



**DEVELOPMENT PLANNING AND MANAGEMENT
TRANSPORT APPRAISAL GUIDANCE**

Contents

	Page
Chapter 1: Introduction	4
Purpose	4
Benefits of Transport Appraisal	4
National Planning Policy	5
Climate Change	6
Transport and Land Use Planning	7
Mode Hierarchy	7
Transport Investment	8
Engagement in plan preparation	9
Chapter 2: Development Plans	11
Introduction	11
Timing of Transport Appraisal	11
Resources and Timescales	12
Monitoring Statement and Evidence Base	12
Preparing the Main Issues Report	13
Developing the Visions and Options	13
Option Generation and Sifting	14
Appraisal of Remaining Options	15
Levels of Appraisal	19
Appraisal of SDPs	20
Appraisal of LDPs in SDP areas	22
Appraisal of LDPs outside of SDP areas	23
Examples of transport interventions and indicative Levels of appraisal	23
The Proposed Plan and Proposed Action Programme	27
Introduction	27
Delivery and Monitoring	27
Developer Funding Protocols	28
Monitoring	28
Statutory Processes to Delivery	28

	Page
The Role of Developers within the Development Plan Process	29
Chapter 3: Development Management	30
Overview	30
Transport Assessment and Travel Plans	31
Index of Figures and Tables	
Figure 1: Integration of Transport Appraisal within the preparation of SDPs	16
Figure 2: Integration of Transport Appraisal within the preparation of LDPs inside SDP areas	17
Figure 3: Integration of Transport Appraisal within the preparation of LDPs outside of SDP areas	18
Table 1: Type of transport intervention and recommended Level of Transport Appraisal for development plans in SDP areas	25
Annex 1 : Guidance and Information Sources	A-1
1. GUIDANCE	A-1
2. KEY PERFORMANCE INDICATORS	A-5
3. DEMAND MANAGEMENT MEASURES	A-6
4. INFORMATION SOURCES	A-9
Annex 2: Definitions	A-15

Chapter 1: Introduction

Purpose

1. This document provides guidance on Transport Appraisal to inform the preparation of development plans. The purpose of the guidance is to show how Transport Appraisal can be carried out at an early stage of the development plan process, where it can be most effective in helping to shape the spatial strategy and the way in which the spatial strategy will be delivered. It can also help the transition of transport projects needed to support the delivery of the spatial strategy through the various statutory processes.
2. Scottish Planning Policy (SPP)¹, published in 2010, recognises the importance of transport as a key element in making development deliverable. Paragraph 166 of SPP states “the relationship between transport and land use has a strong influence on sustainable economic growth, and this should be taken into account when preparing development plans and in development management decisions”. This guidance helps planners to consider transport and land use together by aligning Transport Appraisal with the development planning and development management processes, as set out in Planning Circular 1/2009: Development Planning² and Planning Circular 4/2009: Development Management Procedures³, respectively.
3. To assist both Planning Authorities and Transport Scotland this guidance focuses on Transport Appraisal of developments in the context of the Strategic Transport Network. However this guidance may also be used to assist Planning Authorities in assessing the impact of proposed development on local transport networks and services.

Benefits of Transport Appraisal

4. The benefits of using this guidance in preparing a development plan are summarised below.
 - It provides an evidence based and robust appraisal framework for considering land use and transport together and will assist in the delivery of the spatial strategy
 - It will show how choices for the Strategic Network Transport affect the wider social, economic and environmental policy aims of the plan

¹ Scottish Planning Policy available through the Scottish Government’s website at <http://www.scotland.gov.uk/Publications/2010/02/03132605/12>

² Planning Circular 1/2009: Development Planning is available through the Scottish Government’s website at: <http://www.scotland.gov.uk/Publications/2009/02/13153723/0>

³ Planning Circular 4/2009: Development Management Procedures is available through the Scottish Government’s website at: <http://www.scotland.gov.uk/Publications/2009/07/03153034/0>

TRANSPORT APPRAISAL GUIDANCE

TRANSPORT SCOTLAND

- It will provide an understanding of changes in travel demand arising from changes in land use, population and economic activity and the resultant changes in transport supply that would be needed to reach an agreed level of operational performance of the Strategic Transport Network
 - It will provide an outline business case to inform investment decision making for proposed enhancements to the Strategic Transport Network and, where relevant, to comply with statutory approval processes for infrastructure schemes
 - It provides greater certainty on the level of support from Planning Authorities and Transport Scotland for transport interventions related to development plans
 - It reduces appraisal burdens at the Development Management stage
5. The guidance highlights the value of effective engagement between Transport Scotland and Planning Authorities and forms the basis Transport Scotland's ongoing engagement in the development planning and development management processes. It aims to enable Planning Authorities and Transport Scotland to reach agreement on the principle of the land use allocations and transport interventions set out in development plans as they affect the Strategic Transport Network.
 6. Transport interventions affecting the Strategic Transport Network that emerge from the development plan process and have been appraised using this guidance and receive support in principle from Transport Scotland, will not need to be subject to further Transport Appraisal at a later stage.
 7. This guidance is consistent with the principles of best practice contained in the Scottish Transport Appraisal Guidance (STAG)⁴. It sets out three levels of objective-led appraisal, proportionate to the scale of land use and / or transport intervention being considered. The three levels of appraisal and their role for Strategic and Local Development Plans are explained in Chapter 2.
 8. This guidance supersedes PAN 66: Best Practice in Handling Planning Applications Affecting Trunk Roads.

National Planning Policy in addition to SPP

9. The National Planning Framework for Scotland 2 (NPF)⁵ takes forward the spatial aspects of the Scottish Government's policy commitments on sustainable economic growth and climate change. For transport infrastructure it

⁴ Scottish Transport Appraisal Guidance – available through Transport Scotland's Scot-TAG information source at <http://www.transportscotland.gov.uk/reports/scottish-transport-analysis-guidance>

⁵ National Planning Framework for Scotland 2 - <http://www.scotland.gov.uk/Resource/Doc/278232/0083591.pdf>

promotes the key strategic outcomes set out in the National Transport Strategy⁶ and incorporates the recommendations of the Strategic Transport Projects Review (STPR)⁷.

Climate Change

10. Scotland aims to become a leading nation in developing a sustainable way of life, reducing the impact its people have on the local and global environment. The choices made will be critical to shaping a modern, successful and sustainable Scotland and to maintaining a quality of life which retains and attracts talented people and investment. Emissions reductions in the transport sector can be achieved in a number of ways including reducing demand for travel.
11. The Climate Change (Scotland) Act commits Scotland to reduce its emissions by at least 80% from 1990 levels by 2050; with an interim target of at least 42% by 2020. The Climate Change Delivery Plan: Meeting Scotland's Statutory Climate Change Targets⁸ provides an outline of how we will achieve the statutory emission targets.
12. Emissions reductions in the transport sector can be achieved in a number of ways through, for example, measures which encourage a shift to more sustainable transport modes or a reduction in travel demand. Responsibility for a number of key policy levers for the transport sector rests at the UK or EU level. However, the Scotland Government has powers over measures such as:
 - transport infrastructure
 - local speed limits and Smarter Measures including fuel efficient "eco-driving" and active travel (cycling and walking)
 - demand management measures, including road space re-allocation in favour of more sustainable travel modes
 - the location and nature of new development through the planning system
13. The Report on Proposals and Policies⁹ sets out how Scotland can deliver annual targets for reductions in emissions to 2022, including the interim target of a 42% reduction by 2020.

⁶ See Scottish Government's website

⁷ Strategic Transport Projects Review, Transport Scotland - available through Transport Scotland's website at <http://www.transportscotland.gov.uk/stpr>

⁸ Climate Change Delivery Plan: Meeting Scotland's Statutory Climate Change Targets, The Scottish Government - available through the Scottish Government's website at:

<http://www.scotland.gov.uk/Publications/2009/06/18103720/0>

⁹ Low Carbon Scotland: Meeting the Emissions Reduction Targets 2010-2022: The Report on Proposals and Policies – available through the Scottish Government's website at:

<http://www.scotland.gov.uk/Publications/2011/03/21114235/0>

14. SPP explains that the need to help mitigate the causes of climate change and the need to adapt to its short and long term impacts should be taken into account in all decisions throughout the planning system, including during the preparation of development plans.

Transport and Land Use Planning

15. Demand for transport is derived from land use. Transport provision also influences patterns of land use. Changes in land use can affect the demand for transport and, depending on the availability of capacity in the transport network at a local or strategic level, this can impact on the operational performance of these networks. This in turn may have social impacts (e.g. accessibility), economic impacts (e.g. queuing and delays affecting journey times, journey time reliability, access to markets) and environmental impacts (e.g. emissions). Transport impacts should therefore be considered early in the process of identifying sites for development, along with other key factors influencing land use proposals.
16. In considering different land use proposals it is important to understand the consequences that changes in land use have on the Strategic Transport Network, particularly:
 - whether or not the current Strategic Transport Network and planned enhancements are capable of accommodating future land use proposals at agreed performance levels
 - the potential impact of no changes in the current or committed Strategic Transport Network
 - the nature, scale and location of alternative land use and transport scenarios that could be implemented to more closely align transport demand and supply. Such alternative scenarios could involve either changes in land allocations, in the demand for transport and / or the supply of transport
17. Transport Scotland uses the outputs from a Transport Appraisal to come to a view on each of these areas and, if necessary, additional information provided by the Planning Authority. That view is presented to the Planning Authority as one of the factors to be considered when preparing a development plan or in reaching a planning decision.

Mode Hierarchy

18. SPP supports integration of land use and transport planning and promotes the principles of mode hierarchy. Adopting a mode hierarchy approach requires consideration to be given to meeting demand via walking, cycling and public transport first before considering the extent to which the private car use should

be accommodated, reducing the need to travel and encouraging travel by sustainable modes.

19. Influencing the choice of travel mode for an individual requires knowledge of how people travel and why people travel the way they do. Policies, measures and resources can then be targeted directly and efficiently to influence behaviour and promote sustainable travel choices. Guidance on how to plan for different modes of travel is provided in Annex 1.

Transport Investment

20. Strategic transport investment can require long lead in times and to assist with this, the Scottish Government provides a framework for the prioritisation of transport investment. This is set out in the Infrastructure Investment Plan¹⁰ and developed through the outcomes of the Strategic Transport Projects Review (STPR). The STPR sets out investment priorities over a 20 years period which will be delivered subject to the transport allocation within future Spending Reviews and affordability. Development plans should take account of published transport investment plans.
21. The Scottish Government's transport investment hierarchy for the Strategic Transport Network focuses on:
 - maintaining and safely operating the Strategic Transport Network then
 - making best use of existing capacity, followed by
 - targeted infrastructure enhancements
22. Where, to support the delivery of a development plan, interventions on the Strategic Transport Network are needed which do not form part of current transport investment plans, or are needed ahead of timescales proposed, Transport Scotland will consider these, through engagement on development plans, where it can be demonstrated that there is a delivery mechanism for such interventions without funding support from the Scottish Government.
23. Only in exceptional circumstances, where it can be demonstrated that alterations to infrastructure investment plans will deliver the same or significantly greater national benefits, would consideration be given to altering the published transport investment plans.

¹⁰ Infrastructure Investment Plan 2008, The Scottish Government – available through the Scottish Government's website at <http://www.scotland.gov.uk/Resource/Doc/217601/0058293.pdf>

Engagement in plan preparation

24. Through engagement with the Planning Authorities, Transport Scotland seeks to:
 - support the aspirations of Planning Authorities for the future development of their area and to promote sustainable economic growth
 - continue to deliver a safe, efficient, cost-effective and sustainable Strategic Transport System that meets the needs of all the people of Scotland
 - continue to ensure that the Strategic Transport Network performs its function of improving connections across Scotland

25. In seeking to engage with Planning Authorities throughout the preparation of plans, Transport Scotland aims to reach a position to be able to provide support in principle to proposed development plans. In seeking to reach such a position, Transport Scotland will only consider those issues which affect the Strategic Transport Network, and will be informed by the proportionate Transport Appraisal prepared as part of the development of the Plan, and any additional relevant information provided by the Planning Authority, or others, if appropriate.

26. Through engaging with Planning Authorities in the preparation of main issues reports and proposed plans, Transport Scotland will endeavour to indicate what level of support can be attributed to emerging plans. This level of support will also be expressed within the overall Scottish Government response on the main issues report or proposed plan as appropriate.

27. Where Transport Scotland indicates “support in principle” this means the land uses and transport interventions within the development plan are supported in principle subject to more detailed consideration during the development management stage and statutory processes. Transport Scotland’s full support of the land uses and transport interventions in the development plan will be subject to completion of a Transport Assessment, if appropriate, to support the planning application, the preparation of a detailed and positive business case and, in the case of trunk road interventions, a solution that complies with the Design Manual for Roads and Bridges (DMRB). Transport Scotland’s support of land use and transport interventions does not imply funding support for such interventions.

28. Transport Scotland will be unable to give support in principle to a development plan:
 - when there is insufficient detail on either the proposed land uses or associated Transport Appraisal to enable Transport Scotland to take an informed view of the affects of the development plan on the Strategic Transport Network

TRANSPORT APPRAISAL GUIDANCE

TRANSPORT SCOTLAND

- when a land use and/or transport intervention compromises the performance of the Strategic Transport Network, for example, to the detriment of safety or the promotion of sustainable economic growth at a national level
29. Transport Scotland will seek to continue to support emerging plans as the detail of land uses and transport interventions come forward and will work proactively with Planning Authorities to understand the transport implications of those land uses as the Transport Appraisal is progressed and completed. There may be circumstances, however, where the level of support Transport Scotland is able to offer may change as further details and more definitive outcomes emerge, with the potential that Transport Scotland withdraws support as the full transport implications become clear.
30. Evidence has a fundamental role to play in the Transport Appraisal which informs both the emerging plan and the level of support Transport Scotland is able to offer that plan. In order to secure the greatest level of support for an emerging plan, the Transport Appraisal should be completed to provide input prior to the publication of the main issues report.

Chapter 2: Development Plans

Introduction

31. The key stages in preparing a development plan are set out in Planning Circular 1/2009: Development Planning. Figures 1, 2 and 3 below show the alignment of both the development plan stages and the Transport Appraisal stages for Strategic Development Plans (SDPs), Local Development Plans (LDPs) in SDP areas and LDPs outside of SDP areas, respectively.
32. Transport Appraisal starts with pre-appraisal which includes the identification of transport problems and opportunities, setting transport planning objectives and option generation and sifting. Pre-appraisal is followed by qualitative and quantitative appraisal stages and finally post appraisal monitoring and evaluation. Using the Transport Appraisal framework set out in Figures 1, 2 and 3 and elsewhere in this guidance will ensure that the scale and level of detail of the Transport Appraisal is in proportion to the nature of the issues and proposals being considered and is undertaken at the appropriate stage within the plan process.

Timing of Transport Appraisal

33. The Transport Appraisal provides evidence which is fundamental to informing the emerging plan. The preferred and alternative land use strategies can have significant impacts on the Strategic Transport Network. Such impacts have the potential to be main issues which should be set out in the main issues report so that people have a clear understanding of impacts and are able to provide meaningful comments during the consultation period.
34. The Transport Appraisal should be completed prior to the publication of the main issues report for these reasons. This will make a significant contribution to reducing overall timescales for plan preparation as it should:
 - provide a clear understanding of the transport implications of the preferred spatial strategy and alternatives and any main issues related to the Strategic Transport Network
 - enable early engagement between Planning Authorities and Transport Scotland to seek early resolution of any main issues related to Strategic Transport Network
 - give a clear rationale for transport interventions, and the relationship between the land uses and transport interventions, set out in the main issues report
35. Undertaking a Transport Appraisal before publication of the main issues report reduces the risk of significant changes being needed between the main issues

report and proposed plan which would necessitate further consultation, potential additional strategic environmental assessment and significantly extend the overall timescales for preparation of the proposed plan.

Resources and Timescales

36. It is recognised that the level of Transport Appraisal described in this Chapter can require time and resources that may prove challenging within the development plan preparation timetable. However, as highlighted in paragraphs 58 and 59, existing relevant evidence can be used, where appropriate, to assist in minimising timescales and resources. Nonetheless, following the approach set out within this Chapter will shorten the time period required to actually deliver developments and transport solutions, and allow potential areas of difficulty or conflict to be fully examined before critical decisions are taken.
37. Through engagement with Planning Authorities, at each stage of preparation of development plans, Transport Scotland will be able to offer advice on appraisal and modelling tools and also feedback and comments on proposals as they evolve. This will contribute to keeping appraisals proportionate and associated resources and timescales to a minimum. Development plan teams are encouraged to make use of this resource to secure the benefits of early and continued engagement which are clearly set out in this guidance.
38. It may be appropriate for developers to undertake elements of the appraisal, particularly where there is a direct relationship between the land use and transport solution(s).

Monitoring Statement and Evidence Base

39. Information on the performance of the Strategic Transport Network in supporting current and future demand for travel derived from land use over the plan period and beyond will form an important part of the monitoring statement and evidence base for the plan and the baseline for later monitoring. This information can be provided by Transport Scotland and will be based on outputs from the LATIS service (Land use And Transport Integration in Scotland)¹¹.
40. The input at this early stage of plan preparation will be based on previous forecasts of land use change and will not take account of any further proposed changes in land use that will emerge through the plan production stage.

¹¹ LATIS (Land Use and Transport Integration in Scotland), available at <http://www.latis.org.uk>. LATIS incorporates the Transport Model for Scotland (TMfS) and the Transport and Economic Land Use Model of Scotland (TELMoS)

Preparing the Main Issues Report

Developing the Visions and Options

41. During the preparation of the main issues report, when setting the vision and any objectives of the plan, account should be taken of SPP, which states that the planning system should support a pattern of development which reduces the need to travel, facilitates use of sustainable travel modes and supports opportunities for active travel, and the Scottish Government's investment hierarchy for the Strategic Transport Network.
42. The Transport Appraisal at this stage will ensure that transport is considered in decisions on the location of new development such that:
 - development is supported in locations that are accessible by walking, cycling and public transport making best use of existing networks and network enhancements
 - significant travel generating developments are supported in locations which are well served by public transport
 - decisions on development locations contribute to reduction to greenhouse gas emissions in line with national targets
43. As part of the monitoring statement and main issues report preparation, it is important to identify and set out the problems and opportunities within the transport system once the overall vision and objectives for the plan area are established. An understanding of cause and effect of existing and future transport problems is required, taking into account the interaction of land use and the whole transport system.
44. For the purposes of the Transport Appraisal, transport planning objectives should be set which express the transport outcomes sought for the plan and describe how potential transport problems could be alleviated. The transport planning objectives should be set within the context of the overall vision and objectives for the plan. It is important that the transport planning objectives provide the opportunity to consider the widest possible range of multi-modal transport options.
45. Regional Transport Strategies and Local Transport Strategies should be able to provide context and are likely to inform this and the later stages of Transport Appraisal.
46. Once the proposed vision and any objectives of the plan are set out, a view should be reached on existing and future transport and accessibility issues resulting from land use changes. The results of this analysis, brought together with other non transport factors, will help inform the preferred spatial strategy and alternatives. This is likely to be an iterative process to allow the impact of individual and combinations of land use changes to be fully considered.

47. Accessibility of potential alternative development sites can be analysed and compared adopting a qualitative approach as part of a qualitative appraisal. It may be appropriate to supplement a qualitative accessibility analysis with quantitative evidence from accessibility modelling tools as described in Annex 1.

Option Generation and Sifting

48. Following the iterative process of analysis to determine the best fit of land use and transport options, the rationale for the preferred strategy should be demonstrably clear.
49. The Transport Appraisal should result in a clearer understanding of the implications of potential land use changes on the projected performance of the Strategic Transport Network and how the interaction of transport and land use is likely to affect the wider economic, accessibility, social, safety and environmental aspirations of the plan. Planning Authorities will also gain an understanding of the extent to which current transport investment priorities will meet any identified shortfalls in performance. This process can be aided by the adoption of key performance indicators as outlined in Annex 1.
50. Transport Scotland should be included in all stages of this process where the Strategic Transport Network is involved or where local transport networks may impact on the performance of the Strategic Transport Network. Workshops bringing relevant stakeholders together can be valuable in this process.
51. The output from this stage of the process is likely be a series of transport options that have the potential to meet the transport planning objectives identified earlier. Option sifting helps to reduce the amount of appraisal work that is required at later stages, by ruling out any options put forward that will either not meet the transport planning objectives set or are deemed to be undeliverable due to implementation difficulties associated with feasibility, affordability or public acceptability. Any options which clearly would have an unacceptable impact in terms of safety, the environment, the economy, accessibility and social inclusion or integration can also be ruled out. Sifting may require a level of qualitative appraisal and technical inputs from transport professionals from specific disciplines.
52. Guidance on carrying out Transport Appraisal in Scotland, including setting transport planning objectives, option generation and sifting is provided in Scottish Transport Appraisal Guidance (STAG).

Appraisal of Remaining Options

53. Following option sifting, the remaining transport options that could potentially meet the transport planning objectives require to be appraised to the appropriate level to understand their viability. In addition to considering the contribution that different options make to the economic, social and environmental objectives of the development plan, the safety implications, and deliverability and affordability of potential options should also be considered in carrying out the Transport Appraisal. The STAG Technical Database¹² provides methodology for appraising safety, the environment, the economy, accessibility and social inclusion and integration and for considering the feasibility, affordability and public acceptability of potential transport interventions.
54. In all cases where funding is being sought from Scottish Government (including Transport Scotland) the appraisal must include an economic appraisal which will then go on to inform the development of a robust business case.

¹² STAG Technical Database. Available through Transport Scotland's Scot-TAG information source at <http://www.transportscotland.gov.uk/strategy-and-research/scottish-transport-analysis-guide/stag/td>

Figure 1: Integration of Transport Appraisal within the preparation of SDPs

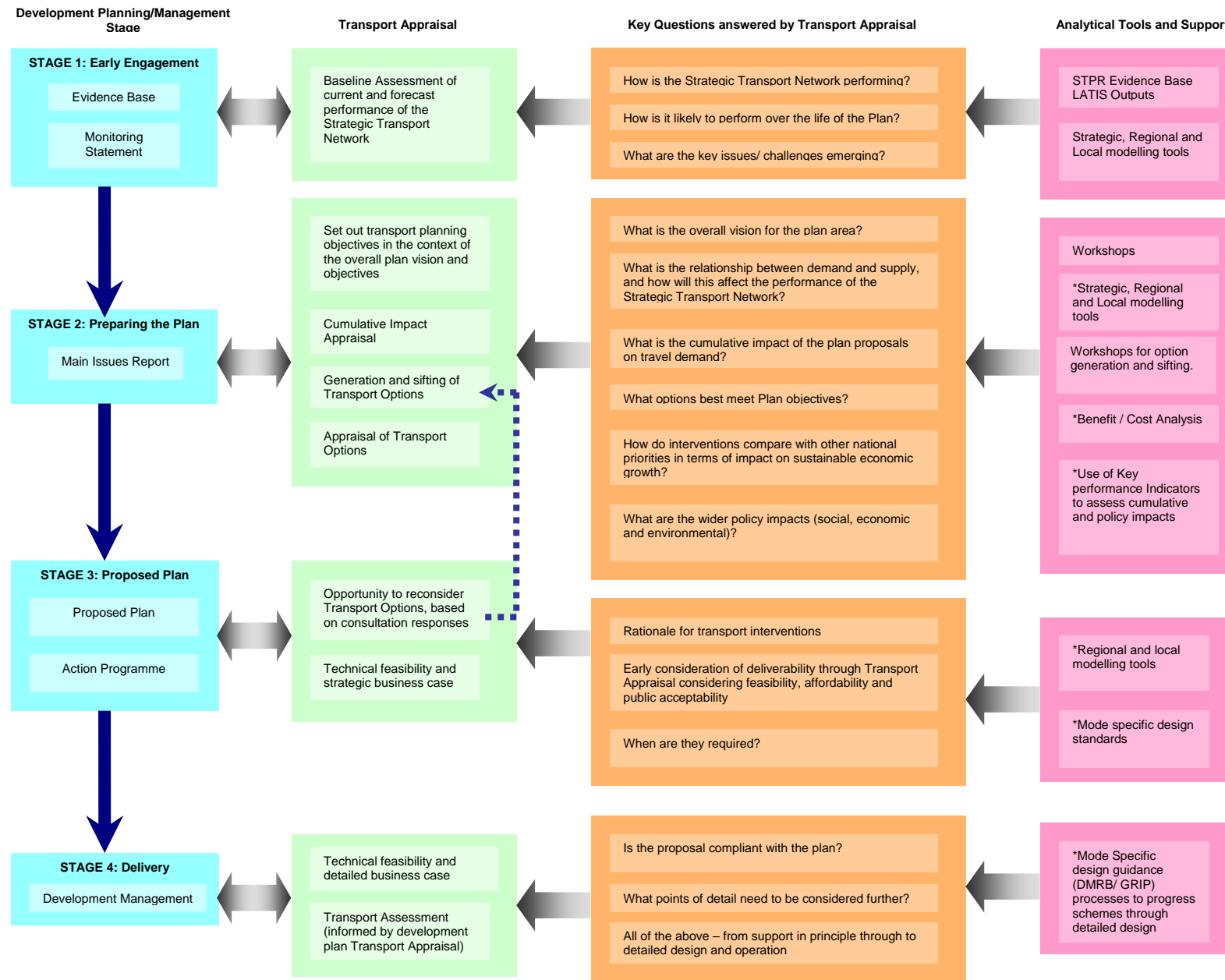


Figure 2: Integration of Transport Appraisal within the preparation of LDPs in SDP areas

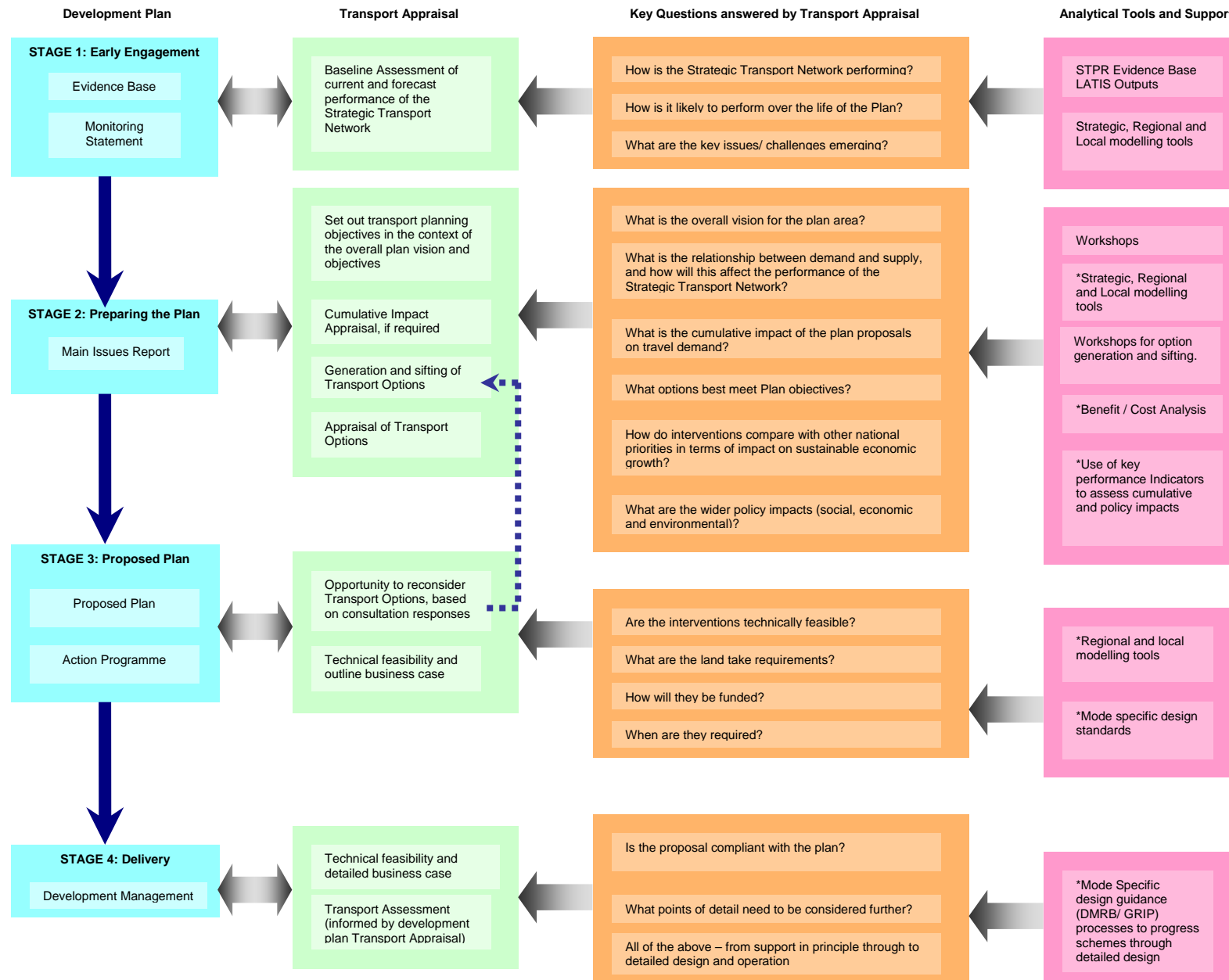
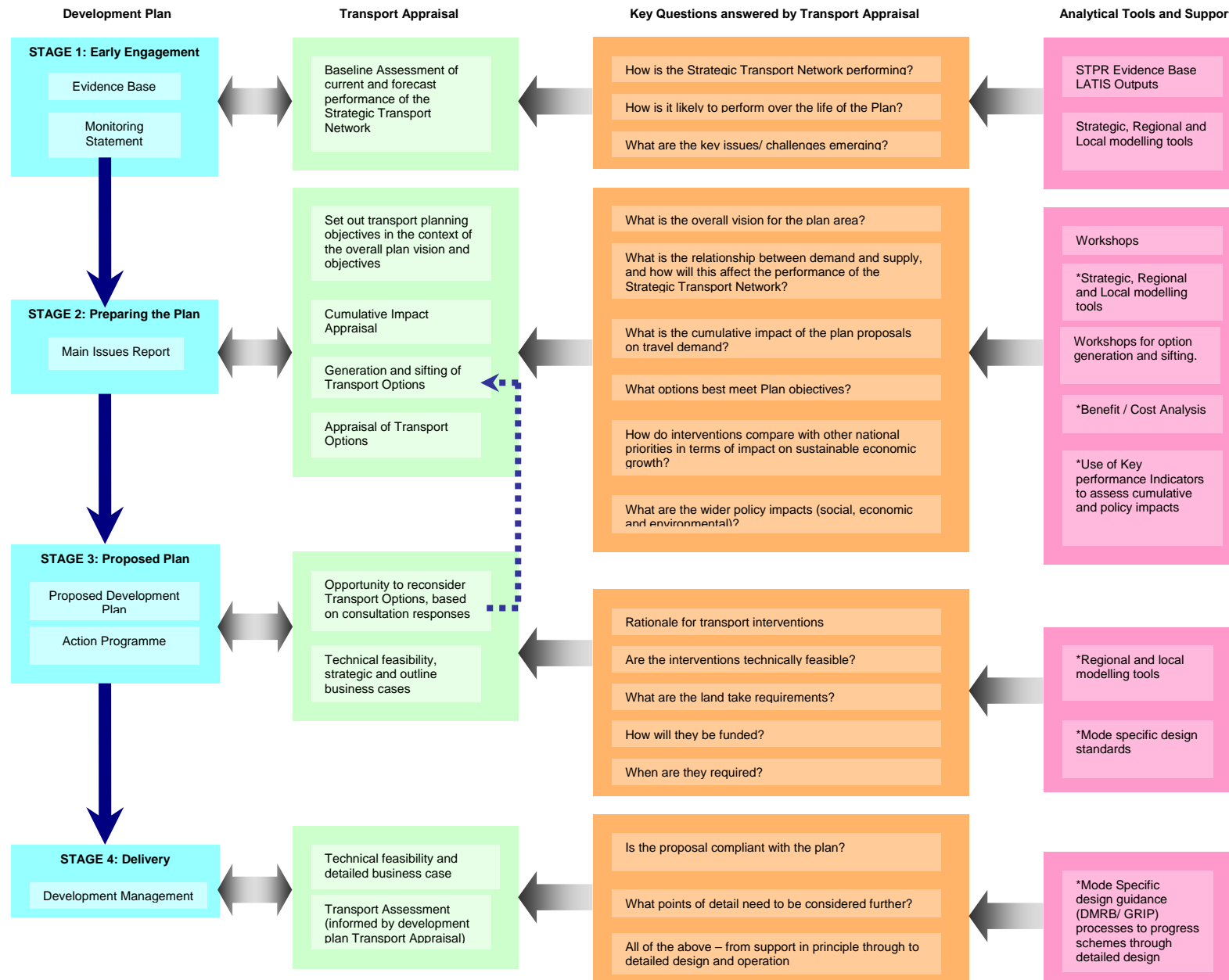


Figure 3: Integration of Transport Appraisal within the preparation of LDPs outside of SDP areas



Levels of Appraisal

55. Transport Appraisal as part of the development plan process needs to consider the cumulative impacts of the developments proposed in the spatial strategy. It is appropriate to adopt differing levels of appraisal depending on the type of development plan being prepared (SDP or LDP) and the nature of the transport options being considered.
56. Three levels of appraisal will be sought by Transport Scotland and will be applicable in differing circumstances as described in the following sections on SDPs and LDPs.
57. A Level 1 appraisal is based on qualitative appraisal only and may be appropriate for SDPs in some circumstances. Level 2 and Level 3 appraisals include either a:
 - qualitative and quantitative appraisal approach across the plan area, where it is considered that the changes in land use across the plan area are significant enough to require appraisal of the impacts of cumulative increases in demand on the performance of the Strategic Transport Network, or
 - qualitative appraisal across the plan area supplemented by a quantitative approach focussed only in areas where the emerging development plan is identifying potential issues which would affect the performance of the Strategic Transport Network or where travel demand will change significantly and/or current transport supply is known or suspected to fall short of future needs.
58. Where available, existing relevant quantitative evidence should be used to strengthen a qualitative appraisal. Existing data and information from previous relevant Transport Appraisal studies, for instance studies supporting Regional and Local Transport Strategies, can provide a valuable contribution to the qualitative appraisal.
59. Quantitative appraisal involves the use of using modelling tools to provide quantitative evidence to support the initial qualitative appraisal. Existing relevant quantitative evidence should also be used, where appropriate, to minimise the extent of new or additional modelling work required.

Appraisal of SDPs

60. A Transport Appraisal of the cumulative impact of land uses proposed within SDPs is needed to consider how changes in land use for the preferred spatial strategy and alternatives would affect the Strategic Transport Network. Strategic, regional and / or local modelling tools are used to consider the cumulative impact of the development proposed in the spatial strategy. At a strategic level, Transport Scotland's LATIS service can be utilised. In some circumstances it may be possible to consider the cumulative impacts of the development without the use of a transport model. Guidance on a range of analytical approaches is provided in the Annex 1.
61. Once the cumulative change in forecast demand for travel is determined, the impact on current and planned transport provision should be assessed. This should cover the lifespan of the proposed development plan, phased accordingly, and may also need to address cross boundary impacts, dependent on the scale and / or location of these impacts.
62. The Transport Appraisal approach adopted will vary depending on the scale of the change in transport demand, the impact of this demand on the transport network and the transport supply envisaged. Use of modelling tools will significantly aid the appraisal process.
63. A Level 1 or Level 2 appraisal will normally be applicable for SDPs in the differing circumstances described below. There may, however, be circumstances where a Level 3 appraisal, as described below will be needed. Advice on the level of appraisal needed can be obtained through engagement with Transport Scotland.

Level 1

64. Level 1 can be described as a minimal level of appraisal where the consideration of potential transport interventions can be established and agreed through a qualitative approach i.e. a judgement based on existing information or professional knowledge without the need for any additional technical appraisal at this stage.

65. A Level 1 appraisal is likely to be appropriate where the:
- potential demand is deemed to be unlikely to have an impact on the Strategic Transport Network; or
 - level of demand is not significant enough to warrant any changes to the Strategic Transport Network; or
 - required interventions on or affecting the Strategic Transport Network are minimal and can be readily accommodated; or
 - required interventions on or affecting the Strategic Transport Network are contained with current national transport investment plans and are designed in sufficient detail
66. The Level 1 appraisal should identify individual and / or packages of solutions that are required to support the development plan and include consideration of realistic alternative options. The level of detail provided, using a qualitative approach, should mean that it is possible to:
- provide the rationale for the land use scenarios and further development of the transport intervention
 - demonstrate that the economic, environmental and safety issues associated with the solution have been identified and, where appropriate, mitigation proposed

Level 2

67. A Level 2 appraisal reflects the scale of the potential impacts of either the plan scenario or transport options being considered. It is likely to be required where:
- the scale of the intervention being considered will have regional or national consequences on the Strategic Transport Network; or
 - significant change in land use has been previously unaccounted for in development plans and is not fed into current national transport investment plans; or
 - the failure to identify potential deliverable transport interventions could impact on the ability for development plan proposals to be realised
68. A Level 2 quantitative appraisal uses modelling tools, such as a Local Authority area wide multi-modal transport model, which will facilitate the consideration of the impact of the different transport options on the surrounding road and rail networks, mode shift and potentially on cross boundary issues.

69. The Level 2 appraisal should also identify individual and/or packages of solutions that are required to support the development plan and include consideration of realistic alternative options. The level of detail, provided through qualitative and quantitative appraisal, should mean that it is possible to:
- provide the rationale for the land use scenarios and further, more detailed, consideration of the transport intervention
 - demonstrate that the economic, environmental and safety issues associated with the solution have been identified and, where appropriate, mitigation proposed

Appraisal of LDPs in SDP areas

70. The appraisal of the cumulative impacts of the development proposed in the spatial strategy is also likely to be needed for an LDP in an SDP area, aligned to the increased definition and detail at this stage, following on from the appraisal for the preparation of the associated SDP. The use of modelling tools such as a Local Authority area wide multi-modal transport model will, therefore, be appropriate for the appraisal of the LDP although it is envisaged that the extent of the study area would be reduced.

Level 3

71. A Level 3 appraisal will also use modelling tools, including localised modelling tools where appropriate, and, additionally, require preliminary design work to a level of detail commensurate with the extent of change to, or affect on, the Strategic Transport Network emerging from the plan preparation process. This is an essential part of the development of transport options and should be identified early in the plan preparation process. The Level 3 appraisal normally needed to prepare an LDP should permit refinement of the Transport Appraisal work undertaken for the SDP in the area covered by the LDP, where required, to confirm the outcomes set out in paragraph 69 and, additionally, technical development and feasibility work in order to:
- confirm that there is an acceptable technical solution
 - identify land that has to be safeguarded within the plan to procure the solution
 - assess the deliverability of options in light of current investment priorities

72. A Level 3 appraisal will normally be needed for the appraisal of LDPs as at this stage either the:
- land use changes are accepted, but there is a need for transport interventions on or affecting the Strategic Transport Network aligned to this that do not form part of current national transport investment plans; or
 - need for a specific transport intervention on or affecting the Strategic Transport Network is recognised in the SDP but is not specified or designed in enough detail to meet the spatial requirements of the LDP. In this instance it is likely that preliminary design work will be required to meet development plan requirements
73. Preliminary feasibility and design work will normally be required as part of the technical development and feasibility work needed in order to provide the outline business case.

Appraisal of LDPs outside of SDP areas

74. The level of appraisal and further technical development and feasibility work for LDPs outside of SDP areas should mean that it is possible to:
- provide the rationale for the land use scenarios and the transport interventions
 - confirm that there is an acceptable technical solution
 - identify land that has to be safeguarded within the plan to enable new transport infrastructure to be developed and procured
 - demonstrate that the environmental and safety issues associated with the solution have been identified and mitigation proposed in addition to identification of the economic issues
 - assess the deliverability of options in light of current investment priorities
75. A Level 3 appraisal of the cumulative impacts of the development proposed in the spatial strategy may also be required for LDPs outside of SDP areas.
76. As stated in paragraph 73, preliminary feasibility and design work will normally be required as part of the technical development and feasibility work needed in order to provide the outline business case.

Examples of transport interventions and indicative Levels of appraisal

77. Table 1 provides examples of the transport interventions and indicates the level of appraisal and further technical development and feasibility information that

TRANSPORT APPRAISAL GUIDANCE

TRANSPORT SCOTLAND

Transport Scotland would need to take an informed view. Table 1 is set within the context of SDP areas.

78. A higher level of appraisal and/or additional further information may be required than is shown in Table 1 where there are likely to be significant impacts on the Strategic Transport Network.

Table 1: Type of transport intervention and recommended Level of Transport Appraisal for development plans in SDP areas

Type of transport Intervention	Desired Outcome	
	Development Plan Process	
	SDP	LDP in SDP area
Roads Based		
New links and bypasses	Provide rationale and confirm the principle of deliverability through Transport Appraisal considering the cumulative impact of development and area wide modelling.	It is expected that all requirements to indicate the layout will be identified in the SDP. Further refinement, including Transport Appraisal considering the cumulative impact of development and preliminary design and feasibility work, to confirm deliverability and secure the line/layout and land take.
Level of Appraisal	2	3
New Junction <i>(dual carriageways and motorway network)</i>	Provide rationale and confirm the principle of deliverability through Transport Appraisal considering the cumulative impact of development and area wide modelling.	Further refinement, including Transport Appraisal considering the cumulative impact of development and preliminary design and feasibility work, to confirm deliverability and secure the line/layout and land take. The Transport Appraisal will also include localised modelling.
Level of Appraisal	2	3
New Junction <i>(single carriageways)</i>	Provide rationale and confirm the principle of deliverability through Transport Appraisal considering the cumulative impact of development.	Further refinement, including Transport Appraisal considering the cumulative impact of development and preliminary design and feasibility work, to confirm deliverability and secure the line/layout and land take. The Transport Appraisal will also include localised modelling. May not require consideration of cumulative impact of all development in LDP area.
Level of Appraisal	1	3
Significant Junction Upgrade and Capacity Enhancements <i>(step change in junction form e.g. at grade to grade separated) strategic e.g. additional lanes, change in type of merge</i>	Provide rationale and confirm the principle of deliverability through Transport Appraisal considering the cumulative impact of development.	Further refinement, including Transport Appraisal considering the cumulative impact of development and preliminary design and feasibility work, to confirm deliverability and secure the line/layout and land take. The Transport Appraisal will also include localised modelling.
Level of Appraisal	1	3
Park and Ride/Park and Choose	Provide rationale and confirm the principle of deliverability through Transport Appraisal considering the cumulative impact of development.	Further refinement, including Transport Appraisal considering the cumulative impact of development and preliminary design and feasibility work, to confirm deliverability and secure the layout and land take. The Transport Appraisal will also include localised modelling.
Level of Appraisal	1	3
Capacity Improvements <i>(Localised – Traffic signals, junction amendment/widening)</i>	Provide rationale and confirm the principle of deliverability through Transport Appraisal considering the cumulative impact of development but no requirement to provide details.	Further refinement, including Transport Appraisal considering the cumulative impact of development and preliminary design and feasibility work, to confirm deliverability and secure the layout and land take. The Transport Appraisal will also include localised modelling.
Level of Appraisal	1	3

Table 1 (continued)

Type of Transport Intervention	Desired Outcome	
	Development Plan Process	
	SDP	LDP in SDP area
Rail Based (<i>applies equally to passenger and freight proposals</i>)		
New rail lines (<i>includes introducing passenger services to freight lines, electrification and track doubling</i>)	Provide rationale and confirm the deliverability through Transport Appraisal considering the cumulative impact of development, Guide to Railway Investment Projects (GRIP) ¹³ Stages 1 to 3, area wide modelling, preliminary design and feasibility work to indicate line / layout.	Any requirement for a new rail line will be identified in the SDP.
Level of Appraisal	2	3
New Rail Station	As stated above for "New rail lines", although in accordance with Network Rail Investment in Stations ¹⁴ Guidance instead of GRIP.	Any requirement for a new rail station will be identified in the SDP.
Level of Appraisal	2	3
Increased Train Capacity Services (<i>Frequency/Stopping Pattern Amendments /platform extensions</i>)	Provide rationale and confirm the principle of deliverability through Transport Appraisal considering the cumulative impact of development.	Further refinement, including Transport Appraisal considering the cumulative impact of development and preliminary design and feasibility work, to confirm deliverability and identify requirements. The Transport Appraisal will also include localised modelling.
Level of Appraisal	1	3
Station Enhancements (<i>Localised car park enhancement, access and other improved facilities</i>)	Provide rationale and confirm the principle of deliverability through Transport Appraisal considering the cumulative impact of development.	Further refinement, including Transport Appraisal considering the cumulative impact of development and preliminary design and feasibility work, to confirm deliverability and identify requirements. The Transport Appraisal may also include localised modelling.
Level of Appraisal	1	3
Park and Ride / Park and Choose	Provide rationale and confirm the principle of deliverability through Transport Appraisal considering the cumulative impact of development.	Further refinement, including Transport Appraisal considering the cumulative impact of development and preliminary design and feasibility work, to confirm deliverability and secure the layout and land take. The Transport Appraisal will also include localised modelling.
Level of Appraisal	1	3

¹³ Guide to Railway Investment Projects - available through Network Rail's website at <http://www.networkrail.co.uk/asp/4171.aspx>

¹⁴ Investment In Stations, A Guide for Promoters and Developers – available through Network Rail's website at <http://www.networkrail.co.uk/browse%20documents/rus%20documents/route%20utilisation%20strategies/network/working%20group%20-%20-%20stations/investmentinstations.pdf>

The Proposed Plan and Action Programme

Introduction

79. Prior to this stage the Transport Appraisal will have been completed. This will ensure that both the Planning Authority and Transport Scotland are clear about the plan's vision and spatial strategy and the decisions necessary about strategic infrastructure investment.
80. Where optimum transport solutions cannot be delivered this should be explained and the extent of mitigation measures outlined. The Transport Appraisal outputs should express the anticipated performance of the transport network, as a result of plan proposals.
81. Where transport investment is being proposed there should be a clear indication within the action programme on when this is required and how it will be procured. Firm proposals expected to be delivered in the plan period should be clearly differentiated from safeguards for potential future development. It is not appropriate to list a series of interventions without a clear commitment to their implementation; however, it is considered acceptable to reserve land for a potential future transport intervention so long as that intervention is not required to realise the plan objectives, and that this is made clear within the plan.

Delivery and Monitoring

82. In exceptional circumstances where Government funding is required for transport interventions, this is the stage at which more detailed consideration of the business case and deliverability of such interventions must be carried out. Where Government funding is being sought for interventions on the Strategic Transport Network the Scottish Ministers will need to consider the business case and decide whether it should form part of future transport investment plans. If a positive robust business case is developed, this may be considered for future transport investment plans.
83. It is clear that transport budgets over the short and medium term will be under pressure, and individual projects will be considered in the context of other priorities. A key aspect of the Scottish Government's investment decision making process is that resources are targeted at those interventions that contribute most to the Government's central purpose of increasing sustainable economic growth.

Developer Funding Protocols

84. Where the impact on the Strategic Transport Network comes directly from a development or number of developments, developer contributions may be sought for improvements. This should be made clear within the development plan and take cognisance of Planning Circular 1/2010: Planning Agreements¹⁵.

Monitoring

85. A benchmark should be set against the appraisal supporting the development plan to demonstrate whether the initial expectation was accurate, and to identify where aspects of the spatial strategy should be reviewed.
86. Given the potential importance of this function it is recommended that appropriate key performance indicators are identified at the outset of the Transport Appraisal. Progress can then be demonstrated against the achievement of transport objectives, can be quantified in terms of the appraisal, and can be monitored as the development plan is implemented. Evaluation of projects in this way can also inform the planning process in relation to potential future developments.
87. Transport Scotland can assist in setting up and agreeing appropriate monitoring frameworks in relation to the Strategic Transport Network.

Statutory Processes to Delivery

88. Once the principle and funding of a transport intervention has been secured other statutory processes are required. Depending on the type and scale of intervention this can take a number of forms, including the need for primary legislation and statutory orders. Further involvement with the planning system may be necessary. If the development planning process has not been robust this can create significant delays in scheme development and can result in challenge at a Public Local Inquiry.
89. Some transport interventions require significant lead times to allow for scheme development and action programmes should be realistic about the length of time it takes to deliver transport infrastructure on the ground. Full engagement with Transport Scotland in the development of action programmes will be essential to implement development plan proposals on the ground as they relate to the Strategic Transport Network.
90. In some instances it is likely that there will be a considerable gap between the completion of phased development and the full implementation of supporting transport infrastructure. The implications of phasing of development, interim

¹⁵ Planning Circular 1/2010: Planning Agreements is available through the Scottish Government's website at: <http://www.scotland.gov.uk/Publications/2010/01/27103054/0>

arrangements for securing and agreeing network performance, and safety will require to be thoroughly discussed.

The Role of Developers within the Development Plan Process

91. Developers can often contribute at the main issues report and proposed plan stages by undertaking all or part of the appraisal work required to support the development. Often, they will have worked up details on potential phasing of land uses, concept master plans, transport and financial viability appraisals all of which can usefully inform the plan process.
92. It is important that the preparation of development plans is an open and transparent process and that where possible all stakeholders can work together to recognise shared benefits. Transport Scotland welcomes the direct role of developers within the appraisal process so long as this is co-ordinated with the Planning Authority and that it is recognised that there may be occasions where the aims of developers and Planning Authorities may conflict with those of Transport Scotland.

Chapter 3: Development Management

Overview

93. This chapter explains the role of Transport Appraisal in the development management process. Planning Circular 4/2009: Development Management Procedures provides an overview of the new development management system. The programme for Planning Authorities to bring forward SDPs and LDPs means that there will be a period of transition.
94. Responsibility for development management on the rail network lies with Network Rail. Developers must therefore consult Network Rail separately on planning applications which have an impact on rail infrastructure.
95. Transport Scotland is responsible for the safe and efficient operation of the trunk road network and ensuring that the interests of all road users are protected while at the same time supporting essential economic development. Transport Scotland's role in development management in respect of the trunk road network is outlined in Development Management Guidance¹⁶.
96. For a proposed development consistent with a development plan that has been appraised using the methodology outlined in this guidance, any significant transport issues should have already been addressed. The principle of the development should be established and should not be in question at the development management stage. Transport issues arising when the planning application is being considered should be about the operational translation of principles already established.
97. If, however, the development is a significant trip generator and is contrary to the development plan or the transport interventions have not been adequately appraised during the preparation of the development plan then Transport Scotland will recommend the following approach with regard to determining transport impact:
 - in instances where the location of the proposed land use has been determined within the development plan process but a Transport Appraisal of the transport effects and access strategy has not been completed the appraisal required would reflect that detailed in Table 1
 - with a speculative development where the proposed land use is not in accordance with the development plan the Transport Appraisal required would reflect that provided in Figures 1, 2 or 3, as appropriate

¹⁶ Development Management Guidance is available through Transport Scotland's website at: <http://www.transportscotland.gov.uk>

98. A key aim of the planning system is to minimise the occurrences of development coming forward at the development management stage that are contrary to the development plan or have not been adequately appraised during the preparation of the development plan.
99. The level of information required to complete the Transport Appraisal linked to the Strategic Transport Network will be dependent upon the nature and scale of development and form of access/junction improvement proposed and the road category (motorway to restricted single carriageway) as set out in Table 1. Other matters that will influence the appropriate level of appraisal include the roadside characteristics, the speed limit and road safety.
100. Where a proposal is clearly contrary to development plan policy, or will result in impacts on the Strategic Transport Networks that cannot be mitigated against, Transport Scotland will advise as early as possible in the planning process to avoid any abortive work.

Transport Assessment and Travel Plans

101. Transport Assessment is the process of defining transport proposals and designs based on the detailed proposals for development. It is at this stage that more accurate assessment of travel demand can be determined and proposed transport solutions can be finalised in a detailed manner. The Transport Assessment is intended to quantify the impact of development(s) and demonstrate through the application of the mode hierarchy and by employing a range of measures how those impacts can be effectively mitigated or managed. Detailed information on conducting a Transport Assessment can be found in Transport Assessment Guidance¹⁷.
102. Mode share targets require to be agreed at the outset of transport assessment. Targets which promote modal shift are valuable in encouraging developers and operators to look innovatively at possibilities for increasing accessibility by sustainable modes. The Transport Assessment process should then, and only then, establish ways to accommodate or mitigate the impacts of residual, less sustainable transport modes in order to meet the mode share targets.
103. A Travel Plan is a detailed description of:
 - how people will travel to and from a development
 - how employees, products and supplies will be transported
 - how an organisation will seek to reduce its transport needs overall
 - targets for change and arrangements for monitoring progress
 - how information on progress will be disseminated

¹⁷ Transport Assessment Guidance is available through Transport Scotland's website at <http://www.transportscotland.gov.uk>

- how the travel plan will be promoted to staff, visitors and suppliers
104. A Travel Plan¹⁸ is an active process that responds to changes in circumstances and builds on past successes. Successful Travel Plans set targets for changes in travel behaviour and make provisions for them to be monitored regularly so that progress can be assessed. In this way, measures chosen to promote more sustainable travel can be adjusted for maximum effect and new measures introduced to supplement those already in place.
105. Transport Assessments and Travel Plans are inextricably linked since the Transport Assessment process is predicated on the application of the mode hierarchy detailed within the SPP i.e. reduction of the need to travel and encouragement of the use of alternative modes to the private car. The Transport Assessment process establishes the proposed mode share at the outset and the Travel Plan is, to a significant extent, the mechanism by which the mode share will be delivered. The Travel Plan, therefore, sets out a package of positive and complementary measures for the overall delivery of more sustainable travel patterns for development.
106. A travel plan is a package of measures aimed at promoting more sustainable travel choices and reducing reliance on the car, and should be encouraged for all significant travel generating developments. Development plans or Supplementary Guidance should explain when a travel plan will be required in support of an application for planning permission. In a development management context, travel plans require to be implemented to deliver the mode share targets identified within the Transport Assessment.
107. Further advice on the type/level of information that is required to support a planning application that will affect the motorway and trunk road network can be found in Development Management Guidance.

¹⁸ Guidance on travel plans is provided in the Transport Assessment Guidance and from the Scottish Government at: www.chooseanotherway.com
Further guidance is available in the form of the BSi National specification for Workplace Travel Plans at: <http://www.iema.net/sections/readingroom/show/18337/c188>.

Annex 1: Guidance and Information Sources

1. GUIDANCE

The main guidance document provides an appraisal approach that allows the inter relationships between land use and transport to be appraised and translated in a way that will assist with the selection of land use and transport options that most contribute to wider policy goals as articulated in the Government Economic Strategy and Local Authority Single Outcome Agreements.

There are a number of approaches that can be employed to achieve the above and this Annex provides both guidance on these approaches and details of the information sources available to inform and support these. This Annex provides guidance on methodologies and approaches that are relevant to undertaking Transport Appraisal. It is recognised, however, that additional methodologies may be better suited dependent upon the specific requirements of the appraisal and its intended outcomes.

Mode Hierarchy

Measures can be specific to a particular mode, or they can be more broadly applied. Planning Authorities should recognise the role of the hierarchy of modes in contributing towards their statutory duty to promote sustainable development and the roles of different modes in contributing to the achievement of wider objectives related to sustainable economic growth. It is accepted that there will be trade-offs in balancing the needs of potentially competing policy objectives.

Walking

Walking is the most sustainable mode and requires relatively little investment to make it attractive, particularly if planned and designed into a new development from the outset. Planning can encourage walking to become the prime mode for shorter journeys through arranging land uses, by utilising urban design and encouraging specific schemes, such as those developed under the Cycling, Walking and Safer Streets or Safe Routes to Schools initiatives.

Cycling

All cycling infrastructure should reflect the local surroundings and the requirements of the residents and transport users. If cycling is to be a realistic choice of travel mode, plans for on-road and segregated paths need to be incorporated at the beginning of a development and not seen as an add on at the end. Consideration needs to be given to bicycle storage and on road cycle parking at new and refurbished developments.

Public Transport

Quality and affordability of public transport - principally bus and rail - has to be taken into account if motorists are to be enticed out of their cars. A change in mode can be encouraged through, for example:

- ensuring that new developments are well served by a range of information on modes available including cycling and walking early on
- high quality infrastructure, e.g. interchanges, quality of vehicles, waiting and cycle storage areas
- integration of developments with walking and cycling networks, Park and Ride schemes and existing or new railway stations
- rail infrastructure or service improvements in high demand corridors
- bus and cycle priority measures on main public transport corridors
- demand responsive services to fill gaps in public transport coverage e.g. public bike hire scheme

Motorised Modes

It is accepted that there will always be circumstances where cars have a role in providing for the transport needs of people or communities. Planning Authorities should consider how best to manage this demand in their area through an appropriate combination of measures to ensure that traffic from new development is balanced and contributes to the sustainability of that development.

Appraisal Approaches

As would be expected, a 'one size fits all' approach to Transport Appraisal to support development planning is inappropriate and would not reflect the differing needs of the range of areas covered (for example, from rural locations where accessibility is critical to inner city areas where consideration of network operation can be a more significant issue). What is clear is that the approach taken to developing and informing the evidence base supporting the proposed plan must be fit for purpose and reflect the complexity of the issues to be considered. To that end a number of approaches or combination of approaches may be appropriate, for example:

Workshops

As set out in the main guidance, workshops will be expected to play a key role in starting the appraisal process, defining the need and scope for further analysis and providing an initial view on the implications of particular strategies or proposals. The workshop format provides a very flexible platform for the analysis of both generic and specific issues and the value gained from each workshop very much depends on having the necessary information available and the correct experts and/or decision makers attending.

In the majority of cases it is expected that the initial workshop would be supplemented by further work – this could be more subject, issue or location specific workshops, or more quantitative or objective analysis based on specific models or tools that reflect the particular issues to be considered.

Accessibility Analysis

Accessibility is concerned with the opportunity for people and goods to reach various locations and facilities by different modes and is an important part of the planning process. New developments can have both positive and negative impacts on accessibility, which may be intended or unintended. Good accessibility will be achieved where many people are linked to opportunities by networks of regular, reliable and affordable travel. The accessibility issues that should be assessed include:

- access to the transport system – locating access and interchange points for freight and links for pedestrian and cyclists to the wider transport network
- access to the local area – providing transport nodes or interchanges for the proposed development that will benefit other developments and the local community as a whole
- community severance – ensuring that the development does not create barriers to access within the local community

Accessibility modelling is a technique that can be used as an alternative to or alongside other tools or models to underpin policy development, compare development proposals and inform mode share targets for individual proposals. Levels of accessibility (in relation to walking, cycling and public transport) for a specific site, or relative levels of accessibility for multiple sites, can be analysed using accessibility modelling tools, such as the 'access' capability within the Transport Model for Scotland or specific accessibility modelling software.

Economic growth generates new demand for freight transport. Efficient freight transport is essential to the economy and quality of life in Scotland. Accessibility is critical in promoting shipment of freight and key issues in development planning and management are locating freight hubs for rail, air and shipping in the most appropriate locations while planning surface access to them to promote most appropriate mode choice to contribute to sustainable economic growth.

Modelling

Transport models can help inform the development planning and management process, not by identifying the 'best' outcome, but by providing an understanding of the implications of different decisions. For example, quantifying the impacts of particular land use decisions on the environment, safety, the economy or accessibility. For example, transport models can be used to inform:

TRANSPORT APPRAISAL GUIDANCE

TRANSPORT SCOTLAND

- operational analysis of public transport and road networks (traffic flows, passenger numbers, accidents, journey times, congestion, delay etc.)
- environmental assessment, including emissions and noise impacts in specific locations or across a model area
- the implications of changes in land use or spatial strategy on the transport networks, including comparative accessibility to particular locations or services
- cost benefit, financial and business case analysis, informing the assessment of transport economic efficiency

Transport and traffic models are tools intended to provide rational and objective assessment of current and/or network operation to inform both policy development and the assessment of proposals. Modelling is expected to inform consideration and analysis of complex issues, for example consideration of policies or proposals affecting congested transport networks, promoting mode change of people or goods or the implications for transport of land use decisions (the spatial strategy).

A transport model is a simplified representation of the transport elements of the real world. Transport models can therefore be important tools to help identify and quantify the implications of different land use decisions and to allow informed and evidence-based decision making. Different modelling approaches should be used dependent on the issues to be considered, for example:

- traffic modelling of locations or areas can be used to consider the operational issues associated with policies or proposals, helping to identify the type and magnitude of impacts associated with each
- transport modelling at a strategic level can take this further by capturing potential mode shift, wider route or destination choice and/or identifying suppressed demand
- land use/transport models can be used to consider the most complex transportation issues, including the impact of land use decisions on demand for travel

The list above is a simplification to show the broad categorisation of model approaches and demonstrate that there is a range of modelling tools available to inform the planning process. The list also serves to demonstrate that transport models are significant databases in their own right and use a variety of data sources on which to base their predictions. For example, the principal data inputs to the LATIS modelling suite, which includes Transport Model for Scotland (TMfS) and Transport Economic and Land-Use Model for Scotland (TELMoS), include:

- large national surveys i.e. 2001 Census and Travel to Work data, National Travel Survey, Scottish Household Survey and its Travel Diary and Scotland-wide rail ticket data

- national/regional economic and geo-demographic information
- planning data forecasts i.e. future development land allocations, as predicted by Planning Authorities
- road network details i.e. link lengths, number of lanes, speed limits, junction lay-outs, signal timings and topography
- public transport service data - routes, frequencies and fares
- origin-destination data - Roadside interviews (RSIs) and on-board public transport interviews –providing information on travel patterns
- count data – traffic counts, turning counts at junctions, public transport user counts and car park surveys
- travel time surveys (predominantly used for validating the traffic model)

Further advice and guidance on the LATIS service is available through Transport Scotland's *Scot-TAG* web based information source for transport analysis guidance, at:

<http://www.transportscotland.gov.uk/reports/scottish-transport-analysis-guidance>

The LATIS service is available to all Local Authorities, Regional Transport Partnerships, consultancies and other interested parties throughout Scotland for use in the assessment of strategies, policies and schemes.

2. KEY PERFORMANCE INDICATORS

Strategic Transport Network Performance Appraisal

- **Demand Indicators:** Demand analysis can be carried out through consideration of the extent of travel movement by:
 - corridor (key movements)
 - mode
 - vehicle/person trips
 - time of day and over time
 - journey type/ purpose/ frequency
 - distance travelled by mode
 - number or proportion of local trips using the Strategic Transport Network
- **Supply Indicators:** Supply analysis can be carried out through consideration of:
 - journey time reliability

- extent of journey time issues / delays on the road network
- capacity issues on the rail network
- public transport routeing and frequency
- comparative journey time by mode

Wider Policy Appraisal

Once an understanding of both demand and supply issues is built up an assessment can be made of how this is predicted to impact on wider policy objectives, with quantitative and qualitative assessment possible. The following are quantitative measures that it is possible to extract from current modelling tools:

- **Environmental Indicators**
 - projected emissions from road transport
- **Economic Measures**
 - projected impact on labour market catchments (within a given journey time), wider economic benefits
- **Accessibility and Inclusion Measures**
 - projected positive and negative changes to access to strategic services (e.g. hospitals, areas of economic activity, centres of higher education) by road and public transport

3. DEMAND MANAGEMENT MEASURES

Demand management measures are specific interventions or strategies that are intended to result in more efficient use of transportation networks and resources. The availability of capacity and opportunity on transport networks influences the choice of transport mode and is a major contributory factor to the rising levels of car usage that are seen today. Spatial decisions in development plans should be supported by appropriate demand management measures reflecting local circumstances and objectives, and contributing towards sustainable economic growth.

Demand management measures must be developed sensitively and adapted to particular local circumstances, for example through the development of a local authority's own design standards for roads (taking account of Designing Streets: A Policy Statement for Scotland¹⁹) and the adoption of an appropriate roads maintenance code of practice.

¹⁹ Designing Streets: A Policy Statement for Scotland is available through the Scottish Government's website at: <http://www.scotland.gov.uk/Publications/2010/03/22120652/0>

Some key demand management approaches are outlined below. Clearly this is an initial list and is intended to provide a general indication of the types of measures or policies that can be used:

- **Parking strategy** - provision, management and pricing are critical in influencing mode choice by controlling the 'trip end' in terms of availability, ease of use and cost of parking. Parking policies must take account of local priorities, for example through the development of local maximum parking standards. Any changes in car parking policies should not impact negatively on spaces allocated for disabled people, parents and children and car sharing schemes
- **Car sharing** is widely implemented and can reduce car dependence by promoting approaches whereby a driver and one or more passengers use a single car for particular journeys, generally commuting. Car sharing schemes involve varying degrees of formality and can include a database to link individuals and define journey needs (mode, partners, timings etc), define pick-up points and general advice
- **P&R strategy** is linked to the parking strategy above and influences travel behaviour by allowing commuters and others wishing to travel into city-centres to leave their car, motorcycle or bicycle in a secure parking area and transfer to another mode such as bus, rail transit system (e.g. Glasgow Underground or Edinburgh Tram) or to car-share for the remainder of their trip
- **Traffic management** encompasses the range of measures to reduce speed or traffic and improve the environment for residents and other road users. Traffic management relies on engineering, education and enforcement and includes measures such as road narrowing, speed bumps, chicanes, pedestrian build-outs etc.
- **Intelligent Transportation Systems** can promote a range of transportation improvements by using technology to, for example, improve operation of networks, reduce congestion, increase safety or make public transport options more competitive and attractive
- **Roadspace allocation** is a key way of managing demand by using the available road capacity to benefit some modes over, generally, the car. Examples of this approach are bus/cycle lanes or providing capacity for high occupancy vehicle priority
- **Promote active modes** such as walking and cycling by ensuring networks are developed and enhanced, new developments link to existing networks and associated facilities (such as easy interchange, changing/showering or cycle storage) make the use of active modes an attractive options for appropriate trips
- **Capacity enhancements** of either the road network or in terms of public transport services or infrastructure are also ways of managing demand and can promote genuine mode choice and more efficient use of the networks in particular cases

The approach to deriving standards or developing the design of specific schemes should consider local characteristics, including issues such as:

- accessibility analysis, particularly by non-car modes
- wider spatial strategy as set out in the relevant development plans
- economic development factors, in terms of levels of activity
- levels of car ownership, use and movement patterns
- implications for potential re-routeing or over-spill impacts
- availability of alternative mode choice or parking availability (on and off street)
- need for traffic restraint
- levels of pollution
- levels and targets for walking and cycling
- neighbouring authorities' policies and standards
- potential for shared use of spaces

For implementation at a local level a zonal approach is recommended. For example:

Measures that can influence mode choice may include:

- development of comprehensive networks for active modes
- allocation of road space to specific modes (e.g. bus or cycle lane)
- ensuring priority for active modes and public transport through congested areas / networks
- appropriate use of Intelligent Transport Systems (ITS) to provide information to network users (e.g. variable message signs, real time transport information or variable direction signs)

Measures that can influence route choice may include:

- integrated transport networks offering interchange and access to support the overall vision and objectives of the development plan
- A functional roads hierarchy reflecting the principles of Designing Streets: A Policy Statement for Scotland
- Charging for road use
- restricting capacity or access to specific areas, by user class or by time of day

Measures that can influence parking can include:

- a maximum number of parking spaces being provided, underpinned where appropriate by a minimum to avoid undesirable off-site overspill parking
- on site parking charges / permits to discourage long term parking
- parking located closer to the building for short stay, mobility impaired and late night / shift work
- dual use car parks serving both new stores and wider town centres
- encouragement of car-sharing by using a database and preferential parking spaces
- establishment of car sharing or a car pool
- complementary restrictions, i.e. on-street restrictions in the surrounding area
- secure, covered cycle parking

Monitoring the impact or use of demand management policies or measures is important after implementation. This should take account of experience, evolving objectives and changing patterns of characteristics. A review of measures and standards should be undertaken at intervals no greater than 5 years.

4. INFORMATION SOURCES

When completing transport analysis and making choices on transport measures for travel plans various information sources will be useful. Those of particular relevance are set out below.

The Census

Origin-Destination Statistics provided by the Census attempt to analyse flows of people, for example travel to work. Such data can then be expanded on to include the method of travel and age patterns. Of particular use would be the following data sets: Standard Tables, Census Area Statistics and Special Travel Statistics. The Census website is available at:

<http://www.gro-scotland.gov.uk/index.html>

The Scottish Household Survey

This survey of around 15,000 households per year across Scotland aims to provide accurate and up-to-date information on characteristics, attitudes and behaviour of Scottish households and individuals on a wide range of issues. Particular sections provide information on travel and transportation, for example household car availability; cycling, walking and use of public transport; travel to work and school. The survey also collects "travel diary" information. Results are available annually for the larger local authorities, and every 2 years for all authorities. These are based on

TRANSPORT APPRAISAL GUIDANCE

TRANSPORT SCOTLAND

interviews with a minimum of 500 or so households in each authority in each two-year period. Local authorities can obtain anonymised copies of the Scottish Household Survey (SHS) data from COSLA, and the data are also deposited at the UK Data Archive.

The SHS's transport-related results are published in three series of statistical bulletins:

- *Household Transport* - main results for Scotland
- *Transport across Scotland* - main results for local authority areas
- *SHS Travel Diary results* - includes some figures for local authority areas

These are available from the Stationery Office Bookshop and the Scottish Executive Web site. For information or questions on Transport, contact Transport Statistics: Tel: 0131 244 8420. e-mail: shs@scotland.gsi.gov.uk

Further information is available at:

<http://www.scotland.gov.uk/Topics/Statistics/16002>

Scottish Transport Statistics

This annual report looks at the trends over the last 10 years and provides information on different modes of travel (for example road, rail and air). It also provides specific statistics on related topics such as finance and injuries. Most of the figures relate to Scotland as a whole: only a few tables provide figures for local authorities. Copies are available from the Stationery Office Bookshop and it can also be found on the Scottish Government Web site at:

<http://www.scotland.gov.uk/Topics/Statistics/Browse/Transport-Travel/Publications>

Scottish Transport Appraisal Guidance (STAG)

The Guidance represents best practice in transport planning and the appraisal process. STAG provides a structure and methodology for reporting information to decision makers on the outcomes of transport planning and appraisal process activities.

The Guidance is supported by the STAG Technical Database, which provides detailed advice to aid practitioners in the application of the STAG process.

Detailed guidance on carrying out Transport Appraisal in accordance with STAG is available through Transport Scotland's *Scot-TAG* web based information source for transport analysis guidance, at:

<http://www.transportscotland.gov.uk/stag/home>

Land use and Transport Integration in Scotland (LATIS)

LATIS is a service provided by Transport Scotland which incorporates an integrated modelling suite of the Transport Model for Scotland (TMfS), a multi-modal transport demand and assignment model, and the Transport and Economic Land Use Model of Scotland (TELMoS). In addition to the modelling suite, the service provides guidance, consultation and an extensive data set of both transport and land use data within Scotland. The modelling suite has the capability to forecast the transport and land use changes and patterns throughout Scotland resulting from major infrastructure and/or policy initiatives.

The model outputs can be used to assess different road and public transport infrastructure schemes or policy initiatives and include: Operational analysis; Environmental and Congestion analysis; Land use and Accessibility analysis; Economic, Financial and Accident analysis; and Subarea analysis.

Data, guidance, application forms to use the service and models and key contacts can be found on the LATIS website at:

www.latis.org.uk

Further advice and guidance on the LATIS modelling suite is available through Transport Scotland's *Scot-TAG* web based information source for transport analysis guidance, at:

<http://www.transportscotland.gov.uk/reports/scottish-transport-analysis-guidance/LATIS>

TRICS® Database

This is a database containing site and development information for some 1,800 development sites in the UK. In each of these developments traffic entering and exiting is recorded, and from this information trip rate calculations are carried out, which can be used to estimate traffic flows for a variety of development types. This is becoming increasingly useful as it focuses less on traffic and more on multi-modal transport. The TRICS® database can be accessed at:

www.trics.org

Scottish Roads Traffic Database (SRTDb)

This is a database for the collection, validation, storage and dissemination of traffic count data for the trunk road network and limited parts of the non-trunk network. The SRTDb is operated and maintained by Transport Scotland's Road Network Maintenance and Management Division. There are over 1300 traffic count sites in the system at present, with more likely as additional non-trunk sites are brought into the system. Data is collected via manual classified counts and automatic traffic counters located (mainly) throughout the trunk road network.

TRANSPORT APPRAISAL GUIDANCE

TRANSPORT SCOTLAND

Access to the data is via the SRTDb Intranet site. Whilst this Intranet site can be accessed remotely from outwith the Scottish Government, there are restrictions on who can be accommodated. In the first instance users should contact SRTDb.

Contacts at SRTDb are:

- Stuart Hay for automatic count data.
Tel: 0141 244 7403
Email: stuart.hay@transportscotland.gsi.gov.uk
- David Brown for manual count data.
Tel: 0141 272 7404
Email: david.brown@transportscotland.gsi.gov.uk

Local Travel Information

In the preparation of Regional and Local Transport Strategies travel surveys will be undertaken by local authorities. They may be for the whole area or site specific. Collating and monitoring details of travel plans may also provide good base line data. Such information also enables comparisons to be made between sites in an area dependent on local circumstances. These are a valuable source of local information which can be utilised.

Travel Plan Measures and Implementation

Further guidance on travel plan methodology and measures that can be initiated are provided in “Choosing Another Way” (Scottish Government 2008) and “The Essential Guide to Travel Planning” (Department for Transport 2008), and can be obtained from the Scottish Government or DfT at:

www.chooseanotherway.com

www.dft.gov.uk/pgr/sustainable/travelplans/work/essentialguide.pdf.

A method for measuring the effectiveness of travel plans, the “UK Standard Assessment Method for Travel Plan Impacts” has been developed by TRICS and can be found at:

www.trics.org

Deriving Walk and Cycle Times

Geographical information systems (GIS) can be used to derive walk and cycle access times. Distances between origin and destination pairs via the network are calculated and converted into time using an assumed average travel speed. It will generally be necessary to use the most detailed networks available. The following should be noted:

- Care should be taken to include all paths and shortcuts in the calculation as well as all roads in the network
- Euclidean (straight line) distances may be calculated with assumed average speeds, but that would not take into account the characteristics of the actual walking network, such as hills or pedestrian crossings

Further information on cycling, including the National Cycle Network, can be obtained from Sustrans Scotland or Cycling Scotland at:

<http://www.sustrans.org.uk/default.asp?SID=1090515197515>

www.cyclingscotland.org

Deriving Car Drive Times

A number of mapping websites and software packages are available (within GIS systems) which perform shortest path calculations through road networks and convert distances into times. In most cases the road network is divided into different road types and a database containing typical speeds by road type is used to derive link times. Routing algorithms are used to calculate a shortest path. Off-peak travel times and free flow traffic conditions are usually used in calculations. For the purposes of Transport Assessments it might be necessary to represent a network for the AM or PM peak period. Although road speeds can be customised to reflect local conditions, the process to validate journey times in a network might be time-consuming.

Public Transport Networks

There are various paper-based data sources available providing information on public transport networks. In Scotland, the Traffic Commissioners and the relevant local authority, should have information on routes operating, and may have mechanisms in place for obtaining information from public transport operators. Often printed timetables are provided. Details of public transport routes can be obtained from websites such as Traveline Scotland or Doe's Directory, at:

www.travelinescotland.com or www.barrydoe.plus.com

Deriving Public Transport Journey Times

Calculating journey times through a public transport network is more complicated. It is not just a matter of selecting routes served by buses and using average bus speeds as various other elements need to be taken into account, including:

- The time to walk to a bus stop or station
- Wait time at the bus stop
- The travel time spent on the bus

- Interchange time (if relevant)
- The time to walk from the bus stop to reach a destination

Currently, data and software to provide door-to-door public transport journey times is not readily available without a large degree of effort, unless special local exercises have been undertaken. The data generally exist to allow such exercises, but the effort involved might only be justified for large development proposals. Availability of accessibility planning software tools is slowly changing this perspective.

Information about railway station locations and railway lines is widely available in digital format for use with GIS. Electronic data on bus stop locations is less widely available, although databases tend to exist in the larger urban areas. Alternatively, bus operators might be able to supply information on bus stop locations. Data on service patterns and frequencies will generally be paper based and locally available, though increasingly they are available on the internet. Walking times to and from rail stations and bus stops can be calculated in a similar way as described under the heading 'Deriving walk and cycle times'.

Bus and Coach Statistics

These statistics provide information about the trends in bus and coach services in Scotland, and include data on distances travelled by vehicles, numbers of bus passenger journeys, fare indices, passenger receipts, public transport support, operating costs, vehicle stock and staffing. Bus and Coach Statistics are produced annually by the Scottish Government and can be accessed at:

<http://www.scotland.gov.uk/Topics/Statistics/Browse/Transport-Travel/TablesPublications/BusCoachStatistics>).

The data may contribute to the assessment by providing background information.

Other Organisations

Local authorities are not alone in collecting data on travel characteristics. Other agencies may be of assistance on more detailed aspects of travel, for example: neighbouring authorities, rail and bus operators, port authorities, Civil Aviation Authority, local businesses, walking and cycling groups, disability groups.

Research Documents

Research completed at both a national and local level will provide useful information as will case studies where similar work has been undertaken elsewhere.

Annex 2: Definitions

Transport Scotland

Transport Scotland is an Agency of the Scottish Government.

Transport Appraisal

Transport Appraisal, carried out when development plans are being prepared, is intended to provide an understanding of the implications of land use changes on the Strategic Transport Network. It should identify where transport interventions may be required to support and mitigate the effects of the land use changes and the form and nature of these interventions.

Transport Assessment

Transport Assessment is the process of establishing transport proposals and designs based on the detailed proposals for development and is carried out by the applicant in support of a planning application. Transport Assessment is intended to quantify the impact of a development based upon its person-trip generating potential and demonstrate how these impacts can be effectively mitigated or managed through measures that will enable a more sustainable and environmentally efficient development proposal. Guidance on Transport Assessment is provided in “Transport Assessment Guidance”.

The Strategic Transport Network

The Strategic Transport Network comprises Scotland’s motorways, trunk roads and rail network.

Planning Authority / Authorities

Planning Authority / Authorities are the local planning authority / authorities and strategic development planning authority / authorities.

Further copies of this document are available, on request, in audio and large print formats and in community languages (Urdu; Bengali; Gaelic; Hindi; Punjabi; Cantonese; Arabic; Polish).

Transport Scotland, Buchanan House,
58 Port Dundas Road, Glasgow G4 0HF.

0141 272 7100



© Crown copyright 2011

ISBN: 978-1-908181-04-6 (web only)

You may re-use this information (excluding logos) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence, visit <http://www.nationalarchives.gov.uk/doc/open-government-licence/> or e-mail: psi@nationalarchives.gsi.gov.uk.

Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned.

Any enquiries regarding this document/publication should be sent to us at info@transportscotland.gsi.gov.uk

This document is also available from our website at <http://www.transportscotland.gov.uk>

Published by Transport Scotland, July 2011