

Saving time no longer tops the planning agenda

Sustainability and levelling-up are now key considerations when decision-makers debate the viability of transport infrastructure projects, reports **Mark Smulian**

The much used quote “half the money I spend on advertising is wasted; the problem is – I do not know which half”* sums up the difficulty any organisation or individual can have in deciding which projects are worthwhile investments and which are not. This very much applies to transport infrastructure projects.

Faced by a clamour for new bypasses, rail lines, cycleways and airport runways, what is a decision-maker to do but turn to tried-and-trusted appraisal methods to inform

* This quote is attributed to **John Wanamaker (1838-1922)**, the successful American merchant, religious leader and politician considered by some to be a pioneer in marketing.

their decisions about spending money wisely?

Appraisals, though, are not neutral. Their results depend on what they have been set up to value, and if the policy environment has changed but an appraisal system has not, decision-makers will get some misleading results.

Transport appraisals hit their stride in the 1960s when the priority was the burgeoning road sector as car ownership grew rapidly.

Methods were developed of measuring how much time a transport infrastructure scheme would save drivers and these were eventually widely accepted.

They were based on the idea that if, say, a scheme would save one driver five minutes, it would save 1,000 drivers about 83 hours during which they would do something productive in the economy thus delivering an economic benefit.

Areas where the economy was most robust would show the greatest gain and so investment would tend to go there.

Two Government policy changes ►►



ABOUT THE AUTHOR

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► have started to change this – sustainability and ‘levelling up’.

The first is now fairly common in thinking about transport projects given concern about decarbonisation (see box on page 25) and the consequent need to promote walking, cycling and public transport.

Levelling-up is less well understood, being new and ill-defined, but concerns investment in economically-lagging regions to try to bring them level with more prosperous parts of the country.

To work, levelling-up would need resources directed to places that tend not to score well in appraisals.

Can either sustainability or levelling-up be delivered effectively while the appraisal system still prizes time savings? Minds are being applied to squaring these circles, but this is not straightforward.

Steve Gooding, director of the RAC Foundation, says: “When transport appraisals were first used in the 1960s they were a very good way to choose between options, but they are much less effective at telling you whether you should be doing something in the first place. Perhaps more weight has been placed on appraisal in the decision process than it can really bear.

“The investment appraisal process tries to capture the implications of doing something and two things can go wrong: you miss something out or you get a valuation wrong.”

Tom Millard, senior consultant at the PJA transport consultancy, says this weight of history, with its emphasis on travel time savings, is difficult to change because its sheer longevity and strong evidence base mean that decision-makers are accustomed to it and instinctively turn to it.

He explains: “Travel time savings are something that people will understand and it’s underpinned by a lot of research over decades so there is a lot of faith in the results.

“It is wrong to say time savings are not relevant, as people will always try to take the shortest route they can, and the inputs for them are robust, but they are less so for walking and so there is a gap there and you can’t monetise the benefits.”

Millard says another example of this difficulty is assessing public realm improvements. They increase well-being but may not have any bearing on time savings.

He says: “If you are the decision-maker on a transport infrastructure project you want the best and most credible evidence in front of you and for driver time saving there is evidence going back years, but for other things there might just be one or two studies.

“You can try to estimate monetised benefits but if there is a gap you have to rely on qualitative data and you can’t feed that into a benefit-cost analysis.”

PJA chairman Phil Jones has grappled first hand with the problem of whether appraisals can capture sustainability, on a project for a local authority in the Midlands.

It intended to bid to the Government’s Future High Streets Fund to build a square to reduce road traffic and make access easier for pedestrians, so increasing footfall and employment.

Jones recalls: “The problem was the council there wanted to do a very traditional transport appraisal which would have shown what they feared would be a large economic disbenefit even though the object was to reduce traffic.”

Another example he gives is how to monetise a new pedestrian crossing that might slow traffic and so look like a disbenefit as the value of time saved for a driver is different to a pedestrian.

He asks: “If you slow a car by a few seconds at a pedestrian crossing then gross that up over 50-60 years does that really give you an economic disbenefit?”

Jones lacks faith in the present approach to appraisals and says: “The underlying principle is that you keep on building roads and if it saves time people will then spend more time on productive business, when, in fact, we know that they just travel further.

“It needs a root and branch change to appraisal so you can say ‘yes there is a slight disbenefit to this for drivers but it does other things’. The trouble is the benefit-cost analysis is simple and familiar so people follow that.”

Others who have been at the sharp ►

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STEVE GOODING,
RAC FOUNDATION

60%

minimum SAT score is the approval target of TfGM



Ambitious programmes in city regions

England’s recently-created city region combined authorities have improving transport and infrastructure at their hearts – although their powers range more widely – and have drawn up ambitious programmes.

They are based on devolution deals agreed by groups of local authorities and the Government and each is led by an elected mayor.

The idea is that by devolving powers to those on the ground (or at least nearer to it than Whitehall), choices over what to build will be made more rapidly and better respond to local conditions.

Greater Manchester Combined Authority is the oldest and best established, but combined authorities now also exist for Liverpool City Region, the West Midlands, Cambridgeshire & Peterborough, West of England (the Bristol and Bath area), Tees Valley, North of Tyne (Northumberland, Newcastle and North Tyneside), Sheffield City Region and one will be formed for the Leeds region.

These are the transport plans of some of them:



LIVERPOOL CITY REGION COMBINED AUTHORITY has approved plans to invest £172 million in public and sustainable transport, including new stations and new Mersey ferries. All projects must complete a full appraisal and meet the criteria of improving public transport to meet new demand, or improving the appeal of public transport, or improving health and wellbeing.

Projects identified for potential funding, subject to appraisal, include an improved station area at Runcorn, an extension for the Merseyrail network from Kirkby to Headbolt Lane, corridors for ‘green’ bus services, increasing demand-responsive bus services and 1,200km (746 miles) of cycle routes.

SHEFFIELD CITY REGION COMBINED AUTHORITY seeks to make the 26-year-old Supertram system part of a mass transit network, supported by smart, integrated ticketing to link urban centres and growth areas with their markets and labour force (see also page 48).

It will pilot a tram-train service for Rotherham and wants to increase local rail capacity. Also, it has secured £7.5m for walking and cycling schemes.



TEES VALLEY COMBINED AUTHORITY has invested £3m in an on-demand bus service Tees Flex serving rural parts of its region. It can be booked via a smartphone app, website or telephone. If a three-year pilot is successful it could be extended across the region.

Nearly £40m has been allocated to transport projects, including railway station redevelopment, improved bus services, cycling and walking schemes and better access to employment.

► end of seeking funds for sustainable transport projects in conurbations tell a similar tale of appraisals not having caught up with policy.

Kit Allwinter who was seconded as intelligent mobility officer at Transport for Greater Manchester (TfGM) but has now returned to consultancy AECOM, says: "Appraisals give priority to small-time savings for drivers; they value those highly. But carbon, pollution from noise fumes and brake dust is not counted high and so it is hard to plan for sustainability.

"It's ridiculous that, even with greater public awareness of climate change, the budget still had £27 billion for building roads and not much for rail when we still need, for example, the Trans-Pennine route and electrification of the Midland Mainline."

Allwinter says there is a difference among transport planners' attitudes

dependent on when they began their career.

"I think the industry is changing. In the 1970s and 1980s, there was a focus on cars and roads, and that was essentially what transport planning was, and those people are now in senior positions," he says.

"But below them you have younger people who are far more interested in walking, cycling and public transport.

"Traditionalists would just say 'put the figures in and run the model and see what we should build' while newer people will say it is not very important that, say, 4,000 drivers save 30 seconds. Members of the younger generation of transport planners are also less likely to own a car."

TfGM has adopted its own approach to appraisals having decided that both the BREEAM standard – concerned with the sustainability of buildings – and its civil engineering counterpart CEEQUAL did not fully offer what was needed.

40%

reduction in emissions compared with 1990 is target for 2030

As a TfGM report states: "We are aware that the applicability of BREEAM and CEEQUAL to public transport infrastructure schemes is not strong.

"We have therefore developed a bespoke Sustainable Assessment Toolkit (SAT). This ensures that areas such as enhancing and maintaining biodiversity, engaging with community and improving quality of life, being sympathetic to heritage and archaeological features, and ensuring protection to local water resources are considered throughout the development and completion of any project within the organisation where it is applied."

SAT is mainly for use on bus stations/interchanges, bus lanes and stops, guided busways, cycle hubs and storage facilities, cycle lanes, Metrolink stops, tramways and park-and-ride.

TfGM has incorporated "ambitious targets for sustainability" in all major infra-

structure schemes, which should gain a minimum 60% SAT score.

SAT is intended to enable designers to create developments "that meet rigorous sustainability criteria and scoring through option selection and wholelife costing".

Kate Gifford, head of future mobility at the West Yorkshire Combined Authority, found her entanglement with a future mobility zone bid showed "the appraisal used did not fit with that as it was not designed to appraise it".

She says: "When we submitted our bid the Department for Transport (DfT) it did not have the means to appraise it, but it is open to discussions on changing that."

The bid would have seen the introduction of small demand-responsive buses in communities normally omitted by commercial operations and the experience there would have been used to understand how

such services could become viable.

There would also be community mobility hubs at which e-bikes and car club vehicles would be provided.

"Appraisal should give more weight to carbon reduction and to inclusive growth, which, in turn, fits with levelling-up and gives less weight to car drivers. I think the mood has changed and the appraisals have to catch up," Gifford says.

Demand-responsive transport is an example of something that can fall through the cracks in appraisal.

She notes there is as yet little evidence on demand-responsive transport, making it hard to quantify the benefits and so proxies could be needed.

"It can deliver social goals like access to supermarkets and doctor's surgeries but it is less to do with journey times to work," Gifford says.

"There is a change in attitudes and local authorities want to try out technologies which perhaps do not yet have much evidence."

So, could the usual approach to appraisal change?

Tom Worsley, visiting fellow at the Institute for Transport Studies at the University of Leeds – and formerly a DfT senior economist – says appraisal should follow from the policy environment.

"Appraisal is about helping decision-makers to decide which transport scheme should be backed," he says.

"Appraisal does not mean setting an overall policy; it's about what you decide within a given policy framework. The real conflicts are solved at a higher level than appraisal when the policy is set."

Even if the appraisal system can be made to follow the new policy emphasis on sustainability and levelling-up, there are always unforeseen consequences to decisions, Worsley says.

"Time savings are really a measure of connectivity between places and it's generally good if you can get from A to B quicker if it helps you get a job there or shop there. Time saving is an easy way to measure that," he says.

"Once you do that though people change where they live, work and shop and take their time savings as those benefits.

"For example when the railway lines

were electrified north of London, places like St Albans and Hatfield became commuter towns and people moved from small flats in London to houses there. The appraisal would have measured it as time savings but people take that benefit by changing where they live."

Another case of unforeseen results is the change in the way cities work.

As Worsley says: "We always get things wrong or do not foresee them. Forty years ago, no one foresaw that cities would become more attractive and would create jobs and have growing populations and be full of fit young people who cycle. There are always things you can't get right."

Gooding thinks a revised system should try to capture wider benefits.

He says: "I don't think we are living under a 'tyranny of time saving' in appraisals, as some people fear, but if you are designing a project to make travel more efficient then time saving is clearly a way of measuring it.

"It is a question of how to do that – saving a minute on a journey makes no real difference to my day, and saving a thousand minutes for a thousand people probably doesn't either, but that gets aggregated together in appraisals and so the project concerned can be judged a 'good thing', which is why the results have to be handled with caution."

Projects intended to help people get to employment, say, 30 minutes earlier, or complete a return inter-city journey in a day without a stopover, "seem to me to be much greater benefits, which we need to be able to capture in appraisals", he says.

One factor appraisals would have to reflect is the commitment entered into by the UK in the Paris climate agreement.

The UK has committed to cut its emissions to a 2030 target of at least a 40% reduction in emissions below 1990 levels, and has committed to net zero carbon emissions by 2050.

Gooding says: "The Government has committed to delivering something so that has to be taken account of in appraisals – which is 'how does this project affect delivery of that commitment?'"

"That is what I think the Heathrow third runway judgement means, that if you make a commitment to something you have to do things that deliver it. The judgement was not on the rights and wrongs of a third runway but of the consistency of the underpinning policy framework with binding commitments made after it was written."

Since the DfT has gone to the trouble of publishing Decarbonising Transport ►



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KIT ALLWINTER, AECOM

► it is, presumably, serious about its intent to do this and to revise appraisals to reflect carbon.

Peter Mackie, emeritus professor at the University of Leeds' Institute for Transport Studies, says the Paris climate commitments can be reflected in appraisal through the approach used by the Department for the Environment, Food and Rural Affairs (Defra) of working out a shadow cost of carbon and other warming gases and applying the marginal value per tonne in appraisals.

He explains: "Anything which reduces carbon gets a benefit, anything which uses it attracts a cost. The question is – what's the price of carbon today to put us on the 1.5 degree warming trajectory?"

"I would say that type of approach is okay for appraisal, but is quite weak because it doesn't directly impact on behaviour and incentives. More powerful would be a carbon tax because it would switch on all the behavioural responses."

Mackie opposes, though, the idea propounded by some green campaigners that the time of walkers and cyclists is valuable while the time of drivers

and public transport passengers is not.

He says the most important issues are whether NOx, particulates and carbon are being correctly valued and are the values really consistent with declared policy goals.

Worsley thinks the DfT paper on decarbonisation is too focused on technology, with an "assumption we go on as before but just use electric cars instead of fossil fuel ones, it's as if everybody with a black car changed to a white one, but if motoring changes so may the travel pattern.

"It could mean that, dependent on how often you need to charge the battery with an electric car, long distance trips become less attractive if you have to wait an hour somewhere to charge. Put that into the appraisal and see if it changes the business case on how often people travel."

The paper received a warmer welcome from EV100, a global initiative of companies that plan to accelerate their transition to electric vehicles.

Project head Sandra Roling called it "a positive signal that this Government remains committed to pushing ahead with critical climate policy even in these challenging times.

£27 BILLION

was the figure set aside for English strategic roads in the Budget

▼ It is difficult to measure the amount of carbon that will be used in the construction phases of HS2

"This is a comprehensive plan rightly covering all areas of transport and with ambition firmly set on net-zero emissions.

"Government must work hand-in-hand with business to enable a faster roll-out of electric vehicles and, coupled with that, an earlier phase out of diesel and petrol vehicles."

Perhaps the largest project touted as improving sustainability is the HS2 high-speed rail line from London to Birmingham and – eventually – Manchester and Leeds.

The HS2 company certainly thinks so, stating: "HS2's long distance journeys will provide a low carbon alternative to the car or plane. HS2 will be a greener way to travel, offering some of the lowest carbon emissions per passenger kilometre, seven times less than passenger cars and 17 less than domestic air travel."

If HS2 is built by 2030 – stress the 'if' – "you could travel 500 miles on HS2 for the same amount of carbon it takes to travel around 70 miles by car and just 29 miles by plane".

When the full HS2 network is running, its trains and those that use released capacity on other lines could reduce car travel by 1.2 million miles a day, which HS2 says would be "a reduction in the annual

DfT starts the decarbonisation conversation

Perhaps little noticed in the middle of the Covid-19 lockdown, the Department for Transport (DfT) published its Decarbonising Transport Setting the Challenge paper, described by transport secretary Grant Shapps not as a conventional consultation on specific policy proposals, but rather "the beginning of a conversation to develop the policies needed to decarbonise transport".

Indeed, the paper admits: "While we know the scale of the challenge, we do not currently know the optimal path for delivering a decarbonised transport network.

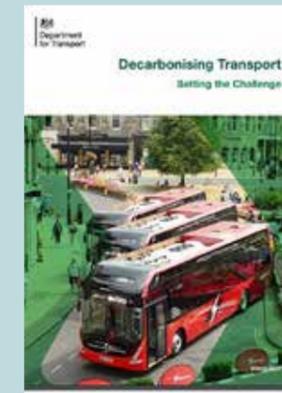
"We, therefore, intend to work with business, academics, researchers and innovators, environmental NGOs and the wider public over 2020 to design

the package of decarbonisation policies that can serve the needs of both passengers and wider society, and deliver our goals."

A final version had been planned for autumn 2020 in the run-up to the COP26 United Nations Framework Convention on Climate Change conference in Glasgow though that event has been postponed to spring 2021 due to the Covid-19 outbreak.

It is part of efforts to get to net zero carbon emissions by 2050 through a transport decarbonisation plan that covers all modes.

The paper stresses that the DfT wants measures to "help make public transport and active travel the natural first choice for daily activities" and use a "convenient and cost-effective" public transport network to reduce car



trips. It also seeks to encourage cycling and walking for short journeys.

There is also a somewhat grand ambition "to position the UK as an internationally recognised leader of environmentally sustainable technology and innovation in transport".

ties and businesses what projects they want and see how transport measures can help deliver those and how that can be factored into business cases."

Allwintter says the DfT will "have to take account of levelling-up as, following the last general election, the Government has said it will invest more in the north even though the figures usually look better for a project in London, so it may have to feed in something in appraisals for social gain".

On this at least the Government appears to have grasped the need for change. The Treasury 'Green Book', which sets the principles of appraisal across Whitehall, is to be updated.

Chancellor Rishi Sunak said in his Budget speech: "The Government is also taking action to review the Green Book, which sets out how decisions on major investment programmes are appraised in order to make sure Government investment spreads opportunity across the UK."

There was some elaboration too: "The review will enhance the strategic development and assessment of projects, consider how to assess and present local impacts and look to develop new analytical methods for transformative or place-based interventions. It will also consider how project approval decisions are being made and provide clearer guidance and support to practitioners."

Sunak's 'levelling-up' references also focused on infrastructure, saying: "For too long the UK has under-invested in infrastructure, leaving many people stuck with delays and poor service."

He said – admittedly before the Covid-19 outbreak – that by the end of this parliament, public sector net investment would be triple the average over the past 40 years with around £640bn of gross capital investment will be provided for roads, railways, communications, schools, hospitals and power networks and a National Infrastructure Strategy would be issued.

Among announcements there was £27bn for English strategic roads, and £4.2bn for five-year integrated transport settlements for the city regions.

Appraisals must change to better reflect both carbon reduction and levelling up or the government will be unable to deliver on some very public commitments.

Talks are in progress among experts on how this will be done, but as Worsley says, perfection is elusive and "you always get something wrong". **ST**

carbon emissions from car travel of more than 40,000 tonnes of CO₂".

It admits though: "Like other construction projects, building HS2 will inevitably create emissions, but we will make sure as little carbon reaches the atmosphere as possible" and that building its first London-Birmingham phase will represent "just 0.15% of total UK budgeted carbon emissions over the construction period".

These are bold claims though as Millard says: "For HS2 you can estimate the benefits of modal switch from car use once it's running, but trying to measure the cars through their production phase is difficult, and it's difficult to measure the carbon used in construction phases too."

If by the time HS2 is complete, electric or hydrogen vehicles have replaced petrol ones, he wonders what that would do to HS2's carbon-saving claims.

HS2 was approved long before anyone thought of 'levelling-up' but has become enmeshed in it because it would provide more rapid rail links to and from London, the Midlands and northern cities.

Worsley has been part of DfT work to try to include this in appraisals. He says: "The DfT constantly updates its appraisals and I was in a meeting recently to discuss how to accommodate the levelling-up agenda, since that means spending money in places that give a lower economic return than others, and it may be that you can measure the potential return instead.

"We need to find out from local authori-

