



Department  
for Transport

# Understanding and Valuing the Impacts of Transport Investment

October 2013

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# Foreword

Good quality appraisal is at the heart of informed decision-making about investment choices.

Transport investments can have significant and very long-lived consequences for the economy, for the way we live our lives and for the environment. Often difficult decisions are involved and, to make effective use of resources, Ministers need to prioritise which projects to take forward.

It is crucial to paint the fullest possible picture of the impacts of such investment choices – to inform the public and to help decision-makers understand those impacts, so they can see how alternative investment choices compare. That is what we seek to do through transport appraisal.

The Department for Transport is proud of its track record in developing and using its world-class appraisal approach to inform key decisions. Where we have led, many nations have followed. But the impacts of transport investments on our society, economy and environment can be complex. The sophisticated methods necessary to understand and value these impacts can provide great insight; but their complexity can increase the challenge of ensuring that the evidence base is accessible.

I am therefore pleased to share this report which explains why and how the Department for Transport appraises investment options, together with our plans for the next phase in developing our appraisal techniques.

Maintaining and developing our methods is an ongoing endeavour, and we want to work with stakeholders and experts to ensure that we remain world-class, and that government has the information it needs to help it invest wisely.

Tracey Waltho



Director of Strategy and Analysis

# Executive summary

1. Our transport system is vital to the way we lead our lives and the success of our economy and it has important interactions with our environment. As a nation we benefit from a substantial network and services and, as further improvements are sought, it is essential that decision-makers have the fullest information about all the impacts each option could have on our society, economy, and environment; and how these align with decision-makers' objectives.
2. The Department's appraisal framework and methods have been built up over many years to achieve this. Most recently, this has been embedded in the 'Transport Business Case', which views the case for an investment option from five perspectives. This stresses the importance of considering each option's strategic fit, commercial strength, achievability, and affordability, alongside the overall balance between costs and benefits of the impacts presented in the economic case.
3. Understanding and valuing the full set of economic, social and environmental impacts of an investment option is a complex challenge. We use sophisticated modelling of the transport system, and insights from economic theory, to provide decision-makers with the information on the broad range of impacts they need to consider.
4. This approach is world-class, and gives us a sound basis for informing decisions. However, it is essential that we continuously develop it, to keep pace with evolving challenges and opportunities. We have therefore commissioned and acted upon important research into: economic geography modelling methods, values of travel time savings and long term demand growth. But we aim to go further. We intend to undertake a comprehensive survey of the latest evidence on how transport investment impacts on the economy and use the findings to inform how the Department should develop its framework in this cutting-edge area. We will also commission new research into the values of travel time savings, strengthen our approach to uncertainty, and advance our approach to long term demand growth and scheme benefit projections.
5. At least as important as these plans, though, is how we will take them forward. We will embed these developments within an ongoing 'Analytical Strategy' for our appraisal framework and methods, to ensure that we continually stay abreast of the needs of decision-makers, and relevant changes in the world around us. To support this, we intend to create a Transport Modelling and Appraisal Panel. We will engage with stakeholders and experts on the formulation of this strategy, and throughout its delivery, beginning by hosting an event, later this year.

# 1. Introduction

- 1.1 Our transport networks and services are vital to the way we lead our lives, and the success of our economy. We benefit from a substantial transport system, built up through investment over many years, in response to evolving challenges and opportunities. This system enables us to enjoy a higher standard of living, by connecting us with jobs, business opportunities, friends, family, and leisure activities. It also has important interactions with the environment which sustains us. In simple terms, the better our transport system, the more of our lives we can spend being productive and doing the things we enjoy, with the people we care about, in a better environment.
- 1.2 As the world continues to change, successive governments have sought the incremental and step-change developments to our transport systems that will strengthen our economy and standard of living, and to tackle the environmental impacts that some transport services have created.
- 1.3 In generating and considering options, it is essential that decision-makers have the fullest possible information about the impacts each option could deliver, and how those impacts would align with their objectives. This is necessary to ensure both the best value for money in the spending of taxpayers' money, and that all the pros and cons for different people are given full consideration.
- 1.4 The Department for Transport's appraisal framework<sup>1</sup> has been continuously developed over many years to achieve this. It has grown from its early years of measuring the more direct impacts of transport investment, through incorporating a broad range of environmental impacts, to understanding its wider economic and social impacts. Most recently, it has been embedded in the 'Transport Business Case'<sup>2</sup> approach, specifically designed to bring out the wide range of factors that decision-makers need to consider.
- 1.5 This appraisal framework has been shown to be comparable with the best available in the world, but the world is changing and we need to go further. Economic impacts are an even higher priority and with the Department taking investment to record levels with major upgrades of the road network, modernising the rail network and improving local transport there is an increasing need to estimate the expected economic growth

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<sup>1</sup> <http://www.dft.gov.uk/webtag/>

<sup>2</sup> The Department supports the decision making process with the 'Transport Business Case' assessment <https://www.gov.uk/government/publications/transport-business-case>. This considers the investment decision from five perspectives – the strategic case, economic case, commercial case, financial case and the management case

impacts of transport proposals. To make sure these impacts are fully understood, alongside the wider range of impacts transport investments can have, we need to continue to develop and improve our framework.

**1.6** The purpose of this document is to explain:

- why we appraise transport investment;
- how we understand and value the broad range of impacts we capture in our appraisal work;
- what our plans are for the next phase in the continuous development of our framework and methods; and
- how we will engage with stakeholders, experts, and academics to deliver the next phase of development.

**1.7** This document focuses on the way we appraise domestic transport schemes. The Department for Transport's appraisal framework is also applied to international transport schemes, and we are also active in seeking to develop and improve the way the impacts of such schemes are captured in our appraisal work.

## 2. Informing transport investment decisions

### Why we appraise transport investment

- 2.1** Everyone can benefit from good transport which makes our economy stronger, and our lives better. The Department for Transport aims to enable economic growth by maintaining and improving our networks, tackling congestion, crowding, and delays. We seek to make people's lives better by enabling them to spend more of their time doing the things they care about, with the people they want to be with. We want to protect the environment which sustains us, by supporting the delivery of carbon targets and tackling air pollution, and we try to support wider Government objectives such as devolving decision making.
- 2.2** To meet these objectives we need to invest<sup>3</sup> in our transport system. The immediate benefits could take the form of shorter journeys, lower emissions, improved ambience, nicer townscapes, more efficient systems or better information. But ultimately, these feed through to outcomes like people having the benefits of greater access to jobs, business opportunities, leisure activities, family and friends, and an improved environment.
- 2.3** To decide when, where, and how to invest, we develop options by monitoring the performance of our transport systems, and responding to evolving challenges and opportunities. Given the complexity of the economic, social, and environmental systems we live in, and their strong interconnections, it is inevitable that any potential transport investment is likely to have a mixture of positive and negative impacts on these outcomes. For example, increased infrastructure might benefit the economy, but increase emissions; and measures to tackle emissions might impact on social and economic outcomes by altering the cost of owning or using vehicles. Furthermore, there are often legal duties on decision-makers including, for example, that they take all relevant information in to account and that the environmental impacts of some proposed developments are assessed. There are also duties placed on officials to ensure value for money in the spending of taxpayers' money.
- 2.4** It is therefore vital that we can inform decision-makers about the impacts and trade-offs between the outcomes of each of the options before them.

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<sup>3</sup> In this document, we use "investment" to mean all improvements in the transport network and its services; it is not limited to just capital expenditure on infrastructure.



We achieve this by undertaking transport appraisal, and presenting the results in the 'Transport Business Case'.

## How we appraise transport investment options

**2.5** To make sure the wide range of relevant factors are properly considered, we present the impacts in the 'Transport Business Case' (see Figure 2.1). This involves viewing the case for an investment from five perspectives:

- Strategic case: Why do we want to do this? How does it fit with other plans?
- Economic case: What is the balance between the costs and benefits of the impacts?
- Commercial case: Is there a robust contracting and procurement strategy?
- Management case: Do we know how we are going to achieve this?
- Financial case: Can this be afforded?

**Figure 2.1 The components of the 'Transport Business Case'**



**2.6** For each of these cases, we draw on appraisal evidence. For example, because we have carbon objectives, the impact on carbon emissions would feature in the strategic case (measured in tonnes of carbon), and

because we value carbon impacts they will also feature in the economic case (converted into an economic value). Similarly, impacts on public transport fares revenue would likely be considered in the strategic case (e.g. number of people affected and average change in fares), and economic case (e.g. value of benefits captured and distributed as a result of a changes in fare levels and revenues), plus the commercial and financial cases (e.g. change in revenue streams for commercial operators, impact on cost of option to the taxpayer).

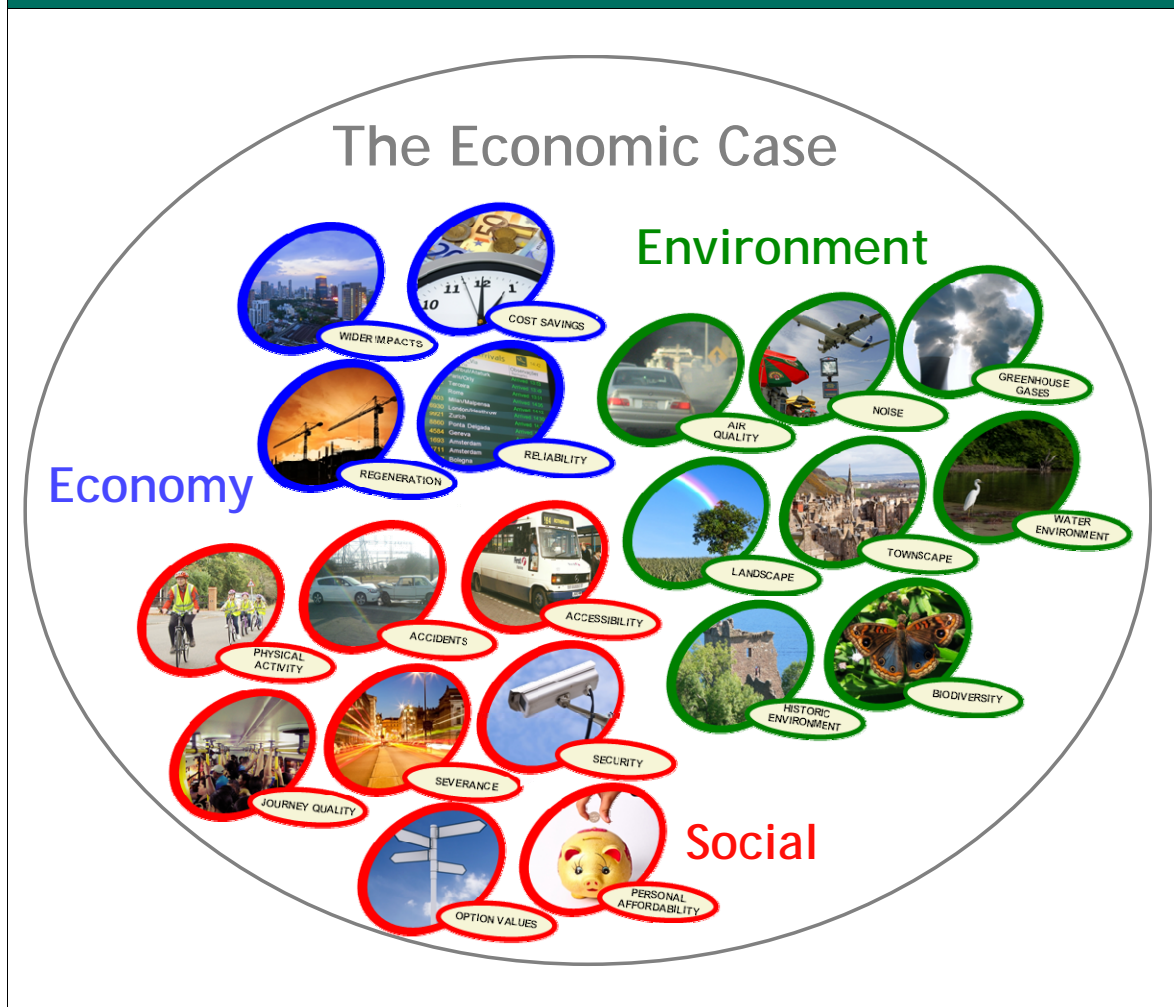
## How 'value for money' fits in

- 2.7** The economic case aims to provide a comprehensive overview of an option's impacts and, as far as possible, place an evidence-based value on them. To ensure this is comprehensive in its scope, our economic case framework considers economic, environmental, and social impacts. This has the advantage of giving a clear indicator of whether, and to what extent, an option's impacts are value-adding.
- 2.8** Figure 2.2 illustrates the scope of impacts that are included in the economic case and the broad outcomes across the economy, society and the environment that would result from these impacts. Some of these impacts influence several outcomes, for example a change in physical activity or accidents would affect both the economy and society.
- 2.9** A value for money assessment of an option brings together the impacts in the economic case which can be valued (in a benefit cost ratio), with a description of the scale of impacts which are hard to monetise. The results of this appraisal are used to assign the option a value for money (VfM) category - poor, low, medium, high, or very high<sup>4</sup>.

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<sup>4</sup> Value for money guidance: <http://assets.dft.gov.uk/publications/value-for-money-assessments-guidance/vfmguidance.pdf>

Figure 2.2 The Economic Case<sup>5</sup>



**2.10** The VfM category resulting from the economic case is an important indicator of the overall costs and benefits of an option's impacts. However, as an option's impacts do not fully describe its business case, this assessment is presented alongside the four other cases for investment, covering how the option's impacts align with decision-makers' objectives (the strategic case), and its financial, management, and commercial strengths and weaknesses.

**2.11** In the next section, we set out more detail about how we understand, value, and present, the rich and complex impacts of transport investment options on the economy, society, and environment.

<sup>5</sup> The following sources are acknowledged for the images in Figure 2.2: <http://www.freedigitalphotos.net>: Grant Cochrane (cost savings), Nirutfdp (wider impacts), winnond (regeneration), artur84 (reliability, water environment), njaj (greenhouse gases), zirconicusso (landscape), Vichaya Kiatying-Angsulee (townscape, security, severance), James Barker (historic environment), Christian Meyn (biodiversity), bunnacula (accidents), suphakit73 (option values), kongsky (personal affordability); <http://www.flickr.com>: biofriendly (air quality), chanelcoc872 (noise), Vinicius Depizzol (journey quality), hamster! (accessibility); <https://www.gov.uk/government/organisations/departement-for-transport> (physical activity).

# 3. Understanding, Valuing and Presenting the Impacts

**3.1** We understand that transport investments will produce complex impacts on the economy, environment and society. The initial transport impacts will develop and transform as people respond to changed economic and social opportunities and impacts are transmitted through the ecosystem.

**3.2** This Chapter sets out how we understand what the impacts are, how we value them, and how we present a detailed picture of these complex transmissions to inform decisions.

**3.3** A transport scheme will have direct impacts on the people who are travelling, by improving their travel experiences, allowing more time to pursue leisure or business activities. But of course, the improved access to employment, business, and leisure opportunities offers people the chance to work in different places, with different businesses, and to switch to more enjoyable activities - all of which would be indicated by a change in the volume and pattern of travel. These economic impacts could transform further, as they pass on into changes in people's and business locations, and property prices.

**3.4** For example, imagine:

- A transport scheme, which makes a cross town journey easier by removing interchanges. Someone who has been put off visiting friends across town and instead has been staying home and watching TV, can now make that journey, switching to what is for them a more enjoyable activity.
- Someone who loves visiting theme parks, regularly goes to a theme park in one county and would prefer to visit a theme park in another county but is put off by the lengthy coach journey. A transport improvement means she can now comfortably get there and back with a full day enjoying the rides.
- A business person who doesn't travel to meet an important potential client because the journey requires two trains journeys and a long interchange and they can't afford the time out travelling. The provision of a seamless service means that they make their vital meeting, sealing the big deal and opening up the markets their business can serve.

**3.5** Not all transport schemes are about speeding up journeys. For example, the primary objective of many rail schemes is to increase capacity, relieving over-crowding and making travel more comfortable and

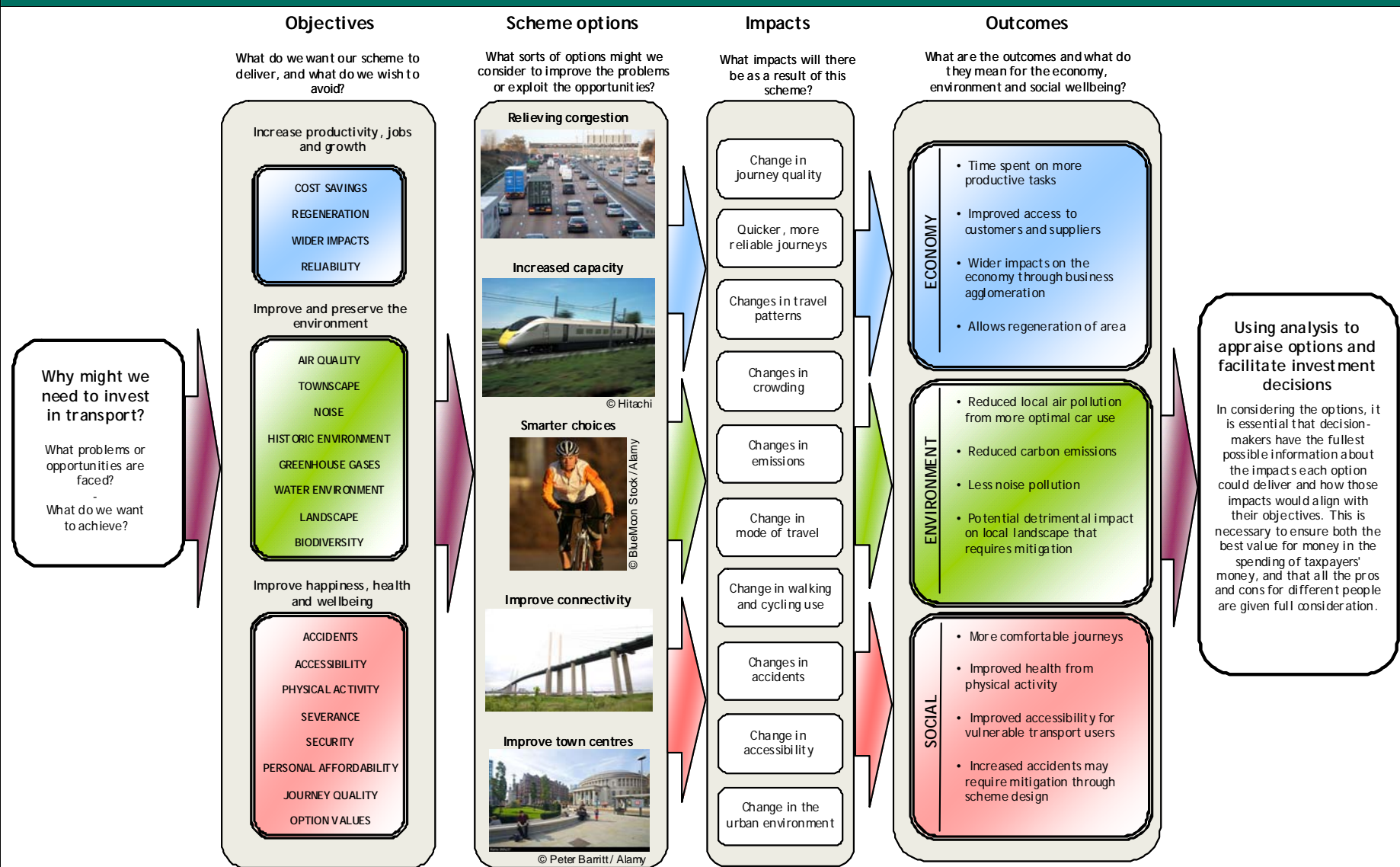
enjoyable. Other schemes, such as junction improvements, may aim to reduce road accidents, reducing road casualties and improving people's health and wellbeing.

- 3.6** Similarly, the impact of a reduction in emissions of pollutants from vehicles goes far beyond the change in 'tailpipe' emissions. It would have complex impacts on people's health, and potentially wider aspects of the ecosystem. For example consider a commuter, who starts to cycle to work when a cycle lane is opened, gets fitter, increases their productivity and reduces their environmental footprint, and also affects other's health and environment.
- 3.7** The key challenge in appraisal is to understand, value and present this complex set of impacts and ensuing responses when informing decision-makers about the pros and cons of the available options.

### **Understanding the impacts**

- 3.8** To understand these impacts, we can use sophisticated modelling of the transport (and in some cases the economic) system, alongside other methods, to estimate the impacts of a transport scheme. But attempting to model and understand the full chain of all these transmission mechanisms and responses through the economy, society, and ecosystem, would usually be unfeasible, disproportionate, and/or very difficult to present as a whole to decision-makers.
- 3.9** Instead we use just enough modelling of the transport system to generate sufficient information on a set of key qualitative and quantitative indicator variables (e.g. congestion, crowding, carbon emissions, accidents, landscape etc.) to:
- provide decision-makers with information on the broad range of impacts, and alignment with their objectives; and
  - deliver the data necessary to undertake the valuation of the impacts.
- 3.10** The exact choice of indicator variables can vary between schemes. But the broad distinction between the indicators we model, and the full chain of ensuing effects they represent, is illustrated in Figure 3.1 below with examples in Box 3.1.

**Figure 3.1 Direct impacts and wider effects**



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### **Box 3.1 - Scheme Examples**

- Cycle City Ambition Grants invested £77m in eight cities to increase cycling take up. The appraisal looked at indicators such as the changes in travel patterns, mode switch and increased walking and cycling with the key final outcomes of improved wellbeing and health from physical activity.
- M62 managed motorway congestion relief scheme. The appraisal looked at indicators such as changes in travel patterns and re-routeing as a result of reduced congestion and quicker journeys. The intermediate effects included improved access to customers and suppliers with the key outcome being economic growth.
- Part of the rail investment package announced in 2013 will deliver increased train capacity into London Waterloo. The appraisal looked at indicators such as crowding and changes in travel behaviour such as switching mode from road to rail. Intermediate effects included more comfortable journeys, improved access to customers and suppliers and improved air quality, with key outcomes being improved wellbeing, economic growth and reduced pollution.
- The investment in the Hindhead tunnel which created tunnels to carry traffic underneath the Devil's Punch Bowl (Surrey), a site of special scientific interest. The appraisal looked at indicators such as re-routeing as a result of reduced congestion and quicker journeys. Intermediate effects included, improved landscape, reduced accidents and better air quality with key outcomes being improved wellbeing, economic growth and reduced pollution.

**3.11** We also examine the distribution of these impacts across different social groups, to ensure equality is considered when making decisions. This is achieved by analysing the significance of social, environmental and financial impacts within the defined area and focuses on the concentration of these impacts on particular users or vulnerable groups. The analysis provides an understanding of the distribution of positive and negative impacts.

### **Valuing the impacts**

**3.12** As mentioned earlier, in the economic case we aim to place values on as many of the impacts of an option as possible to help show the extent to which the option's impacts are value-adding. But valuing the outcomes is a potentially difficult challenge. How should values be placed on the full chain of intermediate effects so that we can value the final outcome? For example, how can we capture and reflect the knock-on impacts of a more seamless rail service with reduced interchanges, which leads to commuters choosing a higher quality of life by moving further away from a town centre, which in turn can influence house prices and shifting patterns of consumer demand?

**3.13** As illustrated in Figure 3.1 our framework includes:

- **direct economic & social impacts.** Using insights from standard economic theory, many of the important social and economic outcomes can be valued by looking at (a) the value of the immediate impacts on people's existing travel patterns, plus (b) the value of the increased social and economic opportunities the transport scheme offers, both of which can be inferred from the expected changes in transport costs and people's travel.
- **environmental impacts.** These impacts, such as changes in noise and air pollution, are valued by understanding the changes in travel and emissions from the transport system and the value of the resulting changes in the environmental system. There are also non-travel related environmental impacts, such as on the visual landscape, which can be positive or negative.
- **wider economic impacts.** The direct economic impacts above do not necessarily capture all impacts on our economy. These 'wider' impacts represent the value of impacts, such as regeneration, the move of workers into more productive jobs, 'agglomeration' effects of urban areas working more effectively, and labour market participation effects.

#### *Valuing the direct economic and social impacts*

**3.14** We are able to 'value' the immediate impacts of an investment option, such as quicker, cheaper, and/or more comfortable journeys by following well established economic theory.

- The immediate reduction in **financial travel costs** (such as fuel costs or vehicle wear and tear) for existing travel patterns delivered by a transport improvement can be valued directly. This is because (a) market prices for these are easily observable (b) economic theory shows that these market prices indicate the value of the good being bought and sold and (c) the sophisticated transport modelling mentioned above estimates these cost savings when simulating travellers' responses to the investment.
- Valuing the immediate change in the **broader class of travel 'costs', such as travel time, discomfort, and/or inconvenience** for existing travel patterns, is less straightforward, but equally achievable. Market prices for these are not available, but this is a familiar challenge in much work to inform decision-makers and there are long-established methods to tackle this. These changes are valued by using these established methods to estimate travellers' willingness to pay for a change in these 'costs' (for example by careful surveying methods) then combining this with the number of travellers expected to experience the cost change.
- Lastly, it is also important to value the **increased social and economic opportunity offered by the lower transport costs (both financial and broader)**. This is sometimes termed an **increase in 'accessibility'** and is revealed as **increased travel**. Again, economic



theory gives a straightforward route into this: establishing travellers' willingness to pay for the increase accessibility. This can be achieved by drawing on the insight that the value to a traveller of the activity enabled by an extra journey must exceed (or at least equal) the journey cost. Hence, the extra travel enabled by a transport improvement, coupled with the willingness to pay for the extra journeys (inferred from the journey cost before and after the improvement), allows us to value the increased social and economic opportunity element.

**3.15** However, all of these valuations clearly focus on the most direct impacts of a transport investment option and, as noted earlier, we would of course expect these impacts to be transformed into a richer set of changes, e.g. changes in travellers' household location, or impacts on property prices. Fortunately, an insight from economic theory (similar to that in the third bullet above) tells us that people would make these further changes only if they are of broadly equal value to the original impact. Hence, the immediate valuation is also a good measure of the value of the final outcome.

**3.16** For example imagine a diner who regularly eats out at a particular restaurant finds that a transport investment has improved transport between their home and an alternative restaurant. They would prefer to go to the alternative restaurant, but it was previously too far away to travel to. They decide that they will now switch to the alternative. The benefit, such as the increased happiness and enjoyment they get from going to the different restaurant, is equal to (or greater than) the change in the costs of the journey, otherwise the diner would not make that change.

### *Valuing environmental impacts*

**3.17** There are many different types of environmental impacts considered as part of the appraisal including noise, air quality and carbon emissions. They are valued in different ways:

- noise is valued using information about how much people are willing to pay to avoid transport related noise, as revealed by patterns in house prices in the proximity of noisy roads;
- air quality is valued using stated preference evidence of how much people are willing to pay to avoid adverse health impacts associated with poor air quality;
- carbon emissions in the traded sector are valued using forecast EU Emissions Trading System prices and emissions in non-traded sectors, such as from petrol and diesel, are valued using the cost of abatement required to meet government carbon reduction targets; and
- other environmental impacts, such as biodiversity, the water environment and heritage of historic resources are assessed qualitatively, using an 'environmental capital' approach which looks at

the likely scale of impact the option will have. This can be further informed by additional analysis of landscape impacts, using estimates of the value of undeveloped land based on how much people are willing to pay for different landscapes, although it is difficult to assign precise values to impacts of this type.

- 3.18** These values are combined with information from the transport modelling about how indicators such as vehicle tailpipe emissions are changed by the investment option, to provide an overall valuation of the environmental impacts.

### *Valuing the Wider Economic Impacts*

- 3.19** The route into valuing 'direct' economic and social impacts used above relies on the markets impacted by the investment option being 'well-functioning'. This means that there are no significant 'market failures' such as a lack of competition, spillovers between firms or barriers to firms capturing all the profits caused by their actions. However, such 'imperfections' are evident in practice. These include:
- the 'agglomeration effects' of firms clustering together in similar sectors, which captures the positive spill-over effects that these firms experience by clustering together so they can benefit from greater business interaction, more efficient labour markets and better access to common suppliers and customers;
  - impacts on labour market participation and the movement of workers to more productive jobs, where commuting costs can act as a barrier to people working, or accessing a more productive jobs which better suit their skills; and
  - the effects of limited competition between firms.
- 3.20** A recent example of wider economic impacts being examined in appraisal are set out in Box 3.2

### **Box 3.2 - Wider Impacts of a Lower Thames Crossing**

The Dartford-Thurrock river crossing on the A282 connects the M25 north and south of the River Thames and provides the only river crossing on the strategic road network east of London. The crossing serves traffic travelling to and from major employment centres to the north of the Thames with South London, Kent, Sussex, and continental Europe via the Kent ports and the Channel Tunnel, whilst also serving local traffic. The provision of new crossing capacity in the Lower Thames area is expected to provide significant economic growth impacts of agglomeration resulting from improved connectivity between these employment centres. Improved knowledge sharing and access to suppliers and customers between firms in this sector is expected to lead to positive spill-over effects which increase productivity and growth.

Similarly, the project is expected to contribute to economic growth from increased labour market participation and a move to more productive jobs. For example, someone living and working in the suburbs might be encouraged to take up a more lucrative position in London which better suits their skills when previously high levels of traffic congestion had put them off. Others might be encouraged to enter the labour market for the first time as a result of the reduced costs of travelling.

### **Presenting the Impacts**

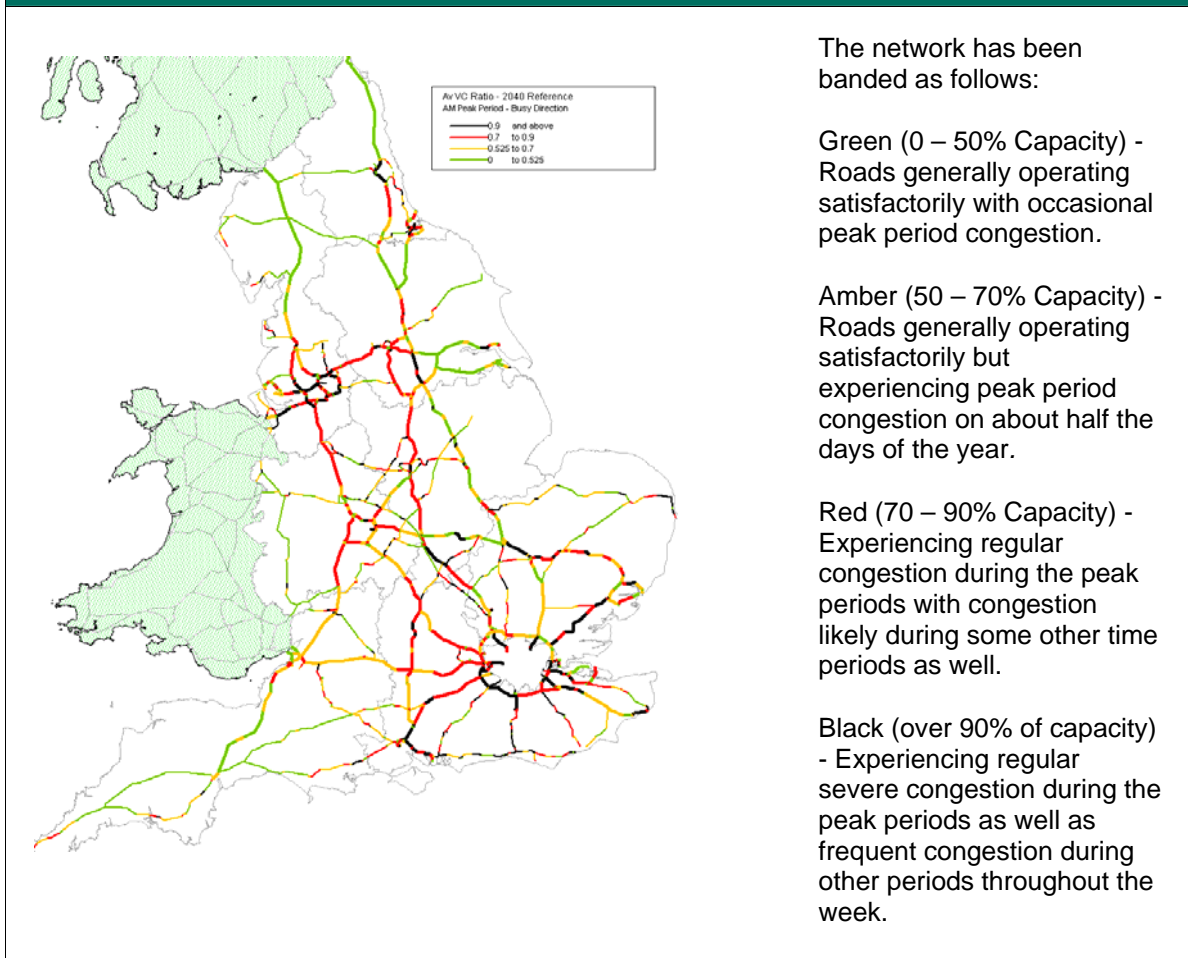
- 3.21** As mentioned earlier, conveying to decision-makers the many complex impacts of an investment option is challenging. We aim to convey an understanding of the impacts, showing qualitative and quantitative impact indicators, and the economic value figures, for each type of economic, social, and environmental impact.
- 3.22** We do this by providing a high level summary of the impacts of a transport scheme, in an 'Appraisal Summary Table' (AST)<sup>6</sup>. For example, it might show that a motorway widening scheme, which would impact on a significant historic building, would deliver economic benefits by reducing congestion, but be to the detriment of our heritage in a way which can be indicated in only a qualitative way. The AST also provides space to summarise significant distributional impacts.
- 3.23** Importantly, this can be viewed in its own right, to provide the decision-maker with a view of all the expected impacts of the option, not just those which have been given a monetary value. It can also be the starting point for the 'value for money' assessment mentioned in paragraph 2.9 above, which is then presented alongside the other elements of the 'Transport Business Case'.

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<sup>6</sup> Example of 'Appraisal Summary Table': <http://assets.highways.gov.uk/roads/road-projects/m1-junction-19-improvement-scheme/M1J19AST.pdf>

- 3.24** Furthermore, one of the benefits of the sophisticated modelling tools is that the detailed outputs can be linked to geographical information systems which can be used to visualise the future transport systems with and without the proposed schemes. This provides the opportunity to present the detailed and complex impacts in an accessible way, such as by mapping key indicator variables (e.g. traffic, congestion, crowding, emissions) onto the network and presenting in map form.
- 3.25** For example, in the development of 'Action for Roads', maps of congestion on the strategic road network were generated from the National Transport Model (see Figure 3.2 below) to illustrate the challenge of future road traffic demand and inform the development of the strategy.

**Figure 3.2 Map of congestion forecast<sup>7</sup> (2040), National Transport Model**



- 3.26** The scope for producing such geographical information varies between the modelling tools used and the type of scheme examined, and the interest in the outputs will vary with the context of the decision-making,

<sup>7</sup> The National Transport Model map shows forecast 'flow to capacity' ratios in the busiest direction of traffic during the Monday to Friday morning peak period for 2040.

so the Department does not set requirements for such information. However, this capability demonstrates that sophisticated and complex modelling tools can be an aid to understanding the impacts of an investment option and public accessibility.

**3.27** This section has set out how the Department for Transport's appraisal framework aids in understanding, valuing, and presenting to decision-makers the broad range of economic, social, and environmental impacts that options for transport schemes would have. Within the 'five case' approach, this helps to show how each option aligns with decision-makers' objectives and conveys the full range of pros and cons.

**3.28** The next section takes stock of our appraisal framework and methods, sets out some recent developments, and summarises the Department's response to them. It then goes on to set out the Department's plan for the next phase of its continuous development, research and engagement.

## 4. Our plans for development

### The need for continuous development

- 4.1** This chapter sets out how our appraisal framework measures up to other nations' approaches to transport appraisal, how we are responding to key developments in the type of projects to be modelled and appraised, and advances in data and analytical methods.
- 4.2** Our appraisal framework has been continuously developed over many years. It has grown from its early years of measuring the more direct impacts of transport investment, through incorporating a broad range of environmental impacts, to subsequent development of 'wider economic impacts' appraisal methods, and the inclusion of 'social and distributional impacts'.
- 4.3** Following the EU's HEATCO review of transport appraisal across Europe, the Institute for Transport Studies, University of Leeds (referred to as ITS Leeds), concluded that *"the UK remains at the forefront of the use of CBA to inform decision making"* (ITS Leeds, 2007).
- 4.4** More recently the Department commissioned ITS Leeds to update their review of our appraisal framework, comparing it with approaches used in other developed nations (ITS Leeds, 2013). This found our framework to be comparable with the best available in the world and that the methods we have developed to capture 'wider economic impacts' are now being adopted in other countries around the world:
- "... appraisal guidance in England can be seen to have pushed the envelope in various ways over the last decade. The guidance on subjects such as wider impacts, walking and cycling, social and distributional impacts and aviation has developed as has the concept of proportionality and a degree of flexibility in appraisal according to what is assessed to be significant. So, within the established framework, there has been evolution."*
- "Our impression is that England has gone further than other countries in systematic codification through WebTAG, which we believe is an international reference point. Other countries have their own practices and evidence base but UK work is frequently referred to."<sup>8</sup>*
- 4.5** While this is reassuring, the world is changing and we need to continuously develop. Understanding and valuing economic impacts is an even higher priority and there is now an increasing need to estimate

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<sup>8</sup> page 7, ITS Leeds, 2013.

the expected economic growth impacts of transport proposals, to ensure the right analysis is in place to support the Department's major programme of investment in transport. The increasing focus on larger, longer term strategies and transport schemes has also highlighted the potentially greater uncertainty inherent in such analysis. Alongside this, developments in evidence, data and computing power have the potential of providing new possibilities for appraising the economic growth impacts.

## **Recent Department for Transport research and action**

- 4.6** In response to these developments, the Department has undertaken research and acted upon its findings. This recent research, its findings, and our actions in response, are set out in the accompanying technical document: 'Understanding and Valuing the Impacts of Transport Investment - Latest DfT Technical Research and Next Steps in Transport Appraisal'.
- 4.7** The Department's appraisal framework and methods, bolstered by the research and actions set out in that document, continues to provide a sound basis for informing decisions about transport investment, as part of the five-part 'Transport Business Case' approach. Nonetheless, maintaining and developing our framework is an ongoing endeavour. We are determined that we will keep pace with emerging challenges and opportunities in appraisal, and do so by engaging with stakeholders and experts to build consensus on the next phase of development.

## **Analytical Strategy and Engagement**

- 4.8** As part of our ongoing engagement we held two workshops earlier this year on Transport and Economy and Openness and Transparency. We have also made it easier for people to engage with our appraisal guidance by publishing restructured guidance which is easier to use, clearer and more accessible to wider audiences. Our new version has gone through extensive peer review and is now published alongside current guidance and we are seeking your views.<sup>9</sup>
- 4.9** To set the direction for the next phase in the continuous development of our core evidence base, we will develop an Analytical Strategy for our appraisal framework and methods. This will set down:
- the key challenges in appraisal we need to meet in the future to meet the needs of decision-makers;
  - the developments that are needed to meet those challenges;
  - our plans for research and new guidance to support these; and
  - how we will ensure we draw upon the views of experts and stakeholders.

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<sup>9</sup> Restructured guidance can be found here: <https://www.gov.uk/transport-analysis-guidance-webtag>  
Contact email: [TASM@dfat.gsi.gov.uk](mailto:TASM@dfat.gsi.gov.uk)



- 4.10** Through engagement with stakeholders and experts, we will develop our Analytical Strategy as a living document and use it to guide development of our framework and methods.
- 4.11** In preparation for the Analytical Strategy, the following section sets out how the challenges and opportunities in transport appraisal are evolving, summarises some of our resulting recent research and actions, and our initial views on possible plans for near-term developments in these three priority areas. However, the development of the Analytical Strategy will encompass a wider range of priorities over a three to five year time horizon.

## **Economic Growth**

- 4.12** There is now an increasing need to estimate the expected economic growth impacts of transport proposals. We need to ensure the right analysis is in place to ensure that transport investment supports economic growth, as part of the wide range of benefits that transport can deliver. Developments in evidence, data, and computing power have the potential to provide new possibilities for appraising the economic growth impacts.
- 4.13** In response to these changes we have commissioned research into, and advice on, the key strengths and weaknesses of the emerging and advancing methods to estimate the impacts of transport schemes on economic geography (see chapter two of the accompanying technical document). As part of our release of restructured guidance, which will replace current guidance in 2014, we are improving the clarity on how Wider Impacts and regeneration impacts should be appraised and reported in scheme business cases. Further we will develop guidance on estimating the impacts of transport on the location of economic activity.
- 4.14** We intend to develop our understanding of economic growth impacts through:
- undertaking a comprehensive survey of the latest theoretical and empirical evidence for the potential growth impacts of nationally significant infrastructure and programmes of expenditure; and
  - developing recommendations for how this agenda should be taken forward by developing appraisal techniques in this cutting-edge area.

## **Valuing journey improvements**

- 4.15** In response to developments in technology and data collection, the availability of new datasets and the potential impacts on how people work and undertake business, we commissioned research into values of travel time which considered whether our approach to valuing travel time savings remains appropriate (see chapter three of the accompanying technical document).
- 4.16** This research considered the case for updating the non-work values of travel time savings, and whether the values and methods used to derive



the business values of travel time savings remain appropriate. This research has informed an update to our guidance including updated values and the introduction of a range around the values reflecting the quality of the available data. We also recognise the merit of the research options put forward by ITS Leeds on alternative valuation approaches for business values and plan to collect fresh revealed and stated preference evidence for both business and non-work travellers' willingness-to-pay.

- 4.17** Furthermore, the challenges of better understanding economic growth impacts suggest we might need to consider the extent to which we use differentiated values of time savings. There is compelling empirical evidence that willingness to pay for travel time savings varies with journey distance. We plan to consider whether changes to our current approach would be appropriate to help better understand and value the impacts of the breadth of transport investment options.

### **Long term demand and benefits growth**

- 4.18** Much of transport investment is for the long term and it has always been necessary to take a long-term perspective on transport investment, but this need is growing with the increasing need to understand and value the impacts of larger and longer-term, transport schemes. The key analytical issues that arise from the long term perspective are how best to forecast transport demand and transport impacts in the long term, and how to handle the inherent forecast uncertainty.
- 4.19** The Department recognises the importance of understanding uncertainty in appraisal. We have strengthened our value for money guidance, which underpins the economic case, to require core sensitivity tests such as those around demand forecasting and values of travel time savings, to be presented within the economic case. We are also releasing more accessible guidance on capturing uncertainty in demand forecasting as part of the refresh to our appraisal guidance, which will replace our current appraisal guidance in 2014.
- 4.20** We aim to go further on tackling uncertainty and we will look to how we can embed our methods in a more general risk-based approach to understanding uncertainty, and to further consider the issues of market saturation, limiting demand growth and extrapolation of benefits over the appraisal period.

### **How to get involved**

- 4.21** We will engage with stakeholders and experts on the formulation of this ongoing Analytical Strategy and throughout its delivery. To support this we will open our next phase of engagement with an event, similar to the Transport and Economy and the Openness and Transparency workshops which were held at the Department for Transport earlier this year, to which we will invite stakeholders and experts to begin to shape

this strategy. Whilst we will be proactive in involving a wide range of stakeholders, we welcome expressions of interest from all parties<sup>10</sup>.

- 4.22** Further, we intend to create a Transport Modelling and Appraisal Panel by early 2014. This will comprise experts and representatives of stakeholders, to help build consensus, and ensure we draw on the best evidence.
- 4.23** We look forward to working closely with stakeholders and experts in pushing ahead with the next phase of developing our appraisal framework and methods.

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<sup>10</sup> Contact email: [TASM@dft.gsi.gov.uk](mailto:TASM@dft.gsi.gov.uk)

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