

THE APPLICATION OF SCOTTISH TRANSPORT APPRAISAL GUIDANCE TO THE ROAD TRAFFIC REDUCTION ACT

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1. INTRODUCTION

In March 2002, the Scottish Executive published their Transport Delivery Report (*Scottish Executive, 2002*). This document set out an ambitious target to stabilise road traffic volumes at 2001 levels by 2021, in order to respond to a projected increase in road traffic levels of 27% over twenty years. The report went on to commit the Scottish Executive to undertaking research into the road traffic reduction targets of each of the local authorities in Scotland, with a view to testing the realism of these targets, and identifying the range of measures necessary to deliver required reductions by 2021. Subsequently, FaberMaunsell were commissioned by the Scottish Executive to undertake this research project. Key aspects of the work included:

- A review and appraisal of the targets set by Scottish Local Authorities in response to the Road Traffic Reduction Act 1997;
- Development of revised methodologies and guidance for establishing RTRA targets;
- Consideration of the measures required to achieve the Scottish Executive's 2021 road traffic reduction target.

This paper provides a brief overview of the main findings of the study, and illustrates how an objective-led methodology, consistent with the guidance contained within Scottish Transport Appraisal Guidance (STAG) (*Scottish Executive, 2003a*) could be used to develop realistic and meaningful targets.

The views expressed in this paper are those of the researchers and do not necessarily represent those of the Scottish Executive, or Scottish Ministers.

2. BACKGROUND

2.1 Legislative Context

Concerns regarding the environmental, economic and social un-sustainability of ongoing traffic growth prompted the development of The Road Traffic Reduction Act 1997 (*HMSO, 1997*). The Act principally requires local authorities to publish road traffic levels for roads within their area, and rates of growth of these traffic levels. Targets for the reduction of traffic within their local authority area are required; alternatively, justification is required for those not setting targets. The legislation was introduced to the UK Parliament by means of a Private Members Bill, and was supported outside of Parliament by

a wide range of environmental organisations. A year later, the Road Traffic Reduction (National Targets) Act 1998 (*HMSO, 1998*) also passed into statute, with similar responsibilities for national governments.

In December 2000, most local authorities submitted their RTRA submissions along with their Local Transport Strategies. Subsequently, a review of Full Local Transport Strategies and RTRA submissions (*Steer Davies Gleave 2001*) found that many lacked rigour and consistency.

2.2 Road Traffic Growth

The Scottish road network is currently experiencing year on year increases in vehicle kilometres. Between 1993 and 2002, there was an 18% increase in traffic volumes. Whilst accounting for 37% of total vehicle kilometres on the Scottish road network in 2002, growth on the trunk and motorway network accounted for over 50% of the total growth over the previous ten years. (*Scottish Executive, 2003b*).

Table 2.1 – Scottish road traffic growth, 1993 – 2002 (million vehicle kilometres)

Road Type	1993	2002	Change 1993 – 2002	% Change 1993 – 2002
All Traffic	35,053	41,279	6,226	18%
Motorways	3,955	5,613	1,658	42%
Trunk A Roads	8,117	9,589	1,472	18%
Non Trunk A Roads	10,471	11,806	1,335	13%
Minor Roads	12,510	14,272	1,762	14%

Source: Scottish Transport Statistics 22, 2003

Forecasts of future traffic levels are subject to a considerable range of uncertainty, particularly over longer timescales. Figures obtained from the Central Scotland Transport Model (CSTM) predict traffic growth between 2001 and 2021 of 27%. Of this growth, 80% is forecast within or surrounding the metropolitan areas of Glasgow, Edinburgh, Dundee and Aberdeen (*Scottish Executive, 2002*). An upper-bound forecast may be obtained by extrapolating historic trends over a twenty-year period, which suggests a potential increase of 39% in traffic levels. A comparison can also be made with UK-wide National Road Traffic Forecasts produced in 1997 (*DETR, 1997*). This forecasts growth of 37% between 2001 and 2021, assuming a central growth assumption; 26% if low growth is assumed; and 48% if high growth is assumed.

A range of factors, many of which are inter-related, have influenced this historic and forecast growth¹. This includes:

- growth in car ownership, particularly in households with 2+ vehicles, and a decline in households with 0 cars;
- increases in the average number of trips made in Scotland per person by private road vehicles, and the average distance travelled per person as either driver or passenger of private road vehicles;
- an increase in numbers of households;
- in real terms, motoring prices have remained broadly constant, whilst rail and bus fares have each recorded increases;
- rising disposable incomes have made travel more affordable; and
- a variety of long-term lifestyle changes have also contributed to and reflected the trends in traffic growth listed above, including dispersal of home, work, education, leisure and shopping locations.

2.3. The Impact of Rising Road Traffic Levels

The impacts of this ongoing traffic growth can be related to the government's five national transport objectives. A summary of some of the main impacts are outlined below.

- Safety – the relationship between road traffic reduction and road accident reduction is not straightforward (*FaberMaunsell/NERA, 2002*), although within the context of congested urban areas, the London Congestion Charge has shown beneficial reductions (*Transport for London, 2004*).
- Environment – there is mounting concern over road traffic's contribution to carbon dioxide and other greenhouse gas emissions. Ongoing traffic growth is outstripping any reductions gained by fuel efficiency².
- Environment – it has been found that overall reductions in road traffic will typically have less overall impact with respect to reducing harmful emissions, compared to improvements in fuel and vehicle technology (*DETR, 2000*). However, within congested areas, localised improvements in air quality can be achieved through road traffic reduction policies (*Bell and Lear, 1989*).
- Economy – congestion forms one of the most significant external costs imposed on society, however this varies considerably by time and by location. SACTRA found that road traffic reduction policies can be beneficial in instances where transport costs exceed transport prices, typically within areas suffering from congestion (*SACTRA, 1999*).
- Integration – the main impacts on health can be summarised into the impacts of local air pollution, and deterrence and subsequent reductions in physical activity such as walking or cycling.
- Accessibility and social inclusion – the use of the car has brought significant recent improvements in accessibility for many, including the elderly and women. However, those suffering social inclusion have experienced significant disadvantage (*Social Exclusion Unit, 2003*)

3. RESPONSES TO THE ROAD TRAFFIC REDUCTION ACT

3.1 Scottish Local Authority Response

Within the study, a review was undertaken of the thirty-two local authority LTS documents and RTRA submissions, complemented by a programme of consultation.

We found that the majority of local authority RTRA targets were established in a less than robust manner. Targets were weakened by limited available data, difficulties in quantified forecasting, and unclear relationships within the LTS. Unfortunately, there has been little monitoring of progress towards the targets since their establishment, and the targets appear to have been largely unsuccessful at influencing the decision making process. Overall, the targets seem to have lacked credibility and support.

Setting RTRA targets at a local authority level was found to be largely ineffective within those large Scottish conurbations made up from, or surrounded by, a number of smaller local authority areas. During our local authority consultation it was suggested that a regional approach could help to ensure that policy interventions were formulated across logical geographic areas, to represent the main trip origin-destination patterns. The separation between local roads and trunk roads within RTRA legislation was also found to have been unhelpful. Local authorities have been reluctant to take action without similar support from the trunk roads authority. A combined approach was suggested due to the complex interactions of policy measures between trunk and local roads.

3.2 Scottish Executive Response

We have found limited evidence to suggest that the existing Scottish Executive target of seeking to stabilise traffic levels at 2001 levels by 2021 is on track. Our research also highlighted that within its current form, the target does not necessarily correspond to the best practice guidance provided in STAG.

Since publication of the target, the Scottish Executive have commissioned a substantial research programme to understand more fully issues related to car dependence, and opportunities to achieve modal shift.

3.3 Barriers To The Delivery of Effective RTRA Targets

The main barrier to the delivery of effective RTRA targets was found to be a limited political and public buy-in to the concept of using road traffic reduction policies as a means of achieving key transport objectives. There were particular fears regarding potential negative impacts on economic development and performance, as well as placing restrictions on personal choice and mobility.

A perceived lack of support for specific road traffic reduction initiatives at a national level has also added to local authorities being reluctant to maintain interest in RTRA. Limited availability of quantitative information regarding congestion (as opposed to road traffic levels) has also led to strategies being quite generalised. There is also an absence of incentives for local authorities to develop robust RTRA targets and reports. Finally, it is recognised that opportunities for delivery of road traffic reduction targets are not wholly in the control of local authorities, but require a much wider partnership and commitment – across most levels of government, the private sector, and with the wider public.

4. A PROPOSED RTRA TARGET SETTING METHODOLOGY

4.1 Key Principles

Considering best practice and current advice, six key principles for the development of effective, realistic and meaningful RTRA targets were established.

- A Clear Rationale for Road Traffic Reduction

The case for road traffic reduction should be demonstrated through a coherent understanding of problems and opportunities on the road network, quantified by up-to-date information. This should also be informed from consultation with affected stakeholders.

- Development of Objectives

Objectives should be developed that reflect the key outcomes that are desired, such as reducing the impact of congestion, tackling rising carbon-dioxide emissions, or improving local air quality. The objectives should fit within the relevant transport strategy.

- An Effective and Achievable Strategy

An effective and achievable strategy will be in place to realistically deliver, or work towards, the stated objectives. A quantitative appraisal of measures will determine the most effective range of measures that can be applied across all the specified objectives, including appropriate balances between managing demand, improving the efficiency of strategic travel, and improving personal accessibility.

- Specific Performance Indicators

Performance indicators will be used to monitor progress towards achieving specific objectives. The performance indicators will be associated with a committed and ongoing monitoring programme. A clear linkage will be made between objectives, the relevant performance indicators, and the means by which they will be measured.

- Road Traffic Reduction Targets

Where road traffic reduction policy can contribute to achieving strategy objectives, road traffic reduction targets will be specifically linked to those performance indicators that relate to changes in traffic growth. In addition to defining an ultimate reduction target, milestone targets for the short and medium term should be defined to illustrate the trajectory of change. The magnitude of the targets will be based on what is achievable, as demonstrated through the quantitative appraisal process. The targets will be SMART (Specific, Measurable, Achievable, Relevant and Time Related), and will clearly identify the units of change, the base year value from which change shall be measured, and the target year value. Road traffic reduction targets will complement other targets, such as those for congestion, accessibility, air pollution and safety.

- A Review Process

Finally, road traffic reduction targets will be associated with a process for periodic review and evaluation, in addition to ongoing monitoring.

6.2 A Possible Target Setting Methodology

The application of STAG provides a suitable, objective-based framework for developing RTRA targets. A methodology was developed in consultation with Scottish local authorities. This methodology is appropriate for both local authorities, and regional transport partnerships. Eight stages to the methodology have been identified, which closely follow the individual steps within STAG.

- Review of Problems and Objectives

The first step includes the collection of baseline traffic information, and the subsequent forecasting of “do-minimum” traffic growth. This analysis provides the context for an assessment of current and future problems on the transport network.

Objectives should be set within the context of national objectives, and regional priorities. They should address specific outcomes that are being sought – for example reductions in congestion, improvements in air quality and reductions in carbon dioxide emissions.

- Assessment of Options

A range of alternative means of achieving objectives should be considered. Road traffic reduction measures may only be appropriate in specific circumstances, particularly where they can effectively contribute to addressing current or future problems, and to the achievement of objectives. Alternative approaches may, for example, include increasing road capacity, and placing an emphasis on managing the network more effectively so as to get more capacity out of that which already exists.

- Initial Strategy Appraisal

If initial consideration shows that road traffic reduction is potentially worthwhile, then initial targets should be scoped up in more detail, considering: their spatial and temporal coverage; their application to specific road types; and specific types of traffic. This can be used to gauge the likely range of reduction that is necessary to achieve strategy objectives, but also achievable with respect to the available tools.

As part of strategy development, road traffic reduction based approaches should be subject to a STAG 1 appraisal, alongside alternative approaches.

- Detailed Strategy Appraisal

If initial assessment shows road traffic reduction approaches to be a viable option, then further development should be undertaken of the range of measures and approaches necessary to deliver specific levels of road traffic reduction. This will consist of a range of measures and policies, including demand management, soft measures, and accessibility improvements. These options should then be subject to a STAG 2 appraisal.

- Assess Impact on Road Traffic

In order to develop specific RTRA targets, an assessment should be undertaken of the impact of preferred strategy on road traffic levels. This is a two-stage process requiring a review and revision of previous do-minimum forecasts, and the development of do-something forecasts. The do-something forecasts may be made up from separate forecasts of impacts of local transport strategies, and additional measures applying to the trunk road network, and regional transport policies.

- Establish Targets

Each objective that is identified should be linked to a measurable suite of performance indicators. The performance indicators should then form the basis of specific targets, particularly when the strategy requires a specific level of change in order to achieve a particular objective. Road traffic reduction targets can be specified when the performance indicators relate to road traffic levels.

- Monitoring Framework

Following development of the objectives, performance indicators and targets, it is necessary to develop a monitoring framework. Three elements should be considered: road traffic levels and characteristics; congestion and emissions indicators; and underlying factors affecting traffic growth. An annual road traffic reduction report can be prepared, setting out progress towards specific objectives, and changes in traffic levels.

- Review and Revision

The final element of the methodology should be the review and revision of targets. After a period of four to five years, the opportunity should be taken to reflect upon the relevance and achievability of the targets and performance indicators. Two elements are part of this review. Firstly, it requires a review of the strategy, including problems and opportunities, and objectives, and progress of scheme delivery. This can lead to an assessment of the achievability and relevance of selected targets.

The second element of the review should consider the usefulness of the adopted performance indicators, and whether those selected are genuinely contributing to an understanding of relevant trends.

7.

MEASURES TO ACHIEVE MEANINGFUL ROAD TRAFFIC REDUCTION

7.1 Measures Applied at a Local or Regional Level

We have found that the majority of demand management measures apply to either the local road network, or to both the local road network and trunk road network. Very few demand management measures can be applied to the trunk road network in isolation, and those that do are primarily aimed at managing and optimising existing trunk road flows, including ramp metering and variable mandatory speed limits. This highlighted the need to take a regional approach in order to achieve traffic reduction, principally based around the four principal Scottish cities.

Focussing on the requirement to tackle congestion, and to contribute to reductions in carbon dioxide emissions, our review of measures found the following.

- Effectively reducing car growth requires measures to make car use either slower or more expensive. This can be achieved through parking controls, road space re-allocation, physical restrictions on access, and traffic calming and management. The most appropriate measure would vary according to circumstances, but in the short to medium term would tend to be mainly focussed on urban areas. Priced demand management measures would require to be carefully designed to reflect the external costs of road traffic by time and area.
- Packages of non-fiscal “soft measures” can provide worthwhile and beneficial reductions in road traffic, particularly in urban areas, when complemented with demand management measures (*Cairns, Sloman et al, 2004*).
- Improvements to alternative modes are a pre-requisite for accommodating mode shift arising from demand management. Improvements to alternative modes, without accompanying demand management measures, may improve public transport patronage and contribute to accessibility, but not achieve traffic reduction. It was noted that regional public transport improvements can increase the demand for longer trips and sub-urbanisation.
- Land use planning measures were found on their own not to be effective in reducing the demand for car travel. However, in the long term denser patterns of development are a pre-requisite for reducing travel demand if accompanied by effective transport policies which make car use either more expensive or slower.

- Trunk road management measures can be effective in maximising the efficiency of the existing network, reducing journey times, and reducing journey time variability.

7.2 Measures Applied at a UK-Wide Level

Achievement of congestion and emissions objectives will additionally require supportive measures to be introduced across the UK.

A critical factor in encouraging on-going traffic growth has been the real price increases in public transport costs, reduced real price motoring costs, as well as increases in average household disposable income. Continuation of this trend will undermine the impacts of the demand management measures outlined above. The effectiveness of holding motoring costs constant over the next 10 years could be significantly more efficient in terms of tackling congestion and reducing carbon dioxide emissions than investment programmes in trunk roads and public transport (*UK Parliament Select Committee on Transport, Local Government and the Regions, 2002*).

In the longer term, network-wide road user charging provides an opportunity to change the manner in which motoring costs are charged, focussing on variable charges related to the external costs that are imposed on society. There are significant barriers to implementation, with this measure only having the ability to be implemented in the long-term. Charging on the road network, relative to congestion levels, is perhaps the most significant technique potentially available to tackle urban and inter-urban congestion in Scotland, particularly as charges can be specifically set with respect to external costs temporally, and spatially (*Department for Transport, 2004*).

7.3 The Necessity for Partnership

A wide range of measures has been outlined above. What is significant is that the powers to implement these measures rarely fall neatly into the control of the stakeholders with most interest in road traffic reduction: the local roads authority; the trunk roads authority; and the Scottish Executive.

At the local and regional level, planning authorities, economic development interests, the private sector, and public transport operators all have controlling influences on policy development and scheme delivery. This is also reflected at a Scottish level, where planning and economic development interests can also significantly influence opportunities to either achieve road traffic reduction, or contribute to its growth. At a UK-wide level, the Scottish Executive is able to influence, but not control, many of the fiscal policies related to motoring and public transport.

This points clearly to emphasis being placed at a local, regional, Scottish, and UK-wide level on partnership working. There is a particular opportunity to achieve this through the proposed regional transport partnerships.

7.4 Performance Incentives

Our research identified the requirement for an improved performance incentive regime, in order to support local authorities that seek to address national transport objectives at a local or regional level. In England, the Department for Transport has focussed on this, and English authorities place an emphasis upon effective scheme delivery, and upon measuring their contribution towards local and national objectives.

Three opportunities exist. Firstly, the award of additional discretionary capital funding based on performance; secondly, the development of a Public Service Agreement methodology, which may be particularly appropriate for regional transport partnerships; finally, formal “Audit Scotland Best Value” reviews of local authorities could include assessments relating to the development and delivery of local transport strategies.

7.5 Funding

Research into Transferability of Best Practice (*Colin Buchanan and Partners, 2003*) highlighted the role of increased capital and revenue funding as a principal reason for achieving transport objectives in areas of best practice transport policy delivery. In these areas, it was found that there were consistently lower fares, and higher levels of subsidy support. The report went on to identify that *“conditions for more effective delivery of transport policy in Scotland would require a doubling in spending in those areas in which change is sought.”*

8. SUMMARY – KEY RESEARCH FINDING

8.1 National Targets

We have found that there is little requirement for a national road traffic reduction target. Due to the diversity of conditions in Scotland, this target would be an average that would only be truly meaningful for small sections of Scotland. A national target also fails to take on board the different problems, issues and capacities for road traffic reduction.

An emphasis upon national outcomes that the Scottish Executive wishes to see (many of which are non-controversial and well-supported), with associated targets, could be more appropriate. In the context of road traffic reduction, these are principally congestion, carbon dioxide emissions, and local air quality. Other related objectives include safety and accessibility.

These targets could then form the context for local and regional strategies, within an overall theme of economic, social and environmental sustainability.

8.2 Regional RTRA Targets

The findings of our work found that the regional transport partnerships could form the main focus of the future development of RTRA targets. Regional transport partnerships could co-ordinate road traffic reduction approaches across individual local authorities, and on their behalf fulfil the requirements of the 1997 Act. This provides benefits from efficiencies of scale, the application of a consistent policy approach across the majority of trip origins and destinations in an area, and facilitates the effective participation of the trunk roads authority and other regional stakeholders.

Annual road traffic reduction reports could be prepared to provide updates on progress, and on the contribution towards achieving the national outcome targets.

8.3 Local Authority RTRA Targets

Local authorities, within their LTS, could continue to implement measures aimed at fulfilling national and regional objectives, and continue to measure their effectiveness. Accordingly, the individual road traffic reduction actions of the local authorities would continue to be developed, feeding into the regional level.

8.4 Trunk Road RTRA Targets

Our work also found that Trunk Road RTRA targets might most appropriately be developed within the context of regional transport strategies. Specific trunk road targets can be developed where trunk road measures are required to achieve elements of the strategy.

8.5 Other Issues

Road traffic reduction should not be the only response to achieving specific national objectives. In particular, our work found that rising levels of road traffic carbon dioxide emissions will be particularly difficult to achieve through an approach solely focussed on road traffic reduction. This emphasises the requirement for continuing to develop ongoing reductions in emissions, not only from cars, but also from other vehicle classes. There is also a requirement to focus upon the development of low carbon fuel technology.

NOTES

1. As discussed in a variety of reports including Scottish Transport Corridor Studies (Scottish Executive (2002) *A8 Corridor Plan to 2010: Executive Summary*, Edinburgh), and Commission for Integrated Transport's assessment report of the 10 year plan (FaberMaunsell (2003), Second Assessment Report, Report for Commission for Integrated Transport, London).

2. Recent projections from the DTI (Department for Trade and Industry (2004), *Updated UK Energy Projections*. DTI, Published on DTI website) confirms that rising road traffic levels are likely to be responsible for the UK to miss its target of a 20% reduction in carbon dioxide levels by 2010, compared to 1990 levels. This is despite emissions reductions being achieved across other sectors. It is significant that road traffic emissions increases are forecast to continue to 2020, against sustained reductions/stabilisation in other sectors.

Emissions Projections by Broad Sector, Including Climate Change Programme Measures

Emissions (MtC)	1990	2010	2020	1990-2010 Difference	1990-2010 % Change
Power Stations	54.14	37.91	34.62	-16.23	-30.0
Refineries	4.80	5.30	5.30	+0.50	+10.4
Residential	21.52	21.55	21.90	+0.03	+0.1
Services	8.50	7.28	7.69	-1.22	-14.4
Industry	35.50	30.68	30.74	-4.82	-13.6
Road Transport	29.78	35.11	40.31	+5.33	+17.9
Off-Road	1.75	1.61	1.62	-0.14	-8.0
Other Transport	3.20	2.89	3.11	-0.31	-9.7
Agriculture	0.40	0.19	0.19	-0.21	-52.5
Afforestation ⁽¹⁾	0.00	-0.70	-1.3	-0.70	-
Total Baseline	159.60	141.80	144.90	-17.80	-11.2 ⁽²⁾

Source: Updated UK Energy Projections, DTI

1. Previously afforestation included in Agriculture.

2. Total excludes impact of "Land Use Change" "Additional Firm Measures" and impact of "European Union Emissions Trading Scheme". With these adjustments, total 2010 emissions are 139.8 MtC, providing a 15.2% reduction from 1990 to 2010.

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