

## GETTING THE BEST OUT OF THE ACTIVE MODE APPRAISAL TOOLKIT (AMAT)

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### 1 SUMMARY

The Active Mode Appraisal Toolkit (AMAT) is a valuable tool for appraising some typical costs and benefits of active travel schemes. Spreadsheet-based and freely available, it is aligned with the Department for Transport's (DfT's) appraisal guidance and is widely used in appraisals and business cases for walking and cycling interventions in England.

This paper helps practitioners to get the best out of this valuable appraisal tool. It offers hints and tips, based on extensive experience, for anyone using AMAT on a project.

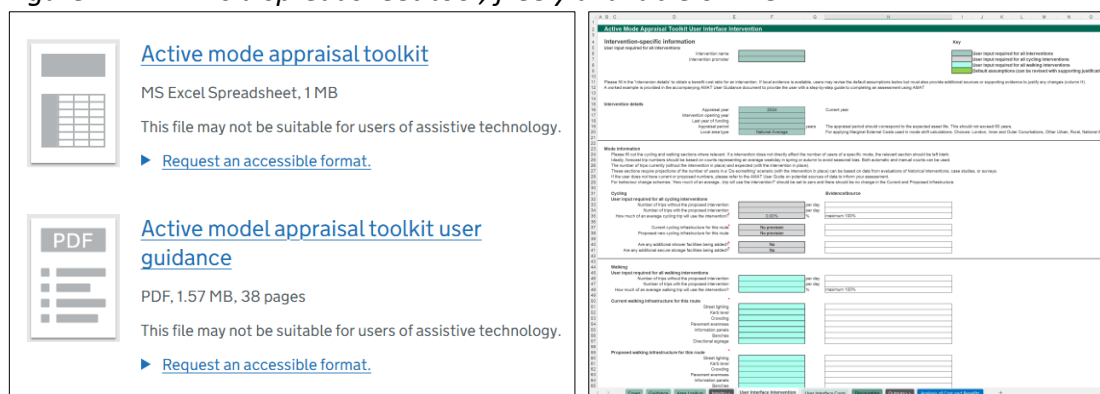
The paper briefly introduces the tool and the key points of a typical AMAT appraisal. It then focuses on the trickier inputs, the considerations around them, some tips and some pitfalls. It also covers the opportunities to adapt AMAT to complex corridors or to support analysis of broader schemes. Finally, there are pointers on interpreting AMAT results.

### 2 INTRODUCTION

The AMAT (DfT, 2024) is a spreadsheet-based tool to support appraisals of proposed walking and cycling interventions. It is suitable for not just capital investments but also behaviour change programmes.

AMAT is published by the DfT as a spreadsheet and is freely available [online](#) (Figure 1).

Figure 1: AMAT is a spreadsheet tool, freely available online



Extract from TAG webpage for downloading AMAT

Sample spreadsheet tab in AMAT

Users enter details about the proposal (such as any infrastructure changes), the existing and forecast demand, and (optionally) the costs. The tool calculates and presents a range of monetised benefits and (if costs are entered) a benefit-cost ratio (BCR). The internal calculation tabs are mostly hidden by default but can be un-hidden if required.

The benefits it considers are:

- Improvements to journey quality (ambience) for users
- Health improvements from increased levels of physical activity
- Other impacts of mode shift, such as decongestion, noise and air quality benefits

AMAT is designed to be consistent with DfT's Transport Analysis Guidance (TAG), which in turn is aligned with the Treasury's Green Book guidance on appraisal (HM Treasury, 2022). Updated versions are published periodically to keep it aligned with TAG. In particular, when parameters such as values of time are updated in the TAG Databook, the AMAT is updated to match.

The remainder of this paper sets out:

- Some available guidance (Section 3)
- A reminder of what can and can't be counted in an appraisal (Section 4)
- Some key user inputs, and considerations or tips about them (Section 5)
- Some types of benefit that AMAT doesn't cover but may be added to a scheme appraisal (Section 6)
- How AMAT can be used in more complex situations (Section 7) or to support appraisal of broader schemes (Section 8)
- Some thoughts on interpreting the results (Section 9)
- Conclusions (Section 10)

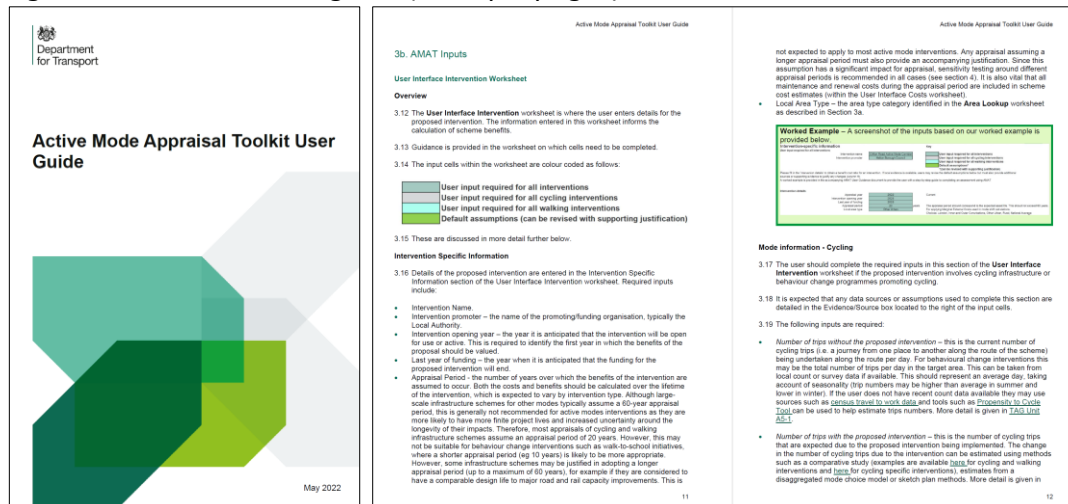
The paper represents hints and tips from practical experience. It is not a complete 'how-to' guide, nor is it a critical assessment of the pros and cons of using AMAT for any particular situation or purpose. It considers English appraisal guidance and practice, but the principles might apply anywhere that AMAT is used.

### **3 AVAILABLE GUIDANCE**

The *AMAT User Guide* (DfT, 2022a) (Figure 2) is valuable to new and experienced users alike. It provides a step-by-step run-through of the inputs, with guidance on what to do (much more detailed than in the AMAT itself) and what the tool does with them. It also has advice on sensitivity testing and the tool's limitations.

The *Active Travel Fund 4 Value for Money Guidance*, published by Active Travel England (2023), is also useful. This does not appear to have been published online, but was made available to local authorities. Although specifically intended to support ATF4 funding bids, and much of the advice specifically relates to that process, some of it could be applied to any AMAT assessment.

Figure 2: The AMAT user guide (example pages)



## 4 WHAT CAN YOU COUNT?

It's worth remembering that an AMAT assessment needs to follow basic appraisal principles. In particular:

- You are appraising the scheme on the basis of 'with it' (do-something - DS) versus 'without it' (do-minimum - DM). The only difference between the two should be the scheme and its impacts, not other schemes or policies that could be applied separately. You can, of course, test different scenarios (with or without other schemes/policies) as long as this rule is followed.
- To feed into an investment decision, you cannot include sunk costs (and their benefits) – for example if part of a scheme has already been built or committed.

Thus a key starting-point for an AMAT appraisal (like any other) is to understand:

- What's the specific investment decision to be made?
- What's already delivered or committed (and should therefore be reflected in both DM and DS)? What other policies or schemes are assumed to be in place? Do other scenarios also need testing?

## 5 SOME KEY INPUTS

This section provides some hints and tips on the trickier inputs (without trying to cover them all). It assumes a typical self-contained active travel scheme with AMAT at the core of the appraisal; subsequent sections look at more complex situations.

We start with the 'user input – intervention' tab, which covers the scheme details and some appraisal parameters. Figure 3 highlights the trickier inputs covered here.

Figure 3: The 'intervention' tab, highlighting the items covered in this paper

The screenshot shows the 'User Interface Intervention' tab in the AMAT software. It is divided into several sections: Intervention-specific information, Intervention details, Mode information, Assumptions, and Default assumptions. Yellow callout boxes highlight specific input fields:

- Appraisal period (see section 5.1):** Points to the 'Appraisal year' field, which is set to 2024.
- DM and DS demand volumes (section 5.2):** Points to the 'Evidence Source' dropdown menu.
- How much of an average trip will use the intervention (section 5.3):** Points to the 'How much of an average cycling/walking trip will use the intervention?' input fields.
- Cycling infrastructure categories (section 5.4):** Points to the 'Current walking infrastructure for this route' and 'Proposed walking infrastructure for this route' dropdown menus.
- Background growth (section 5.2):** Points to the 'Background growth rate in trips' input field.
- Days per year (annualisation factor) (section 5.5):** Points to the 'Period over which this growth rate applies' input field.

At the bottom of the interface, there are navigation buttons: Cover, Guidance, Area Lookup, Inputs >>, User Interface Intervention (selected), and User Interface Costs.

### 5.1 Appraisal period

The 'appraisal period' means how far into the future the benefits (and any ongoing costs) are calculated, starting from the opening year. This is an important input but often generates debate. Sometimes, 20 years has been seen as a default for active travel schemes, but this is not strictly in the guidance (see TAG unit A5.1 (paragraph 3.1.2) and unit A1.1 (section 2.3)) (DfT, 2022b, 2023).

The general principle is that the appraisal period corresponds to the lifetime of the intervention. For behaviour change schemes, the effects are likely to decay over time and relatively short appraisal periods are appropriate. For infrastructure schemes, this is in principle the design life of the infrastructure before major renewal is required. This is partly down to the design standard. On that basis, a 20-year appraisal period may be reasonable, but check with the design engineers as some schemes may be designed for a longer life (eg 40 years). The ATF4 guidance reflected this, recommending a 40 year period for *“high quality schemes...compliant with Manual for Streets and LTN 1/20... and built to design standards comparable to highways.”* For lower-quality schemes, it recommended a shorter appraisal period reflecting the lower expected lifespan.

It is also worth considering the overall nature of the infrastructure. If a key part of the scheme is (say) a major active travel bridge over a river or railway, this might be seen as existing indefinitely (like a road bridge would) and a longer appraisal period might be justified. Similarly, a wholly new off-road corridor might be expected to stay in place indefinitely (with routine renewals). But a low-intervention traffic-calming or carriageway reallocation scheme might not.

Do take the chance for a longer appraisal period if justified. Sensitivity testing is always a good idea.

Operation, maintenance and renewal costs need to be included on the 'cost' side of the equation (see section 5.6) for the same length of time as the benefits. Renewals should not be forgotten. For example, if a new corridor was expected to continue indefinitely but the surface, fencing, etc would need major capital renewal after (say) 30 years, then either:

- the renewal cost needs to be included in the appropriate year(s) – in effect, an assumption that it would happen, or
- the appraisal period should only go up to that point (making no assumption about renewal or closure thereafter).

## 5.2 Demand volumes

AMAT is not a demand forecasting tool. The user needs to determine and enter the opening-year DM and DS demand figures, for walking and cycling separately. A full discussion of estimating and forecasting active travel volumes is outside the scope of this paper, but the user guide and the ATF4 guidance both have useful advice.

*Do-minimum (without the intervention)*

Potential sources of DM data are:

- Counts
- the Propensity to Cycle Tool (PCT) (<https://www.pct.bike/>) (Lovelace et al, 2017; Goodman et al, 2019)
- Census travel-to-work data
- Transport model outputs

For area-wide schemes such as behaviour-change, the ATF4 guidance also offers a method based on regional active travel trip rates but this is very broad-brush.

A good set of count data is often a worthwhile (and relatively small) investment across the project team. As well as feeding into the AMAT, it can help with properly understanding the nature of the demand on the corridor, drawing out nuances that might not otherwise be immediately apparent. It might also feed into some design decisions such as cycle track widths (see, for example, Local Transport Note 1/20 (DfT, 2020)).

The DM volumes should use data from before or after the Covid-19 pandemic, not during it. The 2021 census data reflect pandemic-era changes to travel patterns that have subsequently unwound (at least in part), so should be treated with caution (see, for example, Duke-Williams (2023)). In any case, census data will usually need to be factored-up to represent all trips, not just commuting trips. Similarly the PCT covers commuting and education trips and will also need to be factored-up.

Estimated volumes might be available from an existing multi-modal transport model, particularly if AMAT is being used as part of a larger scheme's appraisal. Proceed with caution: models vary in how well they represent active travel, and indeed shorter trips generally. The model might not include intra-zonal trips, or might have a specific representation of them. If in doubt, ask the modellers.

Whatever the source, the DM should be factored-up from source year to opening year if the difference is material.

#### *Do-something (with the intervention)*

The DS differs from the DM by adding demand growth (generally mode shift) created by the scheme.

Sometimes the biggest component of the benefits is the health benefits, which (along with the mode shift impacts) only relate to the new users. The journey quality impacts (applying to new and existing users) may be minor in comparison. Hence the DS volume (or rather, the difference between DS and DM) is often critical to the calculated benefits and BCR. Yet this is the input with the most uncertainty, so sensitivity testing is crucial.

Options include:

- Assuming a percentage uplift based on typical or previous results, such as the evidence gathered to feed into the government's active travel investment models (Hopkinson et al, 2019).
- Using one of the PCT's future scenarios. This should be treated cautiously as the scenarios are about understanding propensity and broad potential, rather than forecasting the results of individual schemes.
- Using results from a mode choice model if a suitable one is available. If you have DM count data, you could use the modelled absolute or percentage

DM-to-DS uplift and apply that to the counted (not the modelled) DM flows, to get round the limited representation issue described above.

- Active Travel England produced an uplift forecasting tool (to be the default method for ATF4 applications), essentially based on the scale of the scheme as indicated by its costs.

This is a typical sort of transport planning judgment to make and, as so often, triangulating multiple methods is useful – whether it gives reassurance that the chosen answer is ‘roughly right’, or just evidence of the level of uncertainty.

Be careful applying a standard uplift to unusually high DM volumes. The latter may indicate specific flows (such as students cycling to classes) for whom the uplift may or may not be appropriate.

### *Background growth and development growth*

Both DM and DS need to have the same background/development growth assumptions (except perhaps in the rare situation where the scheme itself affects development patterns).

AMAT includes a parameter for background growth, at 0.75% per year unless you change it. Relatively small amounts of development trips could be regarded as part of the background growth and not be added in their own right.

Where stronger development growth is expected (such as on a corridor connecting an urban extension or major development sites with a city centre), you will need to consider the best (most proportionate and transparent) way of dealing with this, depending on the situation and relative timings.

In one area, development trips were treated as if they were background growth. Forecast local trip volumes were available from a strategic model (which included the developments). From these an implied annual growth rate could be calculated and used instead of the default 0.75%.

It is possible to manually over-ride the calculated growth factors for each year in the ‘discounting’ tab, to represent an uneven growth trajectory.

If using development trip figures from a transport assessment that assumes the scheme is in place, then be careful not to double-count some trips in both the development trips and the DS uplift.

### **5.3 How much of an average trip will use the intervention?**

This input exists simply to allow the length of the new infrastructure (and hence the number of minutes’ worth of ambience benefits) to be calculated. It is input separately for cycling and waking trips.

Normally this is straightforward (it’s the length of intervention divided by the average trip length). But if you change the average trip length in the assumptions at the bottom

of the sheet (or split the corridor as described below), you may need to update this input as well.

### 5.4 Cycling infrastructure categories

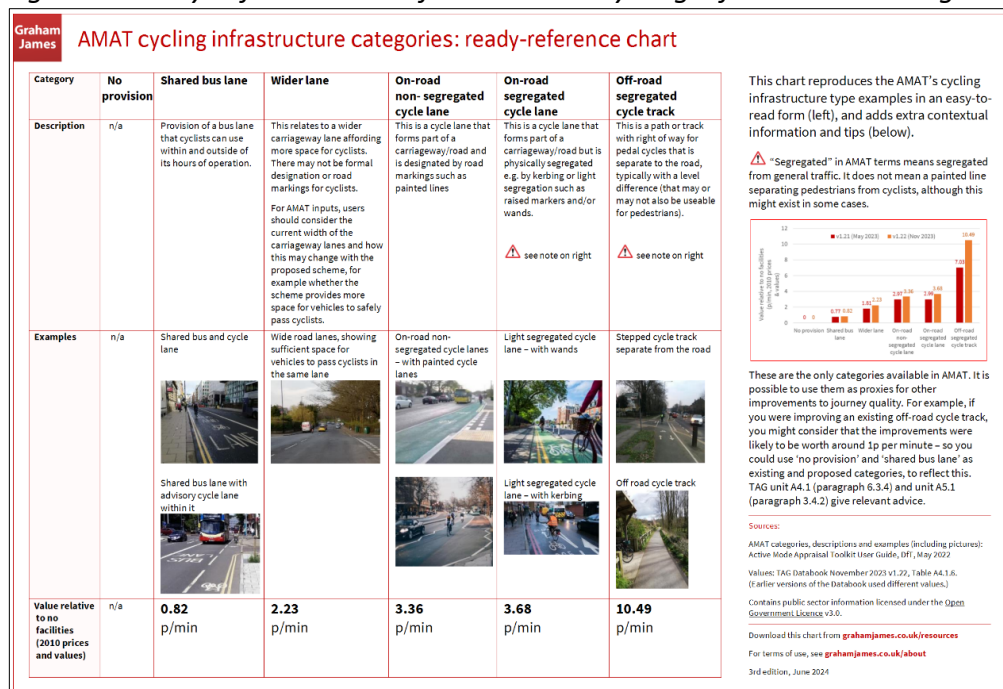
This input feeds into the journey ambience benefits by identifying what level of improvement is being made. The categories listed are a limited set and are simply those for which 'pence per minute' values are available in the TAG databook.

Annex C of the user guide offers valuable descriptions and illustrations of each category. The terms 'segregated' and 'non-segregated' here mean segregation from motor traffic – not segregation between cyclists and pedestrians. Inevitably the available categories won't always correspond exactly to real-world situations, but you can use the best approximation (see also section 7.1 about splitting into sections).

You can also use the categories as proxies for the overall level of improvement. The calculations use the difference between DM and DS categories, so you can select a pair of categories that represents roughly the right level of incremental difference. For example, if you were improving an existing off-road cycle track, you might look at the figures given and consider that the improvements were likely to be worth around 1p per minute. You could then use 'no provision' and 'shared bus lane' as existing and proposed categories to reflect this, as the difference between them is a similar amount. TAG unit A4.1 (paragraph 6.3.4) and unit A5.1 (paragraph 3.4.2) give relevant advice (DfT, 2022b, 2022c).

A ready-reference chart on my [website](#) (reproduced here as Figure 4) shows the AMAT's cycling infrastructure type examples in an easy-to-read form, and also mentions these tips.

Figure 4: Ready-reference chart for the AMAT cycling infrastructure categories



Source: James (2024). Original at <https://grahamjames.co.uk/amat/>

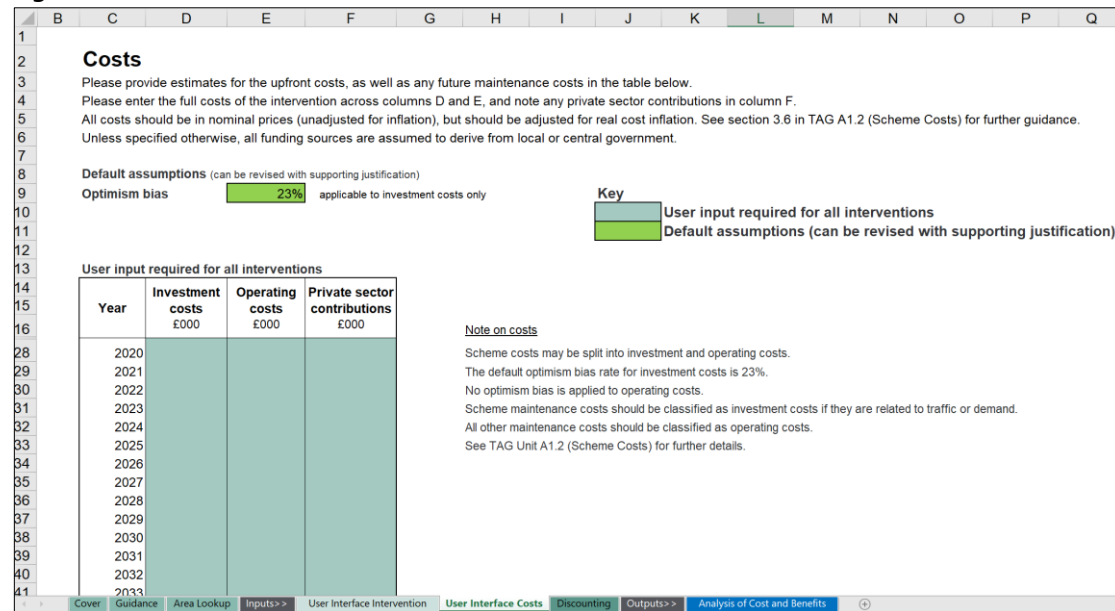
### 5.5 Days per year

The default annualisation factor of 253 days per year represents working days, and is appropriate for a corridor with predominantly Monday to Friday commuting use. A different factor may be appropriate for corridors predominantly serving education or leisure trips. Where weekend flows are also strong (as they can be in high-cycling areas), these could be included (as full days or scaled-down) if evidenced by count data.

### 5.6 Costs

The next tab is for entering the costs (Figure 5). These feed into the Present Value Cost (PVC, the final cost figure in appraisal terms) and the benefit-cost ratio (BCR). If you are only using the AMAT to feed certain benefits into a wider scheme appraisal (section 8), you can ignore this tab.

Figure 5: The costs tab



Converting cost estimates into the right “appraisal format” has its pitfalls and a full discussion is outside the scope of this paper. There are instructions and guidance about what’s needed, and if in doubt ask an appraisal specialist.

AMAT asks for the investment (capital) costs in nominal prices (including both general and real cost inflation). These should be the base cost, not the risk-adjusted cost, as this is what optimism bias uplifts are now applied to. In effect, the costs needed are therefore ‘outturn but only using the base cost, not risk or contingency’.

The 23% default optimism bias uplift corresponds to outline business case (OBC) stage. At the earlier strategic outline case (SOC) stage the figure is 46%. The optimism bias uplift is an obvious sensitivity and these figures are, as always, open to justified variation based on the level of scheme development.

Operations and maintenance costs are often hard to find data on, and sometimes omitted, but are usually small compared to the capital cost. However, any major capital renewals costs (see section 5.1) should be included.

## **6 WHAT'S NOT IN AMAT**

AMAT does not cover any journey time savings due to the scheme providing a shorter or otherwise faster route than existing (eg a more direct route, or one that avoids waiting at signals). If relevant and material, they can be estimated and monetised separately (remembering the rule-of-half for any new users).

Conversely, if there are significant journey time impacts (positive or negative) on other road users, such as due to reconfiguration of junctions or re-allocation of roadspace, this is also not covered in AMAT. Separate traffic modelling may be required to estimate these.

AMAT's collision (accident) benefits figure is just from decongestion (less traffic and hence fewer collisions). It does not relate to safety improvements due to scheme design, which might be much more valuable in benefit terms. These benefits can be estimated separately in the way you would for a local safety scheme, by looking at the collision history, estimating the 'collisions and casualties saved' (if any) and applying the usual valuations to these.

The user guide helpfully lists some further limitations.

Finally, AMAT does not yet cover embodied carbon from scheme construction (which is now to be monetised, following a recent change in guidance). If significant, this will need to be assessed separately.

## **7 USING AMAT IN MORE COMPLEX SITUATIONS**

AMAT is easy to use in the straightforward case of a relatively uniform corridor or area where the only change during the appraisal period is background growth. It can still be used in more complex situations but these may need thought as to how the situation can be represented in a proportionate and reasonable way.

### **7.1 Varying infrastructure or demand levels along the route**

Only one infrastructure type (feeding into the ambience benefits) can be selected for each of DM and DS. The user guide gives advice on when to pick the predominant type and when to split the route into multiple AMATs. The latter approach is useful on longer routes with a variety of DM or DS infrastructure types.

The AMAT calculations revolve around a single DM and single DS demand figure representing the flow on the intervention as a whole. This approximation is often good enough. But long schemes (eg a complete radial route from a city centre out into the countryside) may have very different demand levels at different points. Here again splitting the AMATs can be helpful.

However, the health and mode shift calculations are headcount-based, and splitting these into sections risks double-counting people who use more than one AMAT section on their trip. The easiest solution is to run a whole-route AMAT for health and mode-shift benefits, and run the split AMATs for ambience benefits only. The ambience calculations work on user-kilometres (which are converted into user-minutes) on the upgraded infrastructure – so knowing how many trips are made on what part of the route is what matters to these.

## 7.2 Parallel corridors

Sometimes a scheme being assessed runs parallel to another (existing or committed) one. In this case the latent demand to be tapped by the scheme may be smaller than usual (as the parallel corridor is already partly fulfilling it). The DS demand uplift might therefore need to be lower than usual.

If so, think through the logic of the situation (and the relative quality and catchment of each route), apply a reasonable representation in the numbers, and run appropriate sensitivity tests.

## 7.3 Changes during the appraisal period

Circumstances may change during the appraisal period – for example, another scheme (affecting demand) might open. Again treat it pragmatically depending on the situation. In this example, you could run one AMAT with the other scheme and one without it, then select the discounted benefits from the appropriate years in each version's 'discounting' tab. Or you could manually over-ride some of the growth factors in that tab.

## 8 USING AMAT TO SUPPORT APPRAISAL OF BROADER SCHEMES

AMAT's core use is as a standalone tool for appraising a standalone active travel intervention. However it can also be used to support wider appraisal of broader schemes. Box 1 gives an example of doing this. Being spreadsheet-based, you can also feed inputs from (and outputs to) other spreadsheets.

The key tip here is to avoid double-counting – especially decongestion benefits which may already be covered through the traffic modelling and TUBA and/or environmental appraisals.

### *Box 1: Example of using AMAT within a wider appraisal of a broader scheme*

A city was developing a multi-modal transport package, which included bus service enhancements and priority measures on some corridors and active travel enhancements on others.

A multi-modal strategic model was being used and its results fed into TUBA, CobALT and noise/air quality assessments for calculating most of the benefits. However, AMAT was used to estimate the ambience and health benefits, as these were not

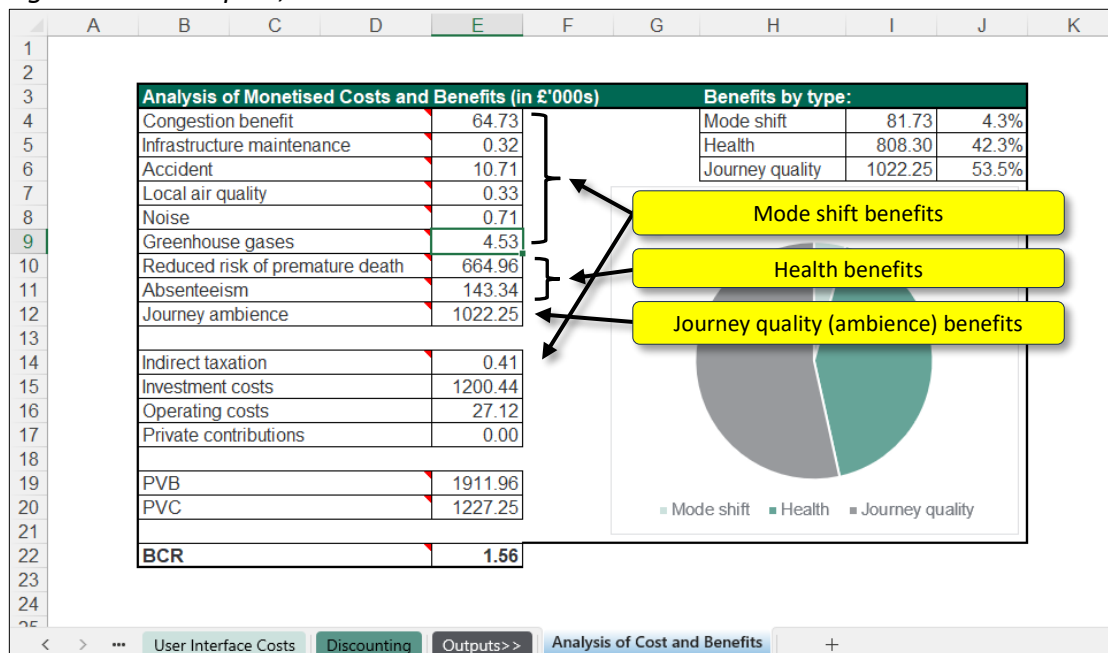
covered elsewhere and the health benefits were potentially an important contributor to the package's overall value for money.

- The DM and DS volumes were based on model outputs for the corridors.
- The health and ambience benefits estimated by AMAT were fed back into the overall appraisal and business case.
- Decongestion benefits were covered by the TUBA and other work, so this aspect of the AMAT output was not needed.
- Costs were dealt with as part of the overall package development and appraisal, so the 'costs' side of AMAT was not needed.

## 9 INTERPRETING THE RESULTS

The results are given on the 'analysis of costs and benefits' (AMCB) tab (Figure 6). If you need a year-by-year breakdown, this is available on the 'discounting' tab.

Figure 6: The outputs, on the AMCB tab



Dummy numbers are shown for illustration. They do not represent a particular scheme

### 9.1 Points to note

Within the benefits that AMAT measures, health benefits will generally far exceed mode-shift benefits. The balance between health and journey quality benefits will vary between schemes; sometimes the health benefits dominate, and as described in section 5.2 this makes the DS volume a critical input.

The collision (accident) benefits are decongestion-related only. As noted in Section 6, you might be able to add benefits from any specific safety improvements.

Likewise the greenhouse gas benefits are also decongestion-related only. Embodied carbon may also need to be considered.

Sensitivity tests on the key variables are, as always, good practice. Common ones to consider include:

- The appraisal period
- The DS volume forecast
- Changes to cost or the optimism bias uplift
- The infrastructure categories (if non-obvious and significant)

## 9.2 How should these results feed into broader decision-making?

Don't over-interpret marginal differences in BCR results, particularly at the boundaries between value-for-money (VfM) categories (as listed in DfT (2016)) or when comparing schemes. Appraisals are inevitably approximations and involve professional judgement; particularly so with AMAT which is proportionate rather than exhaustive. While a BCR of 1.51 (nominally medium value for money) is nicer to have than one of 1.49 (nominally poor), in reality they both indicate a similar level of VfM.

An AMAT appraisal is therefore best seen as confirming (or challenging) a scheme's broad scale of value, at least in terms of monetisable direct effects.

The AMAT figures don't include any broader strategic context, but your own VfM decision should. You might, for example, want the scheme as a way of helping people (particularly those without access to cars) to reach jobs, education and services. This goal, and the scheme's contribution to it, are not reflected in the AMAT outputs and are for you to judge. Likewise you might have a city-wide strategy of creating a comprehensive cycling network in order to nudge default travel patterns or make wider demand management approaches acceptable, and the scheme might be contributing to this notwithstanding any limited impact in its own right.

That is not to say that the numbers don't count. An unimpressive BCR should always trigger further thought. And within a group of similar schemes appraised consistently, comparing their results might feed into prioritisation exercises by indicating (or confirming existing suspicions) that some are more valuable than others.

One final advantage of AMAT is that the process itself helps you think about the corridor, the current and future demands on it, and any opportunities for prioritising particular sections or for securing additional value through changes to the design.

## 10 CONCLUSIONS

This paper highlights some hints, tips and pitfalls in using AMAT, from the author's experience. He welcomes further contributions to helping the profession get the best out of the tool.

AMAT is a valuable tool offering a relatively straightforward way of appraising some of the typical direct costs and impacts of an active travel intervention on a straightforward corridor or area-wide, although it relies on you to determine the DM and DS volumes. It can also, with care, be applied to more complicated situations. Sensitivity tests are simple and this should be exploited. Equally you will soon find that

it is more sensitive to some things (especially the DS uplift) than others and you can be proportionate. There may also be other significant impacts to be assessed outside AMAT.

Where the scheme or the demand have layers of complexity (non-uniform corridors, more complex growth assumptions, or interactions with parallel corridors) it can be trickier to reflect these in AMAT, but a pragmatic approach can be taken. If in doubt, think through the logic, the underlying appraisal methods (eg that health benefits are headcount-based) and what AMAT is actually calculating. You can then focus on being 'roughly right' in a logical, justified and proportionate way.

As with any such tool, it needs to be applied in line with correct appraisal principles and with a knowledge of what's being calculated. And as always, it can't do the whole appraisal for you. Some impacts may not be included. Uncertainties and sensitivities require judgment. Other factors, perhaps less easily monetised, can also matter. In the end, the value-for-money conclusion – and the investment decision – are yours to make.

## **11 ACKNOWLEDGEMENTS**

The author is grateful to current and former colleagues and clients with whom he has worked on AMAT assessments; these practical tips have come from this collective experience. He is also grateful to Galle Saliman for permission to present the paper. All opinions are nevertheless the authors' own.

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The paper is based on the May 2024 AMAT; the tool and other guidance are updated from time to time and this may change some of the details covered here.

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