissions, with an associated value which has been **derived by differentiation of absolute emissions**. The differentiation is usually performed by the difference between two traffic scenarios, one with a transport intervention and one without. Differential values derived this way do not quantify the real impact of atmospheric greenhouse gases by the transport intervention within its transport system, and therefore do not represent the real global heating impact.

#### 1.5 Overview of consultation submissions

- 4 Section 2 provides an update on the 29<sup>th</sup> June 2022, the Climate Change Committee (CCC) “Progress in reducing Emissions - 2022 Report to Parliament” (referred to as CCC\_2022\_PROG), and its conclusions that Government policies (eg in the TDP and NZS) to reduce traffic and set measurable targets for it do not exist, and that a new approach to road scheme appraisal is urgently needed. Further the CCC Progress Report has indeed shown that the success of the NZS and the TDP are by no means secured, and that no weight can be given to the proposition that they are. These are important background considerations to the assessment of the A47NTE scheme against the LTP4 IP as requested by the SoS.
- 5 Section 3 reports on major errors in traffic modelling on the A47 schemes. First, it is reiterated that the Environmental Statement for each scheme was inadequate under Reg 20

of the 2017 Regulations, particularly in relation to cumulative assessment of carbon. Cumulative assessment of carbon does not exist in the A47NTE Environmental Statement. However, cumulative assessment should be simple to do, but only if the traffic models are consistent and coherent. However, they are not consistent or coherent due to error reported in this section. It is now crucial that the applicant is asked to explain these differences between its traffic models on the three schemes, and that the traffic models are corrected, and the SoST holds a further consultation round to enable this.

A serious calibration problem for the traffic model for A47BNB scheme is noted. The applicant must produce traffic models which are consistent and coherent across the three A47 schemes. There is also a requirement more generally for the traffic model for the Norwich Western Link to be made consistent with those on the A47 schemes.

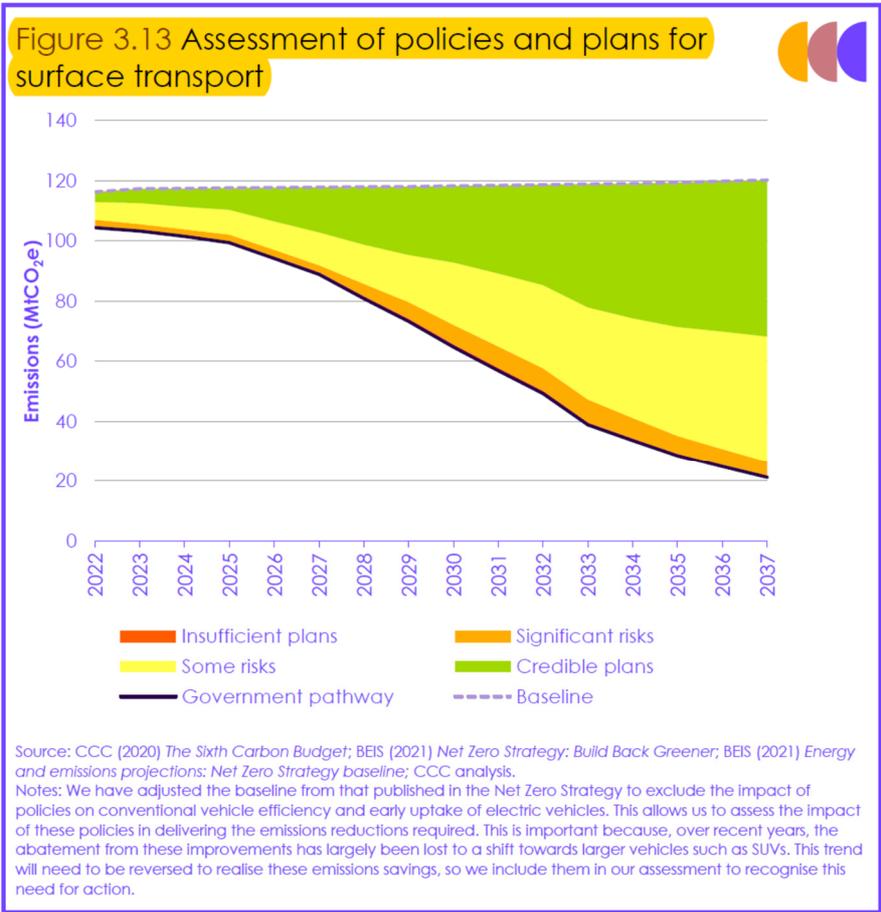
- 6 Section 4 makes the assessment against Local Transport Plan 4 (LTP4) carbon targets. The targets and pathways in the LTP4 IP now provide the crucial frame of reference for assessing the significance of the GHG emissions from the A47NTE, and allows assessment of meeting national carbon targets within the contextualisation of using local carbon budgets and trajectories.
- 7 My conclusions are given in Section 5.

**2 UPDATE SINCE FIRST CONSULTATION**

8 On 29<sup>th</sup> June 2022, the Climate Change Committee (CCC) submitted its “Progress in reducing Emissions - 2022 Report to Parliament” (referred to as CCC \_2022\_PROG<sup>1</sup>).

9 The report finds that overall “credible plans” exist for only 39% of the required emissions reduction to meet the Sixth Carbon Budget (CCC \_2022\_PROG/page 22). This means that 61% of the required emissions reductions for the 6<sup>th</sup> carbon budget are not even secured “on paper” yet.

10 CCC \_2022\_PROG/Figure 3.13 reproduced below shows the relevant data for “credible plans” and other categories for the surface transport sector.



11 The spreadsheet “Progress in reducing emissions – 2022 Report to Parliament – Charts and data” (referred to as CCC \_2022\_DATA<sup>2</sup>) provides the breakdown of the data behind

<sup>1</sup> Climate Change Committee, “2022 Progress Report to Parliament - The CCC’s annual assessment of UK progress in reducing emissions”, [redacted]

<sup>2</sup> Climate Change Committee, “Progress in reducing emissions – 2022 Report to Parliament – Charts and data”, [redacted]

Figure 3.13 above from the report. Delivery of the “Government pathway” requires a reduction of 99.03 MtCO<sub>2</sub>e against the “Baseline” of 120.23 MtCO<sub>2</sub>e by 2037. CCC identify credible plans for 51.97 MtCO<sub>2</sub>e of this (ie **only 52.5%** of the total). So in the surface transport sector about half of the required emissions reductions for the 6<sup>th</sup> carbon budget are not even **secured** “on paper” yet, revealing the true extent of the “delivery gap” in transport decarbonisation policy from the Government’s own advisors on climate change delivery.

- 12 In identifying barriers to closing the delivery gap, the report is clear in identifying that **there is currently no vision from the Government for traffic reduction**, as it states at page 130 “*However, the Government has not yet set out a clear vision of the extent of traffic reduction that is desirable, nor a coherent set of policies to deliver this.*”
- 13 On page 139, the report identifies that “*the Scottish Government has committed to reducing overall car mileage by 20% by 2030*” and that “*the Welsh Government has also recently committed to reducing the car miles driven per person by 10% by 2030*”. By contrast in England, £24 billion is still allocated for Roads Investment Scheme 2 (RIS2) and “*this still provides considerable funding for new roads **which will induce increased demand***”.
- 14 In the section “Recommendations to the DfT” (CCC \_2022\_PROG/page 571), these recommendations are included:

*“Set out, through Active Travel England, guidance for **what actions local authorities should take to realise the Transport Decarbonisation Plan's commitment to half of all journeys in towns and cities being walked or cycled by 2030. This should be accompanied by the required funding.**”*

*“Set out measurable targets for the contribution that reducing car travel will play in delivering transport's Net Zero pathway.”*

*“Reform the Transport Appraisal Guidance to ensure that it enables practitioners to make decisions that are consistent with the Net Zero pathway. **DfT should consider whether a "vision and validate" approach to the future transport system might be more appropriate than a "predict and provide" one in this context.**”*
- 15 These are just some of the recommendations which require solid and quantified plans to start to address the identified delivery gap in the surface transport policies in the NZS and the TDP. **The recommendations from the Government’s advisors also make clear that policies to reduce traffic and set measurable targets for it do not exist, and that a new approach to road scheme appraisal is urgently needed.**
- 16 The CCC 2022 Progress Report is relevant here for several reasons, and my response below on Item 5 of the SoS’ letter of June 27<sup>th</sup> 2022. **First**, because the applicant National Highways has, on other schemes, attempted to rely upon the **inevitable success** of the NZS (and TDP) policies. It has on the A47NTE scheme too. I have previously said

that it is premature for weight to be given to any claims based on the notion that the NZS, or the TDP, will inevitably succeed in securing the Government's carbon emissions reduction targets (see: A47NTE/CEPP\_CONS\_1/section 3.1 and Appendix A) – this applies to both Environmental Statements, and to DCO decisions, where claims are made that emissions will inevitable fall, and that national policy will somehow absorb the additional emissions associated with the road scheme. Such a proposition is clearly not true or evidenced. Following the CCC Progress Report that SoST cannot make the assumption of this proposition with any credibility. **The Secretary of State is required to reach a reasoned conclusion on the significant effects of the proposed development on the environment under Regulation 21 of the 2017 Regulations (the EIA Regulations): he must do so in full consideration of extent to which national policies on climate change, include those of his own department, have been secured or not (as above, the delivery of half the carbon emission reductions of his own policies under the TDP remain unsecured and in doubt).**

- 17 In fact, the evidence from the CCC Progress Report is much more progress is required in securing the NZS trajectories for the Sixth carbon budget and net-zero. **The CCC Progress Report has indeed shown that the success of the NZS and the TDP are by no means secured, and that no weight can be given to the proposition that they are.**
- 18 **Secondly**, the A47NTE traffic model study area contains the urban area of Norwich. So effective decarbonisation of the study area required evidenced policy for reducing traffic and generating modal shift in the urban area. These policies are exactly those highlighted by CCC above in its recommendation as not being developed yet.
- 19 Further the case for the A47NTE is based on expanding capacity to meet unconstrained traffic growth – the exact opposite of the SoS's own TDP policies. It would therefore be irrational, for the SoST to consider that a scheme predicated on promoting traffic growth can be consistent with his departments policies in the TDP for an overall approach that requires a reduction in traffic growth.

### 3 MAJOR ERRORS IN TRAFFIC MODELLING ON A47 SCHEMES

#### 3.1 *Background: cumulative carbon assessment and requirement for consistent modelling*

- 20 There are 5 major roads schemes planned in the Greater Norwich area for delivery around 2025. These are the Long Stratton bypass, the Norwich Western Link (NWL), and the 3 A47 schemes: A47BNB, A47NTE and A47THI.
- 21 From my relevant representations onwards [eg A47NTE/RR-018], I called for cumulative assessment across three A47 schemes and the NWL (and, for these purposes, put the Long Stratton bypass to one side for the moment). On October 24<sup>th</sup> 2021, I wrote to each planning examiner requesting that they take this issue seriously [eg A47NTE/AS-016] and requesting for cumulative carbon emissions to be considered together for the A47BNB, A47NTE and A47THI examinations. **This was a genuine and best effort to alert the examiners that the Environmental Statement for each scheme was inadequate under**

**Reg 20 of the 2017 Regulations by highlighting missing information, particularly in relation to cumulative assessment of carbon.**

- 22 The traffic models for the three A47 schemes are all based on the same NATS 2015 model (eg A47NTE/APP-140/4.4.8), and each include the three A47 schemes and the NWL in their DS case, **so cumulative assessment should be simple to do.** At each stage, National Highways claimed, falsely, that they were doing cumulative assessment (when in fact they had created a cumulative traffic model, but extracted solus only data from it, which led to only a solus assessment).
- 23 **However, cumulative assessment is only simple to do if the traffic models are consistent and coherent.** If they are inconsistent, then they need to be made consistent before quantifications of carbon emissions for cumulative assessment can be modelled and calculated. I laid this out at a simple level in my letter of October 24<sup>th</sup> 2021. I laid it out in more detail in representations to the examination; for example, my submissions of September 1<sup>st</sup> 2021 [REP3-023] and December 13<sup>th</sup> 2021 [corrected version, REP8-024].
- 24 A number of interested parties, including myself, have concerns that our representations have not been properly engaged with during the A47NTE examination. **I therefore suggest that for the A47NTE, that prior to any decision, all representations from all interested parties are carefully considered by the Secretary of State.** This of course includes the ones mentioned above.

**3.2 Calibration and inconsistency errors in traffic modelling**

- 25 I should be noted, first, that I have very clearly stated numerous times that the Applicant has not carried out any quantification or assessment of cumulative carbon emissions. I am **not** saying that there has been an “inadequate” cumulative assessment of carbon emissions from the A47NTE, **I am saying that there has been no cumulative assessment.**
- 26 Whilst the principle of doing a cumulative assessment across the four schemes remains true as one way to comply with the 2017 Regulations, there is a serious error in the traffic models, which as above precludes it being done coherently until the errors are corrected.

Key data to show this is presented in Table 1 below: the key data is taken from the Environmental Statement Chapter 14 for each scheme (ie A47BNB/REP2-002; A47NTE/REP3-014; and A47THI/REP3-006).

	<b><u>Operation emissions ONLY tCO2e</u></b>	<b>A47BNB</b>	<b>A47NTE</b>	<b>A47THI</b>
<b>A</b>	Baseline (2015)	1,072,458	1,095,563	1,092,213
<b>B</b>	Opening Year (2025) – DM	1,065,487	954,647	961,430
<b>C</b>	Design Year (2040) - DM	978,328	875,102	881,015
<b>D</b>	Whole Appraisal Period (60 years cumulative) - DM	59,396,960	53,142,467	53,504,200 <sup>3</sup>
<b>E</b>	<b>Whole Appraisal Period (60 years cumulative) - DS</b>	<b>59,530,297</b>	<b>53,651,530</b>	<b>53,642,005</b>
<b>F</b>	Norfolk LTP4 IP 2025	1,591,304	1,591,304	1,591,304
<b>G=B/F</b>	DM 2025 %Norfolk LTP4 IP 2025	66.96%	59.99%	60.42%
<b>H=B/A</b>	DM 2025 / Baseline (2015)	99.35%	87.14%	88.03%

**Table 1**

- 27 The traffic model is run over the same 60-year period, 2025-2084, in the same model NATS 2015, and over the same study area (eg: A47NTE/APP-140/Figure 4.1 “The extent of the 2015 NATS model”). If the traffic model was configured identically, then it would be reasonable to expect that the DS figures, **row E**, would be identical.
- 28 The differences between A47NTE and A47THI are relatively small but still suggest some difference in configuration. However, the difference between those two schemes and the A47BNB is large. In Table 1, I have compared the DM 2025 Opening year emissions for each scheme model against the Norfolk LTP4 IP carbon target for that year (the source of the data will be explained in the next section). While the A47NTE and A47THI models, at DM<sup>4</sup>, each use approximately 60% of the Norfolk budget for that year, the A47BNB model uses approximately 67% of the Norfolk budget (**row G**) indicating the scale of the inconsistency.
- 29 The difference for the A47BNB DM 2025 appears to be that its emissions have reduced by less than 1% from the 2015 baseline, whereas A47NTE and A47THI each decrease by around 12% between 2015 and 2025 (**row H**). There would appear to be a serious calibration issue with the A47BNB model.
- 30 The Applicant must produce traffic models which are consistent and coherent across the three A47 schemes. There is also a requirement more generally for the traffic model for the Norwich Western Link to be made consistent with those on the A47 schemes.
- 31 In the next main section, I go on to make an assessment of the A47NTE scheme model against the LTP4 IP targets, as the DfT SoST requests at Item 5 of his letter. The error reported above casts doubt on the modelling carried out by National Highways. If the

<sup>3</sup> Table 14-6 in A47THI/REP3-006 gives this as 53,504,200tCO2e whilst Table 14-10 as 53,504,201tCO2e, a presumed difference in rounding

<sup>4</sup> The DM 2025 figure would not be expected to be identical as each scheme is not included. I would expect the DS 2025 figures to be identical for the same reason as the 60-year DS figures should be identical. However, the DS2025 need calculating which I have done for the A47NTE in the next section.

applicant can't get data over the same study area in the same model to reconcile, what trust can be put in any of its data? It can be seen from row G in Table 1 that the 60-year DS models are considerably out of kilter, where they should produce identical results. This is significant at the LTP4 IP comparison level being around a 7% difference in the use of the Norfolk ITP4 IP carbon budget.

### **3.3 EIA Regulation 14(2) and Schedule 4 (6)**

- 32 **Further, it is now crucial that the applicant is asked to explain these differences between its traffic models on the three schemes, and that the traffic models are corrected, and the SoST holds a further consultation round to enable this.** The schemes, and their environmental issues, cannot be addressed in isolation as the applicant is attempting **in defiance** of the EIA regulations.
- 33 I am deeply concerned about the lack of transparency regarding the information and data about the traffic models on which the operational carbon emissions assessment is based. Very limited data is provided in the applicant's Chapter 14's. I have had to reverse calculate some of the data in the next section in order just to determine simple information like the 60-year DS trajectory for the A47NTE. This is basic information which should have been provided to all parties in the first draft of the Environmental Statement.
- 34 **This lack of transparency has undermined the examination process on each of the A47 schemes.** That process should ensure that the SoST is satisfied that the material provided by the applicant is sufficient for him to reach a reasoned conclusion on the significant effects of the proposed development on the environment. Carbon emissions are a significant issue in recent DCO decisions, and the applicant has not made, nor engaged, satisfactorily in clarifying the issues involved. This is evidenced by my submissions, and the defensive and unhelpful responses to them by the applicant.
- 35 This lack of information limits the public's involvement in the EIA process which is important not just to ensure compliance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 ("EIA Regs"), which seek to ensure a process by which the public is given an opportunity to express their opinion on environmental matters (Lord Hoffmann)<sup>5</sup>, but also the Aarhus Convention in respect of public participation<sup>6</sup>.
- 36 In short, the public can only participate and give a reasonable opinion on environmental matters if sufficient background data and estimates of environmental effects is provided. The applicant in this case has not done this. In order to comply with the EIA Regs, the further information which I highlight is not only reasonably required to facilitate meaningful public engagement in the examination but to ensure that the SoST is able to satisfy his duties under the EIA Regs.

---

<sup>5</sup> (See *Berkeley v SSE* [2001] 2 AC 603 (section 8 of Lord Hoffmann's speech) and *Commission of the European Communities v Federal Republic of Germany* (Case C-431/92) at [35])

<sup>6</sup> in particular Article 6 on public participation in decisions on specific activities, sub-paragraph (6) which requires public access to relevant information about a proposed project, including at least a "description of the significant effects of the proposed activity on the environment"

- 37 The requirements of EIA regulation 14(2) include the information set out in Schedule 4 which states at (6):

**“A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.”**

- 38 The error highlighted above where the traffic models deviate so radically between schemes, are a clear example of an uncertainties which appears not to have even been seen by the applicant, let alone addressed and explained to parties.
- 39 There are numerous other issues raised by me and other interested parties, relating to insufficient explanations and data from “forecasting methods”, and traffic model calibration and details (for example in the submissions from Mr Hawker and Mr Robinson), which indicate that the Environmental Statement does not comply with the above schedule under the EIA Regulations.

**4 ASSESSMENT AGAINST LOCAL TRANSPORT PLAN 4 (LTP4) CARBON TARGETS**

**4.1 Context in national policy**

40 In July 2021, the SoST published the Transport Decarbonisation Plan (TDP) which made the commitment<sup>7</sup> “we will drive decarbonisation and transport improvements at a local level by making quantifiable carbon reductions a fundamental part of local transport planning and funding”. As part of this, the TDP required:

*“Going forward, LTPs will also need to set out how local areas will deliver ambitious quantifiable carbon reductions in transport, taking into account the differing transport requirements of different areas. This will need to be in line with carbon budgets and net zero.”*

41 On 6 June 2022, the NCC Cabinet resolved to approve and recommend to Full Council that the Local Transport Plan, comprising the Local Transport Plan 4 Strategy (LTP4) and Implementation Plan (LTP4 IP) is adopted in July 2022. The LTP4 (IP) sets annual decarbonisation targets for Norfolk transport between 2019 and 2037 (the end of the Sixth carbon budget) to meet the national policy requirement above of the TDP.

42 The targets and pathways in the LTP4 IP now provide the crucial frame of reference for assessing the significance of the GHG emissions from the A47NTE, and allows the assessment, given below, of meeting national carbon targets within the contextualisation of using local carbon budgets and trajectories.

43 Further, the assessment requested by the SoST consultation enables assessment of the A47NTE scheme against both local carbon targets, and national policy as the LTP4 IP is part of delivering SoST’s own TDP. The local carbon targets are aligned numerically with the NZS and TDP national trajectories as described below.

**4.2 The LTP4 IP carbon targets – context within, and alignment with, national policy**

44 The LTP4 IP, to be adopted by Norfolk County Council, provides annual carbon targets for road transport against a baseline of 2019, at “Table: Summary of targets for LTP4”<sup>8</sup>.

---

<sup>7</sup> Transport Decarbonisation Plan, page 151.

<sup>8</sup> This is found on pages 303 to 305 of the Infrastructure and Development Select Committee agenda papers for Wednesday 25 May 2022, downloaded from:



The 2019 baseline figure for Norfolk road emissions is **1,717,709 tCO<sub>2</sub>e**, and this is derived from the BEIS “2005 to 2019 UK local and regional CO<sub>2</sub> emissions” dataset<sup>9</sup>.

45 To understand the LTP4 IP carbon targets in the context of wider related national policy (ie the NZS and the TDP), it is necessary to view the spreadsheet<sup>10</sup> given on the NZS webpage, from which the annual targets (reductions from 2019) for each year from 2020 to 2037 may be derived for the domestic transport sector. I have made this calculation in Table 2 below, which shows the reductions in the NZS Figure 21 (“Figure 21: Indicative domestic transport emissions pathway to 2037”) and present it below for the upper bound and lower bound figures<sup>11</sup>.

<i>Reductions from 2019</i>	2020	2021	2022	2023	2024	2025	2026	2027	2028
<b>NZS (Upper)</b>	-10.79%	-0.41%	-3.52%	-4.74%	-5.89%	-7.36%	-11.37%	-15.37%	-21.67%
<b>NZS (Lower)</b>	-17.09%	-7.93%	-11.45%	-13.16%	-14.72%	-16.52%	-20.85%	-25.18%	-31.73%

<i>(Continued)</i>	2029	2030	2031	2032	2033	2034	2035	2036	2037
<b>NZS (Upper)</b>	-27.64%	-34.51%	-40.80%	-47.42%	-56.26%	-61.00%	-65.58%	-69.09%	-72.20%
<b>NZS (Lower)</b>	-37.94%	-44.97%	-51.43%	-58.22%	-67.21%	-72.12%	-76.86%	-80.54%	-83.89%

**Table 2**

46 The surface transport decarbonisation targets in the Net Zero Strategy and the Transport Decarbonisation Plan are for all intents and purposes the same, with NZS Figure 21 being a more refined version, but same trajectory, as TDP Figure 2.

47 This then allows the corresponding Norfolk figures to be calculated, as in Table 3 below.

---

<sup>9</sup> For Norfolk wide in 2019, the “Road Transport (A roads)” figure is 977,100 tCO<sub>2</sub>e and the Road Transport (Minor roads)” figure is 740,600 tCO<sub>2</sub>e. There are no motorways in Norfolk. Together these figures make the 1,717,709 tCO<sub>2</sub>e figure. See: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/996057/2005-19\\_UK\\_local\\_and\\_regional\\_CO2\\_emissions.xlsx](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/996057/2005-19_UK_local_and_regional_CO2_emissions.xlsx)

<sup>10</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1066450/nzs-charts-tables-v1.1.xlsx](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1066450/nzs-charts-tables-v1.1.xlsx)

<sup>11</sup> The data is derived from “Net Zero Strategy: charts and tables (updated 5 April 2022)”, tab “3v.Transport”, data on rows 43 and 44 compared to cell AG40 (2019 emissions – central estimate).

tCO <sub>2</sub> e	2019	2025	2026	2027	2028	2029
NZS Lower	0.00%	-7.36%	-11.37%	-15.37%	-21.67%	-27.64%
NZS Central	0.00%	-11.94%	-16.11%	-20.28%	-26.70%	-32.79%
NZS Upper	0.00%	-16.52%	-20.85%	-25.18%	-31.73%	-37.94%
<b>Norfolk_NZS_Lower = LTP4 IP targets Lower</b>	1,717,709	1,591,304	1,522,483	1,453,662	1,345,515	1,242,986
<b>Norfolk_NZS_Central</b>	1,717,709	1,512,651	1,441,022	1,369,392	1,259,138	1,154,503
<b>Norfolk_NZS_Upper</b>	1,717,709	1,433,999	1,359,560	1,285,122	1,172,761	1,066,019

(continued)	2030	2031	2032	2033	2034	2035	2036	2037
NZS Lower	-34.51%	-40.80%	-47.42%	-56.26%	-61.00%	-65.58%	-69.09%	-72.20%
NZS Central	-39.74%	-46.12%	-52.82%	-61.73%	-66.56%	-71.22%	-74.82%	-78.05%
NZS Upper	-44.97%	-51.43%	-58.22%	-67.21%	-72.12%	-76.86%	-80.54%	-83.89%
<b>Norfolk_NZS_Lower = LTP4 IP targets Lower</b>	1,125,008	1,016,861	903,096	751,410	669,949	591,296	530,903	477,532
<b>Norfolk_NZS_Central</b>	1,035,120	925,568	810,399	657,308	574,442	494,386	432,587	377,109
<b>Norfolk_NZS_Upper</b>	945,231	834,276	717,702	563,206	478,936	397,475	334,272	276,687

**Table 3**

48 The figures in the LTP4 IP correspond to the line “Norfolk\_NZS\_Lower = LTP4 IP targets Lower” so they align with the lower NZS figures.

49 It should be noted that the Norfolk LTP4 IP carbon targets represents the **lowest possible ambition** for Norfolk’s ambition to contributing to delivering the NZS and the TDP. Therefore, even if compliance could be demonstrated for the A47NTE with the LTP4 IP targets, there would still need to be greater emissions cuts made in transport by other Transport Authority areas, or by other sectors of the economy to compensate. However, I shall show that the emissions associated with the A47NTE considerably exceed the allocations in the table above for the LTP4 IP, so not even Norfolk’s lowest possible ambition is achievable if the A47NTE were to be consented by the SoST.

### 4.3 The Applicant’s carbon data

50 I now summarise the data from the Applicant from the revised Environmental Chapter 14, issued at Deadline 3 [REP3-014]. This revision updated the chapter to include data for the 6<sup>th</sup> carbon budget period. This summary is provided in Table 4 below.

tCO2e	4th Carbon Budget			5th Carbon Budget	
	2025	2026	2027	2028	2029
DM	954,647	949,344	944,041	938,738	933,435
DM by CB			<b>2,848,032</b>		
DS	962,571	957,310	952,050	946,790	941,532
DS by CB			<b>2,871,931</b>		

(continued)	6th Carbon Budget							
tCO2e	2030	2031	2032	2033	2034	2035	2036	2037
DM	928,132	922,829	917,525	912,223	906,920	901,617	896,314	891,010
DM by CB			<b>4,640,659</b>					<b>4,508,084</b>
DS	936,271	931,012	925,750	920,491	915,232	909,971	904,712	899,451
DS by CB			<b>4,681,354</b>					<b>4,549,858</b>

**Table 4**

- 51 The derivation of the DM<sup>12</sup> and DS<sup>13</sup> trajectories above, are given in the footnotes. The applicant’s data in REP3-014/Table 14-10 is reproduced exactly.
- 52 It is also worth noting that the DS is a cumulative figure which includes the two other A47 schemes (ie A47BNB and A47THI) and the NWL (as described at APP-140/Table 4.3 “DM/DS network assumptions”) with the A47NTE scheme itself. (I assume here that the applicant’s the traffic model has been constructed as described at REP10-005/3.2.5, so land-based developments, and DfT’s NTEM/TEMPRO growth factors for car usage, and growth in freight is derived from DfT’s National Transport Model, are also included.)
- 53 This is, in contrast, to the differential DS-DM figure(s) which has been used for the only assessment that the Applicant has made in its Environmental Statement. (These are the “Difference (DS-DM)” line of figures from REP3-014/Table 14-10 which the applicant compares to the whole economy carbon budgets at REP3-014/14.8.8 for its assessment). I have explained repeatedly (for example, at A47NTE/CEPP\_CONS\_1/section 9.2) this quantification is solus, and therefore does not give rise to an EIA Regulations compliant cumulative assessment.

---

<sup>12</sup> REP3-014/Table 14-6 gives the DM emissions at opening year 2025 as 954,647 tCO2e, and at design year 2040 as 875,102 tCO2e. Within a rounding error\*\* of 1tCO2e, this corresponds to trajectory shown with an **annual (linear progression) decrement of 5,303 tCO2e**. After 2040, the DM trajectory flat lines at 875,102 tCO2e to 2084. Using these numbers (and assumptions), the carbon budget totals at the “Baseline (DM)” line at REP3-014/Table 14-10 are reproduced exactly in the “DM by CB” line in Table 4 above, including the figure not shown above for the full 60-year appraisal period of 53,142,467tCO2. \*\* The rounding errors are due to decimal numbers in the Applicant’s traffic model outputs being rounded in Tables 14-6 and 14-10. These rounding differences are not significant.

<sup>13</sup> For the DS trajectory, **the annual decrement is 5,260 tCO2e between 2025 and 2040**. This also precisely reproduces the carbon budget totals from the “Operation DS” line at REP3-014/Table 14-10 in the “DS by CB” line in Table 4. Again, there are some rounding errors (of less than 2tCO2e on each figure) which once accounted for reproduces the applicant’s data precisely.

54 Use of the cumulative DS trajectory figures against the LTP4 IP carbon budgets enables a cumulative assessment to be made at the local/regional level. By making an assessment of the DS trajectory against the LTP4, **two aspects of assessment which are absent in the applicant's existing Environmental Statement** may be addressed. These are:

- Cumulative carbon assessment as required by the EIA Regulations (and by the NPSNN which invokes the EIA Regulations), see my written representation, WR, REP1-023/section 2.1; and
- Local and regional carbon assessment, which is required by NPSNN 4.4, and also strongly recommended by the EIA guidance, and the IEMA guidance (see A47NTE/CEPP\_CONS\_1/section 4) and the IEMA version 2 guidance (see A47NTE/CEPP\_CONS\_1/section 5.1).

#### 4.4 *Assessment against LTP4 IP at the Norfolk level*

55 Figure 1 shows the Applicant's carbon data (DS and DM series as derived above) displayed against the LTP4 IP carbon targets. It can be seen by 2032 that the A47NTE scheme, and the other elements in the Applicant's traffic model, use 100% of the Norfolk LTP4 IP budget – as indicated by the red ring on the figure.

56 The implication of this is that, at this date, **there is then no remaining LTP4 IP budget available for any other part of the Norfolk transport network.** On other words, all traffic would need to come to a stop across the rest of Norfolk for compliance with the LTP4 IP budget to be delivered.

57 This is equally true for both the DM and DS trajectories (the DM line is under the DS line on the graph) indicating that there is a fundamental inconsistency with the road developments, land-based developments, and the traffic growth projection built into the traffic model, and case for the Scheme, and the requirements of the NZS, TDP and LTP4 IP. This is not surprising as APP-140, "7.1 Case for the Scheme" promotes traffic growth in contrast with the overall approach of the TDP and NZS that requires a reduction in traffic growth. The scheme, and its traffic model, work in the opposite direction of the policies in the TDP. It is no surprise, then, that the assessment of the A47NTE against the LTP4 IP which is based on TDP and NZS trajectories do not remotely align graphically.

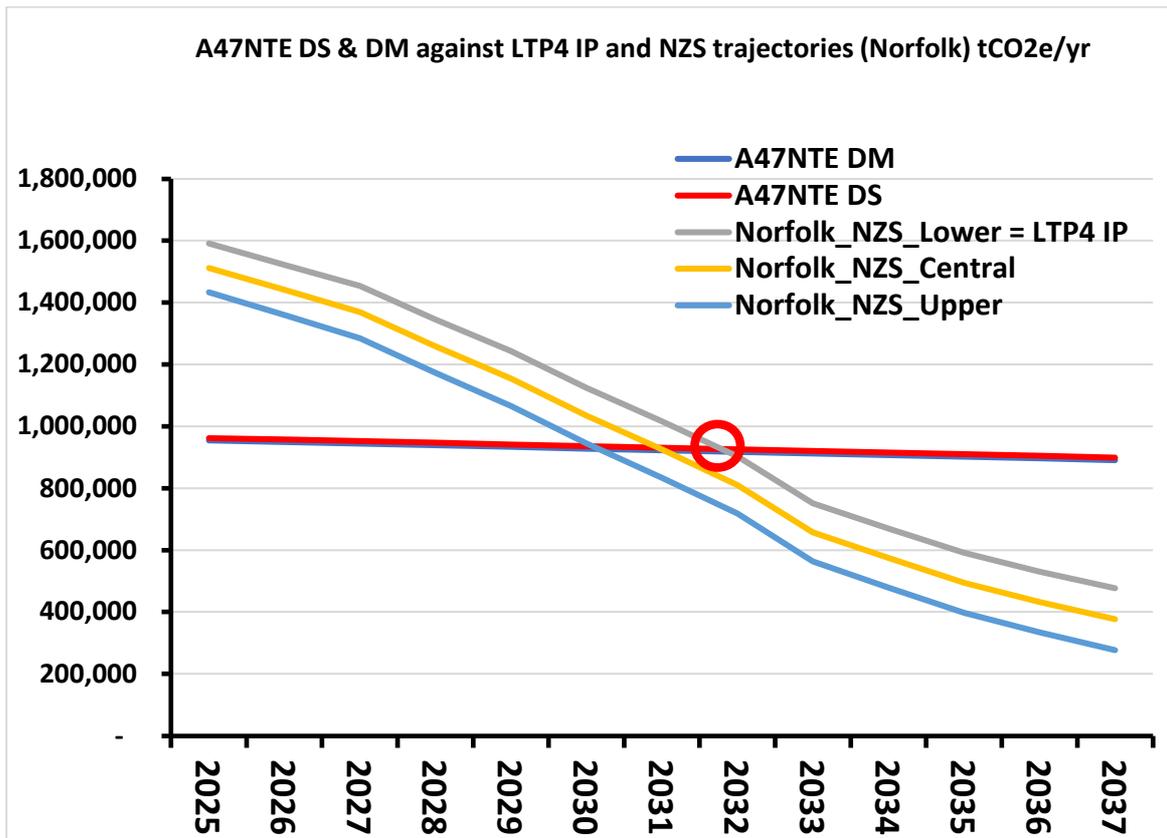


Figure 1

58 Geographically, the extent of the NATS 2015 traffic model being used for the Applicant’s carbon data is given at APP-140/Figure 4.1. This is actually a relatively small part of Norfolk with much of North, South and West Norfolk not included within it. The clear finding of this assessment is that **by 2032, these substantive areas have no remaining transport carbon budget.**

59 At each year after 2032, the A47NTE scheme requires more than 100% of the LTP4 IP carbon budget for the whole of Norfolk.

#### 4.5 Assessment against LTP4 IP scaled to the A47NTE traffic model study area

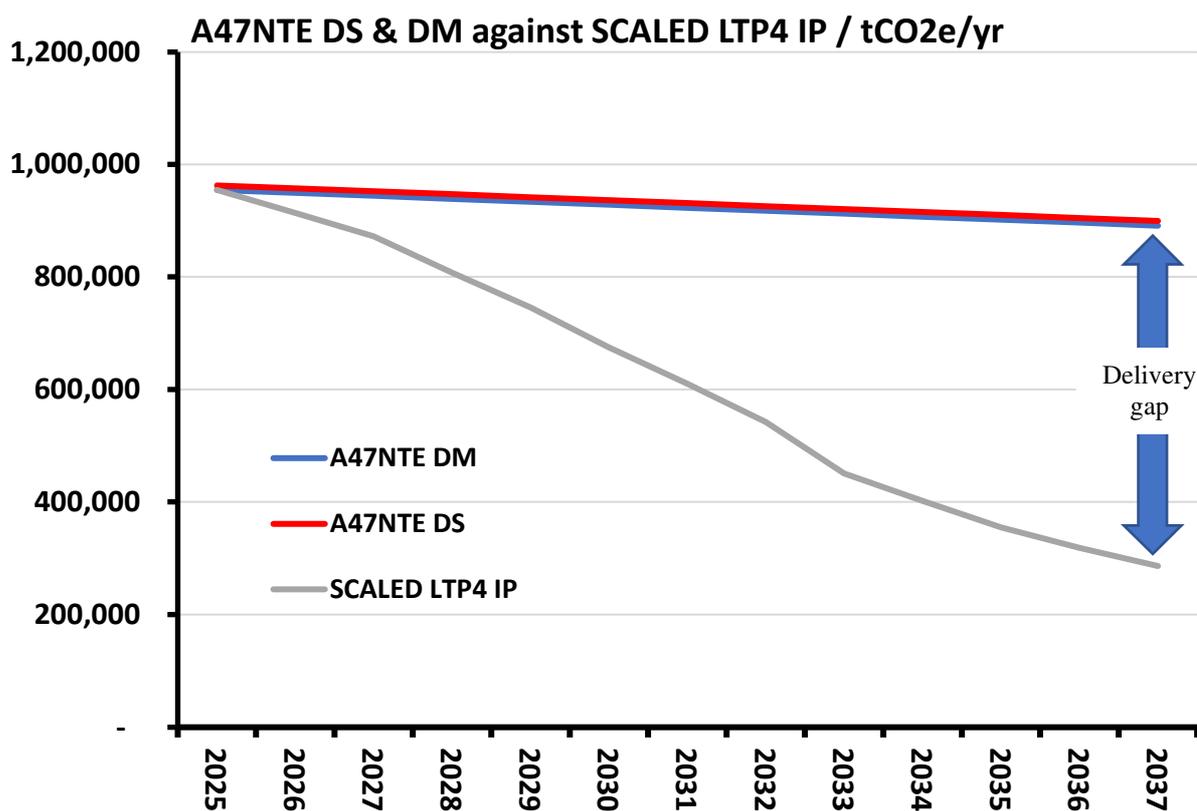
60 Additional assessment, and contextualisation, may be gained by scaling the data across the NATS 2015 traffic model study area rather than the whole of Norfolk. This may be done by normalising the data to the opening year of the A47NTE, 2025. The 2025 DM figure of 954,647 tCO<sub>2</sub>e for the A47NTE study area, as from Table 14-6, may be taken as the 100% reference base for the year 2025 for the study area. This figure is in fact using 60% of the LTP4 IP Norfolk budget in 2025, so it corresponds to 60% of the Norfolk LTP4 IP budget in that year. Then a scaled LTP4 IP trajectory can be generated which is based on this reference starting place at 2025, as in Table 5 below. The full Norfolk LTP4 IP carbon targets are shown at row E below for reference (the ratio of D/E is 59.99% for each year).

A	tCO2e	2025	2026	2027	2028	2029
B	A47NTE DM	954,647	949,344	944,041	938,738	933,435
C	A47NTE DS	962,571	957,310	952,050	946,790	941,532
D	SCALED LTP4 IP	954,647	913,360	872,074	807,195	745,686
E	Norfolk_NZS_Lower = LTP4 IP	1,591,304	1,522,483	1,453,662	1,345,515	1,242,986

(continued) tCO2e	2030	2031	2032	2033	2034	2035	2036	2037
A47NTE DM	928,132	922,829	917,525	912,223	906,920	901,617	896,314	891,010
A47NTE DS	936,271	931,012	925,750	920,491	915,232	909,971	904,712	899,451
SCALED LTP4 IP	674,909	610,030	541,781	450,782	401,912	354,728	318,497	286,478
Norfolk_NZS_Lower = LTP4 IP	1,125,008	1,016,861	903,096	751,410	669,949	591,296	530,903	477,532

**Table 5**

61 Rows B, C and D are now plotted in Figure 2 below.



**Figure 2**

62 By 2037, the A47NTE DS uses **314%** of the scaled LTP4 IP carbon target for that year (the scaled LTP4 IP budget for 2037 is 286,478 tCO2e, the DS figure is 899,451 tCO2e, see Table 5). **Neither the carbon emissions associated with the DS, nor the DM, as**

assessed annually remotely fit within the bounds of the LTP4 IP. There is a huge delivery gap, as shown, between the DS and DM traffic models and the requirements of the LTP4 IP carbon targets.

**63 The conclusion from this assessment of the Environmental Statement against the LTP4 IP must be that the A47NTE scheme is not consistent with the LTP4 IP, and that should National Highways construct the scheme, then the LTP4 IP carbon targets for Norfolk are undeliverable.** The LTP4 IP targets have been aligned with the lowest ambition of the TDP itself, and if Norfolk is unable to deliver its LTP4 IP targets, then this in turn means that the Government will be unable to deliver the TDP and the NZS. The emissions associated with the A47NTE scheme are therefore **so significant** as to have a material impact on the ability of Government to meet its carbon reduction targets, and the scheme is not compliant with NPS NN 5.18. **The SoST therefore must not consent the A47NTE scheme. As well as undermining his own TDP, to do so would not meet the requirements of NPSS 5.18 as the scheme demonstrably has a material impact on the ability of Government to meet its carbon reduction targets.**

#### **4.6 Comparison over the 2025-2037 LTP4 IP carbon budget**

64 The assessment so far is on a year-by-year basis. However, with carbon, a further valuable contextualising assessment is to consider the overall impact of the scheme between the years 2025 and 2037. The total carbon generated for these years is effectively the “area under the graph” and is calculated from the data in Table 4 above as follows

tCO2e	AREA UNDER GRAPH (2025-2037) Cumulative carbon between 2025-2037
A47NTE DM	11,996,775
A47NTE DS	12,103,143
SCALED LTP4 IP	7,932,080
Norfolk_NZS_Lower = LTP4 IP	13,222,005

**Table 6**

65 This shows that, after opening in 2025, by 2037 the A47NTE scheme will have overspent the scaled LTP4 IP carbon budget by 53%, corresponding to an additional 4,171,063 tCO2e over budget (12,103,143-7,932,080). Further, the A47NTE scheme uses 92% of the available 2025-2037 transport carbon budget for the whole of Norfolk.

66 Note that the NZS trajectory in NZS, Figure 21 corresponds to annual national budgets<sup>14</sup> for 2037 between 34.0 MtCO2e (corresponding to the LTP4 IP low ambition targets) and 19.7 MtCO2e (high ambition). By that year, the A47NTE scheme will have overspent its study area scaled allocation by over 4MtCO2e.

<sup>14</sup> The data is derived from “Net Zero Strategy: charts and tables (updated 5 April 2022)”, tab “3v.Transport” – at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1066450/nzs-charts-tables-v1.1.xlsx](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1066450/nzs-charts-tables-v1.1.xlsx)

- 67 Such a significant overrun just from a small area of Norfolk (**60% of Norfolk**) by 2037 poses a significant risk to the delivery of the national 6<sup>th</sup> carbon budget, and to delivery of the Climate Change Act. The local overrun of 4MtCO<sub>2</sub>e needs to be consider against the national targets for surface transport in 2037 of 34MtCO<sub>2</sub>e at low ambition, and 19.7 MtCO<sub>2</sub>e at high ambition.
- 68 **Further, it is not a reasonable proposition that such a year-on-year overspend of carbon budget can be somehow “clawed back” by making very significant compensations between 2025 and 2037 from other Transport Authority areas and other sectors of the economy.** It would be an unreasonable and irrational proposition to consider: these other Transport Authorities and sectors already have their own very stretching targets to try to meet before being able to compensate for other areas.
- 69 The emissions associated with the A47NTE scheme are therefore **so significant** as to have a material impact on the ability of Government to meet its carbon reduction targets, and the scheme is not compliant with NPS NN 5.18. **The SoST therefore must not consent the A47NTE scheme – to do so would be to undermine his own TDP.**
- 70 All of this is based solely on the scheme’s operation emissions ie before considering the construction emissions associated with the scheme and its study area.

#### 4.7 *Construction emissions*

- 71 So far, the analysis has not included construction emissions. If the several concurrent road schemes programmed in Norfolk for construction during the 4<sup>th</sup> carbon budget were to go ahead, then a significant increment of carbon emissions will result in the years 2023, 2024 and probably 2025 (due to planning overruns) would result. This is additional the operational carbon emissions associated with the schemes as above. Known construction emissions are:



75 Whilst calculating DS and DM against the EFT v11 would reduce the DS and DM trajectories, comparison with data from other schemes, strongly suggests that it only compensate for a small fraction of the delivery gap in reducing emissions in Norfolk to meet the statutory LTP4 IP carbon targets: ie it would have little impact of the delivery gap indicated on Figure 2 above. **However, the applicant should make available the DS and DM data for the traffic model run with EFT v11.** The applicant should also make available **the full 60-year data** for DS and DM with EFT v11, so that IPs such as myself do not need to reverse calculate it from the unnecessarily minimal data as that provided in the Environmental Statement (REP3-014).

#### ***4.9 TDP Sensitivity test – unproven and inconsistent with traffic modelling assumptions and the case for the scheme***

76 I previously noted at A47NTE/CEPP\_CONS\_1/section 9.8, and A47NTE/CEPP\_CONS\_1/Appendix C, that the applicant may respond to the consultation with figures that it refers to as a “TDP Sensitivity test”.

77 The so-called “TDP Sensitivity test” is an unproven methodology and as I stated in A47NTE/CEPP\_CONS\_1, it is **not** a sensitivity test.

78 It applies factors. However, the factors involved require that the TDP policies are guaranteed to succeed. In section 2 above, I show how the recent CCC 2022 Progress Report shows that at best around 50% of TDP policies are achievable at the national level. This means that the factors applied are not just what scientists call “fudge factors”, but that **they are “fudge factors” that are not even remotely reliable.**

79 There is a more fundamental problem that the TDP policies are inconsistent with the A47NTE traffic modelling, as built on the case for the Scheme. They act in different directions. The traffic models of the scheme which as enumerated contain the baseline highway network, the scheme itself, other schemes promoted by the applicant, foreseeable developments promoted by third parties, and national government regional growth rates. This is “predict and provide” traffic planning. However, the TDP policies require avoiding a car-led recovery, a significant modal shift to non-motorised journeys, and a **contraction** of the overall need for vehicle movements.

80 If the TDP is properly applied to the A47NTE, and the A47NTE traffic model study area, **then the TDP policies need to be integrated into the traffic models.** Note the “TDP sensitivity test” just applies the factors to the traffic model outputs as a post-processing step. If the TDP policies were integrated into the traffic model itself, then this would change the traffic forecasts on which the “need” for the scheme has been predicated.

81 This explicit contradiction between the case made for the “need” of the scheme, and the policies in the TDP and the application of TDP Policy factors to the scheme, has been succinctly described by transport expert emeritus Professor Phil Goodwin and colleagues recently for another scheme (A303 Stonehenge):

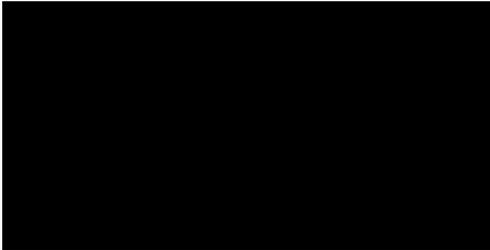
*“There are two incompatible assumptions made by NH, namely that the high traffic growth in its original forecast will continue to cause congestion which will be relieved by the scheme, and the lower traffic growth, or decline, which is inherent to the decarbonisation strategy to deliver lower carbon emissions. If the decarbonisation strategy were indeed successful as planned, there would be less traffic and the scheme would produce less time savings.*

*We consider that this contradiction seriously compromises the appraisal calculations. To claim simultaneously the carbon benefit calculated from lower levels of traffic as well as the decongestion benefit calculated from higher levels of traffic is a form of cherry-picking assumptions which gives appraisal a bad name.”*

## 5 CONCLUSIONS

- 83 The CCC 2022 Progress Report shows that Government's policies (eg in the TDP and NZS) to reduce traffic, and set measurable targets for it, do not exist, and that a new approach to road scheme appraisal is urgently needed. Further the CCC Progress Report has indeed shown that the success of the NZS and the TDP are by no means secured, and that no weight can be given to the proposition that they are. **These are important background considerations to the assessment of the A47NTE scheme against the LTP4 IP as requested by the SoS.**
- 84 In section 3, I report on major errors in traffic modelling on the A47 schemes. Cumulative assessment of carbon does not exist in the A47NTE Environmental Statement. However, cumulative assessment should be simple to do, but only if the traffic models are consistent and coherent. However, they are not consistent or coherent due to major errors reported in this section. **It is now crucial that the applicant is asked to explain these differences between its traffic models on the three schemes, and that the traffic models are corrected, and the SoST holds a further consultation round to enable this.**
- 85 A serious calibration problem for the traffic model for A47BNB scheme is noted.
- 86 There is also a requirement more generally for the traffic model for the Norwich Western Link to be made consistent with those on the A47 schemes.
- 87 Section 4 contains my assessment of the A47NTE against the LTP4 IP. The Norfolk LTP4 IP carbon targets represents the **lowest possible ambition** for Norfolk's contribution to delivering the NZS and the TDP. Therefore even if the LTP4 IP targets were to be met, other regions and other sectors would need to compensate with deeper emissions cuts than Norfolk is prepared to commit to making.
- 88 The assessment which I have made against the LTP4 IP is 1) a cumulative assessment with other schemes in the study area (ie local assessment), and 2) assesses meeting national carbon targets with the contextualisation of using local carbon budgets. Both these aspects of assessment **are absent in the A47NTE Environmental Statement rendering it unlawful with respect to the 2017 Regulations and not compliant with the EIA and IEMA guidance.**
- 89 Conclusions of my assessment are:
- If the A47NTE is built, there is **then no remaining LTP4 IP budget available for any other part of the Norfolk transport network after 2032.**
  - When the analysis is scaled to the A47NTE study area, then **314%** of the scaled LTP4 IP carbon target is used by the A47NTE in 2037.

- This assessment of the Environmental Statement against the LTP4 IP shows that the A47NTE scheme is not consistent with the LTP4 IP, and that **should National Highways construct the scheme, then the LTP4 IP carbon targets for Norfolk are undeliverable.**
- By the 2037, the A47NTE scheme will have overspent the scaled LTP4 IP carbon budget by 53%, corresponding to an additional 4MtCO<sub>2</sub>e in the A47NTE study area. This overspend must be seen in context for the national NZS targets for transport of 34.0 MtCO<sub>2</sub>e (low ambition targets) and 19.7 MtCO<sub>2</sub>e (high ambition). **This poses a significant risk to the delivery of the national 6<sup>th</sup> carbon budget, and to delivery of the Climate Change Act.** It is not a reasonable proposition that such a year-on-year overspend of carbon budget can be somehow “clawed back” by making very significant compensations between 2025 and 2037 from other Transport Authority areas and other sectors of the economy. Nor has any evidence been provided by the Applicant as to how this might be achieved.
- The above is for operation emissions only. Construction emission for the A47NTE and other schemes in the study area use 7.36% of the (whole Norfolk) LTP4 IP budget for 2024 and 2025.
- **As well as undermining the SoST’s own TDP, and the local LTP4 IP, the Environmental Statement for the A47NTE does not meet the requirements of NPNSS 5.18 as the scheme demonstrably has a material impact on the ability of Government to meet its carbon reduction targets.**
- The emissions associated with the A47NTE scheme are therefore **so significant** as to have a material impact on the ability of Government to meet its carbon reduction targets. **The SoST therefore must not consent the A47NTE scheme – to do so would be to undermine his own TDP and national climate targets.**



Dr Andrew Boswell,  
Climate Emergency Policy and Planning, July 8<sup>th</sup> 2022

<END OF DOCUMENT>