

SAR 2022: User Notes

Scheme Appraisal Report

Version 2022

Additional Information

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1. Overview

- 1.1 This document provides additional information relating to the methodology for appraising the cost and economic aspects of the SAR assessment process.
- 1.2 A number of tables are included throughout this document, and the values included therein will be updated from time to time, though this is only expected to occur via official new releases of the workbook.
- 1.3 Note that users are not expected to select values from these tables to carry out a SAR assessment; the application selects the appropriate values to use based on data entered or options chosen by the user.

2. The ‘Costs Master’ Worksheet

- 2.1 The methodology described is consistent with that defined in [WebTAG Unit A1.2](#), to which the user should refer to if more explanation is required.

PARTS A, B, C AND D

- 2.2 The user fills in Parts A, B, C and D of the **Costs Master** worksheet, which is completed to express the most recent cost information in up-to-date prices for budgeting and programming purposes within Highways England.
- 2.3 The simplified list of Works items in Part A should be sufficient for most SAR schemes. The costs should be the most recent available with VAT excluded. Note that Item A.18: Other Costs requires the user to enter a brief description in the “Specify” box provided. In Part A1 the user can opt to use default preparation and supervision costs, or enter their own values. The SAR default costs vary with scheme stage and are shown in Table C.1a overleaf.
- 2.4 Land costs in Part B should include an estimate of the cost of land acquisition, together with estimated Part 1 land compensation costs if appropriate.
- 2.5 Where a local highway authority is contributing towards the cost of a scheme as opposed to funding complementary works on their own network, the contribution should be entered as a negative cost item in Item A.18 of Part A and as a positive cost item in Item C.2 of Part C.
- 2.6 The “Estimate Price Year” price base of costs should be selected separately for Works (*Part A*), Land (*Part B*), and Other (*Part C*) costs – as well as for Contributions (*Part D*) – from drop-down lists at the head of each section on the worksheet.
- 2.7 It is important that Part 1 compensation costs are realistically estimated early in the life of the scheme, as for some small schemes they can have a considerable effect on the total cost. Part 1 claims can be made for loss of value of a property due to specific physical factors arising from the use of a new or altered (*i.e. improved*) road. The specified factors are noise, vibration, smell, fumes, smoke, discharge of any solid or liquid substance, and artificial lighting. Claims cannot be made for loss of view or general amenity, for which there is no statutory right to compensation. Examples of small schemes that might generate valid claims include any scheme that alters the location, width or level of the carriageway (*but not re-surfacing*), and installation of subways, footbridges, bus bays, pelican crossings, traffic signals, road lighting and road humps.

PART E

Risk Allowance

- 2.8 The allowances applied by SAR for optimism bias at different scheme stages are set out in Table C.1 overleaf. Note that a lower level of optimism bias is applied where a risk assessment has been undertaken and a “Mean Risk Allowance” has been entered in the box provided on the **Costs Master** worksheet. It is assumed that a risk assessment will have been undertaken at all stages beyond Conception stage; in view of this, 0% optimism bias is applied at these stages.

Table C.1: Adjustment Factors for Optimism Bias

Scheme Type	Scheme Stage	Adjustment Factor for Optimism Bias	
		With Risk Assessment	Without Risk Assessment
Standard highway schemes such as a major (<i>usually >£10M</i>) non-controversial new road, bypass or widening schemes. Also lesser (<i>usually <£10M</i>) schemes requiring land acquisition and orders.	Conception	5%	10%
	Pre-Public Consultation/ Pref. Solution Decision	0%	0%
	Draft Order Publication	0%	0%
	Commitment of Works Expenditure	0%	0%
Small standard improvement schemes not requiring land acquisition or significant statutory undertakers' works (<i><£10M</i>)	Conception	5%	10%
	Intermediate ¹	0%	0%
	Commitment of Works Expenditure	0%	0%

Table C.1a: Preparation and Supervision Costs

Scheme Stage	% of Works plus Land Cost (<i>but see Note below</i>)	
	Preparation	Supervision
Conception / Public Consultation	9%	5%
Preferred Solution Decision	9%	5%
Draft Order Publication	6%	5%
Intermediate	6%	5%
Commitment of Works Expenditure	2%	5%

Note: To reflect the fact that overheads for small schemes represent a greater percentage of the Works Cost, SAR uses 3x the normal Preparation and Supervision percentages if Works Costs are <£25K, and 2x the normal Preparation and Supervision percentages if Works costs are £25K-£250K.

¹ "Small standard improvement schemes" do not have Intermediate stages.

Non-Recoverable VAT

- 2.9 Non-recoverable VAT should be entered on the **Costs Master** worksheet, but recoverable VAT excluded. Non-recoverable VAT applies only to works to be constructed outside of the existing highway boundary. Therefore the cost of that part of the scheme, if any, outside the highway boundary should be estimated separately and VAT calculated only on that element for inclusion in the estimate.

Construction Year

- 2.10 The year of construction must also be entered on the **Costs Master** worksheet. This is required in order that SAR can adjust the works costs in Part A to reflect construction-related inflation between the Works Cost Price base year and the Construction Year. The risk allowance, where provided, is adjusted in the same way.

Total Scheme Implementation Costs

- 2.11 SAR will automatically calculate the “Total Scheme Implementation Costs in Construction Year Prices” value. The figure includes the costs from Parts A to D, but excludes the Technology Renewals costs (*Item A.17*). It also includes Preparation, Supervision, Optimism Bias, Risk and Non-Recoverable VAT. The Part A Works Costs and Risk element include construction-related inflation to the Construction Year. Parts B to D costs are inflated by the GDPI from their price base year to the latest year for which observed GDPI data is available. Any contributions entered in Part D are deducted from the total cost.

PART F

Change In Maintenance Costs

- 2.12 Part F is concerned with the Present Value of Costs (*PVC*) which relates to the costs of a scheme over the whole assessment or appraisal period rather than just the implementation costs considered under Part E. In order to calculate the *PVC*, it is necessary therefore to include any significant additional maintenance or renewal costs compared to the current Without-Scheme situation. These can then be added to the implementation costs to obtain the additional whole life costs of implementing the scheme.
- 2.13 SAR requires the user to enter the additional average annual maintenance and renewal costs over the scheme Assessment Period. The costs should be entered on the **Costs Master** worksheet in the same price base year as the Part A works costs.

Scheme Present Value of Costs (*PVC*)

- 2.14 SAR calculates the Scheme *PVC* *i.e.* the total cost of the scheme over the Assessment Period compared to the Without-Scheme situation. It comprises the implementation costs from Part E plus any additional maintenance and renewal costs. To allow comparison, the scheme benefits and the *PVC* are expressed in 2010 market prices discounted to 2010.

DETAILED COSTS SHEETS

- 2.15 The detailed cost calculations in SAR are normally hidden, but occur automatically as the user enters data into the **Costs Master** worksheet. These details are spread across three worksheets: **Costs 1** (*replicating Parts A and B*), **Costs 2** (*replicating Parts C and D, and calculating Part E*), and **Costs 3** (*calculating Part F*). If necessary these can be viewed by clicking the **Costs Master**'s [Preview Detailed Calculations of Costs Worksheets] button.

2.16 Table C.2 contains the cost growth factors displayed on the **Costs Master** worksheet and which are used in the calculations on the detailed costs sheets. The cost factors are expressed relative to 2014, so 2014 values are all set to 1.0000. Fixed values in Column ① are taken from HE Inflation Forecast Profile (%) figures (*construction price inflation*), and fixed values in Column ③ are taken from GDP Profile (%) figures (*general price inflation*) :-

Table C.2: Construction and General Price Inflation

Year	HE Inflation Forecast Profile (%)	Construction Price Growth	GDP Profile (%)	Construction Cost Growth Factor	GDPI Factor to 2010
2014	1.78	1.0000	1.78	1.0000	0.9308
2015	0.67	1.0067	0.67	1.0000	0.9246
2016	2.15	1.0283	2.15	1.0000	0.9052
2017	1.94	1.0482	1.94	1.0000	0.8880
2018	2.25	1.0718	2.25	1.0000	0.8685
2019	2.12	1.0945	2.12	1.0000	0.8505
2020	5.81	1.1581	5.81	1.0000	0.8038
2021	0.37	1.1623	0.37	1.0000	0.8008
2022	2.16	1.1875	2.16	1.0000	0.7839
2023	2.32	1.2150	2.32	1.0000	0.7661
2024	1.94	1.2386	1.94	1.0000	0.7515
2025	1.95	1.2627	1.95	1.0000	0.7372
2026	2.06	1.2887	2.06	1.0000	0.7223
2027	2.30	1.3183	2.30	1.0000	0.7061
2028	2.30	1.3486	2.30	1.0000	0.6902

①

②

③

④

⑤

2.17 Values in Column ② are calculated as: $②_y = ②_{y-1} \times (1 + (①_y \div 100))$, where y is the year 2015 or later, and $y-1$ is the immediately preceding year.

2.18 Values in Column ④ are currently fixed at 1.0000 (*see Para. 2.22 overleaf*).

2.19 Finally, in Column ⑤ the value for 2014 is simply the annual GDPI for 2010 (*i.e. 100.00*) divided by the GDPI for 2014 (*i.e. 107.62*). For subsequent years from 2015, all other values in Column ⑤ are calculated as: $⑤_y = ⑤_{y-1} \div (1 + (③_y \div 100))$.

2.20 Table C.2a shows the annual Gross Domestic Product indices from 20197.

Table C.2a: Gross Domestic Product Indices (GDPIs)

Year	Gross Domestic Product Index
2019	117.58
2020	124.41
2021	124.87
2022	127.57

- 2.21 The Construction Price Growth Factor (*CPGF*) indicates the forecast change in actual construction costs relative to construction prices in 2014. The CPGF uses the HE Inflation Forecast Profile for construction costs. This inflation profile is currently set equal to the GDP Profile which measures general price inflation. In other words, it is currently assumed that there is no differential inflation between general prices and construction prices.
- 2.22 The Construction Cost Growth Factor (CCGF) also indicates the change in construction costs relative to 2014, but net of general price inflation. It therefore describes future construction inflation over and above (or below) general price inflation (what is sometimes referred to as the price change in ‘real terms’). Since the current assumption is for no differential inflation between construction prices and general prices, the CCGF is set to 1.0 in all years. It should be noted that, because changes in general price inflation are used to convert works costs from one price year to another, multiplying a works cost estimate by the CCGF gives a future construction cost in the same price base year as the original estimate
- 2.23 Table C.3a contains the social discount factors used on the **Costs 3** worksheet to discount the PVC from the Construction Year (*i.e. the year of spend*) to the DfT’s present value year of 2010. The factors have been calculated based upon the recommended Treasury discount rate of 3.5% per year. The discount factors are applied to implementation costs and any additional maintenance / renewal costs.
- 2.24 Table C.3b contains the capitalisation factors used to calculate the additional maintenance and renewal costs incurred over the whole life of the scheme. The capitalisation factors assume that the real cost of maintenance increases each year in line with projected growth in GDP. Discounting is included within the factors and all future-year costs are discounted to the Opening Year at 3.5% per year. Note that SAR will use interpolation and extrapolation to obtain capitalisation factors for Assessment Periods not explicitly given in the table.

Table C.3b

**Capitalisation Factors for Maintenance Costs
based on a 3.5% Discount Rate**

**Table C.3a
Discount Factors**

Construction / Opening Year	Discount Factor
2010	1.000
2011	0.966
2012	0.934
2013	0.902
2014	0.871
2015	0.842
2016	0.814
2017	0.786
2018	0.759
2019	0.734
2020	0.709
2021	0.685
2022	0.662
2023	0.639
2024	0.618
2025	0.597
2026	0.577
2027	0.557
2028	0.538
2029	0.520
2030	0.503
2031	0.486

Capitalisation Factors for Assessment Periods				
5 yrs	10 yrs	20 yrs	30 yrs	60 yrs
4.9	9.4	17.3	23.8	38.1

(N.B. For all Opening Years)

3. The 'Public Accounts' Worksheet

- 3.1 All calculations on the **Public Accounts** worksheet are completed automatically, with the Local Government Funding and Central Government Funding items all being filled in by SAR using information from the **Costs Master** worksheet and the hidden **Costs 3** worksheet.

LOCAL GOVERNMENT FUNDING

- 3.2 "Investment costs" (*Item (a)*) refers to any local authority expenditure on the scheme. This value is taken from Part C of the **Costs Master** worksheet and then converted to 2010 market prices and discounted from the Construction Year to 2010.

CENTRAL GOVERNMENT FUNDING: TRANSPORT

- 3.3 "Operating costs" (*Item (b)*) refers to the difference in future maintenance costs resulting from the scheme, and is equal to Item (ad) on the **Costs 3** worksheet. It is derived from the additional annual average maintenance costs (*over the whole Assessment Period*) which is entered on the **Costs Master** worksheet in Part F. This value is capitalised over the Assessment Period and then converted to 2010 market prices and discounted from the Construction Year to 2010 to give the Operating costs (*Item (b)*).
- 3.4 "Investment costs" (*Item (c)*) refers to the cost of implementing the scheme to central government, and is equal to Item (ac) on the **Costs 3** worksheet minus any Local Government Investment costs. It is expressed in 2010 market prices, discounted from the Construction Year to 2010.
- 3.5 "Developer and other contributions" (*Item (d)*) is taken from Part D of the **Costs Master** worksheet, then converted to 2010 market prices and discounted from the Construction Year to 2010.

CENTRAL GOVERNMENT FUNDING: NON-TRANSPORT

- 3.6 "Indirect Tax Revenues" (*Item (f)*) is taken from the value entered on the **TEE** worksheet, which should be in 2010 market prices, discounted to 2010. Indirect Tax Revenues are now treated as a benefit or disbenefit rather than a cost and are entered into the **TEE** worksheet as positive for an increase in revenues and negative for a decrease in revenues (*the reverse of the practice when revenues were previously treated as a cost*).
- 3.7 Since Public Accounts is concerned with costs to the public accounts, additional costs are presented as positive numbers and reduced costs as negative numbers. An increase in revenues therefore represents a negative cost to government, whereas a decrease in revenue is a positive cost. This means that SAR will reverse the sign of the value of Indirect Tax Revenues when copying it from the **TEE** worksheet. It should be noted that the **TEE** worksheet only appears in a Standard SAR; there is no facility to enter Indirect Tax Revenues on the **Foundation Economics** worksheet of a Foundation SAR.

4. The ‘TEE’ Worksheet

- 4.1 Transport Economic Efficiency (*TEE*) benefits may be calculated either “Manually”, or by TUBA or COBA. If TUBA or COBA has been used, then the appropriate radio button at the top of the **TEE** worksheet should be clicked and the worksheet will then be re-configured accordingly. If TUBA or COBA has not been used, then the benefits are regarded as being calculated “Manually” and this radio button should be clicked instead. In this case, the user can opt to complete the supplementary **TEE JT** and **TEE VOC** worksheets (*see Chapters 5 and 6*) so that SAR can assist in calculating the journey-time and vehicle operating cost benefits for insertion into the **TEE** worksheet.
- 4.2 The journey-time and vehicle operating cost benefits incurred during construction and maintenance will normally only be available if a QUADRO analysis has been undertaken. However, if the Manual option is selected for the **TEE** worksheet, then the user must input the total QUADRO benefits for all trip purposes combined. SAR will calculate the split by trip purpose internally, as indeed it does for benefits during normal operation.
- 4.3 As far as LNMS are concerned, “Private Sector Provider Impacts” refers to the operating costs of buses and coaches. This value is only available from TUBA and COBA.
- 4.4 Any contribution to the scheme cost to be provided by a developer will be included under “Other Business Impacts” automatically, drawn from Item (d) on the **Public Accounts** worksheet.
- 4.5 In all configurations of the **TEE** worksheet (*TUBA, COBA, Manual*) there is a box for entering MyRIAD incident delay benefits, located in the INCIDENTS section, immediately preceding the TOTAL section in each configuration. The value entered from the MyRIAD output must exclude TTV (*Travel Time Variability*) benefits. The split of the benefits by trip purpose is calculated internally within SAR in all configurations since MyRIAD does not provide such a split.
- 4.6 All configurations of the **TEE** worksheet (*TUBA, COBA, Manual*) contain a box for entering the change in Indirect Tax Revenues arising as a consequence of the scheme. In practice, however, it will usually be the case that this information is only available where COBA and TUBA have been used. Values should be taken from the TEE table within the TUBA or COBA output and should be positive for an increase in revenues and negative for a decrease in revenues. If the values are instead taken from the Public Accounts table of the TUBA or COBA output, the sign will need to be reversed. Any changes in revenue arising from roadworks during construction and maintenance should be added to the TUBA or COBA values; such a value will usually only be available if QUADRO has been used. Finally, any change in tax revenues arising as a result of a change in incident delays should also be added; this value is not output by MyRIAD and will need to be calculated manually.
- 4.7 The value of total Indirect Tax Revenues will be transferred to the **Public Accounts** and **AST** worksheets. It should be noted that the sign of the value is reversed in the **Public Accounts** worksheet *i.e.* an increase in revenues is a negative cost to the wider public finances and vice versa.

5. The ‘TEE JT’ Worksheet

5.1 The **TEE JT** worksheet enables estimates of the average journey-time savings per vehicle in each time period of the week to be recorded; these are then converted into the monetised journey-time benefits over the whole Assessment Period for automatic insertion into the **TEE** worksheet. It becomes available – as does the **TEE VOC** worksheet – if the user opts for the Manual layout option on the **TEE** worksheet itself, and then answers “Yes” to the question as to whether to use VOT / VOC worksheets.

5.2 The **TEE JT** worksheet requires users to enter journey-time savings for up to six separate time periods of the week: AM Peak Weekday, Inter-Peak Weekday, PM Peak Weekday, Nights 19:00–07:00, Saturday 07:00–19:00, and Sunday 07:00–19:00. Hourly flows within these time periods are likely to be similar enough for a single hour to be modelled which is representative of the period as a whole (*or, to be more precise, representative of that part of the time period when the scheme affects journey times*).

5.3 Three data-entry boxes are provided for each time period and are labelled “Average hourly flow in period”, “Time saved / veh in period” and “Hours / day when savings occur”. The user is required to complete all three boxes for a given time period or an “inc” flag will appear. If there are no journey-time savings in any of the periods, then all three boxes associated with that time period should be left blank.

5.4 In situations where more than one traffic movement contributes to journey-time savings, then the total flow across all movements which receive a benefit should be summed and then divided by the number of hours during which a benefit is received; this gives the “Average hourly flow in period” value (*i.e. the period when benefits occur*). For example, if Movement A has a flow of 1000 vehicles per hour and receives a benefit during two hours of the AM Peak, and Movement B has a flow of 500 vehicles per hr and also receives a benefit during two hours of the AM Peak, then the “Average hourly flow in period” (*which receives a benefit*) value for the AM Peak is $(1000 + 1000 + 500 + 500) \div 2 = 1500$. If the time saved by Movement A is 1 minute per vehicle, and the time saved by Movement B is 0.5 minutes per vehicle, then the “Time saved / veh in period” value is given by :-

$$(((1000 + 1000) \times 1) + ((500 + 500) \times 0.5)) \div (1000 + 1000 + 500 + 500) = 0.83 \text{ minutes}$$

Finally, the value “Hrs / day when savings occur” is equal to 2 hours. It should be noted that increases in journey times should be treated as negative values in the calculations.

5.5 Data entered in each time period will be combined as follows to make up an average year :-

- ◆ AM, PM, and Inter-Peak values will be factored by 260 (= 5 days x 52 weeks).
- ◆ Saturday values will be factored by 52 (= 1 day x 52 weeks).
- ◆ Sunday values will be factored by 52 (= 1 day x 52 weeks).
- ◆ Nights data will be factored by 364 (= 7 days x 52 weeks) .

- 5.6 Note that, unlike earlier versions of SAR, there is no longer an absolute requirement to fill in at least the first four columns; the “Assessed days per year” box (*Item (a)*) will reflect the total of all the above factors that apply, up to a maximum of 364 days.
- 5.7 The “Average flow per day which receives a journey-time benefit” value (*Item (b)*) is calculated as follows :-
- ◆ For each time period completed, the “Average hourly flow in period” and “Hrs / day when savings occur” values are separately multiplied together.
 - ◆ The products for the first three time periods (*if any*) are summed and the total multiplied by 260.
 - ◆ The Nights product (*if any*) is factored by 364 if it is the only time period for which data has been entered, otherwise it is factored by the sum of the appropriate factors for all other time periods for which data has been entered, and then added to the previous result.
 - ◆ The Saturday and / or Sunday products (*if any*) are separately multiplied by 52 and then added to the previous result for the first four time periods.
 - ◆ The final value is then divided by the “Assessed days per year” value (*Item (a)*). Depending on the particular combination of time periods for which data has been entered, the “Assessed days per year” value could be any one of the following :-
 - 52 – Saturday or Sunday only (*without Nights*)
 - 104 – Saturday and Sunday only (*without Nights*)
 - 260 – AM and / or PM and / or Inter-Peak only (*without Nights*)
 - 312 – AM and / or PM and / or Inter-Peak plus Saturday or Sunday only (*without Nights*)
 - 364 – all time periods without Nights, or any time period with Nights
- 5.8 Similarly, the “Average journey-time benefit per vehicle per day” value (*Item (c)*) is calculated as follows :-
- ◆ For each time period completed, all three values entered (*i.e. the “Average hourly flow in period”, “Time saved / veh in period”, and “Hrs / day when savings occur” values*) are separately multiplied together.
 - ◆ The products for the first three time periods (*if any*) are summed and the total multiplied by 260.
 - ◆ The Nights product (*if any*) is factored by 364 if it is the only time period for which data has been entered, otherwise it is factored by the sum of the appropriate factors for all other time periods for which data has been entered, and then added to the previous result.
 - ◆ The Saturday and / or Sunday products (*if any*) are separately multiplied by 52 and then added to the previous result for the first four time periods.
 - ◆ The final value is then divided by the “Assessed days per year” value (*Item (a)*) multiplied by *Item (b)* as described in Para. 5.7 above.
- 5.9 The “Total time saved in Opening Year” value (*Item (d)*), is therefore calculated simply by multiplying *Items (a)*, *(b)*, and *(c)* together, then dividing by 60 to give a result in hours rather than minutes.

- 5.10 The rest of the **TEE JT** worksheet is completed automatically. “Total time saved in Opening Year” value (*Item (d)*) is multiplied by the “Unit time value in Opening Year” value (*Item (e)*) from Table C.6 (*see below*) to give the “Total value of journey-time benefits in Opening Year” value (*Item (f)*).
- 5.11 Users may prefer to calculate the Opening Year journey-time benefits externally to SAR. If so, there is a facility to enter a “Total value of journey-time benefits in Opening Year” value (*Item (f)*) directly into the additional box provided. It should be noted that this additional box is greyed out if any data has already been entered in the time-period-specific boxes.
- 5.12 When calculating *Item (f)* manually, it will normally suffice to use the values of time contained within SAR which are based upon an average mix of vehicles for trunk roads. If the local mix of traffic differs significantly from this average, then the value of time appropriate to the local traffic mix can be substituted after discussion with the ACO. Table C.7 below gives the average vehicle mix used to compile the values of time in SAR which are set out in Table C.6 (2010 = 1189p / hr) :-

Table C.6: VOT and Growth in VOT (Market Prices)

Opening Year	Value of time per average vehicle in pence per hour (2010 prices)
2018	1299
2019	1307
2020	1316
2021	1335
2022	1355
2023	1376
2024	1396
2025	1417
2026	1439
2027	1460
2028	1482
2029	1504
2030	1527

Table C.7: Assumed Vehicle Mix in the Calculation of Average Vehicle Time Costs

Vehicle Type	Average All Roads Traffic Mix (%)
Cars	77.5
LGV	10.8
OGV1	4.0
OGV2	7.2
PSV	0.5

5.13 The “Journey-Time benefits over Assessment Period discounted to Opening Year” value (*Item (h)*) is calculated by multiplying *Item (f)* above by the “Capitalisation factor” (*Item (g)*) taken from Table C.8 (*see below*). Capitalisation factors are calculated by SAR using the Assessment Period and percentage traffic growth over that period as entered by the user on the **Scheme Details** and **Traffic & Accidents** worksheets respectively. Table C.8 below shows the capitalisation factors for different Assessment Periods for both zero traffic growth and RTF18 traffic growth. Note that SAR will use interpolation and extrapolation to obtain capitalisation factors for years and Assessment Periods not explicitly given in the table :-

Table C.8: Factors to capitalise Opening Year journey-time benefits over 5, 10, 20, 30, and 60 years

Assessment Period	0% growth Capitalisation factor	RTF18 Growth Capitalisation factor	RTF18 Growth As Factor From Opening
5 years	4.810	4.901	1.010
10 years	9.174	9.561	1.057
20 years	16.721	18.192	1.161
30 years	22.939	25.778	1.235
60 years	36.753	42.843	1.235

5.14 Finally, the “Journey-Time benefits over Assessment Period discounted to Opening Year” value (*Item (h)*) is discounted to a 2010 base year using the “Discount factor from Opening Year to 2010” value from Table C.3 (*Item (i)*) to give the “Journey-Time benefits over Assessment Period discounted To 2010” value (*Item (j)*), in 2010 market prices discounted to 2010.

5.15 The capitalisation factors for RTF18 growth in Table C.8 are calculated using the forecast percentage traffic growth from the National Transport Model between an assumed Opening Year of 2022 and the end of each Assessment Period quoted in the table. The forecasts used are reported in Scenario 1 of the Road Traffic Forecasts 2018, and the growth factors used in Table C.8 relate to all vehicle growth on the various road types for England as a whole (*see Table 1 of the Scenario 1 forecasts*). It should be noted that the NTM forecasts presently go up to 2050 (30 years after opening). The capitalisation factors assume zero growth thereafter.

5.16 RTF18 growth may or may not be appropriate when estimating the percentage traffic growth over the Assessment Period for inclusion on the **Scheme Details** worksheet. Its use in Table C.8 does not imply that scheme traffic growth should be based upon RTF18; in actual fact, Table C.8 could be calculated for any growth factor. The growth factor merely enables SAR to calculate, for each Assessment Period, the change in the capitalisation factor per percentage change in traffic growth. This is then multiplied by the percentage traffic growth on the **Scheme Details** worksheet, and the result added to the 0% growth capitalisation factor. In other words, therefore, it facilitates linear interpolation and extrapolation by defining the gradient of the relationship between capitalisation factor and percentage traffic growth.

6. The ‘TEE VOC’ Worksheet

- 6.1 For most small schemes the change in vehicle operating costs will be small, and thus can be ignored. However, if the scheme significantly changes the total vehicle-kilometres travelled on the network due to reassignment, then it may be necessary to calculate the change in vehicle operating costs. If a TUBA or COBA has been run then the Vehicle Operating Cost Benefits / Disbenefits can be taken directly from the output and input into the **TEE** worksheet. If not, the **TEE VOC** worksheet can be used. Note that changes in VOC are often disbenefits that should be treated as negative benefits in the worksheets.
- 6.2 The **TEE VOC** worksheet requires users to enter the annual vehicle-km travelled and average speed values in the Opening Year for both the Without-Scheme and With-Scheme scenarios for up to six separate time periods of the week: AM Peak Weekday, Inter-Peak Weekday, PM Peak Weekday, Nights 19:00–07:00, Saturday 07:00–19:00, and Sunday 07:00–19:00. Hourly flows within these time periods are likely to be similar enough for a single hour to be modelled which is representative of the period as a whole (*or, to be more precise, representative of that part of the time period when the scheme affects vehicle operating costs*).
- 6.3 Two data-entry boxes are provided for each time period, labelled “Annual veh-km” and “Average speed”. The user is required to complete both boxes for a given time period or an “inc” flag will appear. If there is no change in annual veh-km in any of the periods, then both boxes associated with that time period should be left blank.
- 6.4 The “Annual veh-km” entered into the worksheet should be the distance travelled in the Opening Year by reassigned traffic for the time period concerned; in other words, the total of the distances travelled by individual vehicles. This will require the user to calculate externally the distance travelled in that time period multiplied by the number of such time periods per year. Assuming the reassignment effects are limited to a single reassignment from one route to another, the annual veh-km should relate to the section of route (*one or more roads*) from which traffic diverts in the Without-Scheme scenario, and to the section of route to which traffic reassigns in the With-Scheme scenario.
- 6.5 The “Average speed” entered into the worksheet should be the average speed in the Opening Year of all reassigned traffic for the time period concerned. Assuming this involves a single reassignment from one route to another, the average speed of traffic should relate to the section of route (*one or more roads*) from which traffic diverts in the Without-Scheme scenario, and the section of route to which traffic reassigns in the With-Scheme scenario. If multiple reassignments are involved, then a flow-weighted average speed could be used, but it is likely in such cases that the user will be using a congested assignment model and / or TUBA / COBA. Once the average speed has been entered, SAR will insert the average cost per vehicle-km for the specified speed into the worksheet using the values shown in Table C.9. For speeds in between those shown in the table, SAR will use linear interpolation.

Table C.9: Market Price Vehicle Operating Costs (in 2010 prices at year 2010 values) for trunk road average traffic mix

Speed (km/h)	Pence per km (All vehicles)
30	30.20
40	27.01
50	25.00
60	23.71
70	22.97
74	22.80
80	22.68
90	22.79
100	23.27
110	24.10

- 6.6 The Without-Scheme and With-Scheme “VOC in Opening Year” values (*Items (a) and (b)*) are calculated by first multiplying the “Annual veh-km” value by the cost per veh-km from Table C.9 for each time period. The products for each time period are then summed, and the total divided by 100 to give the Annual VOC’s in £s. The “VOC benefits in Opening Year” value (*Item (c)*) is then calculated as the Without-Scheme “VOC in Opening Year” value (*Item (a)*) minus the With-Scheme “VOC in Opening Year” value (*Item (b)*).
- 6.7 The “VOC benefits over Assessment Period discounted to Opening Year” value (*Item (e)*) is calculated by multiplying the “VOC benefits in Opening Year” value (*Item (c)*) by the “Capitalisation factor” from Table C.10 (*Item (d)*) using the Assessment Period and percentage traffic growth over that period as entered by the user on the **Scheme Details** and **Traffic & Accidents** worksheets respectively. Table C.10 below shows the capitalisation factors for different Assessment Periods for both zero traffic growth and RTF18 traffic growth. Note that SAR will use interpolation and extrapolation to obtain capitalisation factors for years and Assessment Periods not explicitly given in the table :-

Table C.10: Factors to Capitalise First Year VOC Benefits over 5, 10, 20, 30, 60 years.

Assessment Period	0% growth Capitalisation factor	RTF18 Growth Capitalisation factor	RTF18 Growth As Factor From Opening
5 years	4.602	4.688	1.010
10 years	8.302	8.637	1.057
20 years	13.667	14.763	1.161
30 years	17.369	19.277	1.235
60 years	23.300	26.604	1.235

- 6.8 Finally, SAR will calculate the “VOC benefits over Assessment Period discounted to 2010” value (*Item (g)*) using the “Discount factor from Opening Year to 2010” value (*Item (f)*) from Table C.3 to give the discounted benefits in 2010 market prices discounted to 2010.

7. The ‘Accidents’ Worksheet

PART A

- 7.1 In Part A, the user needs to enter the “Predicted number of personal injury accidents saved in Opening Year” value, in addition to specifying the time of day when the accident savings will be accrued (*All Day or Night Time Only*). The predicted estimate should be based upon a detailed examination of the accident history, in which the user has exercised sound and conservative engineering judgement to decide which accidents in the study period would not have occurred had the proposed scheme been in place. SAR will then automatically complete the relevant fields of the table in Part A.
- 7.2 To calculate the “Annual accident benefits in Opening Year” value (*Item (c)*), the “Number of Personal Injury Accidents (PIAs) saved in Opening Year” value (*Item (a)*) is multiplied by the “Average cost of an accident in Opening Year” value (*Item (b)*). Item (b) is taken from Table C.4 / C.4a (see below) for the Opening Year, Road Type and Speed Limit as entered by the user on the **Scheme Details** and **Traffic & Accidents** worksheets, as well as the specified “Time of day of accident savings” option. (*Note that, for a junction improvement, the Road Type specified should be that with the highest accident savings.*) Tables C.4 and C.4a are derived from the [WebTAG Data Book](#).
- 7.3 For road lighting schemes, including provision of reflectors or additional road studs, the Night-Time average cost per PIA in the Opening Year for the appropriate Road Type and Speed Limit is taken from Table C.4a (see below) instead of using the All-Day values from Table C.4. The SAR process forms the basis and / or justification for a) provision of new lighting, or b) removing lighting schemes at the end of their life (*where the cost-benefit appraisal demonstrates that replacement cannot be justified*). TA501 provides advice on the assessment of both new and replacement lighting schemes.

Table C.4: All-Day National Average Values of Accidents (2010 market prices)

Opening Year	All Purpose Roads (40mph or less)		All Purpose Roads (50mph or more)		Motorways
	Single	Dual	Single	Dual	
2018	96,405	96,223	150,781	116,341	105,772
2019	96,205	96,306	149,327	115,594	105,010
2020	96,492	96,595	149,780	115,943	105,316
2021	97,209	97,308	150,433	116,536	105,923
2022	97,937	98,031	151,096	117,138	106,539
2023	98,675	98,764	151,768	117,748	107,165
2024	99,425	99,509	152,451	118,368	107,799
2025	100,186	100,265	153,144	118,996	108,444
2026	100,958	101,032	153,847	119,635	109,097
2027	101,742	101,811	154,560	120,282	109,761
2028	102,538	102,601	155,284	120,940	110,434
2029	103,345	103,403	156,019	121,607	111,118
2030	104,165	104,217	156,765	122,284	111,812

Table C.4a: Night-Time National Average Values of Accidents (2010 market prices)

Opening Year	All Purpose Roads (40mph or less)		All Purpose Roads (50mph or more)		Motorways
	Single	Dual	Single	Dual	
2018	112,993	112,779	173,780	134,086	135,298
2019	112,759	112,878	172,104	133,225	134,323
2020	113,095	113,216	172,626	133,628	134,715
2021	113,935	114,051	173,379	134,311	135,492
2022	114,788	114,899	174,143	135,005	136,280
2023	115,654	115,758	174,918	135,708	137,080
2024	116,533	116,631	175,704	136,422	137,892
2025	117,425	117,517	176,503	137,147	138,716
2026	118,330	118,416	177,313	137,883	139,552
2027	119,249	119,329	178,135	138,629	140,401
2028	120,181	120,255	178,970	139,387	141,263
2029	121,128	121,195	179,817	140,156	142,137
2030	122,088	122,150	180,677	140,936	143,024

- 7.4 The “Accident benefits over Assessment Period discounted to Opening Year” value (*Item (e)*) is calculated by multiplying *Item (c)* above by the “Capitalisation factor” (*Item (d)*) taken from the Accident Benefits section of Table C.5 (*see below*). Capitalisation factors are calculated for the Road Type, Road Width, Assessment Period and percentage Traffic Growth over that period as entered by the user on the **Scheme Details** and **Traffic & Accidents** worksheets. SAR assumes that roads with a speed limit of 50mph or more are Rural, and those with a speed limit of 40mph or less are Urban. Note that SAR will use interpolation and extrapolation to obtain capitalisation factors for years and Assessment Periods not explicitly given in the table.
- 7.5 The “Accident benefits over Assessment Period discounted to Opening Year” value (*Item (e)*) is discounted to a 2010 base using the “Discount factor from Opening Year to 2010” value (*Item (f)*) from Table C.3a to give the “Accident benefits over Assessment Period discounted to 2010” value (*Item (g)*), in 2010 market prices discounted to 2010.
- 7.6 The “Number of accidents saved over Assessment Period” value (*Item (i)*) is calculated by multiplying the “Number of Personal Injury Accidents (PIAs) saved in Opening Year” value (*Item (a)*) by the appropriate “Capitalisation factor” (*Item (h)*) taken from the Accident Numbers section of Table C.5 (*see below*). These capitalisation factors are also calculated for the Road Type, Road Width, Assessment Period and percentage Traffic Growth over that period as entered by the user on the **Scheme Details** and **Traffic & Accidents** worksheets, SAR assumes that roads with a speed limit of 50mph or more are Rural and those with a speed limit of 40mph or less are Urban. Note that SAR will use interpolation and extrapolation to obtain capitalisation factors for years and Assessment Periods not explicitly given in the table.

Table C.5: Factors to estimate 5, 10, 20, 30 or 60 year accident totals by Road Type

1. Accident Benefits

For Motorways

Assessment Period	0% growth Capitalisation factor	RTF18 Growth Capitalisation factor	RTF18 Growth As Factor From Opening
5 years	4.634	4.724	1.011
10 years	8.535	8.904	1.060
20 years	14.966	16.303	1.168
30 years	20.341	22.907	1.244
60 years	32.573	38.127	1.244

For Rural Single

Assessment Period	0% growth Capitalisation factor	RTF18 Growth Capitalisation factor	RTF18 Growth As Factor From Opening
5 years	4.633	4.719	1.010
10 years	8.534	8.884	1.057
20 years	14.972	16.245	1.161
30 years	20.370	22.831	1.235
60 years	32.726	38.095	1.235

For Rural Dual

Assessment Period	0% growth Capitalisation factor	RTF18 Growth Capitalisation factor	RTF18 Growth As Factor From Opening
5 years	4.631	4.717	1.010
10 years	8.527	8.877	1.057
20 years	14.947	16.216	1.161
30 years	20.319	22.772	1.235
60 years	32.582	37.920	1.235

For Urban Single

Assessment Period	0% growth Capitalisation factor	RTF18 Growth Capitalisation factor	RTF18 Growth As Factor From Opening
5 years	4.644	4.730	1.010
10 years	8.569	8.922	1.057
20 years	14.050	16.330	1.161
30 years	20.448	22.916	1.235
60 years	32.651	37.992	1.235

For Urban Dual

Assessment Period	0% growth Capitalisation factor	RTF18 Growth Capitalisation factor	RTF18 Growth As Factor From Opening
5 years	4.644	4.730	1.010
10 years	8.570	8.923	1.057
20 years	15.053	16.334	1.161
30 years	20.454	22.923	1.235
60 years	32.667	38.011	1.235

2. Accident Numbers

For Motorways

Assessment Period	0% growth Capitalisation factor	RTF18 Growth Capitalisation factor	RTF18 Growth As Factor From Opening
5 years	4.785	4.880	1.011
10 years	9.161	9.570	1.060
20 years	17.307	18.952	1.168
30 years	25.318	28.801	1.244
60 years	49.349	58.702	1.244

For Rural Single and Dual

Assessment Period	0% growth Capitalisation factor	RTF18 Growth Capitalisation factor	RTF18 Growth As Factor From Opening
5 years	4.780	4.870	1.010
10 years	9.143	9.531	1.057
20 years	17.251	18.810	1.161
30 years	25.221	28.539	1.235
60 years	49.130	57.076	1.235

For Urban Single and Dual

Assessment Period	0% growth Capitalisation factor	RTF18 Growth Capitalisation factor	RTF18 Growth As Factor From Opening
5 years	4.799	4.890	1.010
10 years	9.216	9.608	1.057
20 years	17.477	19.063	1.161
30 years	25.611	28.992	1.235
60 years	50.011	59.136	1.235

- 7.7 The capitalisation factors for RTF18 growth are calculated using the forecast percentage traffic growth from the National Transport Model between an assumed Opening Year of 2021 and the end of each Assessment Period quoted in the tables. The NTM forecasts used are reported in Scenario 1 of the Road Traffic Forecasts 2018 and the growth factors used in Table C.8 relate to all vehicle growth on the various road types for England as a whole (see *Table 1 of the Scenario 1 forecasts*). It should be noted that the NTM forecasts presently go up to 2050 (30 years after opening). The capitalisation factors assume zero growth thereafter.
- 7.8 RTF18 growth may or may not be appropriate when estimating the percentage traffic growth over the Assessment Period for inclusion on the Scheme Details worksheet. Its use in Table 5 does not imply that scheme traffic growth should be based upon RTF18; in actual fact, Table C.5 could be calculated for any growth factor. The growth factor merely enables SAR to calculate, for each Assessment Period, the change in the capitalisation factor per percentage change in traffic growth. This is then multiplied by the percentage traffic growth on the **Scheme Details** page and the result added to the 0% growth capitalisation factor; In other words, therefore, it facilitates linear interpolation and extrapolation by defining the gradient of the relationship between capitalisation factor and percentage traffic growth.

PART B

- 7.9 If a COBA analysis has been undertaken, then the relevant figures should be extracted from the COBA output and inserted into the relevant sections of the table in Part B of the worksheet after clicking the “Yes” button. The sections on construction and maintenance can only be completed if QUADRO analyses have been undertaken.
- 7.10 If a COBA analysis has not been undertaken, the results from Part A will automatically be entered by SAR into the relevant sections of the table in Part B. The value of benefits is taken from Part A Item (g), and the number of PIAs from Part A Item (i). In addition, the user can manually enter the number of PIAs saved and the accident benefits during construction and maintenance from QUADRO analyses. It is not however possible to enter the number of casualties saved during construction and maintenance.
- 7.11 If the scheme is expected to reduce the Severity Index (*the ratio of Fatal plus Serious accidents to total accidents*) significantly, then it may be appropriate to model the benefits of this within COBA using a local severity split. However, in accordance with the COBA manual, such modelling must not be undertaken without the prior agreement of the overseeing organisation. In particular, it will be necessary to obtain prior approval of the TPG ACO to the principle of modelling changes in severity and also the specific COBA methodology proposed.

8. The ‘VM Non-WebTAG’ Worksheet

8.1 The **VM Non-WebTAG** worksheet is used to record information relating to the impact of the scheme in terms of two distinct non-WebTAG impacts which are of particular importance to National Highways: Roadworker Safety and Disabled Users (*in the context of the Equality Act*). Non-WebTAG impacts can be relevant to all Scheme Categories *i.e.* WebTAG Appraisable schemes (*Economy, Environment, Safety and Severance*), WebTAG Non-Appraisable schemes, and Non-WebTAG schemes. Note that Non-WebTAG Schemes are those developed solely to improve Roadworker Safety and / or achieve compliance with the Equality Act.

PART A: ROADWORKER SAFETY

8.2 For Roadworker Safety, the user enters the number of person-hours of risk exposure at the three risk levels of High, Medium, and Low, for each of the Without-Scheme and With-Scheme scenarios. SAR then automatically calculates the change in risk exposure, and thereby a weighted total as the Assessment Score. If this Assessment Score is non-zero, an explanation must also be entered into the large box below the risk table.

8.3 SAR calculates the value in the “VM Points” box automatically. SAR does this by first converting the Assessment Score into a notional PVB, and then dividing that by the PVC to obtain a notional BCR. Finally the VM points are calculated as follows:

$$\text{VM Points} = \text{BCR} \div 3$$

PART B: DISABLED USERS

8.4 For Disabled Users, the user specifies the appropriate Assessment Score from the drop-down list provided. However, advice on choosing the correct Assessment Score is available by clicking the [Assessment Score Definitions] button, which causes an informative pop-up message to appear. If a non-Neutral Assessment Score is chosen, an explanation must also be entered into the large box.

8.5 SAR calculates the value in the “VM Points” box automatically. This is a fixed number of points depending upon the Assessment Score.

PART C: FINAL VM SCORE

8.6 In the case of WebTAG Appraisable and WebTAG Non-Appraisable schemes, the VM Points awarded for any Non-WebTAG impacts will be added to the points awarded for the WebTAG impacts. This is done by transferring the points for the Non-WebTAG impacts to either the **VM Appraisable** or **VM Non-Appraisable** worksheets where the points for both types of impact are totalled to produce a VM score, and thus no Part C is necessary.

8.7 For Non-WebTAG schemes, however, there are no WebTAG impacts. Consequently, the VM score table appears instead in a dedicated Part C on the **VM Non-WebTAG** worksheet itself as the sum of the VM points for the Non-WebTAG impacts. If the total VM points exceeds 10, then the VM points for each impact are reduced *pro rata* so that the score equals 10: the maximum VM score is thus 10.

9. The ‘VM Appraisable’ Worksheet

- 9.1 The **VM Appraisable** worksheet provides the VM score for all WebTAG Appraisable schemes *i.e.* those with WebTAG appraisable impacts (*including those which also have Non-WebTAG impacts*). In particular, the worksheet shows the VM points for each appraisable WebTAG impact and each Non-WebTAG impact (*if any*) listed in the same order as the impacts appear in the **AST** worksheet. The VM points for each impact are then summed in the table at the bottom of the worksheet to give the total VM points separately for a) Monetised WebTAG Impacts, b) Unmonetised WebTAG Impacts, and c) Non-WebTAG Impacts. The total points for the three types of impact gives the overall final VM score. If the total is greater than 10, then the VM points for each individual impact are reduced *pro rata* so that the score equals 10: the maximum possible VM score is thus 10.
- 9.2 In Standard SARs, the VM points for each appraisable WebTAG impact are calculated using a real BCR for the monetised impacts, and a notional BCR for the unmonetised impacts. SAR does this by converting the Assessment Score into a notional PVB and then dividing by the PVC to obtain a notional BCR. The VM points are calculated as follows :-

$$\text{VM Points} = \text{BCR} \div 3$$

- 9.3 In Foundation SARs, the VM points for monetised impacts are calculated in the same way as described above for Standard SARs. However, in the case of most unmonetised impacts, a fixed number of VM points will be awarded instead. The number of points will depend upon whether the impact is beneficial or adverse, and also – in the case of some impacts – upon the Scheme Category and which other unmonetised impacts have been identified as being beneficial or adverse on the **Foundation Impact Assess** worksheet. Fixed VM points are used in conjunction with the following impacts: Landscape, Townscape, Heritage, Biodiversity, Water Environment, Physical Activity, Journey Quality, Security and Severance. In fact, Reliability is the only unmonetised impact considered in Foundation SARs which uses the notional BCR method used in Standard SARs.
- 9.4 The Assessment Scores and Real BCRs for each appraisable impact are shown on the worksheet. For any Non-WebTAG impacts, the Assessment Scores and VM Points are copied from the **VM Non-WebTAG** worksheet.

COSTS SUMMARY FOR SCHEME

- 9.5 The value displayed in the “Scheme Costs (*PVC*)” box is taken directly from the Broad Transport Budget box on the **Public Accounts** worksheet.

RESULTS SUMMARY FOR ALL WEBTAG SCHEME IMPACTS

- 9.6 Each value appearing in the Assessment Score column is either a numeric benefits value, expressed in pounds for monetised benefits (*PVB*), or a qualitative score (*Large Beneficial* → *Neutral* → *Large Adverse*) for unmonetised benefits, as appropriate for each impact.
- 9.7 The BCR column shows the numeric Assessment Score *PVB* value divided by the “Scheme Costs (*PVC*)” value for monetised benefits, or “Not Applicable” for unmonetised benefits.

- 9.8 The values in the VM points column are the VM points for each WebTAG impact. Calculation of the VM points is described in outline in Paras 9.2 and 9.3 above; any requests for further information should be directed to the TPG Appraisal Certifying Officer for the region concerned.
- 9.9 VM Points values for each impact are sub-totalled by impact group (*i.e. ECONOMY, ENVIRONMENT, or SOCIETY*).

RESULTS SUMMARY FOR ALL NON-WEBTAG SCHEME IMPACTS

- 9.10 For both Non-WebTAG impacts, values appearing in the Assessment Score column are taken directly from the **VM Non-WebTAG** worksheet. Both Roadworker Safety and Disabled Users impacts are unmonetised, so “Not Applicable” appears in the BCR column.
- 9.11 Values appearing in the VM Points column for each Non-WebTAG impact are the VM points taken directly from the VM Non-WebTAG worksheet. Calculation of the VM points is described in outline in Paras. 8.3 and 8.5 above; any requests for further information should be directed to the TPG Appraisal Certifying Officer for the region concerned.
- 9.12 The VM points for each Non-WebTAG impact are in turn sub-totalled.

RESULTS SUMMARY FOR ALL SCHEME IMPACTS

- 9.13 The Total PVB column contains the sum of the PVBs for the monetised WebTAG impacts. For the unmonetised WebTAG impacts and the Non-WebTAG impacts, there is no PVB and the entry is set to “Not Applicable”.
- 9.14 The Total BCR column contains the sum of the BCRs for the monetised WebTAG impacts. For the unmonetised WebTAG impacts and the Non-WebTAG impacts, there is no BCR and the entry is set to “Not Applicable”.
- 9.15 The Total VM Points column contains the sum of the VM Points values for the Monetised WebTAG impacts, the Unmonetised WebTAG impacts and the Non-WebTAG impacts. These are then summed to give the TOTAL FOR SCHEME value; this value is the VM Score for the scheme.

10. The 'VM Non-Appraisable' Worksheet

10.1 The **VM Non-Appraisable** worksheet records the VM score for all WebTAG Non-Appraisable schemes *i.e.* those with WebTAG impacts which are not appraisable (*including those which also have Non-WebTAG impacts*). The worksheet allows authorised HE staff to award VM points in respect of the Non-Appraisable WebTAG Impacts. These are then added to the VM points awarded for any Non-WebTAG impacts on the **VM Non-WebTAG** worksheet to give the Final VM Score at the bottom of the worksheet. If the total is greater than 10, then the VM points for each individual impact are reduced *pro rata* so that the score equals 10; the maximum possible VM score is thus 10.

NON-APPRAISABLE BUSINESS CASE

10.2 The supporting information for a Non-Appraisable SAR must include a short business case document. This should explain the reasons for the scheme, what the scheme involves, the scheme's costs (*which should be consistent with the SAR scheme costs*), and the benefits and disbenefits. Where the benefits or disbenefits relate to WebTAG impacts, the business case should also explain why these impacts have not been appraised. Any other important considerations should also be reported. There is no standard format for the Business Case.

10.3 The filename and date for the supporting Business Case document should be entered into the boxes provided on the worksheet, either by typing directly into the boxes or by clicking the [Browse...] button to bring up a standard Windows File Open dialogue; choosing the document file via that dialogue will then fill in the filename and date boxes automatically.

10.4 Once these two boxes are completed, the "Overall Data Entry is" indicator in the left-hand margin of each worksheet in the SAR should change to show "COMPLETE". At the same time, the data-entry boxes on the remainder of this worksheet should all turn pink. This signifies that these boxes are to be completed by authorised HE staff only. Overall data entry is therefore deemed "COMPLETE" as far as input from the supplier is concerned.

NON-APPRAISABLE CERTIFICATION

10.5 For schemes under £250K, certification that the scheme has WebTAG impacts which are non-appraisable is provided by the TPG ACO. For schemes under £250K, the certification is instead provided by the Project Manager. In both cases, the certification is recorded by selecting the appropriate certification clause from the drop-down list and then entering the name of the certifying officer and the date of certification.

10.6 The appropriate Name box (*TPG ACO or Project Manager*) and its associated Date box will be enabled in pink; the other pair of boxes will be left disabled in grey and containing the words "Not Applicable".

PROJECT MANAGER'S RECOMMENDATION

10.7 The Project Manager should click the appropriate radio-button for each Non-Appraisable WebTAG impact relevant to the scheme. Where impacts are not relevant to the scheme, the Neutral radio-button should be clicked (*as it is by default*).

- 10.8 The Project Manager should then propose an award of VM points for the Non-Appraisable WebTAG impacts by selecting a value from 0 to 10 from the drop-down list provided. The number of points proposed should be based upon the merits of the Business Case, taking account of any comments provided by the TPG ACO and / or the Regional Environmental Advisor on the **HE Approvals** worksheet.

NON-APPRAISABLE APPROVALS OFFICER'S DECISION

- 10.9 Depending on the cost of the scheme, the Non-Appraisable Approvals Officer will either be the OD Asset Development / Service Delivery Team Leader, the OD Asset Development / Service Delivery Group Manager, or the regional OD Divisional Director. The cost thresholds are indicated in this section of the **VM Non-Appraisable** worksheet.
- 10.10 The Non-Appraisable Approvals Officer will decide on the final award of VM points for the Non-Appraisable WebTAG impacts. The decision should be based upon the merits of the business case, taking account of the comments and recommendations provided by the Project Manager and TPG ACO / Regional Environmental Advisor.
- 10.11 The final award of VM Points should be made by selecting a value from 0 to 10 from the drop-down list provided. The name of the Non-Appraisable Approvals Officer must also be entered, along with the date of their decision.

FINAL VM SCORE

- 10.12 The Final VM Score is the sum of the VM points awarded for the Non-Appraisable WebTAG impacts and the Non-WebTAG impacts (*if any*). If the total is greater than 10, then the VM points for each individual impact are reduced *pro rata* so that the score equals 10: the maximum possible VM score is thus 10.
- 10.13 It should be noted that the VM points for the Non-WebTAG impacts (*if any*) are taken from the **VM Non-WebTAG** worksheet, being the sum of the VM points awarded for both the Part A: Roadworker Safety and Part B: Equality Act Compliance impacts.

11. The 'HE Approvals' Worksheet

- 11.1 The **HE Approvals** worksheet records information relating to HE procedures relevant to the approval of each SAR and its subsequent progress to the next scheme stage. In particular, the worksheet records the Appraisal Certification and the decision as to whether or not the scheme should proceed to the next stage.
- 11.2 All information required on this worksheet is to be entered by authorised HE staff only, as indicated by the pink background of the data-entry boxes, etc. It should be noted that these boxes are initially coloured grey and do not turn pink until the "Overall Data Entry is" indicator in the left-hand margin of each worksheet is showing "COMPLETE" *i.e.* the point at which the supplier has completed the extent of their input to the SAR.

APPRAISAL CERTIFICATION

- 11.3 The Appraisal Certification records that the appraisal of WebTAG impacts is compliant with WebTAG, and is required in relation to all WebTAG Appraisable schemes. Certification is not required for WebTAG Non-Appraisable and Non-WebTAG schemes as these do not have any appraisable WebTAG impacts.
- 11.4 The Appraisal Certifying Officer (ACO) will be the local TPG representative if the scheme cost is over £250K and has impacts on any of Greenhouse Gases (*carbon emissions*), Reliability, Severance, Transport Economic Efficiency (*travel times and vehicle operating costs*), and Accidents. In all other cases, the ACO will be the Project Manager. It should be noted that the certification relates to the whole appraisal, and it is therefore important that the TPG ACO has regard to the views of the Environment Group, and that a Project Manager acting as ACO has regard to the views of both TPG and the Environment Group where these have been sought.
- 11.5 Certification is provided simply by entering the name of the certifying officer and the date. SAR will determine whether the ACO should be TPG or the Project Manager. If the ACO is TPG, the name and date boxes for the Project Manager will remain greyed out with the words "Not Applicable" in them; *vice versa* if the ACO is the Project Manager.

TPG / ENVIRONMENT GROUP COMMENTS

- 11.6 TPG Group must be consulted in relation to schemes costing over £250K which have impacts on Greenhouse Gases (*carbon emissions*), Reliability, Severance, Transport Economic Efficiency (*travel times and vehicle operating costs*), and Accidents. In practice, this is only likely to involve schemes of the following Scheme Categories: Safety, Economy and Severance (*formerly Accessibility*), or Non-Appraisable. Environment Group must also be consulted on any scheme costing over £250K which has an impact on Noise, Biodiversity, Water Environment, Landscape, Heritage, Townscape and Air Quality. Such schemes are more likely to be any of the following Scheme Categories: Environment, Safety, Economy or Severance. Consultation with these two Groups is optional for schemes under £250K, but is encouraged in circumstances where the scheme appraisal is based upon modelling or other specialist appraisal techniques.

- 11.7 A drop-down list is provided which allows the user to select “Yes” or “No” in relation to having consulted with TPG / EG on the SAR. Selecting “No” in the circumstances described above where consultation is mandatory will result in an “inc” flag appearing, which in turn will prevent completion of the SAR.
- 11.8 If the user chooses “Yes”, one or both of the two large “Comments and Recommendations” boxes become enabled in pink, along with their associated “Name” and “Date” boxes. Note that the “Comments and Recommendations” boxes cannot be left blank; if there is nothing to enter, “None” must be entered. The associated “Name” and “Date” boxes must still be completed regardless.

PROJECT MANAGER’S RECOMMENDATION

- 11.9 The Project Manager should not make their recommendation as to whether or not the scheme should proceed to the next stage until after the scheme has been value-managed. Following value management, the Project Manager should click the appropriate radio button to recommend that either the scheme proceeds to the next stage, or is not to be continued. The next scheme stage is automatically entered by SAR in a box to the right of the “Proceed to the next stage” option.
- 11.10 Upon clicking a radio button, a “Reasons for Recommendation” box becomes enabled in pink, along with its associated “Name” and “Date” boxes: Note that the “Reasons for Recommendation” box cannot be left blank; if there is nothing to enter, then “None” must be entered. The associated “Name” and “Date” boxes must still be completed regardless.

MANAGER / DIRECTOR’S DECISION

- 11.11 For WebTAG Appraisable schemes, either an Asset Development or Service Delivery Team Leader in OD can decide whether the scheme should proceed to the next Scheme Stage. For WebTAG Non-Appraisable and Non-WebTAG schemes, however, the decision depends upon the cost of the scheme :-
- ◆ for schemes up to £100K the decision maker is an OD Asset Development or Service Delivery Team Leader.
 - ◆ for schemes between £100K and £500K it is the OD Asset Development / Service Delivery Group Manager.
 - ◆ for schemes over £500K, it is the OD Divisional Director.
- 11.12 The Manager / Director should click the appropriate radio button for either “Proceed to the next stage” or “Not to be continued at this time”. If the decision contradicts the Project Manager’s recommendation, then a box becomes enabled in pink headed “Reasoning if not agreeing with Project Manager”; however, if the decision is consistent with the Project Manager’s recommendation, then this box remains greyed out. In either case, the related “Name” and “Date” boxes must be completed.

SAR COMPLETION STATUS

- 11.13 A SAR is not regarded as complete until two distinct elements are themselves deemed complete. The first is the data-entry element; as noted in Para. 11.2 above, the **HE Approvals** worksheet cannot be filled in at all until that element is complete. For that reason, the “Data Entry Complete?” indicator in the SAR Completion Status table should always be showing a green tick before the user gets to the point of completing the **HE Approvals** worksheet; if a red cross is showing, then somewhere within the SAR there is a data-entry requirement still outstanding. Once this element is complete, however, the completion date will appear in the appropriate row for the current Scheme Stage under “Data Entry Completed” in the “History and Programme Dates” table on the **Scheme Details** worksheet.
- 11.14 The second element is the approvals element, which is only complete when all necessary information has been entered on the **HE Approvals** worksheet, at which point the “Approvals Complete?” indicator in the SAR Completion Status table should change to a green tick. If a red cross is showing, then somewhere on the **HE Approvals** worksheet itself (*or possibly within the pink HE-only boxes on the VM Non-Appraisable worksheet*) a data-entry requirement remains outstanding.
- 11.15 Once both individual element indicators on the SAR Completion Status table show a green tick, the final “SAR Complete?” Indicator will itself show a green tick. At that point, the SAR for this scheme at this Scheme Stage is regarded as complete, as will be confirmed by the appearance of the message "THIS SAR IS NOW COMPLETE" in green below the SAR Completion Status table; in addition, the overall completion date for the current Scheme Stage will appear in the appropriate row under “SAR Completed” in the SAR History table on the **Scheme Details** worksheet.