



Department  
for Transport

# Forthcoming Change to TAG

## Details

Description	<b>Updates to economic and demographic data, cost inflation guidance, values of travel time, Marginal External Costs (MECs), air quality, aviation and uncertainty guidance.</b>
Unit	TAG Data Book; A1.1 (Cost-benefit analysis); A1.2 (Scheme Costs); A3 (Environmental impact appraisal); A5.2 (Aviation appraisal); TAG Uncertainty Toolkit; M4 (Forecasting and Uncertainty); Active Mode Appraisal Toolkit (AMAT) and appraisal workbooks
Change announced	October 2023
Expected release date	<b>November 2023</b>

## Description

This Forthcoming Change sets out updates to several TAG units and the TAG Data Book, to reflect the latest evidence and guidance for appraisal and modelling. Additionally, the Active Mode Appraisal Toolkit (AMAT) and relevant appraisal workbooks will be aligned with the latest evidence and guidance in TAG.

All Data Book and guidance updates will become definitive in November 2023, after which an updated version of TUBA, COBALT and WITA will be made available to reflect the updated appraisal values.

## Contact

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## Detail

### **Economic and demographic data**

The TAG Data Book displays a range of economic and demographic data sets used in the appraisal of transport interventions. To maintain the accuracy of appraisals, these data sets are updated in line with new releases of data from the Office for National Statistics (ONS) and Office for Budgetary Responsibility (OBR). A new version of the TAG Data Book (v1.22), to be released definitively in November 2023, will incorporate the latest long-term economic forecasts from the OBR's Fiscal Risks and Sustainability (FRS) Report. Five-year medium-term forecasts from the OBR's forthcoming Economic and Fiscal Outlook (expected to be released on 22<sup>nd</sup> November 2023) will also be incorporated into the TAG Data Book, subject to a review.

The most significant change in the OBR's updated long-term forecasts was a change in population projection, from the OBR Low Migration Baseline, to the *ONS interim 2020-based principal population projection: year ending June 2022 estimated international migration variant* ('ONS projection'). Driven by increased assumptions on future net migration (245k per year vs 129k per year previously), this results in an 8.6M (13%) increase in total population by the end of the OBR's forecast period (2073), compared with the OBR Low Migration Baseline (further detail in Annex A). To maintain consistency with the projection that underpins the OBR's economic forecasts, the ONS projection will be adopted into TAG as the new core projection. The updated population projection will be reflected in TAG Unit A1.1 (Cost-benefit analysis), and Demand Driver Growth (DDG) in due course. The high- and

low-population projections, based upon the ONS 2018-based variant projections, remain unchanged.

Those appraisal workbooks that utilise the Annual Parameters table for price adjustments, discounting and uprating will also be updated accordingly. The relevant workbooks are:

- Greenhouse Gases
- Air Quality
- Landscape Monetisation
- Noise
- Noise (Aviation)
- Active Mode Appraisal Toolkit
- Cost Proforma

### **Additional guidance on treatment of real cost inflation**

TAG Unit A1.2 (Scheme Costs) advises that analysts should account for real cost inflation (defined as inflation over and above the GDP deflator) in estimates of scheme costs. Where no explicit provision for real cost inflation has been made within cost estimates, analysts may either use reference-class forecasting (RCF) evidence, or an alternative approach, provided this can be supported by robust evidence, to incorporate real cost inflation.

The forthcoming update to guidance introduces a full series representing the RCF evidence on the divergence between construction-specific and general inflation. This series, to be published in Table A1.2.1 of the [TAG Data Book](#), provides the Pmean uplift (+2.1p.p.) on the GDP deflator as recommended in the evidence on optimism bias uplifts<sup>1</sup>. It also includes historical evidence from the ONS Construction Output Prices Index (COPI)<sup>2</sup> that should be used if indexing cost prices to a historical year.

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<sup>1</sup> [Updating the evidence behind the optimism bias uplifts for transport appraisals](#), Oxford Global Projects, May 2021

<sup>2</sup> [New work output prices \(infrastructure\) series](#)

Additionally, Unit A1.2 will include advice for where an alternative approach has been used to derive uplifted cost estimates; specifically validating estimates against an uncertainty range generated from RCF evidence. A series representing this uncertainty range will be published in Table A1.2.1 of the TAG Data Book. Where bespoke values fall outside this range on an index basis, this divergence should be justifiable with reference to project-specific inflation risks, and presentation of a sensitivity test using the core, Pmean RCF values should be considered.

The real cost inflation series, and uncertainty range series, are displayed in Annex B.

### **Update to Values of Travel Time for professional and freight drivers**

[TAG Data Book](#) table A1.3.1 contains recommended values of travel time (VTT) per person by mode. For professional and freight drivers (encompassing OGVs, LGVs, PSV drivers and taxi drivers), Working (Employers' Business) Values of Travel Time are based upon the Cost-Saving Approach, in line with the conclusions of the 2013 business value of time scoping study<sup>3</sup>. As a result, the VTT for these segments are based upon the hourly earnings for the driver, uplifted for non-wage labour costs. These four segments have been updated using the latest (2022) data from the ONS Annual Survey of Hours and Earnings (ASHE), as set out in Annex C. There are no changes to other segments of Working VTT, nor Non-Working VTT.

Scheme promoters should follow the [TAG proportionate update process](#) when deciding how to apply the updated VTT in modelling and appraisal. The Department expects that such decisions should be made on a scheme by scheme basis and be based on balancing the need to ensure decisions are based on up-to-date evidence with the need to support decision makers in delivering their programme.

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<sup>3</sup> [Valuation of Travel Time Savings for Business Travellers – Main Report](#), ITS Leeds, April 2013

## **Update to core Marginal External Costs (MECs)**

TAG unit A5.4 provides information on the marginal external costs method, which is used to estimate the benefits of reducing congestion in the absence of a multi-modal model. To assist this, TAG provides estimated MEC values for a range of modelled years, vehicle types and MEC categories, based upon modelling from the National Transport Model (NTMv2R)

MECs have been updated to reflect updated economic evidence and appraisal guidance. The updates are:

- The inclusion of the latest economic data from the TAG Data Book v1.21
- Updated air quality values based upon [Defra guidance, published January 2023](#).
- Updated unit of account for greenhouse gas MECs, aligning with the [Forthcoming Change on valuation of traded carbon](#) (published October 2023). Note at present, traded carbon has not been incorporated into the greenhouse gas MEC, due to publication timelines; this will be added in a future update.

Table A5.4.2 in the TAG Data Book has been updated accordingly, including a new table of the greenhouse gas MEC in non-monetised tonnes, and the core MECs have been implemented in AMAT.

The resulting changes in the updated core MECs are focused on air quality and greenhouse gasses, as set out in Annex D. Relative to the May 2023 release, all MECs excluding air quality, greenhouse gases, and indirect taxation have decreased by 2-3% due to the update in economic parameters. Greenhouse gas MECs have increased by 19% across all years and vehicle types, reflecting the market prices conversion. Air quality values see moderate decreases reflecting the update to Defra valuations, with almost all of these decreases between 15-20%. There is no change in indirect taxation values.

## **Update to air quality appraisal guidance**

[Defra guidance](#) published in January 2023 sets out that promoters should consider whether their policies are likely to result in a breach of any legal limits, and if so, take mitigating action to prevent a breach, incorporating these abatement costs in the appraisal of the scheme in question. Specifically, the guidance advises that *‘The ‘do something’ emission is the level of emissions after the abatement action has been put in place.’*

TAG Unit A3 (Environmental impact appraisal) will be updated to reflect this guidance; that where a scheme results in emissions exceeding legal limits, appropriate abatement (including associated costs) should be accounted for, prior to air quality appraisal. Air quality emissions can then be appraised using the established methodologies currently described in Unit A3. The air quality valuation workbook will also be updated to reflect this guidance.

This guidance does not affect the appraisal of schemes where emissions are expected to be under legal limits.

## **Update to cycling journey ambience values and Active Mode Appraisal Toolkit (AMAT)**

TAG Data Book table A4.1.6 contains values of journey ambience benefit for cycling facilities, relative to the provision of no facilities. These values have been derived from a range of research papers and reflect the recommended evidence for appraising these types of cycling interventions. TAG Unit A5.1 (Active Mode Appraisal) contains guidance on the application of these values, including the use of judgment or a ‘sliding scale’ approach to valuing journey quality impacts.

Following a review of the original evidence and uprating methodology applied in the relevant sections of the Data Book, this table has been updated to reflect a more accurate and consistent uprating methodology. The implementation of an updated uprating methodology across the values has led to implied changes in the real value of the figures, as displayed in Annex E. Most of the changes are of moderate magnitude (10-20% change), while

the p/min value for 'Off-road segregated cycle track' has increased by 49% following a review of the original literature. These updated values will be updated accordingly in the Active Mode Appraisal Toolkit (AMAT).

In addition, various appraisal assumptions in AMAT will be updated to reflect the latest available data, including average trip lengths, return journey proportions, assumed vehicle occupancy rates, and health assumptions (based on data from the 2019 Global Burden of Disease study).

### **Updates to Unit A5.2 on greenhouse gas appraisal and minor clarifications**

[TAG Unit A5.2](#) (Aviation Appraisal) will be updated to align with [DESNZ carbon valuation guidance](#). The updated guidance will state that any changes in emissions will need to be valued with carbon appraisal values published in [TAG Data Book](#) Table A3.4. It will also acknowledge that traded sector emissions will risk double counting emissions from within the traded sector due to existing carbon pricing mechanisms, and will recommend that analysts make an adjustment to avoid such double counting using appropriate data and assumptions about current and future traded carbon prices.

Unit A5.2 will also state that, in line with HM Treasury Green Book appraisal guidance, any UK specific scheme or policy will require all associated changes in emissions to be appraised, which means that changes in emissions from flights both arriving and departing into the UK will need to be appraised. In some circumstances, there may be evidence that a UK-specific scheme or policy has displaced emissions from elsewhere within the sector.

When proportionate and possible to do so, these changes in emissions and associated levels of displacement should be considered in an appraisal.

There will also be minor updates made to other sections of Unit A5.2 – mainly clarifications and updates to references.

### **Clarification of guidance on the application of Common Analytical Scenarios**

The TAG Uncertainty Toolkit provides advice and guidance on the analysis and presentation of uncertainty. An update to the published guidance will provide clarification on how the Common Analytical Scenarios should be applied in business cases, encompassing:

1. Refreshed advice on how qualitative analysis should be performed;  
and
2. A refreshed table advising on a proportionate approach to scenarios analysis.

These updates are intended to provide analysts with practical advice on the application of the Common Analytical Scenarios, depending on the stage and expected impact of the scheme in question. A draft of this guidance is provided in Annex F.

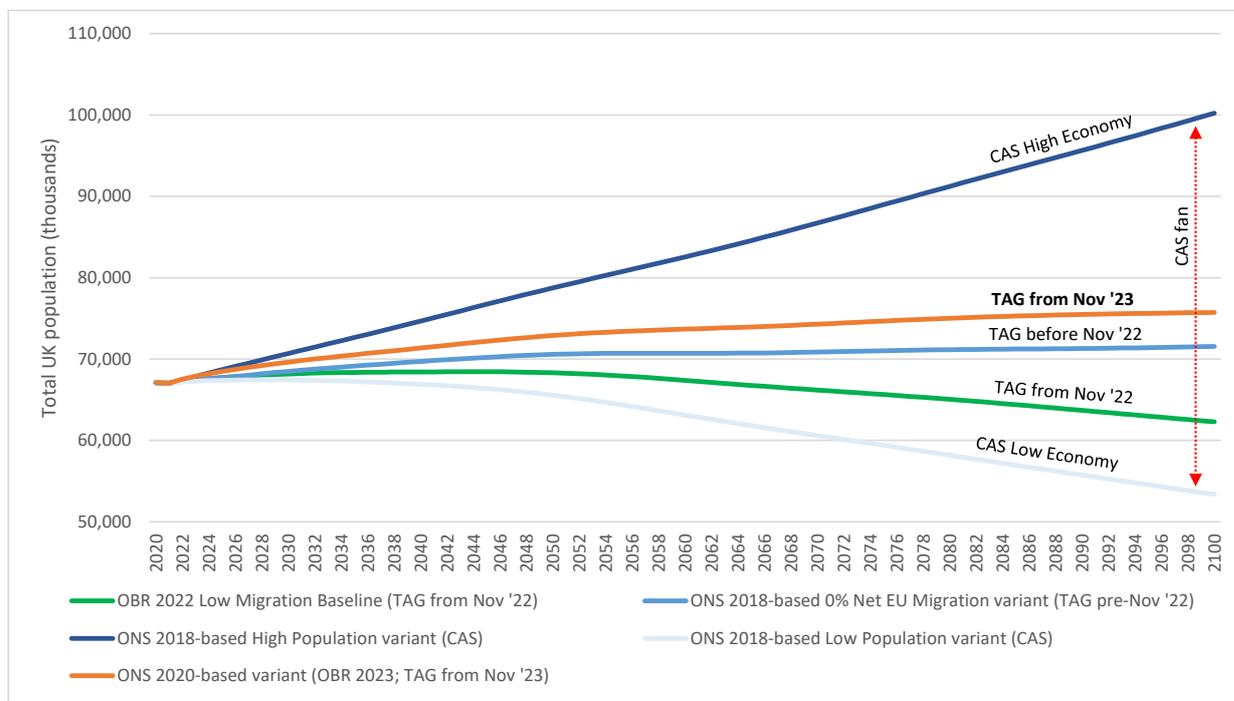
### **Update to guidance on use of TEMPRO**

Following the publication of the [National Road Traffic Projections 2022](#), the facility that allows TEMPRO users to calculate simple local traffic growth factors has been re-enabled. This update will be available in TEMPRO v8.1, and reflected in the guidance contained in TAG Unit M4 (Forecasting and Uncertainty).

## Annex A

### Population projections comparison

New core population projection vs current and previous core, high and low scenarios



New core population projection vs current core, annual growth 2022-2100

*\*subject to change following OBR Economic and Fiscal Outlook publication*

Year	V1.21 Annual Growth (%pa)	V1.22 Annual Growth (%pa)
2022	0.58	0.58*
2023	0.57	0.57*
2024	0.45	0.45*
2025	0.42	0.42*
2026	0.38	0.38*
2027	0.34	0.34*
2028	0.14	0.33*
2029	0.12	0.31
2030	0.10	0.30
2031	0.08	0.28

<b>Year</b>	<b>V1.21 Annual Growth (%pa)</b>	<b>V1.22 Annual Growth (%pa)</b>
2032	0.07	0.27
2033	0.05	0.26
2034	0.04	0.25
2035	0.03	0.24
2036	0.02	0.24
2037	0.02	0.23
2038	0.01	0.23
2039	0.01	0.23
2040	0.01	0.23
2041	0.01	0.23
2042	0.01	0.23
2043	0.01	0.23
2044	0.00	0.23
2045	0.00	0.22
2046	-0.01	0.22
2047	-0.02	0.21
2048	-0.03	0.20
2049	-0.05	0.19
2050	-0.06	0.17
2051	-0.08	0.16
2052	-0.09	0.15
2053	-0.11	0.13
2054	-0.12	0.12
2055	-0.14	0.11
2056	-0.15	0.10
2057	-0.16	0.09
2058	-0.17	0.08

<b>Year</b>	<b>V1.21 Annual Growth (%pa)</b>	<b>V1.22 Annual Growth (%pa)</b>
2059	-0.18	0.08
2060	-0.18	0.07
2061	-0.18	0.07
2062	-0.19	0.07
2063	-0.19	0.07
2064	-0.18	0.08
2065	-0.18	0.08
2066	-0.18	0.08
2067	-0.17	0.09
2068	-0.17	0.09
2069	-0.17	0.09
2070	-0.17	0.10
2071	-0.16	0.10
2072	-0.17	0.10
2073	-0.17	0.10
2074	-0.17	0.10
2075	-0.17	0.10
2076	-0.17	0.10
2077	-0.18	0.10
2078	-0.18	0.09
2079	-0.18	0.09
2080	-0.19	0.09
2081	-0.19	0.08
2082	-0.20	0.08
2083	-0.20	0.07
2084	-0.21	0.07
2085	-0.21	0.06

<b>Year</b>	<b>V1.21 Annual Growth (%pa)</b>	<b>V1.22 Annual Growth (%pa)</b>
2086	-0.21	0.06
2087	-0.22	0.05
2088	-0.22	0.05
2089	-0.22	0.05
2090	-0.22	0.04
2091	-0.22	0.04
2092	-0.22	0.04
2093	-0.22	0.04
2094	-0.22	0.04
2095	-0.22	0.03
2096	-0.22	0.03
2097	-0.22	0.03
2098	-0.22	0.03
2099	-0.22	0.03
2100	-0.22	0.03

## **Annex B**

### **Real cost inflation series and uncertainty range**

Pmean real cost inflation index, P20 index and P80 index (2022/23 = 100)

<b>Financial Year</b>	<b>Pmean index</b>	<b>P20 index</b>	<b>P80 index</b>
2010/11	83.96	83.96	83.96
2011/12	85.72	85.72	85.72
2012/13	87.52	87.52	87.52
2013/14	89.36	89.36	89.36
2014/15	91.23	91.23	91.23
2015/16	91.58	91.58	91.58
2016/17	90.36	90.36	90.36

<b>Financial Year</b>	<b>Pmean index</b>	<b>P20 index</b>	<b>P80 index</b>
2017/18	90.21	90.21	90.21
2018/19	91.90	91.90	91.90
2019/20	93.62	93.62	93.62
2020/21	89.66	89.66	89.66
2021/22	93.68	93.68	93.68
2022/23	100.00	100.00	100.00
2023/24	102.10	99.28	104.96
2024/25	104.24	100.04	108.42
2025/26	106.43	101.24	111.57
2026/27	108.67	102.54	114.86
2027/28	110.95	103.89	117.94
2028/29	113.28	105.38	121.11
2029/30	115.66	106.91	124.32
2030/31	118.09	108.41	127.40
2031/32	120.57	110.08	130.61
2032/33	123.10	111.73	134.03
2033/34	125.68	113.63	137.38
2034/35	128.32	115.52	140.68
2035/36	131.02	117.56	144.39
2036/37	133.77	119.39	147.79
2037/38	136.58	121.45	151.29
2038/39	139.45	123.39	154.88
2039/40	142.38	125.47	158.62
2040/41	145.37	127.30	162.51
2041/42	148.42	129.84	166.18
2042/43	151.54	132.04	170.18
2043/44	154.72	134.22	174.22
2044/45	157.97	136.44	178.14

<b>Financial Year</b>	<b>Pmean index</b>	<b>P20 index</b>	<b>P80 index</b>
2045/46	161.28	138.89	182.50
2046/47	164.67	141.34	186.71
2047/48	168.13	143.73	190.96
2048/49	171.66	146.19	195.62
2049/50	175.26	148.84	199.93
2050/51	178.95	151.45	204.60
2051/52	182.70	154.07	209.31
2052/53	186.54	156.84	213.86
2053/54	190.46	159.80	219.12
2054/55	194.46	162.38	224.04
2055/56	198.54	165.65	229.49
2056/57	202.71	168.74	234.47
2057/58	206.97	171.77	240.41
2058/59	211.31	174.92	245.70
2059/60	215.75	177.56	251.55
2060/61	220.28	181.06	257.17
2061/62	224.91	184.36	262.63
2062/63	229.63	187.09	268.49
2063/64	234.45	190.42	274.57
2064/65	239.38	194.55	281.01
2065/66	244.40	198.07	286.85
2066/67	249.54	201.74	293.56
2067/68	254.78	205.75	300.09
2068/69	260.13	209.15	306.61
2069/70	265.59	212.72	313.65
2070/71	271.17	216.73	320.71
2071/72	276.86	220.27	328.62
2072/73	282.67	224.16	335.42

<b>Financial Year</b>	<b>Pmean index</b>	<b>P20 index</b>	<b>P80 index</b>
2073/74	288.61	228.41	343.10
2074/75	294.67	232.61	350.31
2075/76	300.86	237.27	358.76
2076/77	307.18	242.07	366.96
2077/78	313.63	246.73	375.68
2078/79	320.21	250.47	383.97
2079/80	326.94	255.32	393.07
2080/81	333.81	260.42	401.93
2081/82	340.82	265.65	410.52
2082/83	347.97	270.14	419.33
2083/84	355.28	275.18	427.86
2084/85	362.74	280.49	437.78
2085/86	370.36	285.30	447.00
2086/87	378.14	291.19	457.12
2087/88	386.08	295.94	467.57
2088/89	394.18	302.02	477.43
2089/90	402.46	307.57	488.76
2090/91	410.91	313.15	499.84
2091/92	419.54	319.40	509.45
2092/93	428.35	325.13	521.05
2093/94	437.35	331.44	532.53
2094/95	446.53	337.65	545.46
2095/96	455.91	344.17	557.80
2096/97	465.48	351.22	569.01
2097/98	475.26	358.26	581.70
2098/99	485.24	364.74	594.05
2099/00	495.43	372.10	607.79

## Annex C

### Professional drivers and freight values of travel time comparison

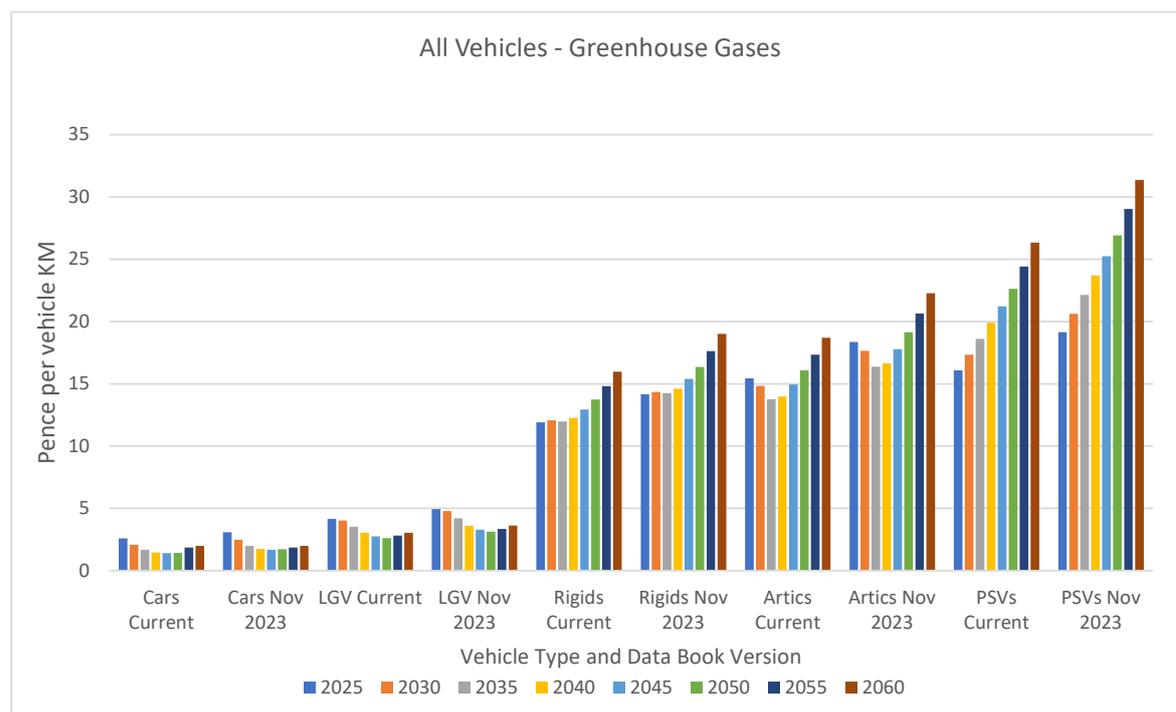
Working (Employers' Business) values of travel time per person (£ per hour), 2010 prices and values

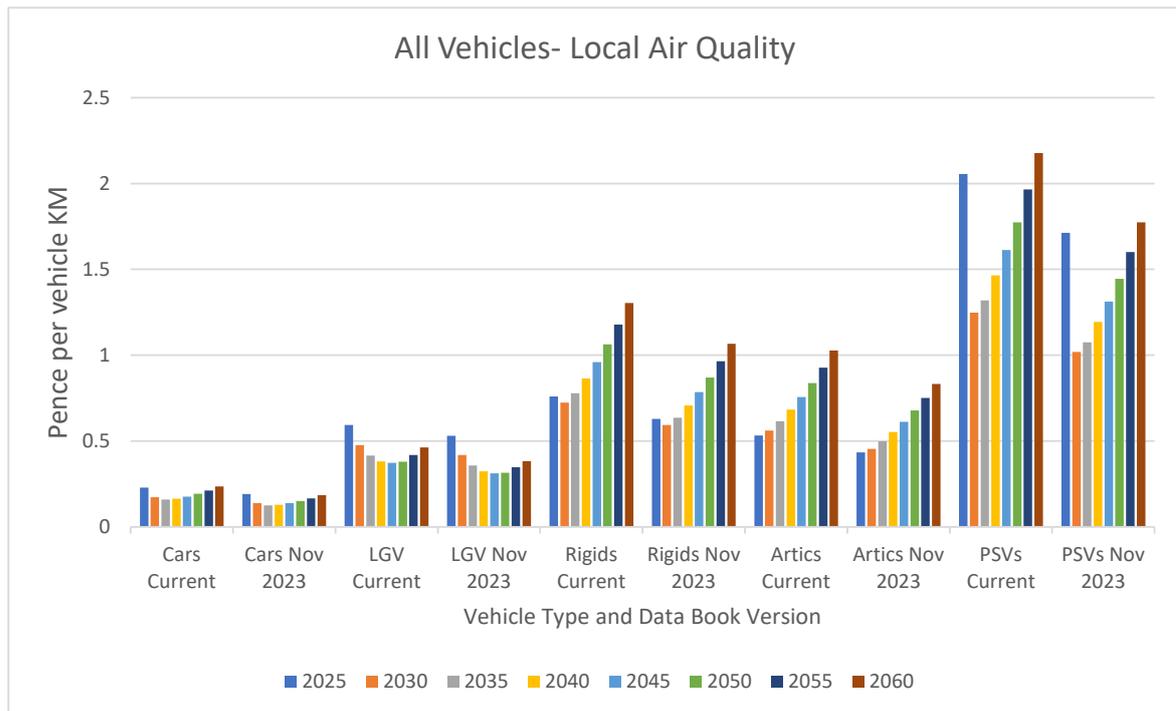
Mode	Factor cost/ perceived cost v1.21	Factor cost/ perceived cost v1.22	Market price v1.21	Market price v1.22
LGV driver	10.52	10.82	12.52	12.88
OGV driver	12.13	13.05	14.43	15.53
PSV driver	11.94	12.22	14.21	14.54
Taxi driver	11.50	10.29	13.68	12.25

## Annex D

### Changes to Marginal External Costs

MECs in Current Data Book vs New MECs (Nov 2023).





## Annex E

### Cycling journey ambience comparison

Value relative to no facilities, 2010 prices and values

Scheme type	Value (p/min), v1.21	Value (p/min), v1.22	Source
Off-road segregated cycle track	7.03	10.49	Hopkinson & Wardman (1996)*
On-road segregated cycle lane	2.99	3.68	Hopkinson & Wardman (1996)*
On-road non-segregated cycle lane	2.97	3.36	Wardman et al. (1997)**
Wider lane	1.81	2.23	Hopkinson & Wardman (1996)*
Shared bus lane	0.77	0.82	Hopkinson & Wardman (1996)*
	<b>Value (pence), v1.21</b>	<b>Value (pence), v1.22</b>	
Secure cycle parking facilities	98.14	108.60	Wardman et al. (1997)**
Changing and shower facilities	20.82	23.65	Wardman et al. (1997)**

\*Hopkinson P & Wardman M (1996), "Evaluating demand for new cycle facilities", Transport Policy 3(4), 241-249.

\*\*Wardman M, Hatfield R & Page M (1997), "UK national cycling strategy: Can improved facilities meet the targets?", Transport Policy 4(2), 123-133.

## Annex F

### Draft update to TAG Uncertainty Toolkit

*In place of Table 2, and paragraphs 3.18-3.19:*

	<b>Low Impact Projects</b>	<b>Medium Impact Projects</b>	<b>High Impact Projects</b>
<b>Requirement for all schemes at all stages</b>	Qualitative discussion as to how the options developed could be impacted by each of the different Common Analytical Scenarios.		
<b>Recommended for Strategic Outline Cases</b>	Qualitative discussion of Common Analytical Scenarios as described in the 'requirement for all schemes'.	Proportionate quantitative analysis of scenarios critical to decision making.	Proportionate quantitative analysis of scenarios critical to decision making on a subset of longlisted options.
<b>Recommended for Outline Business Cases</b>	TAG M4 Low/High or envelope of Common Analytical Scenarios to be run and VfM reported.	Critical Common Analytical Scenarios to be run, with reported VfM. Alongside this, any relevant local scenarios could be run.  For scenarios not critical to decision making, there should be proportionate quantitative analysis.	Critical Common Analytical Scenarios to be run, with reported VfM. Alongside this, any relevant local scenarios could be run.  For scenarios not critical to decision making, there should be proportionate quantitative analysis.
<b>Recommended for Full Business Cases</b>	TAG M4 Low/High or envelope of Common Analytical Scenarios to be run and VfM reported.	Critical Common Analytical Scenarios to be run, with reported VfM. Alongside this, any relevant local scenarios should be run.  For scenarios not critical to decision making, there should be proportionate quantitative analysis.	Critical Common Analytical Scenarios to be run, with reported VfM. Alongside this, any relevant local scenarios should be run.  For scenarios not critical to decision making, there should be proportionate quantitative analysis.

3.18 Note that, in order to consider a wide breadth of uncertainty, the range of scenarios examined in greater depth for appraisal should cover a range at least as stretching as the TAG M4 Low/High growth scenarios, unless the TAG M4 Low/High growth scenarios themselves are used (in line with the proportionate approaches set out in Table 2).

3.19 Qualitative analysis could consider how the different assumptions used within each CAS will impact on scheme objectives and potential solutions. This should inform sifting and also inform which CAS to focus on when doing quantitative analysis in later stages.

3.20 There should be a qualitative discussion as to how the options developed could be impacted by the different CAS. This discussion should reflect the complexity and impact of the scheme considered. There should be a discussion as to the risks and opportunities facing the strategic objectives of the scheme under each of the CAS. For example, a decarbonisation scheme may perform poorly on decarbonisation objectives under the High growth scenario.

3.21 This qualitative discussion should include a discussion on the direction the VfM would move under every scenario, and an explanation as to why.

3.22 A scenario might be critical to decision making for a scheme because it presents high adverse risks to the scheme as well as scenarios that are particularly advantageous to a scheme. Additionally, a scenario may be critical if a scheme promoter wishes to show resilience under that scenario – that the value for money does not fall.

3.23 The decision as to which CAS scenarios are critical for a scheme should be documented together with appropriate qualitative and quantitative analysis undertaken to inform the decision. The decision should be reviewed and updated as necessary at each stage of scheme development.

*In place of paragraphs 5.52-5.54:*

5.52 Examples of impacts that can be considered are provided below in Table 9. When it is not proportionate to conduct quantitative analysis (see Proportionate Scenario Analysis section 3.15), a qualitative discussion of the scenarios can be used. This has been discussed in section 3.19.

5.53 Quantitative analysis of the Common Analytical Scenarios can range from using the data series in the CAS Data Book [note 31] to full model runs. Scheme promoters should use the CAS Data Book [note 31] and the Scenario narratives in section 5.11 as a guide to which variables change in each scenario.