TransportPlanningSociety

DfT Appraisal Periods Consultation: TPS response

January 2021

Introduction and context

This submission is in two parts: a general response to the topics raised and a more detailed response to the DfT consultation document and the list of questions.

Before submitting our overall response to this consultation and replying to the individual questions, we want to make it clear that the discussion on appraisal periods must be seen in the context of the significant criticisms and proposed reforms following the Treasury Green Book review. Addressing these is an urgent matter and it would be wrong to divert resources to making adjustments in a detailed methodology which has been the subject of such a clear and consistent critique.

Objectives of the response

These can be summarised as:

1) To address the way in which many future impacts are undervalued – although the ones listed in the consultation do not represent the main problem areas.
2) To address uncertainty in appraisal and how it varies widely between impacts: this would be an issue in any circumstances but is particularly important given the changes which are flowing from Covid 19.
3) To contribute to the reforms identified in the Green Book Review, especially to reflect policies for net zero and levelling up: the latter also needs urgent work to provide a better analytical framework and should be a priority.
4) To reform the current system so that appraisal identifies schemes which achieve objectives rather than, as at present, over value schemes which don't.

The consultation: appraisal period and key role of discounting

Changing the length of the appraisal period, in particular raising it beyond 60 years, raises fundamental issues well beyond an academic discussion of economic theory and its application to cost benefit analysis. It is inextricably linked with the approach to discounting costs and benefits over time, which itself raises major issues, for example about inter-generational equity.

While some major future impacts are discounted too rapidly in the current system, others are assumed to continue for decades without such a strong decline. One reason is that some benefits are assumed to grow in value over time, offsetting a major part of the discount rate.

Reflecting uncertainty and risk

There is also poor representation of uncertainty and risk, these are critical to the selection of time periods and rates of discounting. Some impacts are given precise values decades into the distant future when it is doubtful they can be identified after even a few years. Driver time savings are an example – they are rapidly "spent" in ways which are not tracked by current methods and the ways in which they are spent have hugely different impacts. These in turn are likely to generate new disbenefits and change the outcome of the appraisal. Spending time savings to travel further might continue to benefit users, but are likely to have major negative impacts on non-users not included in the original appraisal. Ironically, there will also be negative impacts on the users – extra travel causes congestion and erodes the time savings. But in the meantime the longer journey patterns have had land use and locational impacts which are hard to reverse. There will also be equity disbenefits to those not included in the group which is benefitting from the time savings. These effects suggest that the simple discounting approach and a long fixed time period is simply not fit for purpose, at least for this type of impact.

We suggest a way forward would be to categorise impacts and treat each in a different, more suited to their individual nature.

Discussion

We begin by dividing relevant impacts as follows:

1) fundamental, long lived and hard to change (e.g. landscape, climate, health, land use)
2) tradeable, short lived and likely to be used for different purposes (e.g. time savings, operating costs)
3) fundamental but mutable (e.g. safety, air quality, noise)
4) unknown and fundamental to the extent that the predicted impacts are rendered irrelevant by natural, social or technological change.

In the first category time scales will be long (possibly perpetual) and discounting is inappropriate. The concept of valuing damage to future generations less than the current one is a well known problem and discount rates of zero (or very close) are used to deal with this. That issue in particular was extensively discussed in the 2006 Stern review[1] and subsequently[2].

This is compounded by the fact that monetisation in terms which can be compared to other costs is extremely difficult and probably impossible to the level of accuracy required.

In the second category time scales would be short and discounting high, to reflect uncertainty, volatility and risk. Valuation is easier but still with problems, for example

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1 *Stern Review on the Economics of Climate Change*, Stern N, UK Government October 2006

2 *Decision making for sustainable transport,* Buchan K, Green Alliance February 2008

business versus private time savings and the use of national equity values (to avoid penalising the less well off).

In the third category valuation is also problematic, for example assessing the cost of a death[3], the non-linear nature of noise impacts and their correlation with other costs and benefits[4]. If used, discounting would have to be at a low rate, but this would not adequately represent uncertainty and sensitivity to other policies and technologies.

The fourth category contains what could be called known unknowns and unknown unknowns. The former may contain elements where we have some idea of what they might be but not the effects. Autonomous vehicles is an example. However it also contains elements which are game changing and we don't know about, usual examples include pandemics or climate disasters. The likelihood of having such an event rises over time – how can this be factored in? All impacts need to reflect this and compound discounting may not be appropriate. Borrowing from accountancy, a straight line reduction might better reflect this impact.

Overall this shows the impossibility of addressing such a wide range of impacts with one time period and a common discount rate.

One rate: many divergent purposes

In the list below we distinguish some of the key areas which are included in the current approach.

- uncertainty over future demand – patterns of travel change as do the people who travel ("churn"), change may also result from restructuring the economy, but is inextricably linked to the location of homes and workplaces and to transport and communications networks. The latter are subject to rapid and sometimes unpredictable developments (e.g. smartphones, social media)
- uncertainty over how those changing transport/comms networks are used, for example changing transport system technology such as vehicle autonomy could let people drink and drive, on the other hand substitutes for travel, especially communications (remote working, internet shopping) will lead to different journey patterns
- how people value future costs and benefits compared to today: "pure time preference", but note serious inter-generational issues
- chance of a one off change reducing or removing value (including catastrophic events)
- erosion of, and substitution for, tradeable values over time
- rising value (ramp) effects: environment, health

[3] For example older people who are drawing a pension may generate a net benefit if they are killed in a transport accident. There is no balancing loss from productive work. The system currently generate values for not dying at least partly to avoid this unacceptable outcome.

[4] Such as visual intrusion and community severance.

Different rates and timescales

It is important to note that discount rates can be calculated using different methods:

- Compound discounting
- Straight line depreciation
- Mixed discounting including rates from zero upwards for each category

The first is the current catch all approach, the others could be applied in a new approach. In this case it will be important to apply any separate rates sequentially to avoid double counting. This is common practise where multiple impacts are applied (such as in Active Travel).

It is also important to distinguish different time periods for different effects and this runs counter to the desire for an overall absolute measure of value for money: the Benefit to Cost Ratio (BCR). This in turn requires long appraisal periods to generate enough benefit to "justify" the scheme being appraised.

Given the Treasury criticism, and the fact that the BCR has always been portrayed by DfT as being part of the picture (even if it has in practise dominated), the requirement for long time periods to produce total value should be removed. We prefer a disaggregated approach which will represent the differing nature of impacts and give the decision makers greater clarity. The existing Assessment Summary Table (AST) was originally designed to go some way towards this, but has not been implemented as a valuable element in its own right. Too often it has been an afterthought. The disaggregated approach will now be possible since the purpose of undertaking of a cost benefit (or cost effectiveness) analysis in future should be to choose between different options to achieve common strategic objectives. It cannot overrule a failure to meet strategic objectives.

This would return CBA to its original purpose: to choose between different schemes which have common characteristics. In other words if there is a fixed budget for a certain type of scheme and no other, it will inform the choice between different schemes of that type. It will not decide whether that type of scheme is the best intervention. That is the task of the strategic assessment. However, that assessment must be taken at the individual scheme level or it will have no impact.

Conclusion and way forward

The use of long time periods and discounting has been used inappropriately for some very significant impacts in transport appraisal. The difference in nature of the impacts has been subsumed in a single rate and time. The economic theory on which this is based is narrow in scope and does not reflect key elements such as uncertainty and inter-generational fairness.

We suggest a classification of impacts including those which may not be easy to value, and which would be able to reflect uncertainty in a transparent and effective way. This would lead to a revived version of the AST which indicates timescales during which benefits will be gained or lost and the nature of the costs and benefits being included.

Thus the impacts would be classified according to their longevity and level of certainty. For those which are monetised this would be reflected in a reduction in value over time – much faster than at present for elements such as road time savings and much slower than at present for impacts such as carbon emissions and damage to landscape. We do not consider current valuations for either are satisfactory, in particular carbon emissions should be measured in tonne years before end date rather than tonnes.

We would also caution against focussing on technical improvements to appraisal when more fundamental issues, such as the lack of an objectives led analysis and strategic assessment should be the priority. The consultation is in the end seeking to adjust benefit to Cost Ratios (BCRs). The over emphasis on the BCR was a major criticism in the Treasury Green Book Review.

However, the consultation could contribute to the important debate about uncertainty[5] and the way in which the current system works against schemes which would achieve social objectives and in many cases promotes schemes which undermine them. A more realistic approach to the transient nature of time benefits and disbenefits would, for example, remove current barriers to sustainable schemes which cause time delays for road users[6].

[5] Which the DfT is already engaged in, for example through the scenario based forecasts

[6] See the joint professional body submission to Treasury and DfT on the Green Book Review, LGTAG, TPS, CIHT, RTPI, 2020

Part Two: Detailed response to the consultation document

In this section we go through the individual sections of the consultation document and respond to the questions asked.

DfT Executive Summary

This starts with some examples of assets with long term values. However, these were transformational, not marginal: East Coast Main railway line, M1 motorway. This distinction needs to be made: most appraisal is of marginal changes to an existing network. We recommend that transformational infrastructure projects need great care and a different approach. Scenario building and cross disciplinary work is required to test the validity of the claims made for transformational projects and to compare them to other major projects. Transport is especially sensitive in this regard since it is closely linked with the provision of other, often non-physical, means of communication.

"Overall, a balanced appraisal framework should be able to consider the possibility that project benefits could last into the very long term, while also acknowledging the risk of obsolescence or catastrophic failure and the increased uncertainty associated with any modelling and appraisal outputs when using a longer appraisal period."

The DfT also say "uncertainty about the future increases very significantly over time, so we need to explicitly address uncertainty as an integral part of any change to the length of the appraisal period."

We think the consultation needs to recognise that uncertainty is **not** being addressed in the current time period of 60 years and that this could be too long rather than too short for some elements of appraisal. This borne out by the TPS Annual Member Survey[7] and by a survey of 200 transport planning practitioners by Professor Glenn Lyons for CIHT. This identified their lack of confidence in the current forecasting and appraisal system.

We have no problem in using different time periods for different elements but recognise this may cause concern for some more traditional economists. In this case the answer is to ensure that uncertainty is applied with a rapid and escalating impact while still being theoretically present through the appraisal period. The present system of discounting does not cover this explicitly and its true significance is lost.

DfT Section: Background including the current approach

This describes the way in which longer term costs and benefits are not modelled beyond 20 years and the uncertainty associated with extrapolating for the remainder of the 60 year period. The 2016 research quoted by DfT is clear about the way in which uncertainty rises, and the way that congestion can cause benefits can be "significantly curtailed towards zero". This is important because most current appraisals for road infrastructure deal with

[7] See TPS Annual Member Survey

mitigation of a future with worsening congestion, not an improvement in present day conditions. This of itself is a source of uncertainty not recognised in the current system.

DfT Question 1 Do you think there is a case for including long-term benefits, beyond the existing 60-year appraisal period? What do you think are the main challenges associated with this?
There is a case but not for transient benefits where it should effectively be shorter. Long term costs must also be included – especially climate change and loss of natural capital. Uncertainty needs to be taken into account – at present it is poorly represented if at all.

DfT Section: Alternative approaches for reflecting long-term value

This sets out three options: longer time period, market based valuation and scrap value. Understandably the latter two are rejected and but this is not a reasonable approach to considering alternatives. For example the differential time period approach should be considered, together with the consideration of costs as well as benefits. These are particularly important given the long term nature of costs such as carbon emissions, landscape damage and loss of habitats.

DfT Question 2: In light of our assessment of alternative approaches, are there other methods we may not have considered? In particular, should we be focusing on the wide range of possible social, economic and environmental impacts over the longer term, which are unlikely to be fully captured in a market-based valuation?

The three alternatives do not represent a full range of alternatives and the idea of a scrap value is hardly a realistic option. We set out an approach which better reflects the reality of appraisal and the different timescales and certainties of different costs and benefits.

DfT Section: Modelling and appraisal challenges

This is a long section with several questions. The opening is confined to the question of how to extrapolate benefits and discusses conceptual problems such as infinite value. There is an interesting description of the difficulties in extending time periods, for example when the modelled period ends after about 20 years and benefits are simply extrapolated after that. While interesting it could be said that a more practical approach is needed and the key problem is that no modelling beyond the 20 years would be feasible or reliable.

Given that parameters and money values are in many cases based on the preference of individual people, the idea of extending to time periods outside normal life span, let alone normal working lifetimes, should at least be questioned. This immediately raises the issue of impacts which are long term and fundamental in nature, not tradable and transient, and how they need to be treated differently. For example, it seems reasonable to assume that future generations beyond 60 years will continue to value landscape and that very long term changes to that landscape (say 100+ years) will also have long term impacts. On the other hand a marginal decrease in the time taken for a future journey may have a different value

in a much shorter time than 60 years and may not actually be there after a very short time, probably well below 10 years.

Later in this section the DfT consultation sets out 3 types of uncertainty:

1) Direct Inputs, such as GDP or fuel costs
2) Methods for translating those inputs into transport demand
3) Methods for translating changes in that demand into appraisal values

We think this classification fails to represent some key aspects of uncertainty.

Transience and uncertainty

The DfT analysis does not recognise the special nature of transport which makes the level of uncertainty for some impacts very high – this is due to the transient nature of many elements amalgamated into DfT categories 2 and 3 above. For example, transport demand is not comparable to the need for food, shelter, social activity or education. It is largely a derived demand and is very susceptible to technological change and to behavioural change. Travel demand is also highly substitutable. This is at least in part a reflection of the high level of infrastructure provision and activity choices in many, although not all, parts of the UK.

Most appraisals are focussed on marginal changes in predicted travel patterns which produce benefits by being aggregated over a long period of time. However, it only requires a modest change in the overall pattern or level of travel to have a massive impact on the marginal changes. A good example is road travel time. In congested conditions a small reduction in traffic flow will have a major impact on congestion and thus completely change the conclusions of a conventional appraisal.

This suggests that a rapidly declining level of certainty should be applied to some elements currently accounted for. It is important to note that this is separate from the economic theory underpinning the current discounting approach. Nor is it the same as the "catastrophic event" element which DfT say is already included in discounting.

Parallel to this the DfT classification does not recognise the long term nature of some of the external costs and third party impacts which are far less transient or substitutable. For example this applies to CO2 emissions, which persist for about a century and have a continuous warming impact throughout that time. This means that the level of uncertainty associated with that impact is low and declines slowly over time, probably not at all. This also applies to a number of significant and well known environmental impacts such loss of habitats, eco systems and landscape.

In addition, the DfT analysis underestimates the inherent difficulties in bringing together benefits over a long time period which have progressively higher levels of uncertainty. To avoid these there could be an uncertainty discount in addition to those commonly applied to other benefits. Alternatively they could have a very short appraisal period. It is also

important that the uncertainty function is applied at the time of the analysis (including the data), not the predicted opening year of the scheme.

In summary, the current system justifies schemes on the basis of benefits which are uncertain and transient, and costs which have a high and enduring level of certainty, in some cases the effects are to all intents and purposes permanent.

Land use timescales

Land use changes, which are strongly influenced by transport planning, are also long lived and hard to reverse. But within existing patterns of land use, people can choose to change where they live in relation to where they work, or choose different locations for their social, educational and leisure activities. One powerful element in house prices, for example, is the catchment area of well performing schools.

There seems to be widespread recognition that this is an important factor, but action to include this in the appraisal of transport plans or programmes has been and still is largely absent. The inclusion of single elements, such as a station or a road scheme enabling housing, ignores the full range of other impacts on patterns of travel and locational choices. We know that journeys have been getting longer in distance at the same time that average speeds have increased.

There are a number of questions from this section which we address below.

DfT Question 3: What do you consider to be the key sources of uncertainty associated with appraising benefits over a longer timeframe?
DfT Question 4: To what extent do you believe that limiting the appraisal period to a set timeframe is an appropriate way of handling uncertainty? Are there other approaches which might better balance uncertainty with the potential longer-term benefits of investment?

We have identified examples in the body of the response and conclude that there are some elements with stable impacts over time (e.g. carbon) and some which are more transient (e.g. non-work travel time). To address this we propose a classification of elements at least into high and low categories. In the high category an uncertainty discount would remove the majority of costs or benefits in a much shorter timescale than 60 years. A major example is vehicle time savings. In the low category elements such as carbon emissions and landscape impacts would retain their value over time and should be seen in the context of their lifetime, probably exceeding 60 years. This would however, require reform of the way these elements are measured and recognition of the problems created by over zealous monetisation.

DfT Question 5: To what extent do you think that current practice in relation to appraisal periods materially biases against particular schemes or options? What do you consider the source of this bias to be?

Again the body of the response deals with this but one example supplied to the DfT in another context was a sustainable transport package with good local support that was deemed poor value because of time delays to road users.

DfT Question 6: Do you think there is a case for reflecting potential inter-generational effects in appraisal?

Yes, if applied to impacts we define as fundamental such as carbon, habitats, landscape, townscape.

DfT Question 7: Do you have any further thoughts on the interaction between the discount rate and the approach to uplifting appraisal values which we should consider in the event that appraisal periods are extended?

We suggest that this is an issue which must be addressed whether or not the appraisal period is extended. As DfT say: "discounted benefits are driven by the combined impact of growth in appraisal values (e.g. values of travel time savings) and the discount rate." This effectively reduces the impact of the discount rate for time savings. The only previous DfT research we know of did not find a direct relationship between GDP growth and growth in the value of time savings.

DfT Question 8: Are there any further considerations we have omitted with regards to profiling relevant cost or benefit streams over a longer appraisal period, including environmental, social and wider economy impacts?

Again we consider current profiling needs to change without a longer period. Our view is that the powerful differences between the different cost and benefit streams in terms of stability, longevity and inter-generational fairness are not currently included and should be. If this were done there would fundamental changes in the economic assessments of major schemes and a significant change in the decisions taken.

DfT Question 9: How should we determine the appropriate appraisal period for a programme or package of schemes, with potentially different opening dates? Should this differ from the approach taken for a standalone project?

Given that we are relaxed about different time periods for different elements of appraisal, we agree with the DfT that each element should have its own appraisal period is right in principle. However the process needs to take into account the way in which some benefits are interdependent. This is an area where strategic assessment should be the guide: the bigger picture implied in this question needs to be identified.

DfT Section: Supporting decision making

This section discusses some impacts on decision making in particular increasing the BCRs of some schemes. This seems to go against the idea of reducing the absolute dependence on BCRs which is a consensus view across transport planning and in the Treasury Review. We therefore think that the idea of adjusting appraisal periods should not be allowed to distract efforts from reforming the system. The DfT do mention the Strategic Case as a substitute for lengthening the period and using a scoring system to indicate long term impacts. This is the option we would support, but in the context of the other reforms contained in this response.

DfT Question 10: How can we best ensure that decision makers understand the potential value of longer-term assets and the risks, uncertainties and limitations of the analysis in relation to long-term benefits?

A classification into some simple categories such as stability, longevity and inter-generational fairness would help of itself to make uncertainty more transparent and an improved risk analysis would also help. This scoring system would enable the production of realistic Assessment Summary Tables – these have been part of appraisal for years but poorly implemented in many cases. They could be of great value to decision makers and public alike – as they were intended to be.

DfT section: Potential Ways Forward

This is cast in the light of lengthening the appraisal periods which we think is too simplistic an approach to the several major problems with current appraisals, especially high uncertainty in relation to the key benefits and the high discounting of long term fundamentals such climate change. We think that the DfT list of "criteria" which should be applied to longer appraisals should be applied to all schemes, with the addition suggested below.

DfT Question 11: What are your thoughts on our proposed criteria for identifying the preferred approach?

They should be applied at present but the level of uncertainty needs to be prioritised and made more explicit. Proportionality is important but is process guidance rather than part of the appraisal itself. We suggest different types of uncertainty are listed and how they apply to individual elements of the appraisal as above.

DfT section: Seeking Your Views

This sets out the consultation process and says that the aim is to publish a response to the consultation and plans for new guidance in February 2021.

There is no consultation question on this but we consider this timetable completely inappropriate considering the context of the Treasury Review and the strong criticisms of the current system, many of which are highly relevant to this consultation, made across the profession and its institutions. Now that we have had the opportunity to consult with our members and produce this response, we do not think changes should proceed without further discussion with the profession which was not afforded by the Christmas period and the Covid 19 situation.

The Transport Planning Society

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