

## **Summary**

Appraisal under the Economy objective has two components which, between them, should summarise the full extent of economic impacts resulting from a proposal. The first, Transport Economic Efficiency (TEE), covers the benefits ordinarily captured by standard cost-benefit analysis - the *transport* impacts of a scheme. The second, Economic Activity and Location Impacts (EALIs), allows the impact of schemes to be expressed in terms of their effects on the local and/or national economy.

### **Transport Economic Efficiency (TEE)**

Appraisal in this section is designed to make explicit the impact of the proposal on social welfare, as represented by the costs and benefits incurred by users and operators of the transport system. Costs to the public sector are itemised separately (see Chapter 11 - *Cost to Government*).

A key aspect of TEE analysis is the demonstration of impacts experienced by particular groups, particularly the users of a specific mode. Thus it is necessary to derive not just an aggregate statement of impact (in terms of Net Present Value or Benefit Cost Ratio) but to make clear in the AST all significant distributional impacts.

Quality and reliability costs and benefits should be assessed and, where possible, quantified and valued in money terms.

### **Economic Activity and Location Impacts (EALIs)**

Transport projects, and particularly large projects that result in significant changes in accessibility, have the potential to impact upon economic performance at least at the local level. They may also influence demand for where economic and other activities will be located. In STAG, these have been called EALIs - economic activity and location impacts. They are potentially important to decision makers.

EALIs are measured in terms of GDP and/or employment; these are narrow measures of economic welfare and so are different from the welfare measures used in TEE analysis. EALIs stem from time savings and other changes in the same way as TEE impacts. In many instances, EALIs will simply restate the TEE impacts using alternative measures of impact, but where there are market failures, the TEE analysis may fail to assess fully all of the economic impacts of a scheme. Where EALI impacts are expected to be significant, the suggested approach is to assess EALIs directly and to present these separately using GDP and/or employment measures.

EALIs must be presented at the Scotland level, and hence must include both local, or intra-area, impacts and inter-area impacts. It is important to identify both the positive and negative impacts attributable to the scheme, including displacement impacts. Decision makers may also be interested in more local level impacts, especially if projects impact upon areas at which public funds are targeted for the purpose of stimulating employment and investment in order to achieve economic and social regeneration.

## **8. ECONOMY**

### **8.1 Introduction**

8.1.1 This chapter is structured as follows:

Guidance on appraisal to establish Transport Economic Efficiency (TEE) impacts is presented in §8.2 - §8.6;

Guidance on Economic Activity and Location Impact (EALI) appraisal is given in §8.7- §8.13.

### **8.2 Transport Economic Efficiency - TEE**

8.2.1 This section provides guidance on assessing the contribution which a transport proposal may make to economic welfare through consideration of the resultant transport costs and benefits. It provides guidance on the principles which underpin the general approach and outlines the issues and methodologies relating to different sub-objectives.

8.2.2 The approach seeks to extend the New Appraisal Methodology to cater for public transport and multi-modal proposals. It also seeks to ensure that proposals are assessed on a common basis whatever mode is preferred. The approach is to quantify those benefits which make a direct contribution to economic welfare in terms of “willingness-to-pay”.

8.2.3 The method set out is broadly consistent with that previously specified in WebTAG but has some key differences in the scope of impacts and in the interpretation of outputs. In particular, as defined in STAG, TEE covers user benefits and private sector operator impacts, but does *not* include financial costs and benefits to the Government as these are quantified separately (see Chapter 11).

### **8.3 TEE Process**

8.3.1 The assessment of transport impacts should follow the process outlined below. The first bullet relates to the Part 1 appraisal whilst the remainder refer to Part 2.

- Scoping – for the Part 1 appraisal, the relationship between planning objectives and benefits which fall within the TEE criteria should be identified. For example, the comparative journey times of a proposed new public transport investment compared with the do-minimum. If the volume of existing travel is known then a simple estimate of journey time savings can be made and compared with proposal costs as a broad indicator of absolute and relative benefit between proposal options.
- Analytical tool – the planner will need to decide the most appropriate tool with which to measure passenger demand, revenue and benefit impacts. The decision should depend on the scale of the investment; the availability of existing models and data; and an early assessment of the relative robustness of outputs.
- Option development – advice on option generation, sifting and development is provided in Chapter 4.
- Option appraisal - identifying and quantifying what the impacts may be.
- Reporting - presenting the results of the assessment in a manner which will assist decision makers, including the use of the Transport Economic Efficiency part of the Appraisal Summary Table (AST).

8.3.2 The remainder of this part of this chapter focuses on the last two of these processes.

### **8.4 Principles of TEE Analysis**

8.4.1 The central principle of transport economic efficiency analysis is to estimate the welfare gain which results from transport investment, as measured by the individual’s willingness to pay for such an improvement and the financial impact on private sector transport operators. Willingness to pay should be consistent with the demand response to the improved transport opportunities.

8.4.2 The accepted best measure of welfare gain is the change in consumer surplus enjoyed by individuals and the change in producer surplus/deficit accruing to transport suppliers. Consumer surplus is defined as the benefit that an individual enjoys over and above the cost they would be willing to pay. In transport, cost is defined in money and time terms (usually

called *generalised cost*). Thus, if an individual is currently willing to travel for 15 minutes to enjoy an activity and a transport proposal reduces that to 10 minutes then the time saving of 5 minutes is an accurate measure of their consumer surplus. However, if new users are attracted to use the facility (either by switching from another mode or by choosing to travel when otherwise they would not have) in response to this time saving, then it is not normally clear at what time cost they would have been willing to switch. Here, the convention is to assume that the switch would have occurred, on average, halfway between the do minimum and do something costs. This approximation would attribute 2.5 minutes of benefit to new users in the above example. This approximation normally holds but where a wholly new mode (e.g. light rapid transit) is introduced, further guidance should be sought from the Scottish Executive.

- 8.4.3 As in all aspects of STAG appraisal, it is important to show significant distributional impacts within the overall TEE performance. For example, a rise in fares will reduce the consumer surplus of existing travellers (and discourage some from travelling by this mode) but will represent a benefit to the public transport provider, provided there is an inelastic response.
- 8.4.4 The relative importance of different types of distributional effects will depend on the proposal being appraised. Where public transport operators are affected, the breakdown of costs and revenues by mode should be undertaken. The spatial distribution of time savings can also be of value where it highlights gainers and losers. The distribution of benefits and/or fare changes by user group can also be valuable.
- 8.4.5 The results of economic appraisals should be expressed in the market price unit of account<sup>1</sup>, i.e. including indirect taxes. This is consistent with the willingness to pay principle underpinning the calculation of benefits.
- 8.4.6 A key issue is to determine the *scope* of the TEE appraisal. The following items should be included:

- Net benefits to transport users, comprising:
  - travel time savings;
  - user charges including fares, parking charges and tolls;
  - vehicle operating cost changes for road vehicles;
  - quality benefits to transport users;
  - reliability benefits to transport users.
- Net benefits to transport operators, comprising:
  - investment costs;
  - operating and maintenance costs;
  - revenues;
  - grant and subsidy payments.

- 8.4.7 Financial costs (and benefits) to the Government should **not** be included in the TEE assessment - these impacts are covered in Chapter 11 (Cost to Government). The reason for this change in practice is to emphasise that the cost to Government should be compared with **all** of the benefits (i.e. including safety, environment etc) in order to assess overall value for money – not just those costs and benefits which are quantified in the TEE analysis.

## 8.5 Calculation of TEE Inputs

### Benefits to Transport Users

- 8.5.1 In transport proposals, the principal benefits are often to transport users of whatever mode. These users fall within the following sub-groups:

- Transport users whose travel patterns do not change but who enjoy time saving and/or other benefits;
- Diverting users, who switch from other routes because of changes in relative (generalised) costs;

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<sup>1</sup> The theory behind this approach and advice on its application are set out in Developing a Consistent Cost-Benefit Framework for Multi-Modal Transport Appraisal. Robert Sugden, Economics Research Centre, University of East Anglia. January 1999. <http://www.roads.dft.gov.uk/roadnetwork/heta/resresult/develop>

- Diverting users who switch mode in response to changes in relative (generalised) costs;
- Generated users, whose use was previously frustrated by, for example, traffic conditions on the proposal, route or service;
- Redistributed users who may change their origin or destination in response to transport changes (e.g. take a job elsewhere).

8.5.2 Benefits typically arise because of some or all of the following:

- Changes in the monetary costs of travel;
- Journey time savings achieved directly, for example by using a new road or bridge rather than the next best alternative;
- Improvements in journey time reliability, which may be especially important for certain types of users such as delivery services;
- Improvements in journey quality, such as comfort or reduction in number of interchanges.

8.5.3 Other transport users may also gain if a proposal is implemented, because transport projects form part of a system or network, and network effects need to be included, where they are attributable to the proposal under consideration. Network effects which will give rise to benefits to non users include:

- Reduction in journey times on other routes which arise because of some users of the other route(s) switching to the new route or switching mode;
- Improvements in journey time reliability and other aspects of journey quality, arising for similar reasons.

8.5.4 These impacts may be reduced as changes in travel conditions are likely to generate additional traffic on other routes, so that, for example, time savings generated as some users switch routes are reduced, while suppressed demand is released on the other routes. These effects also need to be assessed where they are likely to be significant.

8.5.5 These impacts, which occur outwith or external to the proposal under consideration, need to be identified at an early stage in the Part 2 appraisal. Where these are likely to be important in relation to the costs and other benefits of the proposal, they should be quantified in the same manner as direct benefits and costs.

#### *Traffic Growth*

8.5.6 The starting point for the assessment of traffic growth should be the DfT database TEMPRO - NTEM. This provides local growth factors consistent with future land use plans. Details can be found in Appendix A. However, the factors highlighted in the following paragraphs will also need to be considered on a project specific basis.

8.5.7 It is necessary to make forecasts of traffic growth which distinguish and take account of:

- Growth in demand which will occur in the network whether or not the particular project is undertaken;
- Specific generated traffic growth, which should be treated where possible in a dynamic rather than static framework;
- Collateral traffic growth/generation, i.e. growth due to specific additional activity, defined fully in §8.5.10.

8.5.8 Provided land use plans are not dependent on the transport proposal, then TEMPRO – NTEM should be the best source of information for the first of these factors.

8.5.9 It may be appropriate to adopt growth forecasts derived from a comprehensive multi-modal transport model such as the Transport Model for Scotland (TMfS). If such models are used then the socio-economic data which forms inputs to the model (population, employment etc.) must be consistent with those used in TEMPRO-NTEM. If planners wish to adopt growth

forecasts other than those derived from TEMPRO-NTEM, they should discuss their proposals with the Scottish Executive or other relevant funding agency at the earliest opportunity.

8.5.10 In addition to the release and subsequent growth of demand (generated traffic or patronage), proposals may give rise to factors which alter the overall demand for travel at each level of generalised cost – a shift of the demand curve. This is here termed collateral traffic growth, in order to avoid confusion with the concept of induced traffic growth, which typically refers to direct or indirect generated traffic.

8.5.11 Collateral effects need to be identified and, where important, quantified. These effects derive from a chain of cause and effect in which the transport proposal changes the parameters which determine the level of demand at local or national level, and can take place for a number of reasons, including:

- Land use effects, for example where the transport investment would open up otherwise unavailable land resources for industrial, commercial and residential development;
- Mobile investment which is attracted because of improved accessibility, involving perhaps additional workers and/or the attraction of industries which raise local/regional incomes, leading to additional traffic.

8.5.12 These effects are traffic effects but take place through what are termed EALIs -economic activity and location impacts. As discussed below in the section on EALIs (§8.7 *et seq.*), the essential first step is to identify the EALIs and the rationale for them, then to assess their implications for demand for travel.

#### *Growth in Public Transport Patronage*

8.5.13 Projected trends in public transport patronage should be considered with particular reference to local time-series trends. Planners may also wish to take account of:

- industry projections of growth (for example for the rail network);
- forecasts produced by multi-modal area-wide models, such as TMfS.

8.5.14 If growth in public transport patronage is of particular importance for the proposal under consideration, planners may wish to consider developing bespoke public transport growth models. In such circumstances planners should discuss their methodology with the Scottish Executive or other relevant funding agency.

#### *Valuation of Travel Time Benefits*

8.5.15 The recommended methodology for calculating and valuing transport travel time and vehicle operating costs is as set out in the Transport Analysis Guidance (TAG) issued by the DfT. Unit 3.5.6 of TAG sets out appraisal values of time for travellers in the course of work, disaggregated by modal group. It also includes specific values of time for walkers and cyclists. For non-work journeys, at present a standard appraisal value of time is used across modes. Any proposed deviations from the standard advice in TAG should be discussed with the Executive.

8.5.16 The TAG includes advice on the split of work and non-work travel time by travel mode.

8.5.17 In a multi-modal or public transport context, there is the complication that travellers do not value time spent walking to or waiting for public transport at the same rate as time spent travelling in the vehicle. This disutility should be valued at twice the value of in-vehicle time, *for non-working time only*. This is because the time spent or saved in the course of work is assumed to be productive working time - the travel activity is deemed to be irrelevant. Further detail on this issue is given in TAG, 3.5.6, 1.2. Where a proposal may be specifically designed to enhance the waiting environment (for example a bus station) then local surveys to measure disutility and willingness to pay for improvements may be valuable to modify this approach. This may be particularly useful where this represents the main justification for a proposal.

- 8.5.18 Similarly, there is evidence that travellers are willing to pay to avoid interchange between modes in addition to the reduction in time spent waiting for the subsequent leg of the journey. This 'interchange penalty' must be included in changes to benefit. The factor to allow for this disutility will normally lie in a range between 3 minutes and 15 minutes for urban travel, depending on the quality of the interchange and the distribution of perceptions of users, which can vary widely. Research for the Scottish Executive<sup>2</sup> derived values of 4.5 minutes for bus users and 8 minutes for rail users, each based on research in large cities. For interurban rail travel, the value will be higher. The use of an appropriate value should be justified either through establishing local values through research or with recourse to comparable examples elsewhere. Planners should be careful not to double-count time spent waiting for a connecting service within an appropriate interchange penalty.
- 8.5.19 The rate of growth in the value of time is assumed to change in line with real GDP per head. Growth rates that should be adopted are included in TAG Unit 3.5.6.

#### *Indirect Taxation Adjustments*

- 8.5.20 All costs and benefits should be quoted in market prices. The market price values of time for working time include a mark up for indirect taxes of 20.9%, the average rate of indirect taxation in the economy in 2002<sup>3</sup>. For non-working time, the benefit is perceived by the individual and is therefore inclusive of indirect tax. These market price values should be used as set out in the TAG (Unit 3.5.6). Section 2.
- 8.5.21 In disaggregating the impacts upon user groups, allocations of financial impacts between Government and others is required. For example, a saving in fuel costs for drivers should be valued at current market prices (i.e. including fuel duty), but on the other side of the equation the loss of tax revenue to Government needs to be taken into account (see chapter 11). TAG (Section 3.5.6) provides parameter values for the appropriate taxes.
- 8.5.22 More detail on this issue can be found in TAG (Section 2.7.1, 1.9).

#### **User Charges**

- 8.5.23 The treatment of travel charges should be consistent with that set out in TAG (Section 3.5.3). In essence, any additional charges paid should be treated as a cost to travellers (i.e. a negative value in the AST) and a reduction in charges should be treated as a benefit. For users who switch mode from car to public transport, the additional fare paid will be disbenefit to the car user, but they will also make a financial gain in terms of savings in vehicle operating costs.

#### **Vehicle Operating Cost Savings**

- 8.5.24 Transport proposals can lead to changes in the cost of fuel consumption and other costs of operating motor vehicles. This comes about due to changes in the volume of car travel, either through mode switching or induced traffic, and in the speed and distance travelled as a result of route changes.
- 8.5.25 Vehicle Operating Cost (VOC) calculations should be as set out in TAG (Section 3.5.6). This incorporates future changes in the resource cost of fuel and in vehicle efficiency.

#### **Quality Benefits**

- 8.5.26 Journey quality can be found to be an important determinant in travel behaviour, particularly poor quality as a deterrent to mode or route choice or as a disincentive to make a journey. Travel decisions may be based on the weakest link in the journey and addressing poor quality travel elements may therefore remove barriers to travel.

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<sup>2</sup> Interchange and Travel Choice: Volumes 1 and 2. M.Wardman, J. Hive and S. Stradling. 2001

<sup>3</sup> Transport Analysis Guidance. Unit 3.5.6, Section 1.1.8

- 8.5.27 The debate as to whether willingness to pay for quality benefits should be included in transport economic efficiency analysis has been partly influenced by the absence of definitive values for quality improvements. However, it is invariably the case that the costs of quality improvements are subsumed within proposal costs. By not including perceived benefits, there would be a problem of bias against those proposals that have an explicit objective to improve quality (e.g. quality partnerships for buses).
- 8.5.28 For rail proposals, the SRA expects fares alone to be the most commonly used indicator of user benefits (i.e. in general consumer surplus should be captured in fares, rather than accruing to users). Discussions should be held with operators to determine the scope for increasing fares beyond the regulated increase. An increase in fare revenue acts as a benefit to operators and a cost to users, although second order effects on demand will change the overall appraisal. For appraisal purposes, the net (generalised cost) benefit should be considered separately where it may form a key part of any benefit. The specifics of rail proposals are dealt with in more detail in Appendix D.
- 8.5.29 Willingness to pay for quality benefits has been investigated through stated preference research but further research is needed to provide definitive values in this area. In the interim, a qualitative assessment of quality benefits should be included.

### **Reliability Benefits**

- 8.5.30 Evidence suggests that travellers value changes in excess travel time (i.e. late running) more highly than changes in scheduled travel time. For private road travel there is a distinction between day-to-day variability in journey times which a traveller might allow for and the delay associated with unexpected incidents. However, at present there are no reliable techniques for quantifying and valuing changes in the reliability of the road network, so benefits will need to be assessed in a simple or qualitative manner, e.g. through the examination of changes to volume-capacity ratios. Further research into improving the measurement and valuation of reliability benefits is currently being undertaken by the DfT.
- 8.5.31 Similarly, for public transport proposals, it is not always possible to forecast what the change in reliability will be. However, the SRA sets out a methodology for valuing changes in reliability on rail services<sup>4,5</sup>. This should be considered for proposals which are likely to demonstrate a significant improvement in reliability.

### **Private Sector Operator Impacts**

- 8.5.32 The other category of transport economic efficiency benefits is the impact on private sector operators – investment costs, operating and maintenance costs, revenues, and grant/subsidy payments. In all instances costs presented should be adjusted for optimism bias (ref. Chapter 12).
- 8.5.33 As noted in §8.4.7, costs and revenues to the Government (including public sector operators) should be separately identified – see Chapter 11.

### **Investment Costs**

- 8.5.34 These should include all infrastructure costs and vehicle costs incurred by private sector operators which are additional to those incurred in the 'do-minimum' scenario. Fees, design, land acquisition and other preliminary works should be costed. Costs should be entered into the AST as negative amounts.

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<sup>4</sup> Planning Criteria – A guide to the Appraisal of Support for Passenger Rail Services. OPRAF November 1997

<sup>5</sup> Passenger Demand Forecasting Handbook, issued by TCI Operational Research (Commercial in Confidence)

## **Operating & Maintenance Costs**

- 8.5.35 Operating and maintenance costs should include the additional annually recurring costs incurred by the private sector in running and maintaining the facility. Examples of these costs include operating costs for new public transport services, and maintenance costs of vehicles and facilities.

## **Revenues**

- 8.5.36 Extra revenue should be treated as a benefit to operators. Revenues are related to user charges, as user charges (fares etc) represent money transfers from users to operators which become revenues from the operator's point of view. However, this does not mean that the economic benefit of changes in user charges is the same to the traveller and the operator. In fact, for travellers, the economic benefit of a change in charges is the resultant change in their consumer surplus. For those who do not change their behaviour, the change in consumer surplus is the same as the change in money paid, but for those who do change their behaviour, this is not the case. For operators, however, the economic benefit of a change in charges is simply the change in net revenue received. Therefore, the values for User Charges under User Benefits and the values for Revenues under Private Sector Operator impacts will usually not be equal in size.
- 8.5.37 In many cases extra revenues to one operator will to some extent represent a transfer from other operators. For example, a rail investment may lead to modal switch from buses, which represents a loss to bus operators. Where such impacts are likely to be significant, they should be taken into account and the revenue impacts should be disaggregated by mode in order to identify both the 'winners' and the 'losers'.

## **Grant and Subsidy Payments**

- 8.5.38 In the majority of cases, private sector operator revenues are unlikely to cover the investment and operating costs of a proposal, and hence some form of grant or subsidy will be required to deliver actions by private sector operators (e.g. ScotRail, bus operators, etc). Any such grant represents a benefit to operators.
- 8.5.39 At the appraisal stage funding agencies are unlikely to be able to give commitments or to be precise about the amounts of support likely to be available. However, the deficit arising from private sector provision without the benefit of grant or subsidy will be indicative of the level of support likely to be required to deliver the strategy or project (although it should be noted that the private sector is likely to require an additional profit margin/return on capital). Consideration should also be given to whether the level of grant or subsidy would be likely to meet the relevant decision criteria published by funding agencies.
- 8.5.40 In some cases, there may be a need to disaggregate the market into different operators in order to assess overall subsidy requirements. For example, a rail enhancement may lead to a loss of bus revenue but there will generally be no requirement to compensate the bus operator (though this should still be recorded as a disbenefit to bus operators under "revenues").
- 8.5.41 In some cases, it may be possible to identify potential developer contributions. In effect, these are 'negative grants'. These should be recorded both as a cost to the private sector and a benefit to the public sector (see Chapter 11).

## **8.6 Discounting, Price Bases etc**

- 8.6.1 *Test Discount Rate.* Discounting costs and benefits which occur at a later date reflects the preference of society for benefits now rather than later. A full discussion of the basis of discount rates can be found in the Treasury Green Book. The rate is currently 3.5%. Note that the previous rate of 6% has now been "unbundled" and no longer covers risk and optimism bias, and hence there are now additional requirements to explicitly take account of risk and biases – see Chapter 12.

- 8.6.2 *Base year for discounting.* All costs and benefits should be discounted to 2002 in line with parameters presented in the Transport Analysis Guidance.
- 8.6.3 *Price Base.* The price base year should also be 2002. Thus all costs should be in 2002 prices and benefits valued at 2002 fares and values of time. Appropriate indices should be used to adjust modelled benefits and costs (e.g. NCE construction cost index; historical fares indices).
- 8.6.4 *Opening Year and Appraisal Period.* The opening year should be the year in which operating costs and benefits start to be incurred. Investments should be appraised over the economic life of the main serviceable assets. For most significant proposals the standard appraisal period should be 60 years. This is to ensure that the appraisal covers the period of the useful lifetime of the asset and captures the stream of costs and benefits accrued during the project life. Residual values should continue to be calculated for assets with finite lives for less than 60 years e.g. ferries. In such circumstances the planner should seek guidance from the Scottish Executive on the appropriate period. The discount rate for the period between 31 and 60 years is 3.0%. However, the costs of asset replacement or refurbishment within the period should be included (e.g. public transport vehicles). Particularly, for assets with a long design life (e.g. railway tunnels) residual values at the end of the period should be included. For smaller proposals, an evaluation period of less than 30 years may be more appropriate; in such circumstances the planner should seek guidance from the Scottish Executive on the appropriate period.

## 8.7 Economic Activity and Location Impacts – EALIs

### Introduction

- 8.7.1 The aim of Economic Activity and Location Impact (EALI) analysis is to describe the impacts of the transport investment (or policy measures) on the economy, using the “measuring rods” of income and/or employment. EALI analysis is intended to identify how and under what circumstances transport projects might have impacts on the economic performance of different areas, and also capture those economic impacts which the standard TEE approach may, in certain circumstances, fail to capture.
- 8.7.2 The latter is a relatively technical matter and readers are referred to the report by the Standing Advisory Committee on *Trunk Road Assessment* (SACTRA), and further comment and advice on appraisal issues and practice can be found in the SACTRA report *Transport and the Economy* (HMSO 1999).
- 8.7.3 It is important to emphasise that a detailed examination of EALIs might not be required in all cases, especially for small proposals. The decision on whether to undertake an EALI analysis should be informed by the scoping work undertaken in the Part 1 appraisal.
- 8.7.4 Decision makers are often interested in how a transport proposal might affect economic performance - income and employment - at national and/or regional or local level. Decision makers are also interested in how particular groups and/or areas might be affected, again in terms of levels of income and access to new or existing employment. This applies particularly in areas where there are issues of social inclusion to be addressed.
- 8.7.5 While the well being of areas and of people suffering from social exclusion is an important area of policy, the Scottish Executive has Scotland-wide interests and responsibilities, and hence is interested in economic impacts at the national as well as at a more local level. It is also the case that the impacts of transport projects are generally highly pervasive and not limited to particular areas. Accordingly, in looking at impacts on the economy it is necessary to assess these at both the Scotland and the regional or sub-regional level. In some instances, particularly for proposals submitted to the SRA, it will also be necessary to indicate impacts at the UK level.
- 8.7.6 Net impacts at the Scotland level are likely to be important mainly in larger proposals that may have some impacts on the level, location or distribution of economic activity, or where there are “threshold” changes in accessibility (generalised cost) that will give rise to changes such as

access to labour or to markets. However, the overall net impact is derived from a number of different gross impacts, some of which may be positive and others negative. As a result, even quite small proposals may have gross EALIs which are positive for specific areas or for particular groups, and negative for others. It is important that these are also considered as components of an overall net impact.

- 8.7.7 The guidance given in the remainder of this chapter for assessing EALIs recognises that their appraisal is a developing field and that advice can be expected to be refined as experience grows and techniques are developed. Also, as the inclusion of EALIs in transport appraisal is a relatively recent innovation, it is covered in more detail than some of the other appraisal measures covered by this Guidance.

### **Presenting the Findings on EALIs: Gross and Net Impacts**

- 8.7.8 In STAG, EALIs will be reported in two ways, both of which are of interest to decision makers:

- as a net impact at the Scotland level; and
- in terms of its gross components, which will distinguish impacts on particular areas and/or on particular groups in society.

- 8.7.9 It is likely that net impacts at the Scotland level will occur in very few cases, mainly for large proposals. This is because it is rare for individual transport infrastructure or service changes to generate additional economic activity which does not represent displacement from another location, or locations, in Scotland.

- 8.7.10 Therefore it is expected that in practice the principal interest in EALI analysis will be on local and distributional impacts, where analysis of gross rather than net changes must be considered. This is because even small proposals have the potential to give rise to changes in economic activity which will benefit some areas or groups while disadvantaging others.

- 8.7.11 For example, replacing parking spaces with bus lanes may have an adverse effect on retail businesses on bus routes, but in general this would lead to a redistribution of retailing activity to nearby areas. By implication, net economic impacts may be negligible at the local level and certainly at the national level. Nevertheless, the gross impacts may be of interest, particularly in terms of determining the likely public acceptability of the proposal.

- 8.7.12 Therefore, even if the *net* impact at a local level is expected to be negligible, at the stage of developing a proposal, decision makers should consider the potential gainers and losers from a proposal, and the scale of both positive and negative impacts. The EALI approach will provide a structure for identifying such distributional impacts, even though at the Scotland level the net result is likely to be zero.

- 8.7.13 For most proposals seeking funding from the Scottish Executive the important appraisal output to be considered by the Scottish Executive will be the level of net EALI at the Scotland level. This is because the Scottish Executive has to assess the use of Scottish resources at the level of Scotland as a whole. However, there are exceptions. These include instances where proposals affect people/social groups who are the subject of other Scottish Executive (or UK Government) policies, such as those suffering from social exclusion and people in remote rural areas.

- 8.7.14 The EALI appraisal process therefore enables aspects of appraisal such as how economic activity benefits (costs) are distributed to be considered. In cases where socially excluded groups or regeneration areas are likely to be affected by a proposal, it will be important to include (at least) distributional impacts.

- 8.7.15 The appraisal of these is discussed briefly below, and in greater detail in §8.12, Further Technical Guidance.

## **Presenting the Findings - EALIs and the ASTs**

- 8.7.16 In STAG, EALIs will be scoped qualitatively in the Part 1 AST in order to establish whether there is a need to undertake a detailed Part 2 appraisal. A detailed Part 2 appraisal of EALIs is unlikely to be required for small proposals, except where economic impacts are their principal or sole justification, or where the scoping exercise indicates that there are positive or negative impacts on particular areas or groups; this is especially important where areas or groups are targeted by other policies such as those designed to tackle social exclusion or regeneration.

### **When to Include EALIs in an Appraisal**

- 8.7.17 In completing the Part 1 AST, even where economic development impacts are not expected at the outset, or not thought to be central to the case for a proposal, the potential for such impacts should be considered. At this stage, gross impacts should be considered – that is, the impacts on different sectors of economic activity, on different areas within a region or sub region, and on different groups in society.
- 8.7.18 This is especially important where a regeneration or development area might be affected. As discussed later, it may well be the case that gross impacts will cancel each other out, but in the interests of transparency and to ensure that impacts on particular areas or social groups are not omitted, it is desirable to consider the (gross) components which go to make up the overall net impact.
- 8.7.19 Where no gross EALIs are expected following an initial appraisal, there should be a statement to this effect, together with the reasons for this judgement. At the proposal development stage, this should be indicated in the Part 1 AST in the section on impacts on the local economy. In some cases the Scottish Executive might ask for such impacts to be investigated, even if the planner does not expect any to arise.
- 8.7.20 The results of detailed investigation should be reported in the Part 2 appraisal and summarised in the Part 2 AST. If on more detailed appraisal there are no gross EALIs, this should be stated in Part 2 and the relevant sections of the Part 2 AST need not be completed.

## **8.8 EALIs as the Rationale for a Transport Project**

- 8.8.1 In developing the case for a transport project, it is necessary to consider the extent to which that case rests on economic development or regeneration impacts, rather than on direct transport impacts. For example, where a project is proposed because it will effectively address problems of congestion without expectations of other collateral economic activity impacts (such as attracting local employment by opening up land for industrial and commercial development), then the option appraisal would be conducted against transport objectives.
- 8.8.2 However, where tackling congestion is seen as essential to the attraction of further economic development, for example in areas experiencing rapid economic growth, then the objectives of that proposal are in reality economic development rather than transport – transport is a means to economic ends in such a case.
- 8.8.3 Where the objectives of a proposal are solely or substantially concerned with economic development or regeneration, the reasons for preferring a transport proposal rather than other economic development measures needs to be clearly articulated. In keeping with guidance on setting objectives and sifting options, it will be necessary to demonstrate that other economic development measures, as well as transport measures, have been properly considered. This should include consideration of potential synergies between the various measures being appraised.
- 8.8.4 Where there is a development or regeneration agenda for a particular area, it is likely that in most instances the transport investment will be only one component of a strategy; here, alternative transport inputs should be tested against total (economic development/regeneration) outcomes.

8.8.5 In all cases, but especially where EALIs are central to the case for the proposal, it is necessary to be able to demonstrate how the economic development or regeneration outcomes can be attributed to the transport proposal. This should include a discussion of the reasons why the market will not address the economic development or regeneration objectives.

## **8.9 The Basis of Analysis of EALIs**

### **Understanding the Links Between a Transport Proposal and EALIs**

8.9.1 In order to identify and assess the scale of any potential EALIs, it is necessary to develop an understanding of how the transport proposal will generate impacts in terms of GDP and employment. This can be thought of as developing a (credible) chain of cause and effect, linking the transport proposal (inputs) to its final economic outcomes, namely GDP and employment impacts.

8.9.2 In order to develop this, it might be useful to consider a series of questions, beginning with the transport impacts:

- what will the transport proposal achieve in terms of transport benefits and costs; for simplicity, focussing on benefits such as time savings, improved accessibility, improved journey quality and so on;
- who will benefit from these impacts, and who, if anyone, will lose; where are the beneficiaries (and losers) located: it will be useful here to consider the economic roles of those affected – businesses, workers, tourists and so on;
- what are the likely responses of the gainers and losers in terms of travel behaviour;
- what are the likely responses in terms of economic behaviour.

8.9.3 To use an example, the link from an improved ferry service to an island through to economic activity and location impacts is straightforward to conceptualise, as improved accessibility should make that island more competitive as a leisure destination (for most of the market). This should lead to an increase in visitor numbers and hence expenditure, and this in turn should expand employment and output.

### **Assessing Gross and Net Impacts**

8.9.4 As discussed above, in both the scoping (Part 1 AST) and detailed (Part 2 AST) appraisals, it is necessary to consider:

- how individual (gross) impacts arise;
- how these affect particular areas and/or groups; and
- how these combine to give net impacts at “local” and national (Scotland or UK depending on sources of funding) levels.

8.9.5 In undertaking this analysis, it is necessary to consider how the transport proposal potentially affects economic activity, first at a local level and then at the Scotland level. It is then necessary to undertake research on this at a level commensurate with the size of the transport proposal and the significance of potential EALIs as part of the case for that proposal. Guidance on practical approaches is given below in the section on the Part 2 AST and in the section on further technical guidance.

8.9.6 First, however, it may be useful to illustrate the point regarding gross and net impacts using the above example of a ferry service. Tourist visitors to that island who would come even without the improved service gain through improved accessibility, but this may have little overall impact for the island as a whole, but time savings might translate into re-distributing visits to more remote parts of the island.

8.9.7 In addition, improved access could also lead to more people travelling to that island and hence more tourist bed-nights, which generate a GDP and employment impact at the level of that particular island. Here there could be both positive and negative gross impacts; there could for

example be a negative impact from loss of expenditure by tourists who decide not to come if the island is perceived to have become “too busy”, but a larger positive impact arising through a larger increase in new visitors who would not have come had the ferry not been improved.

8.9.8 However, where the extra travellers would have come to Scotland regardless of the improved ferry service, the impact of the service for these visitors is to re-distribute their travel and associated expenditure to the island with the improved ferry service at the expense of other areas.

8.9.9 Thus the impact at the island level may be positive, and within the island there may also be redistribution benefits. But at the Scotland level the net impact is likely to be zero, as the additional expenditure on the island will almost certainly be at the expense of places elsewhere in Scotland. If a case were made for a positive (or negative) net impact, convincing evidence would be required to justify such a case.

## **8.10 The Part 1 AST - Identification and Scoping of Potential EALIs**

8.10.1 In Part 1, there is a scoping table which is based on the analysis format presented below for the Part 2 AST. As with the Part 2 analysis, this involves:

- segmentation of the economic context by economic sectors or drivers of economic development; and
- analysis of potential local and national level impacts in each sector.

8.10.2 However, in Part 1 only qualitative/indicative information is required. What is important in Part 1 is to ensure:

- that both positive and negative impacts are scoped; and
- that areas and people/social groups likely to be affected are identified, with indicative levels of impacts.

## **8.11 The Part 2 AST - EALIs**

### **The Need for a Case by Case Approach**

8.11.1 In cases where the Part 1 scoping has identified EALIs as potentially important or significant, in Part 2 it will be necessary to identify and quantify the impacts. As a practical approach to identifying and quantifying EALIs (at least in orders of magnitude), it is necessary to consider the nature and scale of these impacts on a case by case basis. Such an approach was recommended by SACTRA for all but the largest proposals, for which a more comprehensive approach involving formal modelling might be more appropriate.

### **Developing a Case by Case Approach**

8.11.2 A case by case approach needs to be tailored specifically to the transport proposal and to the appropriate area or spatial level. This is essentially a partial analysis, which involves a detailed segmentation of the economic actors in the spatial areas relevant to the appraisal of the proposal. The following sets out a feasible approach which involves completing two analysis forms (shown here in Tables 8.1 and 8.3). The information used in completing these tables can be transferred directly to the Part 2 AST.

8.11.3 The approach outlined here can be adapted to particular proposals and local circumstances, and the degree of quantification can be tailored to the size of the proposal and the expected relative significance of EALIs (both positive and negative) in the overall appraisal.

8.11.4 The case specific approach suggested here involves analysis of the potential behavioural responses of different “sectors” of economic activity. Here, the term “sector” has been used to describe different types or areas of economic activity, such as the manufacturing sector. Within each sector are “economic actors” whose decisions affect the economic performance of an area or region. Economic actors include businesses both in an area and outside it, land and property

developers, and individuals in their roles as residents, workers, shoppers, visitors and tourists.

8.11.5 The following is a possible segmentation, adopted in Table 8.1, which could be used:

- existing manufacturing and process industries, which produce physical products: this may usefully be segmented by sector/industry, and/or by size;
- service businesses, which may be sub-segmented into those serving the local area and those which export services outwith that area; and/or by whether a physical product is produced;
- mobile/inward/foreign direct investment, which may be capable of being attracted to the area;
- tourists, who may be considered as a specific market served primarily by local service industries;
- day visitors including shoppers, also a specific service sector market;
- working residents, who may migrate from or to the area and who may have jobs in or outwith the area.

8.11.6 The above is suggested as a general starting point for segmentation of economic activity into sectors. However, not all will be relevant or important in some areas, while in some areas it might be necessary to sub-segment sectors, for example where there are many different types of manufacturing industries where different industry responses to a transport proposal might be expected.

8.11.7 Once a usable segmentation has been selected, this approach involves investigating how the economic actors relevant to each sector might be affected by, and respond to, the changes in costs or accessibility brought about by the transport proposal under analysis. As outlined below, in most instances much of the required analysis will be based on survey evidence and accessibility analysis.

8.11.8 For example, in considering the business sectors, including the tourism industry<sup>6</sup> and retailing, a combination of data gathering and structured interviews could be used in order to establish:

- current performance, including size, recent growth, profitability/margins;
- future objectives and aspirations – products, size, markets, production locations;
- current and future/expected constraints, to include physical resources, human resources, management and capital;
- output/product market conditions/competitiveness; location and size of main competitors;
- the significance of transport and accessibility to the business;
- the role of changes in transport costs and journey time reliability in overcoming constraints and achieving future objectives and aspirations.

8.11.9 This process could also be advised by other data gathering, analysis and interviews, including suppliers and professional advisers, and in particular the property and recruitment sectors. The latter are important with regard to gathering information and opinion on impacts relating to land use and labour market factors respectively.

8.11.10 SACTRA suggest that this analysis should aim to cover a range of behavioural choices or responses:

- reorganisation effects, for example where a company is enabled to operate more efficiently and may therefore be able to expand output and employment;
- output effects, again potentially arising from cost savings and/or improved access to resources such as land and labour;
- product market effects, where market competitiveness is improved with benefits to consumers;
- factor market (land and labour) effects, where factor market competitiveness is improved and hence markets are enabled to operate more efficiently;

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<sup>6</sup> Strictly speaking this is a misnomer, as tourism is conventionally treated as a demand sector comprising specific types of visitors, and the focus of analysis here should initially be on the impact on demand by tourists, which then impacts upon a number of industry sectors including hotels and restaurants but also transport, fuel supply, gifts and crafts and the whisky industry.

- dynamic interactions between sectors, which should examine how changes in different sectors or areas of activity might complement or oppose each other.
- 8.11.11 The EALI assessment table includes these, albeit in a simpler form, but a fuller treatment of these can be found in SACTRA (paragraph 10.158 *et seq.*). Here, the basis of the analysis is to assess how a transport proposal will impact upon each sector of the spatial economy under consideration. Such impacts will arise through factors such as:
- market and competitiveness changes, such as costs of delivery or increased reliability of logistics systems and lower costs of access to supplies;
  - labour market impacts through access to a larger pool of labour, which might have efficiency benefits;
  - land and property impacts arising through access to land for business development and expansion or the attraction of mobile investment.
- 8.11.12 In order to adopt a systematic approach to the identification and quantification of impacts, each case should be segmented to identify the principal sectors which act as the sources or drivers of economic performance at the appropriate spatial level. Then for each sector, the potential role of the proposal in enhancing its economic performance needs to be considered. Generally, this will require an understanding of the potential responses of the economic actors within each sector to the transport proposal. This could usefully be informed by the methodology set out in Chapter 10 for accessibility and social inclusion impacts. Change in accessibility for each people group and employment sectors indicates the positive and negative pressures and assists in developing understanding of the links between causes and effects.
- 8.11.13 The suggested way of bringing together information is to use the summary assessment table, shown as Table 8.1. For most proposals, this should be derived from completion of individual sector tables. It should be noted that the activity sectors shown in Table 8.1 are indicative and may be changed depending on the proposal and its likely impacts. In some instances, sectors might be omitted while some sectors might require further segmentation to permit the necessary level of analysis. An example of a completed summary table is shown in Table 8.2.

**Table 8.1: Potential EALIs - Summary Assessment Table**

Year of Assessment	Summary of Impacts			
(year):	Local		National	
Sector	Gains / Gainers	Losses / Losers	Gains / Gainers	Losses / Losers
Manufacturing and Processing				
Locally Traded Services				
Externally Traded Services				
Inward/Mobile Investment				
Tourism				
Day Trips/Shoppers				
Residents				
Sector Interactions/ Synergies				
Total Gross Impacts				
Net Impact	<i>Overall Impacts</i> <i>Local: National:</i>		<i>Summary of Distributional Impacts</i> <i>Local: National:</i>	

**Table 8.2: Completed Example of Potential EALIs - Summary Assessment Table**

Year of Assessment	Summary of Impacts			
<i>(year): 2006</i>	Local		National	
Sector	Gains / Gainers	Losses / Losers	Gains / Gainers	Losses / Losers
Manufacturing and Processing	1200-1300 jobs £70-90m in GDP	None	as local	Very limited – loss estimated up to 100 jobs
Locally Traded Services	Zero	Zero	Zero	Zero
Externally Traded Services	Zero	Zero	Zero	Zero
Inward/Mobile Investment	500-1000 jobs £40-80m GDP	Zero	Zero	Zero
Tourism	Zero	Zero	Zero	Zero
Day Trips/Shoppers	Zero	Zero	Zero	Zero
Residents	500-1000 additional residents	Zero	Zero	Zero
Sector Interactions/ Synergies	200-500 jobs £15-40m	Zero	100-200 jobs £10-20m GDP	Zero
Total Gross Impacts	1900-2800 jobs £125-210m GDP	Zero	1300-1500 jobs £80-110m GDP	loss of 100 jobs, up to £10m GDP
Net Impact	<i>Overall Impacts Local:</i> 1900-2800 jobs; £125-210m GDP <i>National:</i> 1200-1400 jobs; £70-100m GDP		<i>Summary of Distributional Impacts Local:</i> potential for benefits in regeneration areas affected by the proposal, and also at peripheries of TTWA <i>National:</i> minimal losses in competitor companies, likely to be short term as external markets expanding	

8.11.14 Table 8.3 should be completed to set out those impacts which have been examined in detail and quantified. An example of a completed sector table is shown in Table 8.4.

8.11.15 This two step approach is suggested because a review of the qualitative version should help planners in identifying which impacts are most important (in gross terms) and hence to determine where to focus efforts to derive quantitative estimates of impacts.

8.11.16 Taking the individual sectors first, for each sector of activity, the assessment (shown in Table 8.3 and completed as an example in Table 8.4) should:

- First, set out an analysis of current market conditions and constraints relating to each individual sector: these can be analysed under the headings of land/physical resources, labour/human resources and product market impacts, which can be analysed at local and national levels. In certain cases it might also be necessary to include access to natural and /or manufactured resources and supplies;
- Second, set out (and justify) an assessment of how the transport intervention is expected to contribute towards enhanced performance in each sector: this must address inter and intra regional/area impacts;

- Third, consider how sectors might interact: for example, where there are links between sectors or where growth of one activity might feed through to impacts in other sectors, the assessment should at least describe potential interactions;
- Fourth, set out an overview of the gross GDP and/or employment impacts at the appropriate local and national spatial levels.

8.11.17 Once this analysis has been completed for each identified sector or driver, the results should be summarised using Table 8.1; the completed example shown as Table 8.2 suggests how these findings might be summarised and presented.

## **8.12 Further Technical Guidance**

8.12.1 EALI analysis is not well developed compared with the conventional cost benefit analysis used in TEE. The interested reader should therefore consult the report by SACTRA, Transport and the Economy for further guidance and references. The subject is also treated comprehensively by Bannister and Berechman in Transport Investment and Economic Development, UCL Press.

### **Applying a Sector by Sector Approach**

#### *Existing Industries and Activities*

8.12.2 Market conditions set the context for economic activity impacts. It is therefore important to consider the competitive conditions in each sector, and how these will be affected by the transport proposal. Where competition is imperfect, for example in industries in which there are few players and barriers to new competition, a transport proposal might promote greater competitiveness leading to more efficient production and/or better use of human and/or physical resources.

**Table 8.3: Example of Sector Table: Qualitative/Quantitative Analysis of First Round Impacts (Manufacturing and Processing)**

Sector		Manufacturing and Processing	
Sources / Types of Impact		Qualitative	Quantitative
Market / Competitiveness Context			
Labour Market Impacts			
Land / Property Impacts			
Product Market Impacts	<i>Local</i>		
	<i>National</i>		
Overall Impacts	<i>Local Gainers</i>		
	<i>Local Losers</i>		
	<i>National Gainers</i>		
	<i>National Losers</i>		

**Table 8.4: Completed Example of Qualitative/Quantitative Analysis of First Round Impacts (Manufacturing and Processing)**

Sector		Manufacturing and Processing	
Sources / Types of Impact		Qualitative	Quantitative
Market / Competitiveness Context		High % of firms & jobs in highly competitive markets where changes in transport costs will have potential impacts. Principal markets in England and Europe: local accessibility poor & journey times very unreliable, impacts on need for non-optimal working times & use of vehicles / drivers	Total of 3,500 manufacturing jobs in local TTWAs, 2,500 – 2,700 in volume / low margin sectors suffering from local transport related constraints
Labour Market Impacts		Labour shortages in skilled & semi-skilled trades currently constraining output in 60 – 70% of firms accounting for around 80% of total employment. Labour pool area constrained because of local accessibility / costs / travel times. Potential to tap under/unemployed labour in wider TTWA	Potential to recruit / train / employ 200 – 300 additional workers in short – medium term
Land / Property Impacts		Half of all major firms seeking additional land, 3 have alternative locations in Scotland, 4 considering non Scotland expansions. Land severely constrained by access, planning and cost factors	Potential loss of around 1,000 jobs which could be retained if land can be made available locally
Product Market Impacts	<i>Local</i>	None expected; non Scottish firms have very limited market presence & surge of imports considered very unlikely: no displacement impact expected.	Zero
	<i>National</i>	Principal markets are external; potential for expansion of sales through lower cost access to markets and access to labour which currently limits output and adds to costs. Very high % of Scottish output within TTWAs examined.	Expansion of output and employment: est'd GDP annual value of £20m, (excluding any multiplier effects); 200-300 jobs in short-medium term
Overall Impacts	<i>Local Gainers</i>	Two principal sources of impact: • output & employment impacts through combined labour & product market impacts • substantial output & employment benefits through retention of existing manufacturing activity which otherwise would relocate due to limited access and land for expansion Gainers are those with skills or semi skilled living in wider TTWA plus some jobs to people in regeneration areas – requires job access and training schemes by LEC	Output impacts estimated GDP annual value of £20 m, excluding multiplier effects Plus up to 1000 jobs retained, accounting for estimated £50 – £70 million
	<i>Local Losers</i>	No local losers identified	
	<i>National Gainers</i>	As above, plus possible multiplier impacts within wider TTWA where there are unemployed resources	As above
	<i>National Losers</i>	Limited expected losers as almost all production concentrated in the group of TTWAs examined	Very limited potential displacement within Scotland

8.12.3 Such changes will generally enable an increase in output and employment: however, as noted by SACTRA (in Transport and the Economy), competitiveness impacts are a potential consequence where inter-regional links are improved. For example, businesses in a formerly remote region might benefit if the transport proposal reduces delivery costs into external markets; however the same proposal also opens up the markets in that region which were previously protected from external competition by transport costs. This illustrates why it is important to look at gross impacts, as this enables this so-called “two way street” effect to be considered.

- 8.12.4 Competitiveness impacts may also occur through factor markets, for example expanding the labour market catchment area and making it easier and quicker for companies to recruit personnel, or by expanding the supply of land suitable for industrial and commercial activities.
- 8.12.5 In addition to competitiveness based impacts, consideration should be given to other potential market failures. This is a relatively technical area which is not covered within the guidance.

#### *Inward Investment*

- 8.12.6 The ability to attract mobile or inward investment is frequently put forward as a reason for a transport proposal, generally in relation to land use or access to rail, air or port facilities. It is not enough simply to assert that such investment will arise, however, and evidence needs to be obtained to show that there is demand from potential investors which cannot be met in some other way or in some other location. As with other economic actors, this will generally involve use of survey information.
- 8.12.7 In looking at this issue, information could be gathered from investors who did locate in the appropriate spatial area and with others who considered the area but chose to locate elsewhere. This should include information/opinion on why an area was selected/not selected; as far as possible, survey techniques should be used which elicit information on the relative importance of transport factors. In practice, it may be necessary to rely to a large degree on agencies involved in inward investment.

#### *Population Change and Economic Performance*

- 8.12.8 Gain or loss of working residents may be an important driver of local income performance, and the attraction of people with skills can help an area to attract new investment. The attraction of more people with jobs either in or outwith the in-scope area will also add to local spending power and the tax base, while loss of people will reduce income if not replaced. Inter area and intra area transport accessibility will play a role in the attraction of people and the location of place of residence in relation to place of work, as will factors such as housing availability and costs, location of services such as schools and other factors which affect overall quality of life.
- 8.12.9 In examining this issue, evidence may be gathered through surveys of individuals in cases where this is seen to be an important benefit from the proposal under consideration. In other instances, information from property agents may be adequate to show that transport infrastructure plays a role in the ability of an area to attract/retain residents. Additional information on this sector could involve discussions with the development industry, property agents and the public sector, the latter as planning authority and as provider of basic infrastructure.
- 8.12.10 It should be noted that attracting residents who would otherwise locate elsewhere involves displacement, and should be treated as a positive impact only where increasing resident numbers or strengthening the social mix of the population is a policy objective, as may be the case in regeneration areas.
- 8.12.11 While partial and to a degree qualitative, this approach can be used to consider both future economic and other trends in an area, and also future developments such as housing. The role of the transport proposal in inducing or enabling such development can be considered, but this will also help to identify developments which are not induced by the transport proposal but which may give rise to additional demand on the transport network.

#### **Selection of the Appropriate Spatial Level for Assessment**

- 8.12.12 In all cases, the impacts need to be reported at the Scotland level, but in presenting findings, it will generally be necessary to indicate how different areas or regions are affected. Where areas

affected include locations with some form of regeneration designation<sup>7</sup>, or where the justification for a proposal depends upon impacts affecting a particular area, the impacts on such areas need to be distinguished as specific distributional impacts.

8.12.13 In order to look first at the immediate and direct consequences emanating from the transport proposal, it may be useful to conceptualise impacts as intra area and then inter area. It is necessary to consider “two way street” effects, whereby transport links between regions open up scope for new economic interactions. An example of this is where a new road links two regions; firms in region A are then better able to compete within region B, but similarly firms in region B are better able to compete in region A’s market. The net impact may be lower prices and more production at the Scotland level, but more detailed analysis would be needed to assess the impacts on individual regions.

8.12.14 While impacts need to be reported at the Scotland and appropriate local/regional levels, consideration must be given to how best to conduct the appraisal and in particular the data gathering required. In deciding how to conduct research to assess EALIs, it will generally be useful to consider:

- The direct or immediate EALIs which will arise within the area directly affected by the transport proposal;
- The spatially wider EALIs, which will arise as these direct effects work through to the rest of the economy.

8.12.15 It is likely that, where a transport proposal is relatively small and can be expected to have only localised transport impacts, a high proportion of both transport and economic impacts will accrue within a distinct travel to work area. Impacts outside that area are likely to be dispersed and difficult to assess efficiently. In such instances, therefore, it will generally be sensible to focus on the local impacts.

### **Place and People Impacts**

8.12.16 A further factor to be examined in considering the spatial level(s) for the appraisal is the people dimension. While it is convenient to think in terms of spatial areas, especially where there are regeneration areas, policies are ultimately targeted at people rather than places. Policies which address place issues such as the visual environment do so in order to bring about some ultimate benefit for the people living in or experiencing that environment.

8.12.17 Therefore while it is helpful to begin by looking at areas, the ultimate consideration is the extent to which people or social groups who are targeted by Government policies on social inclusion will in reality be the beneficiaries. For example, where a new tram proposal stimulates developer interest in an area and helps to open up land for development in or close to a regeneration area, the associated jobs might be claimed as a benefit because of their location in or close to a regeneration area<sup>8</sup>.

8.12.18 However, if the jobs are all for graduates then the people living in the regeneration area are very unlikely to benefit from these jobs. Accordingly, in claiming a gross or distributional employment impact, care must be taken to ensure that there is a sound case. This should be based not only on place/location arguments but also on the argument that the people or social groups targeted by regeneration policies are actually likely to benefit from the jobs arising from the transport project.

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<sup>7</sup> This term is intended to refer to areas which receive some form of positive assistance from local authorities and/or the Scottish Enterprise Network in order to bring about economic and social regeneration and to overcome problems such as multiple deprivation, decline and population loss.

<sup>8</sup> Note that at the Scotland level a net impact could be claimed only where it can be demonstrated that the economic activities taking place on the development land would not have taken place in Scotland had that land not been developed. This is likely to be the case only where some unique type of site is made available.

## **Multiplier Impacts**

- 8.12.19 Where there is spare capacity in the economy, there may be subsequent multiplier impacts arising through the purchasing of inputs by businesses and by the spending of wages and salaries. Such effects will be highly pervasive beyond local impacts, and the smaller the area under consideration, the greater the likelihood that the income will “leak” out of the area. Given the economic context of the proposal, consideration should be given to whether such effects are likely.
- 8.12.20 For example, in areas where there are skill or labour shortages, it is difficult to argue that there is spare capacity in the economy and hence to include local multipliers in the appraisal. However, there may be multiplier impacts at the Scotland level where businesses and residents in the local fully employed area purchase goods and services from areas with spare capacity.
- 8.12.21 In contrast, in regeneration areas, multiplier impacts are more likely, provided income is spent within the area, as such areas are characterised by the availability of spare labour capacity.
- 8.12.22 In all instances where a multiplier impact is considered, account needs to be taken of where incomes are generated and where they are spent. If income is earned by residents of a regeneration area but is largely spent outside that area, it will not be appropriate to apply local level multipliers to all of the identified increase in local income. Where the regeneration area is small, the level of leakage is likely to be very high, and in such cases multiplier effects may be minimal.
- 8.12.23 Where it is proposed to include multipliers in the estimates of EALIs additional advice on this topic can be obtained from the Scottish Executive. Useful advice on values for regeneration areas will be found in *A framework for the evaluation of regeneration projects and programmes* (HM Treasury, January 1995).

## **Defining Areas – The Role of Travel to Work Areas**

- 8.12.24 In cases where the immediate impacts are expected to be relatively localised, the travel to work areas within which the transport impacts occur may realistically be the areas within which to commit effort in assessing the immediate EALIs arising from that transport proposal. This would be appropriate where, for example, much of the impact arises from changes in accessibility within local labour markets.
- 8.12.25 However, there may be circumstances where there will be further impacts outside the focus area which need to be considered, for example where increased labour productivity within that area might result in other impacts elsewhere in the economy.
- 8.12.26 For larger proposals, a number of travel to work areas may be involved, and for such proposals the appropriate spatial level for considering labour market impacts may be a whole sub-region such as central Scotland. Larger transport projects are also more likely to affect product markets or sectors such as tourism or the attraction of mobile investment, and accordingly the economic impacts will fall over a very wide area and need to be considered at a regional or national level.

## **The Use of Gross Impacts**

- 8.12.27 Economic development arguments for investment are frequently made on a distributional basis, typically in order to benefit a particular area or social group. Areas include those which are the focus of other economic policy initiatives, such as remote rural areas, urban housing estates and under-performing/regeneration areas; social groups include the long term and young unemployed and single parents, many of whom have multiple problems of accessibility to jobs and training.

- 8.12.28 While a transport investment may have EALIs for a particular area and/or social group, for example by significantly enhancing access to jobs, or opening up land which is otherwise not available, it is highly unlikely that these impacts will be net benefits at the national level when measured purely in terms of the value of national output. This is because measures such as improving jobs access will generally redistribute employment opportunities without expanding labour demand through an associated impact on output by employing industries. This results in offsetting displacement elsewhere, while not increasing the total number of jobs available. How this is treated will, however, depend upon the areas affected.
- 8.12.29 In particular, where impacts accrue to areas which receive special treatment or additional resources in order to achieve regeneration objectives, it might reasonably be argued that these benefits should not be totally “netted out” at the national level. Therefore a gain of 100 jobs to residents of a “regeneration area” might be presented as a positive employment distribution benefit of up to 100 jobs, even if it results in a displacement effect of 100 jobs in a non-regeneration area and no gain in output. In other words, some or all of the displacement might arguably be discounted in certain circumstances; however, outside such areas, displacement impacts need to be fully netted out.<sup>9</sup>
- 8.12.30 There may, of course, be instances where accessibility improvements result in gains in output. For example, such impacts could arise where labour markets are so constrained by poor accessibility that there is an inability to achieve a match between skills on offer in some areas and skills required in others. In such circumstances, better accessibility should lead to more output through productivity effects of better skill matches and shorter periods to fill skilled vacancies. Similarly, where improved accessibility to training expands the availability of labour skills which are in short supply, it is possible that output will increase as a consequence of better accessibility.
- 8.12.31 However, where the impact of accessibility change falls on people who have no, or inappropriate, skills and who are not in short supply, then where such people gain jobs because of accessibility improvements, the impacts are likely to be distributional. This is because in a situation where this category of labour is in excess supply, others would have been employed had the accessibility improvements not been made; as a consequence, this will involve displacement. If there are specific regeneration objectives for the area, a change which enables residents of such areas to obtain employment may properly be regarded as a distributional welfare gain and should be noted as such under distributional impacts, provided this gain is not at the expense of residents of other regeneration areas. The earlier footnote provided further guidance on this point.
- 8.12.32 Similarly, opening up development land in one area will almost always represent activity that would have taken place elsewhere, in which case there will be no additional impact. However, if the area in which development takes place is one designated as a regeneration area, there is a potential distributional gain provided that development clearly enables residents of the regeneration area to secure (additional) employment. Accordingly, it is necessary to make clear the spatial level at which the appraisal is being conducted, and where a sub-national level is used, to make a case for so doing based on factors such as regeneration policy.
- 8.12.33 It is likely that in practice the core transport analysis will be conducted for an area considered to be in-scope for the effects of the transport improvements such as journey times. This may be a small area or a whole corridor, depending on the nature and scale of the intervention. As discussed above, it will in practice be necessary to decide on the most appropriate spatial area at which to conduct the EALI analysis, and this will involve a

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<sup>9</sup> If this labour is the only labour which is unemployed, it might be argued that there is an economic gain here as the labour resources used have a shadow wage which is less than the market wage. However, in practice there are areas or pockets of unemployment even while most of the economy is close to its capacity. Therefore where there are others who are unemployed, if those who are actually or potentially displaced then become or remain unemployed, as is likely to be the case with low/no skill employments, arguably the impact is purely a distributional one rather than an economic gain. The distributional case here rests on the argument that unemployed people in certain areas (regeneration or similar policy priority areas) are more seriously excluded than other unemployed people, and the appraisal must be able to demonstrate that it is these target groups who gain from the employment impacts of the proposal.

judgement regarding how and how far the economic effects of the particular transport changes are transmitted and the practical issue of information gathering.

8.12.34 It is essential to report impacts at both the local level and at the Scotland level. In reporting EALIs it will be necessary to set out estimates of gross additional (attributable) impacts, both positive and negative, at the appropriate spatial levels, and also to show displacement impacts also at the appropriate spatial levels.

8.12.35 In practice, in reporting impacts at the Scotland level, an appraisal where there are no “regeneration” or special policy areas may usefully distinguish:

- direct or immediate impacts within the travel to work area(s) affected by the transport proposal being appraised;
- positive and negative economic impacts outside this area, in order to present a net assessment.

8.12.36 Table 8.5 below might be useful in showing these impacts.

8.12.37 If it is expected that some of the displacement impacts will fall within a “regeneration” area, these should be noted separately within the rest of Scotland impacts, using a supplementary table based on the above. Similarly, where impacts within the immediate travel to work area fall within a “regeneration” area, these should be shown separately within the immediate area impacts.

**Table 8.5: Sample Presentation of Spatial Impacts**

Area	Employment impact	
Immediate travel to work/local area		
<i>Employment gains (additional)</i>	200	a
<i>employment losses (displacement)</i>	140	b
Net impact within immediate area	60	a - b
Rest of Scotland (outside above area)		
<i>Employment gains (additional)</i>	20	c
<i>Employment losses (displacement)</i>	55	d
Net impact - rest of Scotland	- 35	c - d
Net impact – Scotland	25	= (a-b) + (c-d)

### Measurement Over Time

8.12.38 The economic activity and location impacts of transport projects will be experienced as a future flow of additional GDP and jobs, and as such it may be necessary to consider impacts over time, rather than just at a particular point in time. The summary table (Table 8.1) provides a column in which the time frame for assessment should be stated, and this should also be used to refer to more detailed supporting information on the assumptions and caveats relating to forecasting or projecting impacts over future years.

8.12.39 In principle, the EALI analysis could be treated in the same manner as TEE benefits, by creating an estimated flow of impacts which is then discounted to a present value at the prevailing discount rate. While this is in principle relatively straightforward in the case of GDP (although even here there may be issues regarding use of market values, and the need to allow for costs to Government), the treatment of employment is more complex and requires specific guidance. In practice, there are real difficulties forecasting industry level impacts even a few years ahead.

8.12.40 For employment, the familiar measure is a “job” but for appraisal purposes it is necessary to consider what this means over a period of years. The accepted convention is that a job equates to 10 person years of employment, discounted at the prevailing rate. Therefore, where a proposal generates a stream of person years of employment, these need to be discounted and divided by 10 to give a “job”. Further information may be found in the EGRUP guidance, *A Framework for the Evaluation of Regeneration Projects and*

### **Full and Temporal Additionality**

- 8.12.41 The term “full additionality” refers to situations where a change in output/employment is the difference between what would happen with and without the transport proposal. For example, if a road proposal would enable a site to be developed, the local impact might be stated as, say, 250 jobs, if no other site were available for development if the proposal did not go ahead.
- 8.12.42 However, in many cases a transport project will simply enhance what is happening in a local economy, and might therefore simply accelerate the rate of development of sites. This in effect changes the time profile of development when comparing the “with” and “without” proposal scenarios, and the impact of the project has to be measured as the difference between the stream of impacts with and without the proposal.
- 8.12.43 Where GDP impacts can be measured and valued, this is simply a matter of discounting the “with” and “without” streams to the present day and showing the present value of the difference between these streams. In the case of employment, the principle is the same, namely that the “with” and “without” streams of person years of employment must be discounted to the present day and each divided by 10 to get the “job” impact. The “temporal additionality” impact of the proposal is the difference between the two “jobs” totals.
- 8.12.44 In practice, there may be difficulties in projecting employment and GDP impacts ahead, and simplifying assumptions may be required. As a minimum, there should be a brief statement of the expected impacts, expressed as a range and with an indicative time frame, over a 3 to 5 year horizon and with some qualitative indication of potential longer term impacts. For consistency/comparability, these ranges of impacts should be projected ahead to provide time streams of impacts which can then be discounted to present values. Where the impact of the transport proposal is to increase the rate of growth/development of an area over an expected trend/rate based on the do-nothing or do-minimum (or without proposal) scenario, the forward projections need to be undertaken at the different estimated “with” and “without proposal” growth rates. Caveats and assumptions should in all cases be made explicit and justified.

### **Construction and Operations Related Employment**

- 8.12.45 Construction jobs are frequently claimed as a benefit from the implementation of transport (and other) investment proposals. Similarly, the employment of people to operate transport equipment and maintain the infrastructure is also frequently claimed as a benefit. However, a number of factors affect the validity of such claims.
- 8.12.46 Construction is a sector where in many areas there are skill shortages, and the use of construction labour for one project will in such areas simply displace that labour from other projects, resulting in delays to other work and/or escalation of construction costs. In other areas, where there is spare capacity in the construction sector, it might be reasonable to argue that the employment associated with the implementation of a transport proposal represents an employment benefit at the local level. This would have more validity if the labour were drawn from regeneration or other policy priority areas.
- 8.12.47 Similar arguments apply to labour required to operate a new transport proposal, and here direct displacement of employment arising from, for example, transfer of travellers from one mode to another should also be considered.
- 8.12.48 In quantifying such employment impacts, the principles set out above regarding temporal additionality should be applied.

## **Land Use and Development Related Impacts**

- 8.12.49 In practice, for many transport projects the source of economic activity and location impacts is an expected release of constraints on land availability. Where a transport investment does enable land that would otherwise be incapable of development to be developed for productive uses, there is potentially a local economic benefit, where the use of the land gives rise to GDP and employment impacts.
- 8.12.50 However, even at a local level the argument that the EALI is additional is valid only where no other site is available which could be developed in a similar manner. Where there is a potential site whose use is ruled out through environmental/planning considerations, the benefit of using the site released by the transport project is in effect related to planning and/or environment objectives rather than economic objectives.
- 8.12.51 However, it is very unlikely that no alternative site would have been available for that development, and therefore the impact at the Scotland level should be noted as zero, unless there is a convincing argument that the development would have gone elsewhere.
- 8.12.52 Similar considerations apply to employment impacts.
- 8.12.53 It is possible that even where there is no economic (GDP or employment) impact, because development would take place elsewhere, there may be an *environmental* gain, where that alternative land has a higher environmental value than that made accessible and developable through the transport intervention. If such a gain were expected, it would be useful to note this in the EALI section, so as to make decision makers aware of how this impact has been assessed. However, as this is an environmental gain, it should be addressed fully in the section on environment.
- 8.12.54 It should be noted for proposals requiring SEA, that the SEA Directive's definition of "environment" includes not only the natural environment and the historic environment, but also some human effects such as health and material assets. Therefore within the SEA process, significant effects on material assets should be assessed and presented in the SEA Environmental Report. Material assets include land use and development-related impacts such as effects on infrastructure, and property.

## **8.13 Additional Guidance on Completing the Part 2 AST**

### **Reporting EALIs**

- 8.13.1 For consistency in appraisal, consideration must be given to the scale and nature of possible EALIs in all cases. Where no impacts are expected, this must be stated, together with the reasons why this is the case, using the EALI section of the AST.
- 8.13.2 In all cases therefore, there are three elements in the AST which need to be completed. This section provides some additional guidance in completing these sections.

### **Local and National Economic Impacts**

- 8.13.3 These two sections should be used to summarise GDP and/or employment impacts at both the local level and the national level, based on the information provided in Table 8.1.
- 8.13.4 GDP is a standard measure of economic activity; GDP impact should be estimated on the basis of expected changes in output arising from the proposal. Under the heading quantitative information, there should be a brief statement of the expected impacts, expressed as a range and with an indicative time frame, for example over a 3 to 5 year horizon and with some indication of longer term impacts. Depending on the sources of impacts and the scale of the proposal, GDP impacts should be provided at a detailed level using an appropriate segmentation of economic activity in the in-scope area.

- 8.13.5 Under the heading qualitative information, the rationale for expecting such changes in output should be provided, and this should include the factors noted above, including in particular changes in competitiveness, labour market impacts and effects on land supply/constraints.
- 8.13.6 Where there is an expected release of constraints on land availability, such impacts should be indicated clearly. It should be noted that where a transport investment enables land which would otherwise be incapable of development to be developed for productive uses, there is potentially a local economic benefit, where the use of the land gives rise to GDP and employment impacts. However, it is very unlikely that no alternative site would have been available for that development, and therefore the impact at the Scotland level should be noted as zero, unless there is a convincing argument that the development would have gone elsewhere.
- 8.13.7 It is possible that even where there is no economic (GDP or employment) impact, because development would take place elsewhere, there may be an *environmental* gain, where that alternative land has a higher environmental value than that made accessible and developable through the transport intervention. If such a gain is expected, it should be noted here and quantified, if possible, in the section on environment.
- 8.13.8 The information used to estimate output changes could also provide the basis for estimation of employment changes, and similar considerations to those set out above also apply to employment impacts. Employment changes can be measured in a variety of ways, but ideally should be measured by estimating numbers in employment at different dates over the life of the proposal, in order to produce an estimate of person years of employment. This should be provided under the heading quantitative information.
- 8.13.9 In smaller proposals, simpler indicators can be used, such as jobs in snapshot years. Changes in employment are of particular interest where the project will benefit people who are unemployed or underemployed, as occurs in regeneration areas, for example. The rationale for expecting changes in employment should be provided under the heading qualitative information.

#### **Distributional Impacts**

- 8.13.10 The GDP/employment sections of the AST are intended to present a summary of the appraisal in terms of GDP and employment, and impacts will generally be shown as net impacts. However, there may be cases where a statement of the net impact hides important gross changes, especially where these affect particular areas or social groups.
- 8.13.11 Planners should generally include such gross impacts in their AST and these would be presented in the section on distributional impacts. Depending on the context, it may be helpful to show impacts separately in terms of both “place” (area) impacts and “people” impacts (by social group).
- 8.13.12 Distributional impacts will be particularly important where a proposal affects a regeneration area or a particular social group targeted by Government. In this part of the AST, it is important to indicate any positive or negative distributional impacts arising from a proposal which affect regeneration areas and/or socially excluded groups. This should include those impacts arising from changes in the spatial characteristics of economic activity.
- 8.13.13 In such cases it is necessary to indicate where and how a particular “regeneration” area and its residents is affected. This should show gross impacts affecting regeneration and non-regeneration areas. The nature and sources of such impacts should be indicated under the heading qualitative information, while quantitative estimates of gross impacts should be shown under the quantitative information heading.

- 8.13.14 Even where there is not a designated regeneration area, there may be groups such as the long term unemployed, the elderly and the disabled who could be affected by a proposal. Impacts upon such groups should be indicated under the qualitative and quantitative headings. Where relevant, these impacts should be cross-referenced to the section dealing with accessibility and social inclusion.
- 8.13.15 It should be noted for proposals requiring a SEA, that the SEA Regulations' definition of "environment" includes human effects such as population. As such there is some overlap with the assessment of distributional impacts within the STAG assessment. Therefore, within the SEA process, significant effects on population, if relevant to the plan or programme, should be assessed and presented in the SEA Environmental Report