less traffic, better towns

Friends of the Earth's illustrated guide to traffic reduction

Friends of the Earth

Less Traffic, Better Towns

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Author: **Tim Pharoah**
Design: **David Caines**
Maps and diagrams: **Sue Sharples**
Photographs: All photographs by **Tim Pharoah** unless otherwise stated.
Editorial team: **Adrian Davis, Roger Higman, Vicki Hird, Athena Lamnisos, Adeela Warley** and **Joanna Watson**
Translations: **Anna Clater**

July 1992

Published by Friends of the Earth Trust Limited
ISBN 1 85750 120 9

Friends of the Earth
26-28 Underwood Street
London N1 7JQ
(071) 490 1555

FUNDED BY

LONDON BOROUGHS GRANTS COMMITTEE

UK2000
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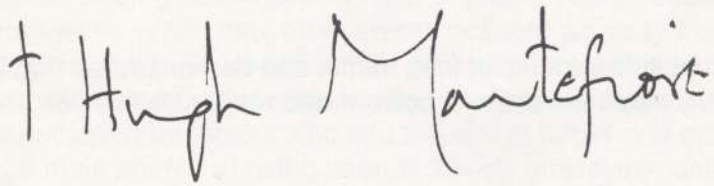
Foreword

I am glad to commend this important new guide to traffic restraint in towns. It is well informed, and it is practical. I have been concerned with matters of transport for twenty years, and this will be one of the most useful books I have yet seen. It will be invaluable not only to local groups of Friends of the Earth, but also to those who work for Local Authorities and for all concerned about the intolerable growth of vehicular traffic in our towns. The huge increase of vehicles forecast by the Department of Transport must never be allowed to happen.

It was a great advance in civilisation when people first gathered together to live in towns. It increased social life and social activities, it was a spur to commerce and industry, and it was a great convenience to all who lived there. But now, instead of being a blessing, towns are becoming a curse, and one of the major factors in their deterioration is the traffic which will get worse unless strenuous efforts are made to restrain cars and vans. We have fallen behind other European countries here. Friends of the Earth is calling for a target of 30 per cent traffic reduction by 2005. This is both practical and possible, and it is needed not merely for the convenience and safety of those who live in towns, but also to restrain emissions of carbon dioxide, the chief globe-warming gas.

How can it be achieved? By upgrading urban quality (through traffic calming and other methods), by improving public transport and facilities for pedestrians and cyclists, by achieving a more selective role for the car, and by land use planning which will reduce dependence on the car. It is all spelled out in this book. It can be made to happen.



Rt. Rev. Hugh Montefiore
Chairman *Friends of the Earth Trust Limited*

Introduction

Traffic growth and the challenge for local authorities

Local authority leaders face a major challenge in presenting their electorate with an attractive vision for the future of their towns and cities. Traffic growth has meant worsening travel and environmental conditions for everyone. Pollution is becoming severe, the quality of alternative modes of travel is declining, and we are seeing the benefits of car use diminish as roads and parking spaces fill up.

If present trends are allowed to continue, the prospects for the future are bleak. The Government's own forecasts for car traffic in Britain show that it could more than double over the next thirty years. Much of this increase will occur in built-up areas.

Attempts to build our way out of the problem by providing more roads and parking will simply reproduce present problems on a larger scale. Yet, if nothing is done, traffic growth will mean further congestion, pollution and urban economic decline. Both scenarios will aggravate further the wider problem of global pollution.

The need for action is therefore imperative, both to prevent the forecasts of traffic growth from becoming a reality, and, more positively, to achieve the full range of environmental, social and economic benefits that less traffic in towns can bring.

Action to reduce traffic is widely accepted as being inevitable but too often this is seen in political terms as an evil necessity to be postponed as long as possible. This guide explains to the contrary that traffic reduction is a desirable goal, allowing a new and exciting urban future to emerge.

The guide therefore emphasises the positive benefits of less traffic, and demonstrates that it is possible to reap these benefits, even within the present powers and responsibilities of local authorities.

It is not easy to convey in writing or pictures the satisfaction that can be derived from a high quality public transport system, or a car-free residential area, or a safe network of cycle routes. Such things are difficult to achieve before traffic has been curtailed, yet people are reluctant to give up car use before they are convinced of the alternatives. Political vision will be required to break this circle. This report is designed to help local authorities provide that vision.

Part I - The need to reduce traffic

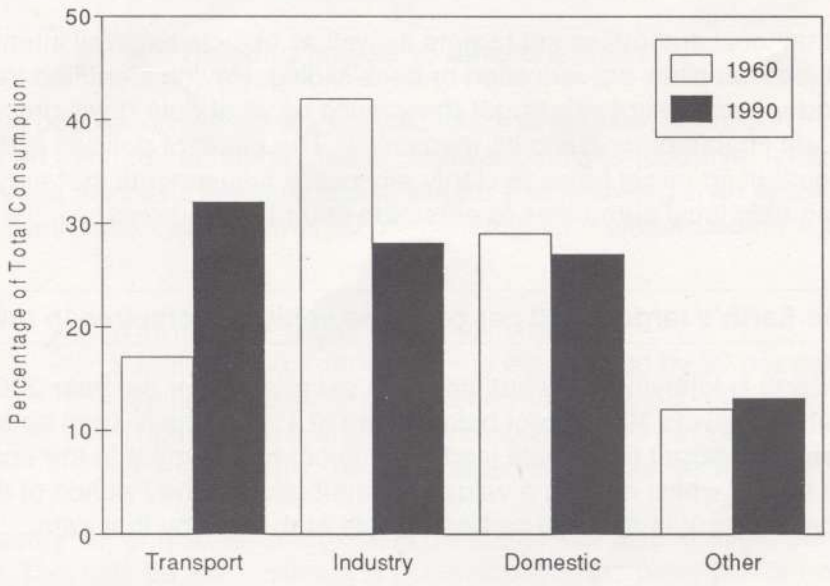
Traffic reduction is not an end in itself, but is justified as a way of achieving specific benefits. The value of reducing traffic has long been recognised but over time the objectives have tended to change emphasis. Caesar apparently introduced bans on the use of chariots in the centre of ancient Rome, because of the interference with daily life. In modern times parking meters and yellow lines were introduced in the 1960s to unclog central area streets, and to reduce peak hour traffic. In the 1970s the need to conserve energy became apparent. In the 1980s the emphasis shifted to the economic costs of congestion. Now, in the 1990s there are added concerns about the wider environmental and social impacts of traffic growth.

Calls to reduce traffic, either at particular places and times, or generally, are the result of actual or feared adverse impacts of traffic. The two possible responses are to make vehicles less harmful or to reduce the volume of traffic. The former approach is politically the most attractive because it involves the use of technology and causes minimal interference with people's way of life. However, there are doubts about the ability of technology to solve all the problems posed by motor vehicles. Even if all vehicles used renewable energy, moved slowly, and produced no noise or fumes, would we relish the prospect of a lifestyle that involved twice as much traffic as today? Real improvement will require not just 'nicer cars', but less of them.

The environmental imperative

In the past, environmental concerns about motor traffic have focused on the direct impacts caused by moving and parked vehicles in the street. Concerns about the effect of air pollution on global warming have in recent years added a new dimension to the problem. Prevailing winds may often sweep polluted air away from populated areas, but they cannot prevent the build-up of harmful gases in the Earth's atmosphere. Technological advance in vehicles could reduce emissions per kilometre travelled, but so far such benefits have been outstripped by more traffic and the use of larger and more powerful vehicles. Transport is the main source of rising carbon dioxide emissions, and increasing energy consumption (see Figure 1).

Figure 1: Energy consumption by sector



Source: Department of Energy 1991

The debate centres around what contribution the transport sector should make to reducing the threats posed by global warming. These aspects of transport policy have been discussed in the *Transport and Climate Change* report (Friends of the Earth, 1991).

There have been many attempts to limit traffic in *urban areas*, with varying degrees of success, but the growth of total motor traffic has continued unabated. If there is an environmental imperative to act, it will demand changes well in excess of what has been achieved or attempted so far. In particular it will involve reducing traffic not just in towns but in all areas. It will involve traffic restraint policies aimed not just at reducing local traffic congestion, but at a reduction in the total number of vehicle kilometres travelled.

The new consensus

There is now widespread and pragmatic recognition that continued provision for the car is never going to keep pace with rising demand. In other words a solution to the urban transport problem means curbing car traffic, not making it easier to drive. (For further discussion of this consensus see Goodwin et al, 1991.)

No longer can urban policies be driven solely by the aim of providing for the car. More and more people, and politicians of all persuasions, are having to accept that limiting the volume of motor traffic is inevitable. The Government has itself acknowledged that its forecasts of future traffic growth are not targets to be accommodated by increased road capacity, stating:

"It has been clear for some time that town centres simply cannot take unrestricted traffic growth. In many towns, the roads are already at or near capacity, so small increases in traffic have a disproportionate effect on congestion. And there is no point in increasing the capacity of roads leading into areas which are already congested."

Transport and the Environment, DTp, 1991, p26

However the consensus about the need to curb traffic growth is not matched by agreement on *what* traffic should be limited, by *how much*, or by *what means*. This guide therefore aims to promote wider consensus on these matters.

Targets for traffic reduction

The importance of targets

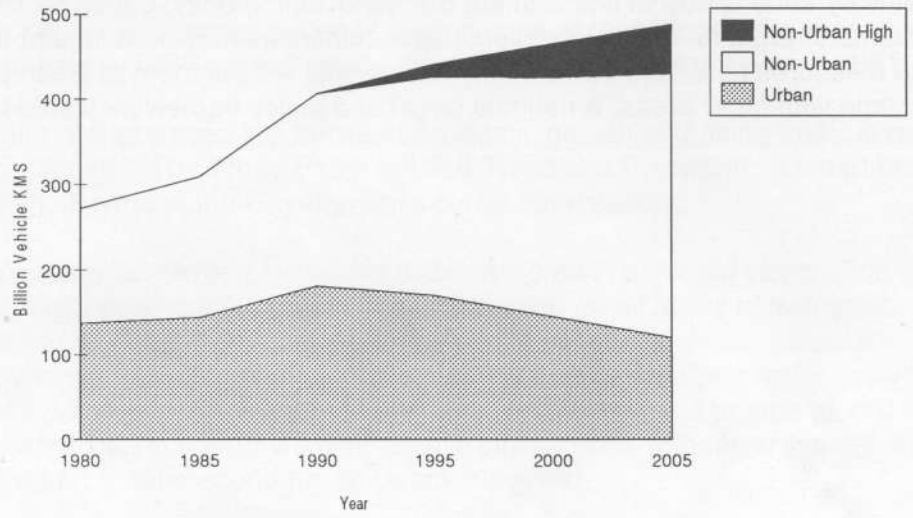
It is important that local authorities set targets as well as objectives. Well intentioned but unquantified objectives allow prevarication or back-sliding. Having identified traffic reduction as a goal, the adoption of a specific target (how much by what date?) will provide a focus for action, and will enable progress to be measured. The effect of policies is difficult to predict, and a quantified target helps to clarify any policy adjustments that may be required. Targets also can help local authorities to persuade other bodies to act.

Friends of the Earth's target of 30 per cent less vehicle kilometres in towns by 2005

Friends of the Earth is lobbying local authorities to set a target for the year 2005 of reducing urban motor traffic to levels 30 per cent below those of 1990. This is seen as a radical but realistic and desirable target that would lead to a major improvement in the economy and quality of life in towns, whilst making a valuable contribution to the Friends of the Earth target of a 30 per cent cut in national carbon dioxide emissions by that date.

A 30 per cent cut in urban traffic would return traffic in our towns and cities to the levels experienced in the mid 1970s. The effect on total traffic forecasts is shown in Figure 2. National traffic levels will continue to rise if traffic growth trends outside urban areas continue. Between 1977 and 1986, for example, traffic on non- built-up roads grew five times faster than that on built-up roads, and motorway traffic grew ten times faster. In addition to a 30 per cent cut in urban traffic the overall carbon dioxide emission reduction target will require either restraint of non-urban traffic growth, or greater fuel economy from the vehicle stock. Friends of the Earth (1991) suggests that the cut can be made with average fuel economy of seventy miles per gallon by 2005, and traffic levels approaching five hundred billion vehicle kilometres travelled (the upper forecast shown in Figure 2).

Figure 2: Effect of 30 per cent reduction in urban traffic on forecast traffic, year 2005



Source: Calculations using Department of Transport, transport statistics for Great Britain, 1989,1990, 1991

Traffic reduction in *urban* areas is important not only to benefit the eighty per cent of people who live in towns and cities, but also to enhance the attractiveness of urban living. The recent trend (and encouragement) towards population dispersal to rural areas can thus be reversed, thereby avoiding higher traffic growth, as rural residents travel 40 per cent further than their urban counterparts (Department of Transport, 1988).

Relating targets to different areas

Traffic reduction policies do not have a uniform effect throughout an area. They will have a varying impact on the number, length, mode, route and time of journeys. It may therefore be necessary to refine the basic traffic reduction target. The following is an example of how the Friends of the Earth target reduction of 30 per cent might be elaborated for a particular town:

Town centre traffic - to be eliminated
Traffic to and from centre - to be reduced by 50 per cent
Traffic in the inner ring - to be reduced by 30 per cent
Traffic in outer ring - to be reduced by 10 per cent
Overall traffic - to be reduced by 30 per cent

It will be necessary not only to reduce existing car traffic, but also to avoid the emergence of new car traffic. This may be more difficult to achieve, since the potential for new traffic is concentrated outside town centres, in non-radial directions, and outside the peak journey-

to-work times; that is, outside the places and times usually targeted for traffic reductions. The reason for this is that the community of car drivers is becoming more heterogeneous as car ownership spreads amongst women and older people. In addition, the out-of-centre, out-of-peak car journeys are less constrained by shortage of road or parking space. There are few examples of restraint policies aimed at such traffic, and new measures will be required.

National and regional targets

Local authorities would benefit from national targets, not only as an encouragement to act, but also as a way of identifying the contribution that their own targets can make. The Netherlands national target, for example, is the context for a wide range of planning and transport policies. The British Government target of returning carbon dioxide emissions to 1990 levels by 2000 is now in line with the European Community, but so far there is no complementary target for traffic reduction. Local authorities may be reluctant to take unilateral measures to reduce traffic if they believe this will put them at a competitive disadvantage with other areas. A national target and policy framework would help.

Part 2 - The benefits of less traffic

We have set out the imperative for action to reduce traffic and provided a clear target for local authorities to aim for in urban areas. The objectives are improvements in economic vitality and in environmental quality, and a range of social and personal benefits.

Economic

Breaking the link between traffic and prosperity

Before the oil crisis of the mid-1970s it was commonly held that economic growth inevitably resulted in more consumption of energy. We have now learned that a growing economy can be achieved without using more energy. Between 1974 and 1990, Gross Domestic Product rose by 38 per cent in real terms, but energy consumption rose by only 5 per cent; a reduction in the energy/GDP ratio of nearly a quarter (Department of Energy, 1991).

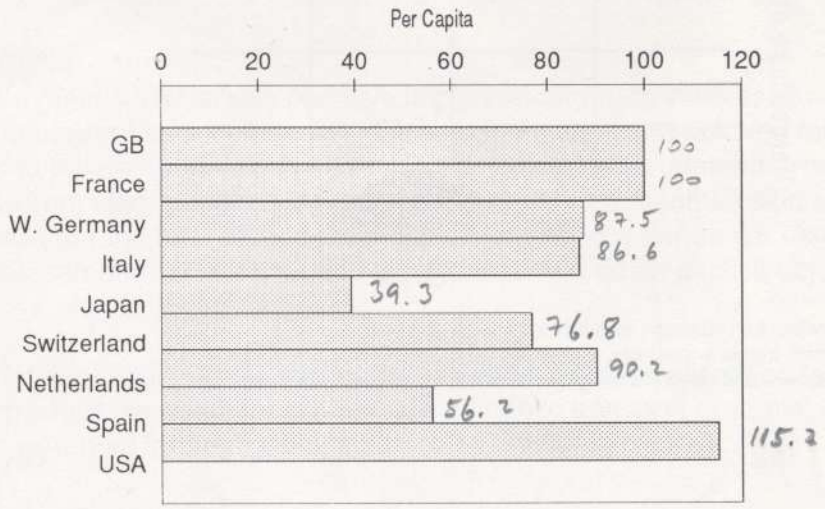
In similar fashion, the assumed link between economic growth and rising traffic levels also needs to be challenged. The White Paper entitled 'Roads for Prosperity' (Department of Transport, 1989), illustrates the Government's current perception:

"There has been unprecedented sustained economic growth in recent years. One of the consequences has been very large increases in demand for all forms of transport..."

While it is easy to see how an expansion of economic activity results in traffic growth, such expansion does not *depend* on traffic growth. Transport is a means to an end, not an end in itself; in other words it is a cost. If we can achieve similar ends with fewer means, then costs can be reduced and greater economic efficiency achieved.

Compared to other European countries it seems that traffic levels in Britain are higher than can be justified by our economic performance. For example, between 1979 and 1989 the rate of economic growth was roughly the same in Britain and West Germany, yet car traffic in Britain grew more than twice as fast as in West Germany. Also, Britain has more car traffic for each unit of economic output, compared with most other countries: at least 10 per cent more than Belgium, Germany, Italy, the Netherlands and Switzerland. France generates a similar amount, but distances are greater in a country more than twice the area of Britain (see Figure 3).

Figure 3: Car kilometres per unit of GDP, per capita, 1989. (Index, Britain = 100)



Source: Calculations from data in DTp 1991

Less traffic therefore is not incompatible with economic growth. We must break with the notion that catering for traffic growth is necessary to promote economic performance.

Improving the local economy

Improvements to the urban economy can be expected from traffic reductions, for three reasons.

Firstly, people are travelling further to achieve access to broadly the same activities, and the cost of travel is rising. If people travel less to get to the same facilities they have more time and money for other things.

Secondly, congested roads are inefficient and impose unnecessary and indiscriminate costs on the economy. If the volume of less important traffic can be reduced, journey times and hence costs of more important activity will be reduced. This is the main justification for "road pricing", which is intended to achieve an "optimum" use of the road system. Such price discrimination already exists on public transport where higher charges are imposed at peak times, and for parking in high density areas.

Thirdly, there is a relationship between local economic performance and local environmental quality. Shops in pedestrian-only areas command higher rents than those in traffic streets.

Evidence from Germany (Figure 4) suggests that the retail trade in central and inner city locations will receive a boost not from parking provision, but from policies that encourage the 'town friendly' modes of travel. Of 38 cities studied, 14 had above-average retail growth, and 10 of these were cities with below-average provision for the car.

Figure 4: Distribution of 38 German cities according to retail turnover and car use

Growth in Retail Turnover 1978-85 (1)

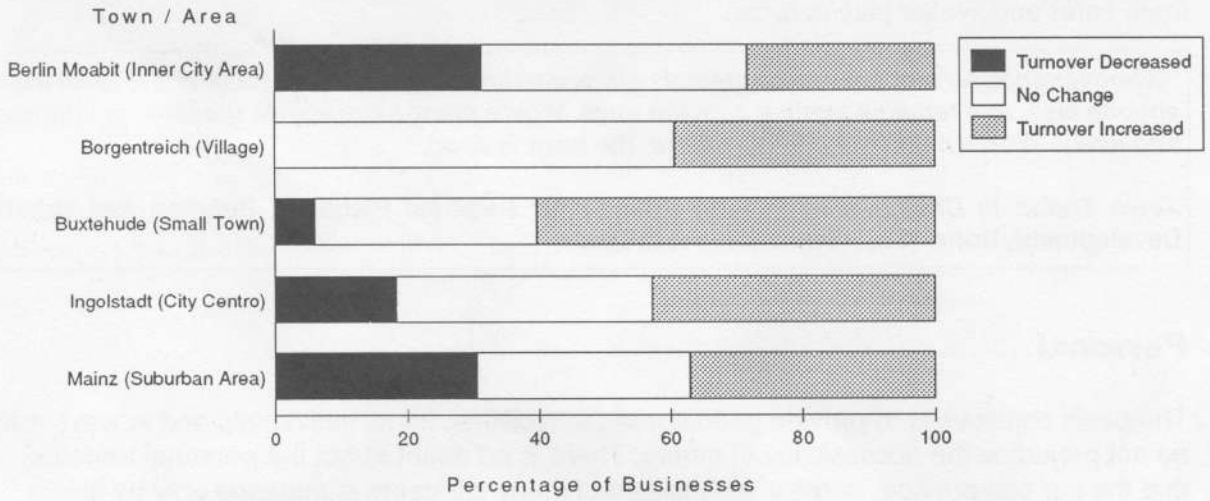
Percentage of Trips by Car (2)

	Below Average	Average	Above Average
Below Average	1	6	10
Average	1	7	2
Above Average	3	6	2

Source: Deutches Institut fur Urbanistik, Berlin 1991
Notes: 1. Retail growth trends in inner city
2. % of customers and visitors arriving by car, in relation to average for city size

Traffic-calmed areas also seem to benefit traders (see Figure 5).

Figure 5: Changes in business turnover after traffic calming in five German area-wide projects



Source: Kanzlerski 1990

Environmental

The environmental objective of less urban traffic is to reduce noise, vibration, foul or harmful air, and the physical and visual intrusion of vehicles in the community. Reducing the danger from traffic may also be included under this heading. These objectives can be achieved by reducing the speed and power of vehicles (through traffic calming measures and vehicle construction regulations) as well as by reducing the volume of vehicle traffic. Making a contribution to the reduction of global warming and acid rain should also be an important objective for local authorities.

Maintaining relatively attractive urban life-styles and reversing the current drift of people and activities to rural and other "car-dependent" areas is another important objective that can be served by traffic reduction.

Social

Because of its dynamic and largely negative impact on alternative methods of travel, the car has brought about great social inequality. Travel opportunity has improved for those who have switched to the car at the expense of non car users. Under present arrangements it is particularly children, older people, women, and those with low incomes who suffer most, and the gap between the best off and the worst off is getting wider as car use increases. Traffic reduction can narrow this gap, and therefore should be an explicit objective in the strategy.

Claims that car travel aggravates other social problems, such as alienation, stress, ill-health, aggressive behaviour, crime on the streets and on public transport systems, and fear of crime are also worthy of further investigation.

Too many cars threaten the city because it means people are no longer walking. In many North American cities less than 5 per cent of journeys are made on foot compared to 25-40 per cent in most European cities. This almost defines the difference in urban quality between the two continents. If a city is to be 'livable', it has to be 'walkable'. Reducing car travel will lead to a repopulation of footways and public spaces, and this in turn will make them safer and livelier places to be.

> ***"Whoever goes on foot sees more, detects more, smells more, and hears more of the town than anyone else, and remains familiar with the town. Where many people walk the town is intimate and lively. Where nobody walks any more, the town is dead."***
>
> ***Town Traffic in Changeover*, Federal Ministry for Regional Planning, Building and Urban Development, Bonn 1986. (Translation A C Clater)**

Personal

The basic objective is to provide good access to facilities, for all individuals and in ways that do not prejudice the accessibility of others. There is no doubt about the personal benefits that the car can provide, and the enthusiasm of many car users is matched only by the aspirations of those who do not have access to a car. But there are important personal benefits to be enjoyed from being less dependent on the car, provided of course the alternatives are sufficiently attractive. Examples may include better health (from walking and cycling), more opportunities for social contact, and heightened awareness of climate and surroundings. Many people also value the choice of *not* owning a car.

Part 3 - Strategies for reduction

Basic principles

The strategy for reducing traffic in any particular town will depend on the specific objectives and benefits that are intended. Three strategies for traffic reduction can be identified, reflecting a broadening of objectives over time.

1. Reducing or banning traffic from particular streets or areas. This has been adopted in some shopping streets and residential areas to boost trade and to improve the local environment, or to improve safety.

2. Reducing non-essential traffic, such as city centre car commuting and through traffic. This has been adopted in many towns to reduce peak hour congestion and to release parking space. Some cities (eg Oxford, York and Zurich) are fairly explicit about their traffic priorities. For example:

York: transport priorites

1. **Pedestrians**
2. **People with disabilities**
3. **Cyclists**
4. **Public transport passengers**
5. **Commercial/business vehicles requiring access**
6. **Car-borne shoppers**
7. **Coach-borne visitors**
8. **Car-borne long-stay commuters and visitors**

Source: York City Council, 1990

3. Reducing traffic in the urban area as a whole. Unlike the first two strategies, this level of reduction has yet to be attempted, though many authorities have set objectives that would require it. These include improving air quality both locally and globally, energy conservation, improving the role of public transport, and easing the pressure for roads and parking.

Traffic reduction strategies involve more than the obvious and direct measures such as parking control and road pricing. To support and encourage lifestyles that are less dependent on the car, it will also be necessary to improve alternative means of travel and to promote urban quality in all its aspects. This section of the guide emphasises traffic reduction as a positive objective and an aspect of urban improvement that is both essential and desirable.

An integrated approach

A strategy to improve the quality of life and to provide better access for everybody will need a package of measures designed to address four main policy areas, which provide the headings for this section:

- Improving urban quality.
- Improving access by developing the 'town friendly' modes: public transport, walking and cycling.
- Achieving a new, more selective role for the car.
- Avoiding and reducing dependence on the car through land use planning.

Improving urban quality

Improving the quality of urban life means more than just providing the occasional shopping precinct, or riverside walk. It requires the creation of comfortable and pleasing surroundings throughout the fabric of buildings, streets and spaces which people can use without fear or intimidation or inconvenience imposed by motor traffic. In any traffic reduction strategy, attention must be paid to the enhancement of the spaces vacated by traffic. This will require cross-departmental teams to look at and improve buildings, paving, street furniture and so on. Cultural, artistic and ecological programmes can also be used to attract people back into the city.

Urban regeneration and development

Many authorities in Britain have made great efforts to maintain the social, cultural and architectural identity of their traditional urban centres, and to maintain their commercial competitiveness. Attempts have been made to direct both public and private sector investment to established centres, rather than to set up competing centres on edge-of-town or greenfield sites. These policies must be successful if traffic growth is to be avoided, and if the use of public transport, cycling and walking are to be increased. However, not all local authorities pursue such a policy, and those who do sometimes have their efforts undermined when unwanted development is allowed on appeal. This emphasises the value of strategic planning objectives, supported at all levels of government.

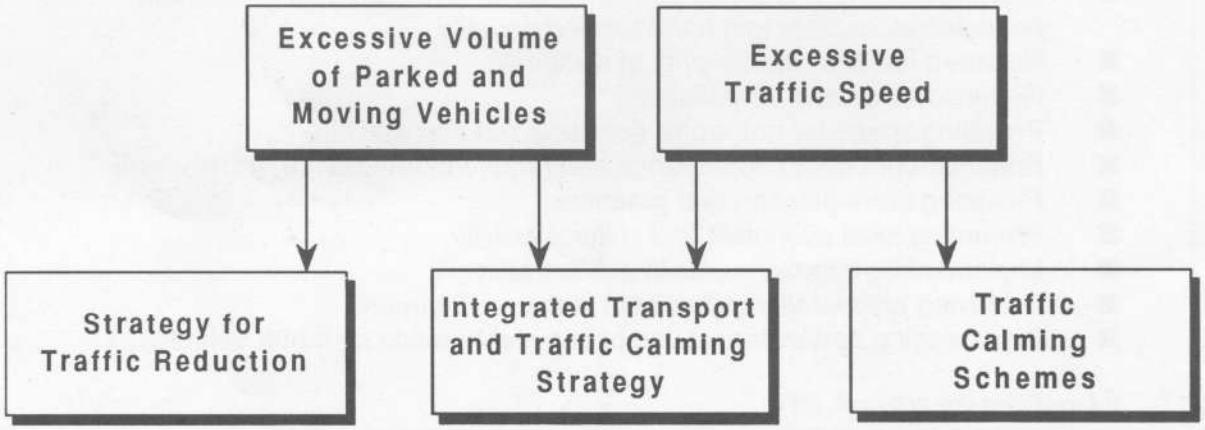
Between 1985 and 1990 five major British chains invested about £7 billion in four hundred and fifty new food superstores. Of these, two hundred and fifty (fifty five per cent) were in off-centre locations, representing a major loss of investment that could have helped to revive existing centres (estimated from data in Debenham Tewson Research, 1991).

The success of many European cities and regions in preventing the spread of car-based commerce may help to explain why their centres have so often become more attractive and accessible than their British counterparts. The Dutch 'compact city' policy is an example. Out-of-town shopping centres have not been allowed since the 1970s, while new housing and employment as far as possible are located on vacant and rehabilitated land near town centres or public transport interchanges.

Traffic calming

Traffic calming is the use of physical and legal measures to reduce traffic speeds and to improve safety and the environment. It is (or should be) an approach to the design of urban spaces which makes them enjoyable and usable by those on foot. Traffic calming can be implemented in many areas without confronting the issue of traffic volume. But the potential for improvement is inversely related to the volume of moving and parked vehicles. It is therefore necessary to develop traffic calming in the context of wider transport policy as shown in Figure 6.

Figure 6: Traffic calming in relation to transport strategy

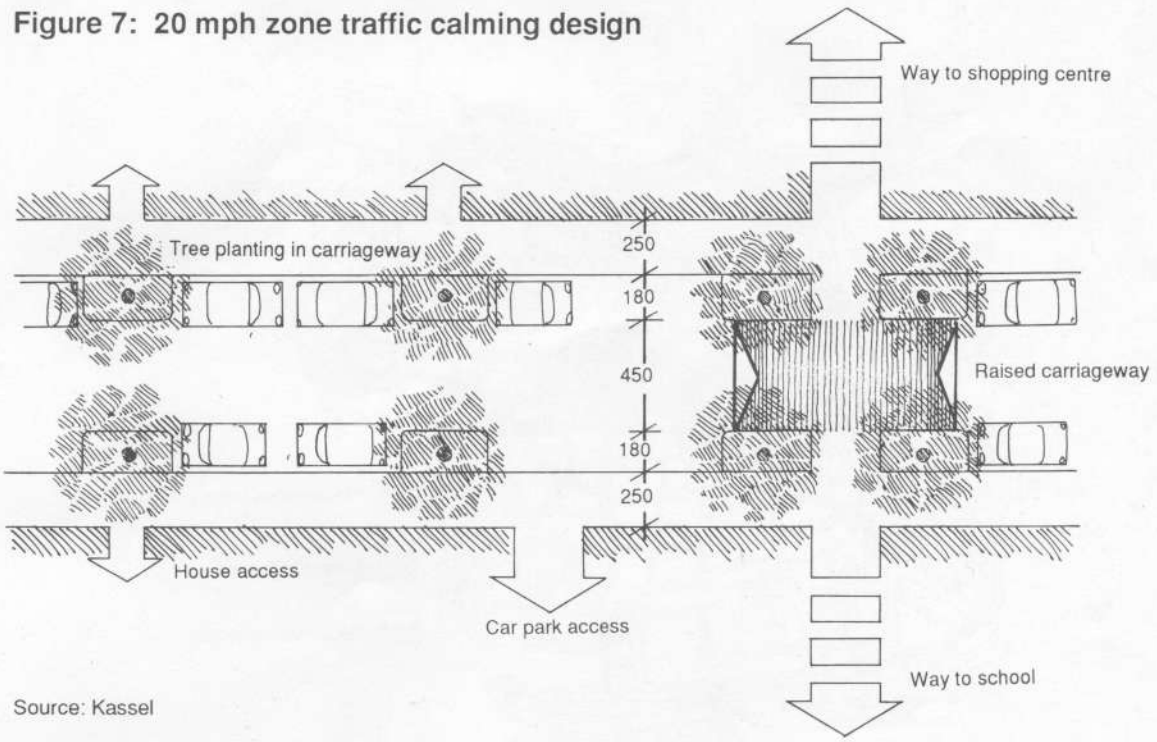


Measures to reduce traffic speeds and to encourage a calmer style of driving will bring direct environmental and safety benefits. Accident reductions and greater safety can be achieved when speeds are kept to 20 mph or below, and this should become the norm for the great majority of urban roads. Techniques for achieving lower speeds and a calmer driving style are becoming better known, with a growing number of examples not just in residential areas, but also on main roads, village streets and in town centres (Devon County Council, 1991; Environmental and Transport Planning, 1992).

Calmer driving creates potential for the redesign of urban streets, and to make space for activities and amenities. Surplus space does not have to become a car park or a wider traffic junction: new parks, piazzas and play areas can be created. Landscape and ecological development will also help to improve the attractiveness of streets. Signs, paving detail, planting, street furniture, all need to be sensitively designed to a scale appropriate to those on foot. Entrances, doorways and side ways need to be frequent and interesting.

If such measures attract more people to walk they are an aspect of traffic reduction.

Figure 7: 20 mph zone traffic calming design



Source: Kassel

The benefits from traffic calming include:

- Improved safety and convenience for vulnerable road users, including pedestrians, cyclists and handicapped people.
- Reduced number and severity of accidents.
- Reduced noise and air pollution.
- Providing space for non-traffic activities; (eg rest and play).
- Enhancement street appearance and reduce the number of traffic signs.
- Providing more planting and greenery.
- Promoting local economic and cultural activity.
- Implementing improvements in public transport.
- Achieving an overall improvement in the environment.
- Discouraging non-essential use of unsuitable roads by motor vehicles.

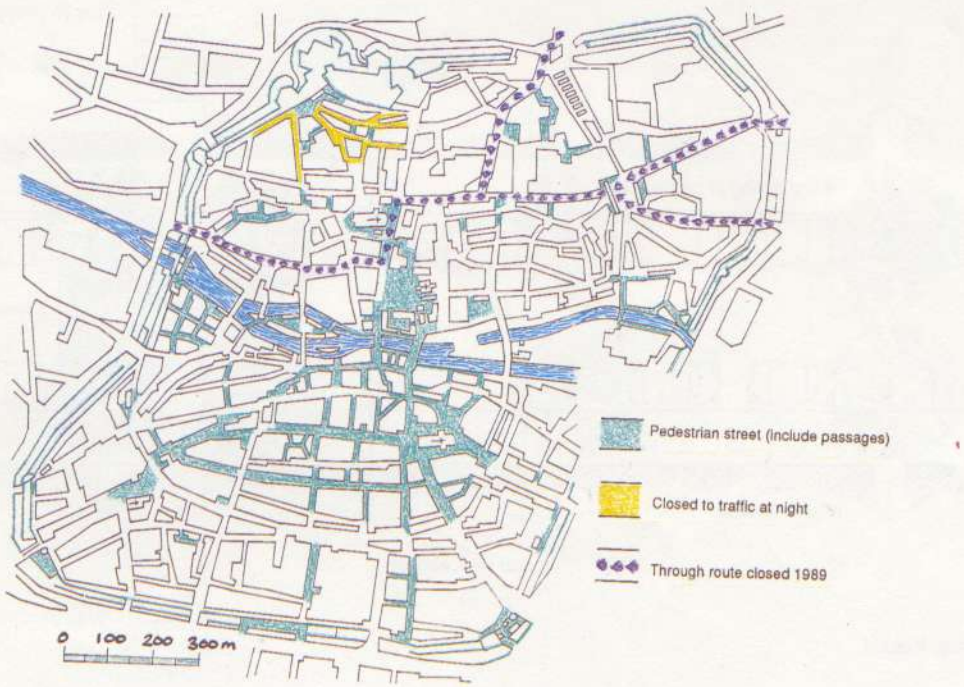
Source: Devon County Council, 1991

Reducing roadspace

Traffic tends to expand to fill the roadspace available. This process also works in reverse. A popular myth is that if traffic capacity is removed (or is not expanded to cope with traffic growth), traffic will 'grind to a halt'. Yet there is no evidence that this happens. As road space is reduced, traffic shrinks so that the overall level of service is roughly unchanged. This process may be termed 'traffic evaporation'.

Perhaps the best known example is Oxford Street, London. Predicted traffic chaos on surrounding roads failed to materialize when Oxford Street was closed to all motor traffic except for buses and taxis. In Nuremburg, Bavaria, about one sixth of the traffic using a main radial corridor disappeared when rat run routes were closed, and the capacity of the main road was reduced. In the city centre, when the last remaining through traffic route was closed in 1989, less than 30 per cent of that traffic was found on the alternative route (the inner ring road). The remaining 70 per cent had 'evaporated'. (See Figure 8)

Figure 8: Nuremburg pedestrian areas



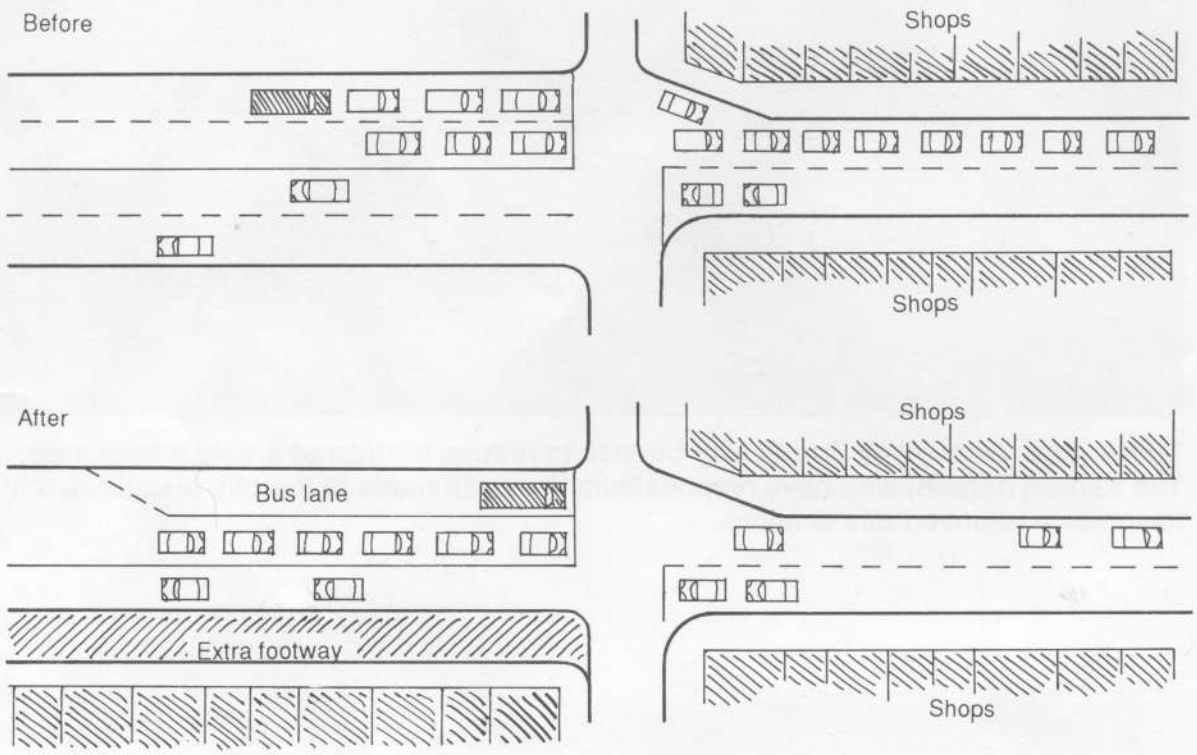
Selective and progressive reduction of road capacity for general traffic is therefore an important traffic reduction technique. Of course, schemes which transfer roadspace from general traffic to public transport (eg. when a bus lane scheme is created) may increase capacity when the flow of *people* rather than the flow of *vehicles* is measured.

Traffic lane removed by Zurich City Council to reduce traffic and create a tram stop. The Kanton (region) who have responsibility for main roads in the city disagreed and have since removed this scheme.

Planned congestion

Some degree of congestion will always have to be accepted in towns, particularly in the absence of comprehensive road pricing. It therefore makes good sense to plan congestion to minimize the nuisance it causes. An early example was the Bitterne Road scheme in Southampton in the early 1970s where traffic flows were reorganized so that congestion occurred on roads which were not bus routes. Figure 9 shows a technique for relocating a traffic bottle-neck to reduce congestion in a shopping street, whilst giving buses protection from delay. This approach could be used on main roads which are narrower where they pass through district centres, such as Holloway Road and Streatham High Road in London.

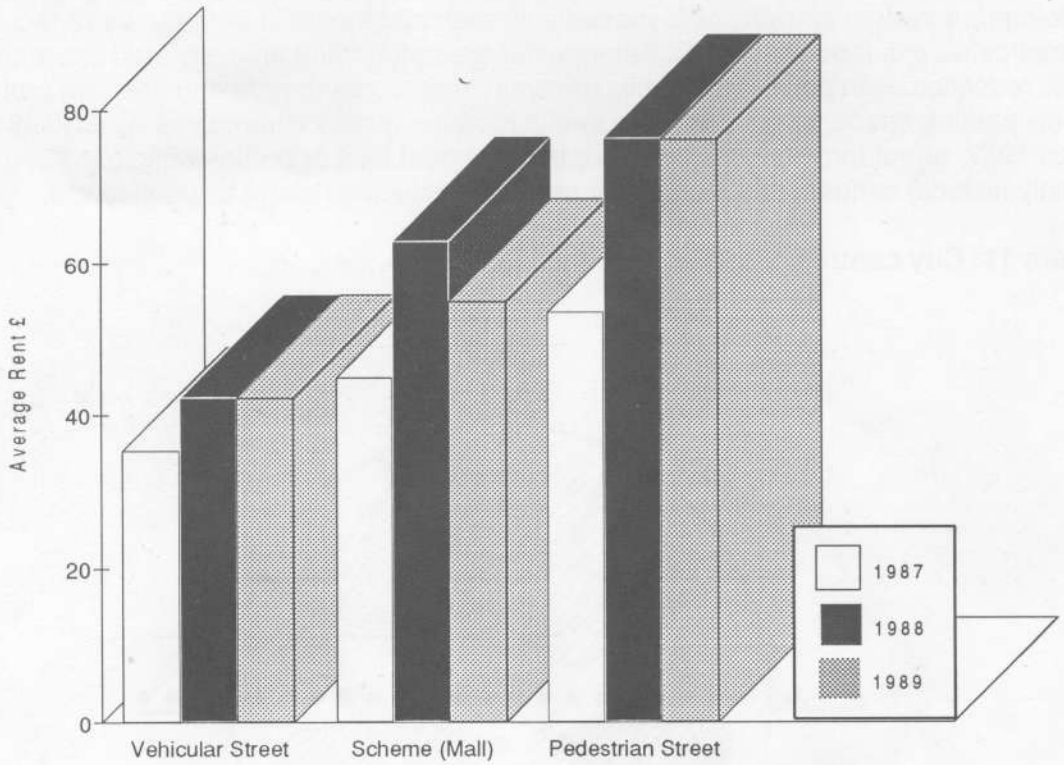
Figure 9: Example of planned congestion to help shoppers, pedestrians and bus users



Traffic-free shopping

The idea that reducing traffic is good for trade is not new. Principal shopping streets in Essen and Cologne were turned over to pedestrians in the 1920s. Today, almost all towns and cities have traffic-free shopping streets, and some have been expanded to form networks of 'footstreets' as in York and Cologne. Nuremburg has one of the largest networks of pedestrian streets and squares, totalling more than five kilometres. (Figure 8) The improved environment when traffic is removed invariably attracts larger numbers of people, and trade increases as a result. This is reflected in the higher rents paid for shop units in traffic free areas, as shown in Figure 10. The growth of retail rents in pedestrianized streets has also tended to be faster than in other locations as shown in Table 1.

Figure 10: Prime shop rents and unit location



Source: Edward Erdman Research 1990

Table 1: Growth of prime shop rents and unit location

Unit location	Rental growth 1987-1989
Pedestrianised street	42.5 per cent
Purpose-built scheme	40.9 per cent
Vehicular street	19.7 per cent
Average of all locations	36.2 per cent

Source: Edward Erdman Research 1990

Small-scale pedestrianization is unlikely to reduce car use overall but it is one method of securing the benefits of wider traffic reduction policies.

Traffic-free centres

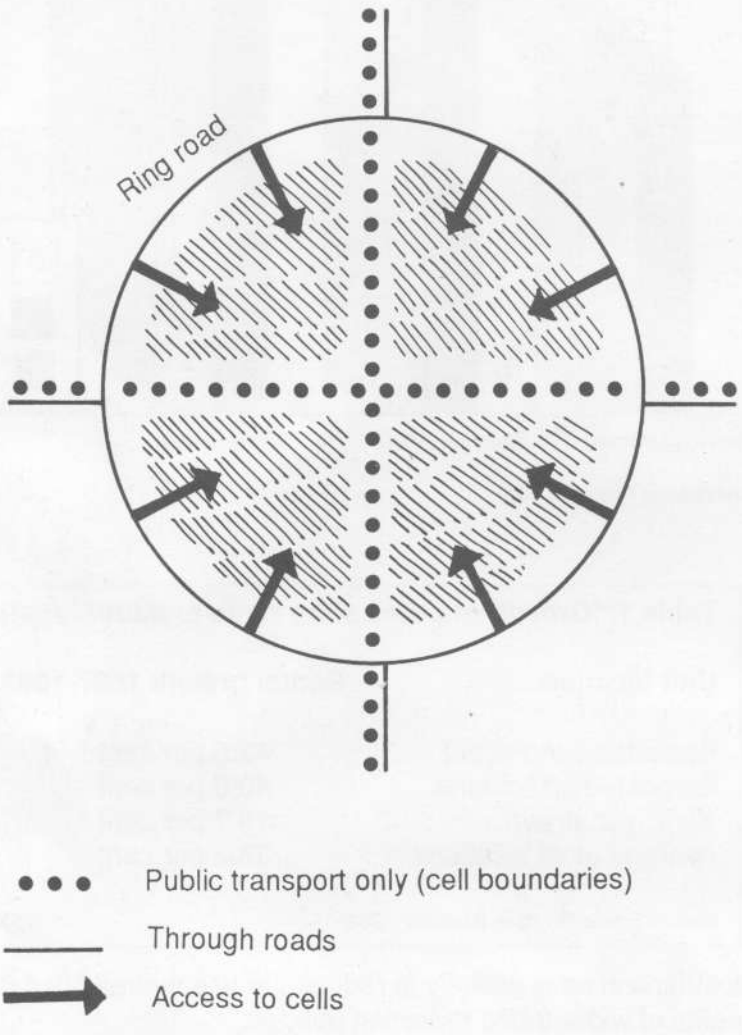
Town centres usually occupy about 1 per cent of the total area of a city. Banning traffic from the entire centre is not therefore going to have much impact on total traffic volume. However, removing traffic from the city centre produces far greater environmental and commercial benefits than its removal from other parts of the city. The impact on overall traffic volume will depend on whether car traffic *to and from* the centre is reduced, or simply diverted to roads and car parks around the edge of the centre.

Cities promoting a traffic ban over a wider area than just a few shopping streets have emphasized several objectives, for example, giving more freedom to pedestrians and cyclists (Groningen), boosting trade (Aachen), regaining the social and cultural identity of

the city (Bologna), and reducing acute pollution (Milan).

In Italy, partial bans and permit schemes have succeeded in reducing traffic entering the city centre. For example, 60 per cent reductions have been claimed in Bologna and Milan. In Bologna a system of traffic cells prevents through movement in an area about two kilometres across (see Figure 11). Bologna has also attempted an integrated approach to traffic reduction, with policies for public transport improvement, park and ride and prohibition of new parking space, to get drivers to switch to better quality alternatives (Gout, 1991). Since 1987, about forty Italian cities have implemented total or partial traffic bans in their (mainly historic) centres, ranging from large cities (including Rome) to small towns.

Figure 11: City centre cells to cut out through traffic



Permit schemes or exemptions to traffic bans require, to quote Thomson (1972) *"an exceptional degree of impartial, sensitive and competent administration".*

A growing number of cities are coming to the conclusion that traffic reduction in the centre fails to bring sufficient environmental improvements, and that a total ban on traffic has a major advantage over piecemeal tinkering. A single pedestrian street, a bus lane here, or a pelican crossing there, is unlikely to capture people's imagination or persuade them to change their mode of travel. Clearing out all the traffic shows people the benefits, even if only for one or two days a week. In Lubeck this policy was introduced as 'an act of faith' (see panel). It worked! There is no evidence that residents or businesses have fled the centres with traffic bans. Rather the reverse has been true.

Lubeck

City leaders in Lubeck, a Hanseatic town in north Germany, argued that removing all traffic from a fairly large area would enable people to more fully appreciate the benefits of an alternative approach. Since 1990 an almost total ban on traffic has been imposed in the entire city centre between 10.00am and 6.00pm at weekends. More people now travel by bus, bicycle and on foot, and greatly enjoy the new freedoms of a traffic-free centre. It is planned to extend the traffic ban to the whole week in 1993. A few roads giving access to parking garages are presently exempted, but none passes right through the centre. Eventually parking will be available only for city centre residents and businesses. Service traffic is allowed before and after the hours of the ban.

Initial objections from traders and others are no longer heard. A television crew making a documentary about the scheme in 1991 reported that they were unable to find anyone in the town who was prepared to speak against it!

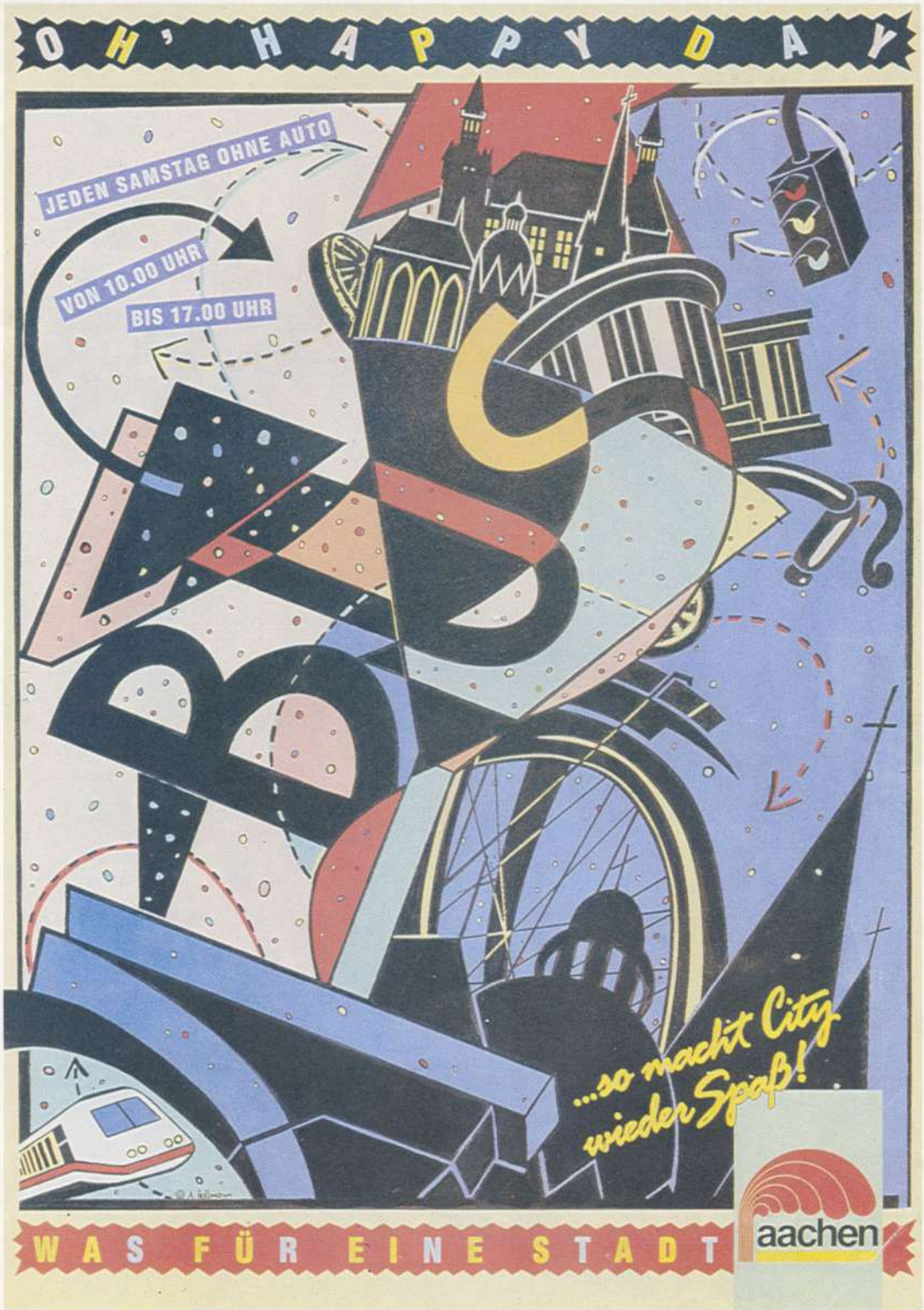
Figure 12: Lubeck car-free city centre

(About 12kms of road are car free)

Aachen

Aachen has now followed the Lubeck model. Most of the city centre was closed off to traffic on Saturdays from 10.00am to 4.00pm (shops close early in Germany) for a six-month experiment started in October 1991. Travel to the centre is provided by bus from seven Park-and-Ride sites in the suburbs. The sites are factory and office car parks that are not required by employees at weekends. Buses at 5-10 minutes intervals serve a total of fifteen thousand car spaces. It costs 2DM (70p) to park, but this includes the bus ride. An interesting feature of the Aachen scheme is that it was jointly planned between the city council and city centre traders. The traders also paid for promotional literature and events on the opening Saturday (see Figure 13).

Figure 13: Aachen car-free centre publicity



Top left: No roads equals no traffic! Venice. (Note hand cart for deliveries)

Left: Town centre with traffic removed. Paving, planting and street furniture combine to improve the quality of the space. Nantwich, Cheshire.

Bottom left: Reduced traffic speeds allow space to be used for living. Here cafe tables and shrubs occupy former carriageway. Cologne, Germany.

Top right: Good lighting helps pedestrian security. Footways and carriageways can have separate lighting, as in this example from Esslingen, Germany.

Top left: Attention to detail is essential for an attractive walking environment. Wandsworth, London.

Top right: Speed reduction, townscape and ecology objectives are all achieved in this coordinated design. Moabit district, Berlin, Germany.

Bottom left: Creating an urban 'place'. Before. Berlin, Charlottenburg
Photo: C. Dyckhoff

Bottom right: Creating an urban 'place'. After.
Photo: C. Dyckhoff

Improving access by 'town-friendly' modes

Helping everyone to reach places easily and safely, and in a way which does not consume vast resources or place intolerable burdens on the environment, means improving the quality of what we have termed the 'town friendly' modes, namely public transport, walking and cycling. A 30 per cent reduction in car traffic will be feasible only if such improvements are made, although reducing traffic itself makes the task easier.

There is little chance of major improvements to public transport, walking or cycling resulting simply from selective restraint of car trips. Equally, even if major improvements to these alternative modes can be made, experience has given little support to the view that this *in itself* will attract significant numbers of people out of their cars. An integrated multi-modal approach is therefore required.

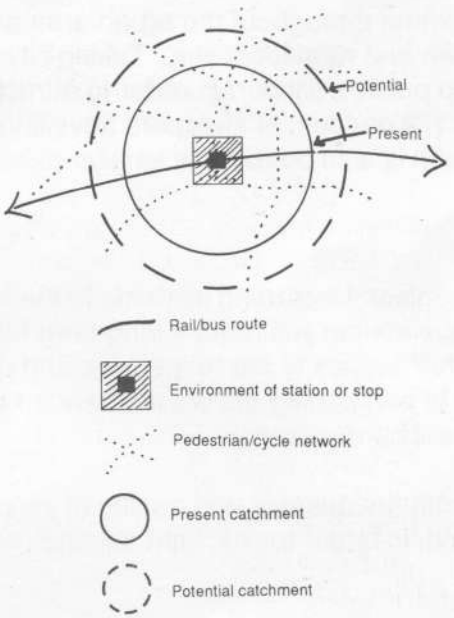
Public transport

The role of public transport in urban areas should not be under-estimated. Most medium-to-large towns and cities are structured on the basis of public transport operation, with concentrations of activity in the centre and along transport corridors. Despite a heavy decline in local public transport over forty years, a majority of the population still has no alternative for journeys beyond walking distance. Moreover, car users depend on public transport to ease the demand for road and parking space.

The United Kingdom is one of the few areas of Europe where public transport continues to decline. (In 1985, only a third of people used a bus once a week or more. Department of Transport, 1988). There is clearly room for more positive attitudes amongst decision makers because they underestimate public support for policies which give public transport priority over the car (see section on implementation).

Local authorities can improve public transport infrastructure and take steps to encourage its use. Public transport can be made more attractive by improving not only the services themselves, but also the quality of bus stops and stations, and the access ways to them. Local authorities are particularly well-placed to make "off-route" improvements, which can attract more passengers, and effectively extend public transport catchment areas, as shown in Figure 14.

Figure 14: Impact of public transport improvements on catchment areas



Local authorities can improve operating conditions for buses by providing priority measures, bus-only roads, well-designed bus stations and stops, and enforcing parking controls on bus routes. Access to bus and train stops can systematically be improved. Local authorities can take a lead on the provision of information, marketing, concessionary fares and 'social' bus services. In addition, they can campaign for wider powers and influence.

A wider role for public transport
Public transport will need to be encouraged for a wider range of trips throughout the day and evening and at weekends. The traditional emphasis on peak radial demand to and from town centres is too limited either to reduce car travel, or to support a financially sound public transport system. The choice in practice is between an expensive, low capacity system providing for those without cars (as in most North American cities), and a high capacity, high quality system serving a large share of the travel market at reasonable fares.

A priority network
A first step should be the definition of a comprehensive network of routes where public transport has priority, and where buses, trams and other public transport vehicles are protected from delays and uncertainties caused by other traffic. When priority is applied throughout the network of routes, benefits to passengers and operators will be very much greater than can be achieved by ad hoc measures. Attempts to justify each individual bus priority scheme in isolation fail to take account of this.

Not just bus lanes
A priority network will not just involve bus lanes, but a wide variety of measures to suit the highly varied character of Britain's urban roads. Examples are 'bus boarders' instead of bus laybys, priority traffic signals and bus-activated signals, controlled traffic entry to bus routes, bus-only roads, bus-only turns, and queue relocation (Figure 9). Some measures have been illustrated by the Department of Transport (1991).

The 'network effect'
To attract passengers it should be possible to change from one route to another without undue or uncertain delays. This requires the provision of high frequency services operating every day and evening on all routes. Reliability must be ensured by the priority measures described above. Frequencies of 10 minutes or better produce a 'network effect' in which the need for interchange is not seen as a major deterrent. If frequencies are low (eg 20 minutes or worse) the time-penalty of changing routes produces a 'corridor effect', and only a limited range of journeys can be served.

Extending the network
The public transport system of the future must extend throughout the urban area and beyond, eventually linking suburban, edge-of-town and rural locations. Taking city-centre shopping as an example, it is possible to develop public transport in order to attract visitors from the hinterland. This is easier in larger cities (72 per cent of shoppers travelling to Munich for instance do so by public transport) but it is also possible in smaller cities (the comparable figure for Freiburg is 45 per cent).

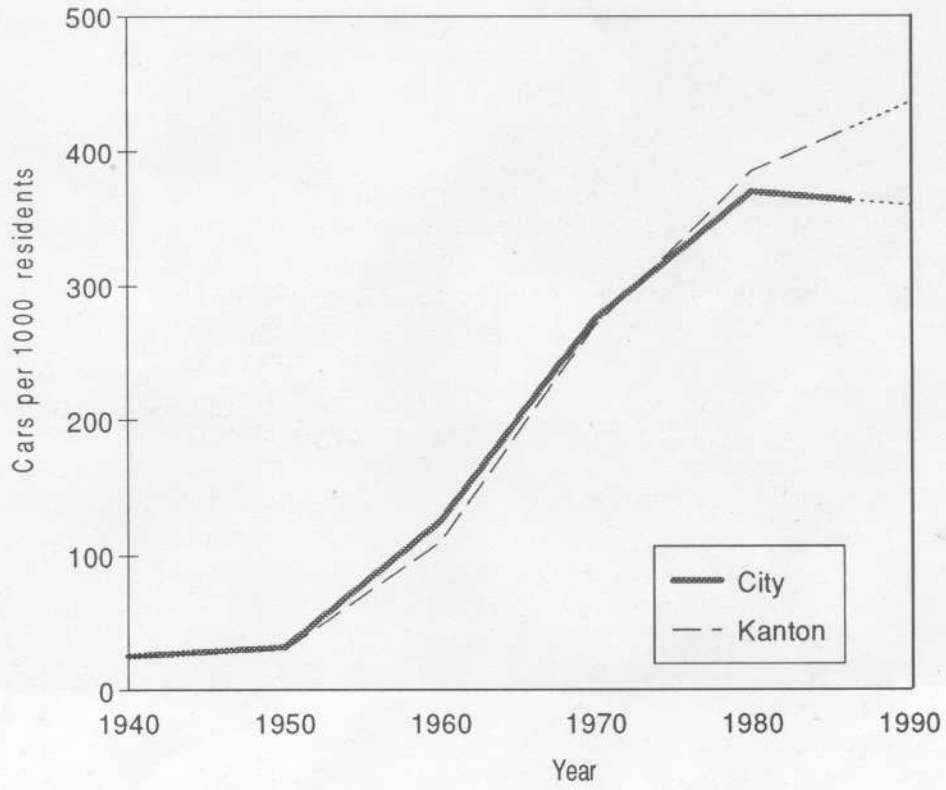
Long term investment
For too long public transport has suffered from neglect. Upgrading systems to the high standards now demanded by those used to the private car will require long-term funding. Some bus users may prefer a "cheap and cheerful" service to the "expensive and dreary" service currently on offer. But neither is capable of persuading drivers to abandon their cars. Fast, friendly, reliable and inexpensive services will be necessary.

To achieve this it will be necessary to invest in both the quantity and quality of services, for example, using modern buses and equipment and, in larger towns, light rail and other guided vehicle systems.

Hypothecation of tax or road revenues for public transport investment is likely to prove the best way of ensuring the necessary stability of funding. There are many possible ways of achieving this. In the USA, cities have been able to divert Federal highway funds for public transport investment, whilst in Paris, employers pay a percentage of their wage bill towards public transport (used to subsidize the "Carte Orange" travelcard) as well as contributing to the commuting costs of employees. In the Netherlands there is a policy that public transport fares should rise no faster than inflation or the cost of motoring. Road pricing will prove more effective (and hence acceptable) if revenues are used to improve public transport.

Zurich has developed a comprehensive, high frequency network of buses, trams and trains. The "S Bahn" trains run to the same frequency throughout the day and evening. The city now has the highest rate of public transport ridership in West Europe (five hundred trips per person per year), and the highest market share (50 per cent of all trips). The result has been a stabilization of city traffic since 1990, and a decline in car ownership since 1982.

Figure 15: Car ownership in Zurich Kanton and City



Source: Hüsler, W. 1990

Top left: Bus only road provides direct access to the centre of Almere, Netherlands.

Top right: Buses and cycles are the only vehicles allowed through the centre of Groningen, Netherlands.

Bottom left: Priority signals allow buses to turn across the traffic flow when leaving the bus stop. Esslingen, Germany.

Bottom right: Speed 'cushions' slow down cars but cause no discomfort to bus passengers. Herne, Germany.

Top left: Trams can provide convenient access in pedestrian priority shopping streets. Amsterdam.

Top right: Quality of information is important. Stop indicator on top deck of a Berlin bus.

Bottom left: Access is better with low-floor and 'kneeling' buses, and stops designed so that buses can stop at the kerb. Note also route information provided on the side as well as the front of the bus. Ruhr, Germany.

Bottom right: Unfortunate contrast. Obsolescent and unsuitable buses compete for trade in the centre of Glasgow following deregulation.

Top left: Comprehensive passenger information is required at all stations and stops. An integrated design helps to create a positive image for public transport. Zurich.

Top right: Improving stations and the access ways to them can boost the appeal of rail travel, even if the train service remains unchanged. This scheme was part of a joint initiative between the local authority and British Rail. Wandsworth, London.

Bottom left: High quality interchange between modes is essential to achieve the 'network effect'. Interchange between S and U Bahn integrated with new development. Stuttgart, Germany.

Bottom right: Buses and taxis are important feeders to Victoria rail station, London.

Walking

"The freedom with which a person can walk about and look around is a very useful guide to the civilized quality of an urban area. Judged against this standard, many of our towns now seem to leave a great deal to be desired". **(Ministry of Transport, 1963)**

Walking is the most valuable form of travel, and at its best an extremely pleasurable and healthy activity. Its value lies not, of course, in the proportion of distance covered (only 5 per cent of all travel), but in the fact that a journey carried out on foot imposes the least cost on the individual concerned, and on the community at large. About a third of all journeys in Britain are made entirely on foot, and walking also forms part of most other journeys. Despite this, very little is done to increase the relative attractiveness, and hence the amount of walking.

We have been unable to find any local authority plan which sets out to increase the 'market share' of walking. The quantity of walking seems to be left to chance, or determined by the availability and relative quality of other modes. Insofar as pedestrians are planned for, policies seem to consist of 'taking account of' pedestrians in plans to facilitate motor traffic, or of providing pedestrian havens (mostly for shopping) to which it is expected people will travel by motor vehicle (see 'traffic-free shopping' above).

In the past, pedestrians have been physically segregated from motor traffic, for example by providing underpasses and footbridges, or by herding people behind barriers to force them to cross the road at specified places, or at pre-determined time intervals. Even if this approach leads to less accidents, it has been at the expense of convenience. For pedestrians, safety and convenience have become inversely related. Encouraging people to travel on foot will mean the adoption of wholly new transport priorities.

Local authorities need to draw up pedestrian plans, perhaps appointing a 'pedestrian officer' for the purpose, in order to achieve four main objectives:

- Prevent people switching from walk to car trips, (ie maintaining Britain's presently favourable degree of walking: see Table 2).
- Increase the proportion of journeys made on foot, especially local trips transferred from the car.
- Improve pedestrian access to and within public transport facilities thus also increasing the market share of the latter.
- Improve the quality of the 'walking experience', not just in the town centre but throughout the town.

Table 2: Walk trips as percentage of all trips

Larger cities		**Medium-sized cities**	
Great Britain*	37%	Great Britain	36%
Amsterdam	23%	Basel	25%
Bologna	30%	Freiburg	22%
Stuttgart	30%	Kassel	30%
Zurich	26%	Northrhine-Westfalia	30%

* Average for London, W Midlands, G Manchester, W Yorkshire, Glasgow, Liverpool, Tyneside.

Sources: Potter and Hughes, 1990; Apel, 1992

These objectives can be pursued in two ways, firstly by investing in the quality of pedestrian facilities, and their immediate surroundings, and secondly by planning so that facilities are accessible on foot (see the section on land use planning below).

A strategy to improve the quality and safety of walking could include the following:

- Provision of new pedestrian links to create a finer *network* of convenient routes.
- Upgrading the quality of footways (paving, landscaping, lighting, street furniture).
- Designing streets and public areas to be interesting and attractive for pedestrians (building frontages, signs and advertisements scaled for appreciation by people passing on foot rather than in vehicles).
- Giving pedestrians priority on residential and local streets. This should be achieved by street design and self-enforcing 20 mph speed limits.
- Improving crossing facilities on main traffic roads by reducing the speed and volume of traffic, and increasing the time given to pedestrians.
- Planning developments to ensure facilities are available within walking distance.

Reduction from four traffic lanes to two makes crossing easier. Tactile paving helps blind people to locate the crossing. Camden, London.

Footways should be comfortable to use. Here a generous width and weather protection make for pleasant walking. Southport, Lancashire.

Top: Careful design can help to stop major roads acting as barriers to walking. Pedestrian zone passing under major road. Hamburg, Germany.

Bottom left: People with visual impairment are guided across a large station forecourt by ribbed tiles, and rubber tiles to denote a change of direction. Amsterdam.

Bottom right: Pedestrian routes need careful planning in all locations. Ribbed tiles for blind people are provided on this route to a local sub-centre. Utrecht, Netherlands.

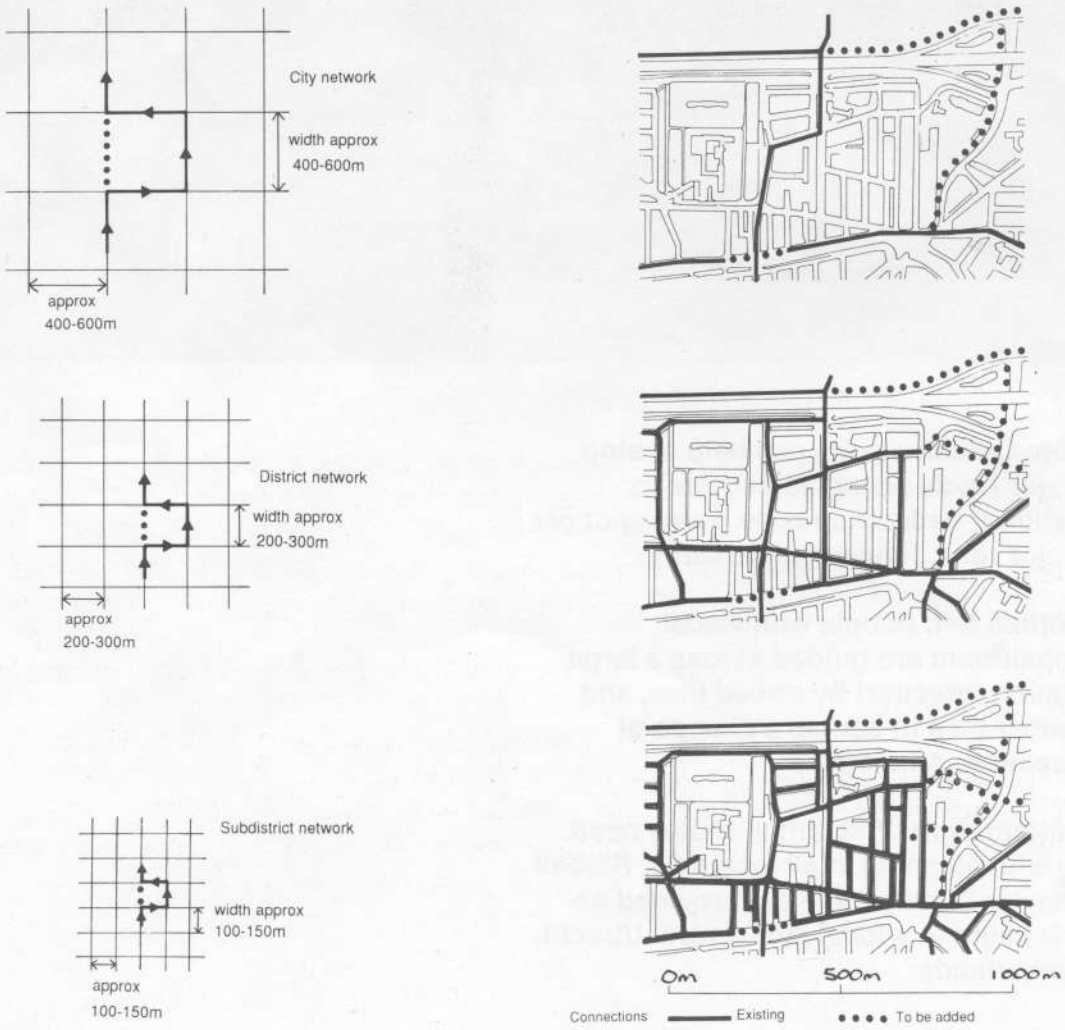
Cycling

Cycling in Britain accounts for only 1 per cent of all travel, but 2 per cent of all trips (about the same proportion as by train) (Potter and Hughes, 1991). There is potential and good reason for radically increasing the proportion of travel undertaken by bicycle. The Cyclists Touring Club (CTC) estimates that the bicycle could replace half of present car trips (CTC, 1992). Although each year people who cycle are only slightly more likely than other people to be injured on the roads, mile for mile travelled the rate of death and serious injury is 14 times higher for cyclists than for car drivers (Morgan, 1991).

The main deterrent to cycle use is danger. Experience has tended to show that high levels of cycling can be achieved where safe and attractive facilities are provided. The promotion of more travel by bicycle therefore must be achieved with measures to dramatically improve cycling safety, so that more cycle miles do not result in more accidents. In Basel, Switzerland, cycling has doubled since 1975, but cycle accidents have declined (CTC, 1992).

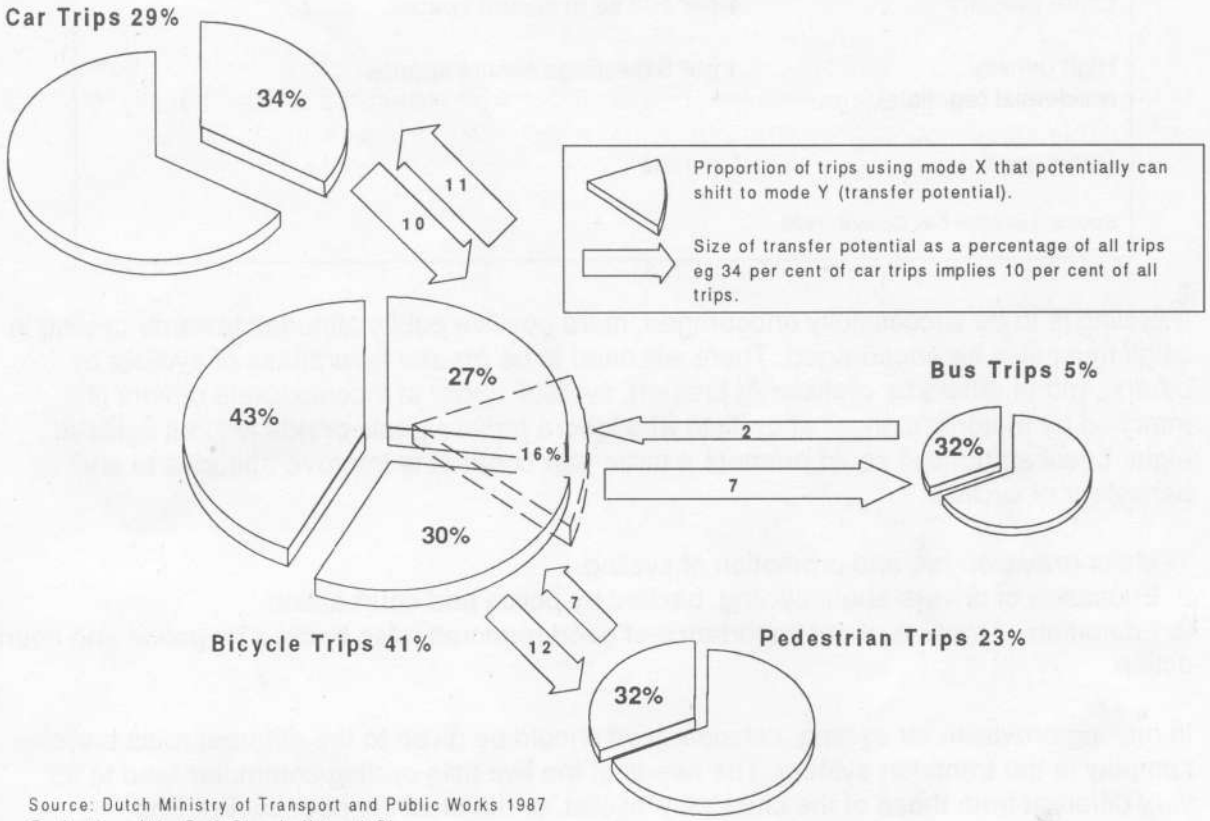
If increased cycling is to result in less traffic, journeys must be transferred to cycling from the car, rather than from walking or public transport. The Dutch town of Groningen has one of the highest percentages of cycle travel in Europe (about 50 per cent of all journeys), but public transport accounts for only 5 per cent, and walking is also low at around 15 per cent. In Delft, however, the rise in car traffic has been halted, while it continues elsewhere, and this is believed to be the result of investment in a high quality cycle network.

Figure 16: Delft cycle network



In planning the scale of cycle provision, it can be helpful to quantify the potential journeys that could transfer to bicycle, for example by virtue of the distance involved or the journey purpose being suited to cycling. (This approach can also be used to quantify other mode transfer potential, for example from car to bus, or bus to rail.) Figure 17 provides an example used in determining cycle provisions in Delft (Netherlands).

Figure 17: Potential for transfer between bicycle and other modes in Delft, Netherlands.



Source: Dutch Ministry of Transport and Public Works 1987
Evaluation of the Delft Bicycle Network Plan

Different approaches to improving cycling conditions include:

1. Traffic calming so that vehicle speeds are closer to cycle speeds. A widespread self-enforcing 20 mph speed limit should greatly improve cycling safety on local streets. On main roads cyclists will need special provision (CTC, 1991).
2. Provision of a fully segregated cycle network, easiest to achieve in new settlements as in Basildon and Stevenage. Livingston has achieved this by legalizing cycle use on its segregated footpath network.
3. Provision of cycle facilities integrated with the main road and footpath network (eg. Delft).
4. Provision of cycle routes. Individual routes will have a limited impact on modal split, and should therefore be planned as part of wider measures, as in 1 - 3.
5. Parking and storage for cycles that is secure and conveniently located. Cycle parking standards can be applied to new developments, as in the 1992 draft plan for Leicester.

Leicester proposed cycle parking standards

Land use	Minimum provision cycle spaces
Shops	1 per 500 sq m spaces for staff, secure and undercover 1 per 1000 sq m for customers
Offices, services	1 per 400 sq m secure spaces, light industry plus customer spaces on merit
Other Industry	1 per 500 sq m secure spaces
High density residential (eg. flats)	1 per 5 dwellings secure spaces
Other uses	On merit

Source: Leicester City Council, 1992

If cycling is to be successfully encouraged, more positive public attitudes towards cycling in cities must also be encouraged. There will need to be greater awareness of cyclists by others, and of others by cyclists. At present, cyclists' anger at inconsiderate drivers is matched by motorist's anger at cyclists who ignore traffic signals or ride without lights at night. Local authorities could promote a three-part contract to improve attitudes to and behaviour of cyclists:

1. Major provision for, and promotion of cycling.
2. Education of drivers about cycling, backed by police and court action.
3. Education of cyclists about importance of good roadcraft, also backed by police and court action.

In making provision for cycling, consideration should be given to the different roles bicycles can play in the transport system. The needs of the five mile cycling commuter tend to be very different from those of the child 'play' cyclist, or the local shopper cyclist. The compatibility of cyclists and other traffic including pedestrians varies greatly between these categories.

Cycling is the most popular mode of travel in Groningen, Netherlands.

Top left: On main roads, separate cycle facilities should be provided. Here a cycle path is denoted by red paving at a slightly lower level than the footway. Note the escalator and wheelchair lift giving access to trams now running under the street. Cologne, Germany.

Top right: Cyclists who do not wish to mingle with other traffic are allowed to use part of the footway in this traffic calmed street in Hennef, Germany.

Bottom left: Cyclists and pedestrians can learn to live together when cars are removed. Freiburg, Germany.

Bottom right: Cycle and ride is the "greenest" way of making longer journeys. In Dortmund, Germany, the car parking spaces *nearest* the station have been converted to cycle racks.

Cycle parking should be attractive and secure. Here covered cycle racks are located to allow supervision. Main station, Cologne, Germany.

Lorries

The great majority of goods are moved by road, and there is no prospect within towns of any alternative distribution system. There is, however, enormous potential for reducing the environmental impact of goods traffic. Heavy lorries can be banned from living areas (as in London). Lorry generating uses can be located to minimize movement through towns (as in the Netherlands). Break-bulk depots can be established on the edge of towns, and goods delivered using smaller vehicles. Car-free area can be serviced using trolleys or electric trucks, as in St. Moritz. Industry and commerce as well as the environment can benefit from the rationalisation of deliveries to reduce vehicle mileage. Hong Kong has adopted a policy of reducing commercial vehicle traffic by 25 per cent.

Priorities

Since we cannot provide for all car travel, we must decide:

How much car use should we provide for?
What type of car use should we provide for?
Whose car travel should we provide for?

Because these questions can be politically sensitive, they have often been avoided. Local authorities tend to favour what is called 'the balanced approach' (Figure 18). This consists of accepting some increase in congestion, providing for some increase in traffic capacity (for example road widening and more car parking), and restraining some traffic (usually town centre commuter traffic).

The problem with this approach is that it does not discriminate between desirable and undesirable car use and does not break the vicious circle of transport decline (Figure 19). Everyone in the long run is worse off than before. The convenience of the car will decline as demand for road space continues to outstrip supply. Public transport will further decline because of shrinking passenger numbers and worse operating conditions on the roads, while general safety and environmental conditions will steadily deteriorate. In short, instead of balanced improvements we have balanced decline.

Attempts to compromise between competing demands will no longer suffice. Local authorities must draw up strategies which address all sides of the problem, and which offer some real improvement in the future.

Figure 18: The 'balanced approach'?

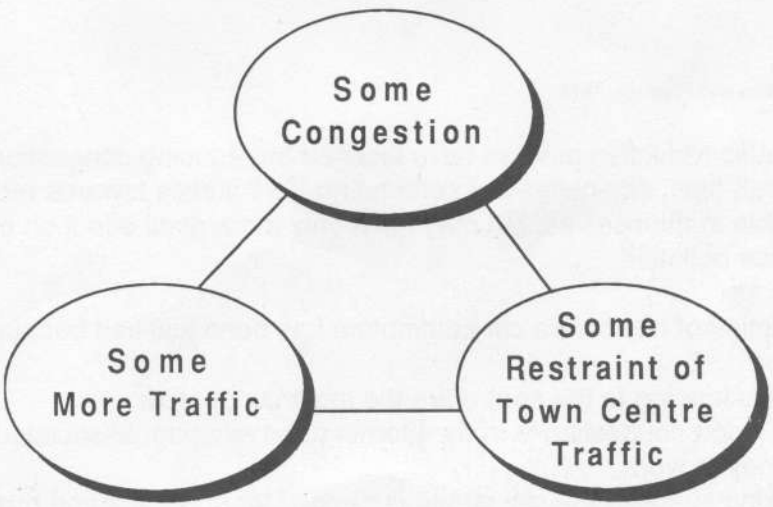
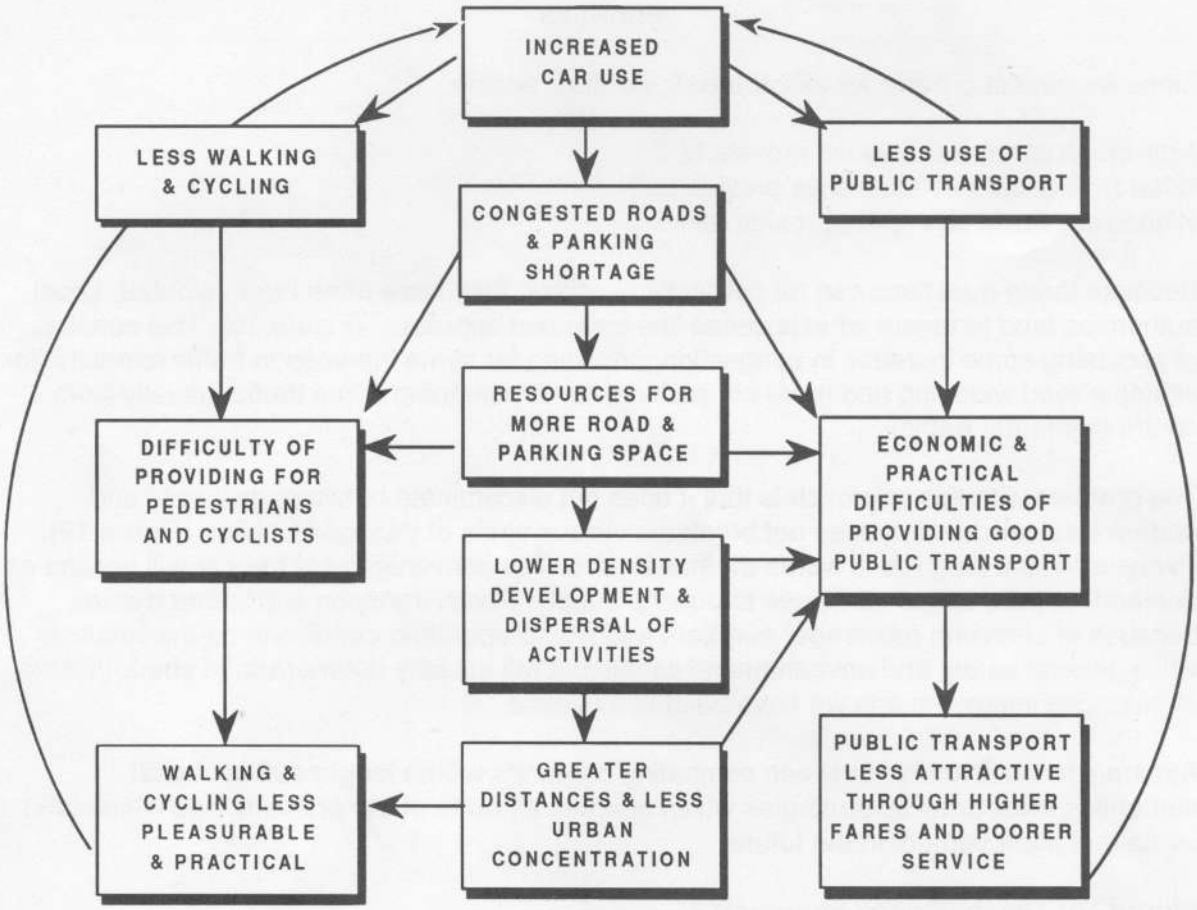


Figure 19: The vicious circle of transport decline



Source: Based on Collins and Pharoah, 1974

To date most traffic reduction policies have focused on reducing congestion by discouraging peak-time, city-centre car commuting. The moves towards reducing such traffic are valuable in themselves, but may have only a marginal effect on overall traffic growth and hence pollution.

Peak hour reduction of city centre car commuters has been justified because:

- Roads leading to the centre are the most congested.
- The worst congestion is in the morning and evening, associated with the journey to work.
- Parking space in the city centre is needed for shoppers and business visitors during the day.
- Public transport routes focus on the city centre and so can provide an alternative to the car.

The main instruments have been parking policies aimed at reducing long-term parking, such as by installing meters to limit long-stay parking and increasing scale charges at off-street public car parks. While this has limited car commuting in some cities, other problems have either not been addressed, or have been aggravated. In particular:

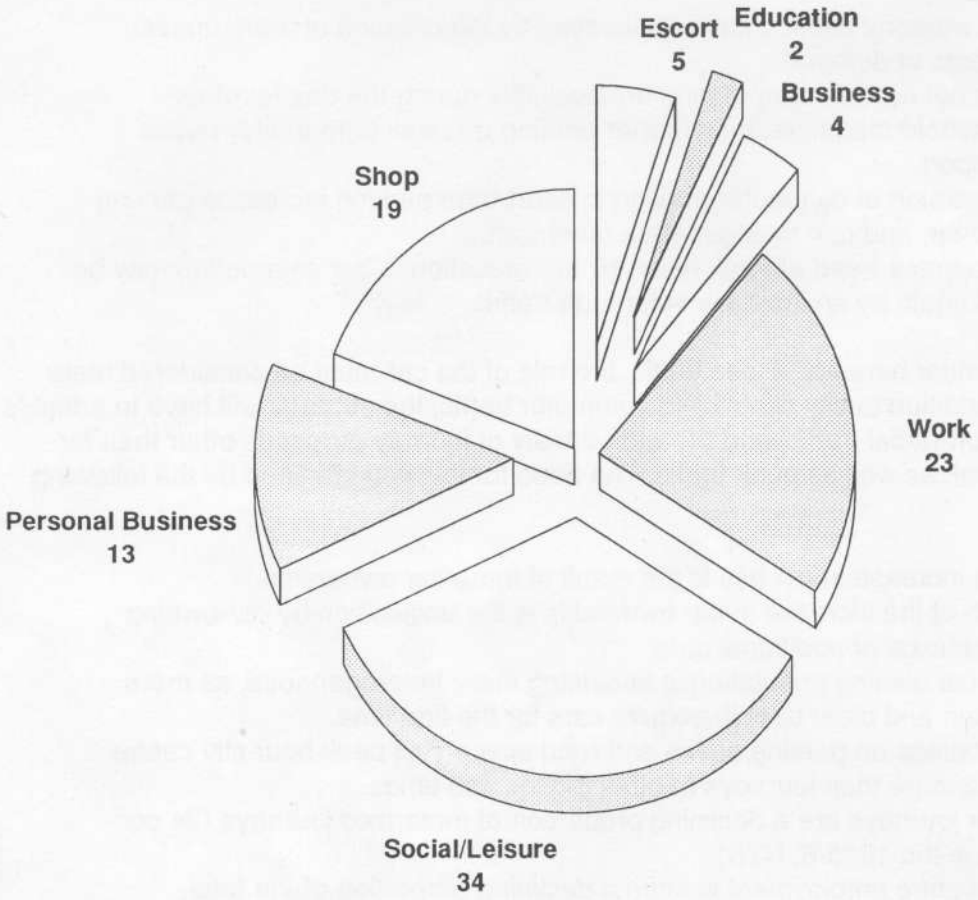
- Reduced car commuting increases public transport demand at the busiest times.
- This worsens public transport finances by the creation of more uneven patterns of demand.
- Cars not used for commuting are available during the day for other household members, thus further eroding off-peak demand for public transport.
- Conversion of commuter parking to short-term parking increases parking turnover, and can thus generate more traffic.
- Roadspace freed at peak hours by the reduction in car commuting may be filled again by an increase in through traffic.

To achieve the wider benefits of less traffic, the role of the car must be considered more extensively. In addition to city centre and commuter traffic, the strategy will have to address suburban and non-radial traffic, and the wide variety of journey purposes other than for work, and off-peak as well as peak traffic. The need for this is underlined by the following facts:

- Most increase in car use is the result of more car ownership.
- Much of the increase in car ownership is the acquisition by car-owning households of additional cars.
- The car owning population is becoming more heterogeneous, as more women and older people acquire cars for the first time.
- Limitations on parking space and road space limit peak hour city centre traffic more than journeys at other places and times.
- Work journeys are a declining proportion of motorized journeys (24 per cent in the 1985/6, NTS).
- City centre employment is often a declining proportion of the total.
- All of these factors tend to reduce the viability of public transport.

Multiple car ownership severely limits the market for public transport

Figure 20: Car travel by purpose (percentages)



Source: Department of Transport 1988

Controlling car use

Many of the measures required to reverse traffic growth throughout the country can only be implemented at national or international level, such as by raising fuel tax, or introducing a tax on carbon dioxide emissions. However a reduction in traffic in towns can best be achieved at the local level, either by regulation or pricing. A regulatory framework which allows local authorities to make the right decisions will of course aid the local effort.

Car use declines when people:

- choose a nearer destination (shorter car trips);
- switch from car to an alternative mode (walking, cycling, public transport);
- or decide not to travel (less trips).

Policies can also be designed to encourage travel at off-peak times, but while this tackles peak-time congestion, it does not reduce total traffic volume.

The contribution expected from each of these can be specified in traffic reduction strategies, and a scenario drawn up as in Figure 21. The base from which the reduction is sought will vary from city to city, and in particular will vary with city size (see Figure 22). The market share of the car can be reduced by radical improvement of the alternatives, so that people choose to drive less. But this approach will be difficult and expensive unless reinforced by policies which make driving a less attractive choice.

We now turn to the measures available.

Figure 21: Scenario for urban traffic ~~restraint~~ reduction

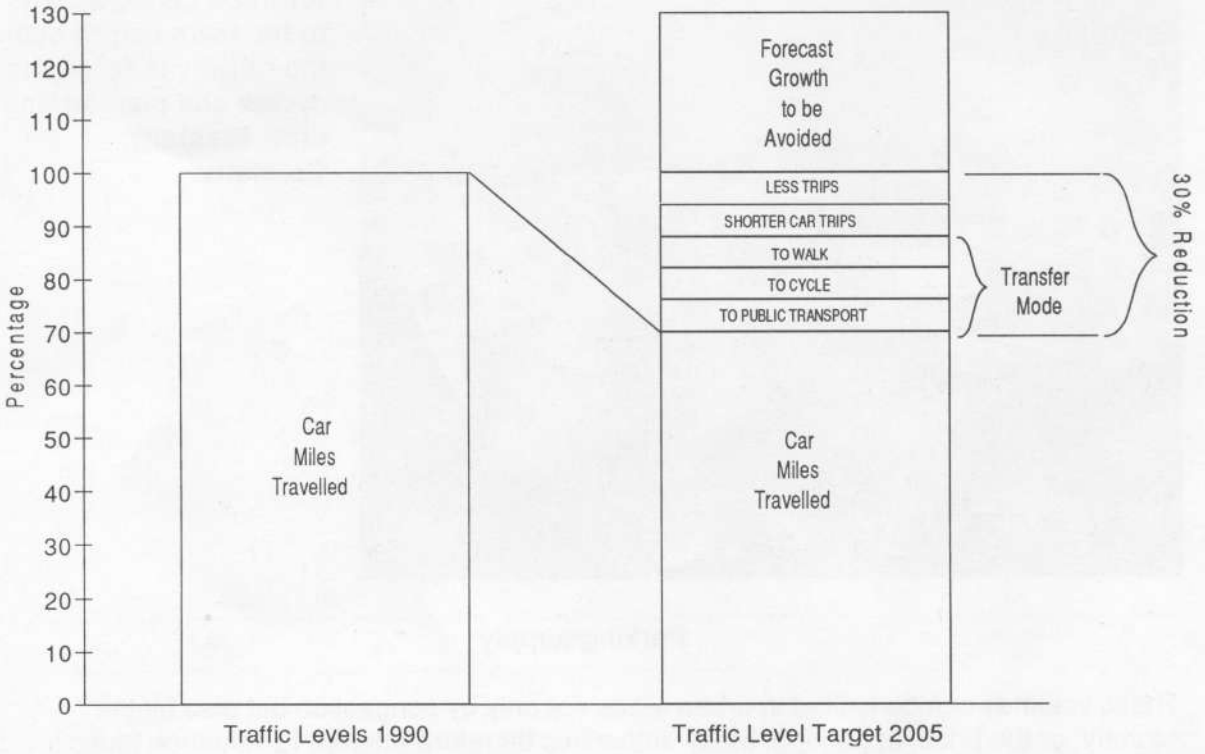
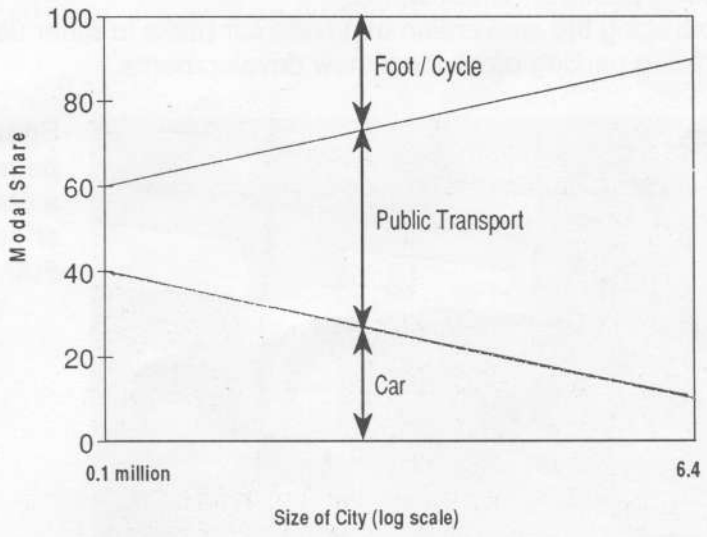


Figure 22: The effect of city size on travel to the centre



Derived from Apel and Lehmbrock, 1990

Freiburg, pop. 250,000. Only one in ten citizens shopping in the centre travel by car. This results from a combination of limited parking (13 per 1,000 inhabitants) and good quality public transport, walking and cycling facilities.

A bridge giving access to the town centre over the railway is for trams, cycles and pedestrians only. Freiburg, Germany.

Parking supply

Traffic volumes can be limited in urban areas not only by congestion but also by the scarcity, or the price, of parking. Many authorities therefore attempt to influence traffic levels by controlling the number of parking spaces, and the way they are used. This is limited it its effect, however, because it does not act on traffic not requiring parking space (through traffic, taxis and commercial vehicles).

The supply of parking can be reduced by:

- reducing on-street parking (eg by yellow lines, but preferably, by using the space for better purposes);
- reducing public off-street space;
- encouraging the conversion of private car parks to other uses;
- restricting parking provision in new developments.

Special provision can be made for drivers with a disability, as in this shopping street in Frankfurt, Germany.

All of these methods have been used. Many cities have replaced minimum parking standards with maximum standards for new developments. London was a world leader in making this change in the early 1960s. Where provision within the development site is inappropriate, a system of 'commuted payments' has been set up by some authorities. For example, York intends to use the money from such payments to develop park and ride facilities. Specific legal powers to do this would promote this policy in other areas. An irony is that as parking standards are reduced, the scope for commuted payments decreases. A better solution would be developer contributions to a transport fund, which local authorities could spend according to their transport priorities.

Table 3: Parking standards and provision at 74 London office developments

Office location	No. of sites	Recommended max. standard 1 space per (sq. metres)	Provision compared to standard
Central London	7	1200	20% higher
Inner London	20	743	12 times higher
Outer London centres	10	465	15 times higher
Rest of outer London	37	186	5 times higher

Source: London Planning Advisory Committee, report on parking, March 3rd 1992

Parking standards for new development are not yet designed to meet traffic reduction objectives, and 'minimum' standards apply, except in some town and city centres. Parking in new shopping and commercial developments is usually designed to cater for traffic growth, often by 100 per cent. Even where restraint is a stated objective, it is not always reflected in parking practice. For example, new offices in London are often provided with car parking well above the maximum recommended by the Department of the Environment, as shown in Table 3.

Uniform parking standards have been suggested as a way of reducing the attraction for developers of sites accessible only by car (SEEDS, 1990).

Strict new parking laws are applied in Zurich. The photo is taken from a former barracks now converted for office use. Offices occupied before the new parking law are allowed to use the old parade ground for parking (beyond the fence). Parking by employees in offices occupied more recently is prohibited (foreground).

The application of strict maximum parking standards in new development will help to avoid traffic growth, but to be effective in reducing present traffic, existing parking spaces will need to be reduced not only in town centres, but throughout urban areas, especially parking associated with non-residential activity. The obstacles to this are firstly, the high proportion of parking space in private ownership and the lack of specific local authority powers to reduce it, and secondly the difficulty of controlling parking on-street when off-street provision is reduced or limited. Incentives in the form of planning permission for more profitable uses could be tried to reduce private non-residential parking, coupled with on-street controls.

In the centres of Oxford and Cambridge, private parking accounts for two thirds of the total spaces. The figure for most cities lies between 40 and 50 per cent. New measures are needed if traffic generated by this space is to be reduced.

Parking controls and charges

Parking charges are important for matching demand to supply, at whatever level of supply. If charges are too low, then parking demand rises, available parking becomes scarce and traffic is generated by drivers searching for vacant spaces. Meter parking in town centres can cause unnecessary problems. Drivers will often drive round the centre in the hope of finding an on-street space before ending up in an off-street car park. Banning on-street parking altogether means that drivers go directly to the car park, thus cutting out this 'nonsense traffic'.

Variable message signs can direct drivers to the most convenient parking area, cutting out unnecessary car mileage. Kingston town centre, London.

Short-stay parking can generate more traffic, especially if parking is limited to only 30 minutes, as at this meter in Zurich.

Parking charges aimed at providing for short-stay rather than long-stay car users are common in most cities. This is consistent with reducing peak hour commuting, and with the (unsubstantiated) notion that car-borne visitors and shoppers are economically more beneficial to the town centre than car commuters. However, the conversion of space to short-stay use will increase the turnover per space and will lead to an increase in vehicle kilometres. Turnover at two hour meters is thought to be at least two or three times the turnover at unrestricted spaces. Encouraging short-term parking is thus not a traffic reduction policy. It also limits possibilities for extending pedestrian areas, or providing better conditions for buses.

Munich proposes to make on-street parking available to firms in the old town, using permits similar to those for residents' parking.

To sum up, to reduce traffic, parking charges should be high and not favour short-term parking. On-street parking should be reduced, or reserved for residents' cars.

Park and Ride

Park and Ride schemes enable car users to switch to public transport for the journey into the town or city centre to reduce traffic on the radial roads, and to reduce the parking demand at the centre. 'Cycle and Ride' schemes reduce traffic in the outer parts of the town as well, and require a fraction of the space. Park and Ride is best suited for residents outside the town, while cycle and ride is better suited for suburban residents.

The creation of park and ride schemes with dedicated bus services has become one of the most popular traffic reduction policies in Britain and elsewhere. Park and Ride is easier to achieve on a large scale in bigger cities with rail services, where the relative speed of the journey makes the switch from car more worthwhile. London's Park and Ride, for example, exceeded fifty thousand spaces by the early 1970s, whereas total spaces in all other British cities put together is estimated currently to be no more than twenty thousand. German cities with strong rail-based Park and Ride include Hamburg, Munich and Stuttgart. (See Table 4.)

Table 4: City centre shoppers arriving by public transport, 1989

City	Non-residents	Residents
Frankfurt	57%	64%
Hamburg	57%	77%
Munich	72%	81%
Stuttgart	64%	67%

Source: Apel and Lehmbrock, 1990

Schemes in Britain (other than London) with more than one thousand users per day include Bath, Maidstone and Oxford. Maidstone also has a "sail and ride" service on the River Medway. At least fifteen other cities have permanent Park and Ride schemes, and many more have seasonal schemes (Parking Review, passim). In Oxford, Park and Ride is estimated to reduce daily radial traffic to the centre by about 10 per cent, and at peak hours by 24 per cent (Oxford City Council, 1989).

Hamburg is an example of a city which has used commuted parking payments on a large scale. Office developers in the city centre can provide only 40 per cent of the 'normal' parking standard, and the rest are paid in lieu to fund large Park and Ride garages at S Bahn stations, like this one at Neugraben.

Park and Ride in Oxford has reduced traffic bound for the city centre.

Photo: Oxford City Council

Park and Ride will not always lead to a reduction of traffic. To be successful in this objective it must be accompanied by a reduction of car parking space at the centre (See Lubeck above). In Canterbury, four Park and Ride services are intended to cater for long-term visitors and commuters to the city centre to make parking space available in the centre for short-term visitors (*Local Transport Today*, 1991). Unless the total number of spaces is reduced, this will mean an overall increase of traffic bound for the city centre. Cheltenham Park and Ride, however, replaces two city centre car parks lost through redevelopment, which could result in a net reduction of vehicle kilometres (*Parking Review*, January 1991).

Although Park and Ride is often targeted at the journey to work, this is rarely effective when parking is available to commuters in the centre. For example, most of the users of Cambridge Park and Ride are shoppers, while commuters continue to use the private off-street spaces in the city centre, which are still not fully occupied. The success of Park and Ride in Cambridge has also been limited by the fact that only a quarter of traffic entering the city is bound for the city centre (private communication, Cambridge City Council).

Road pricing

Road pricing schemes aim to charge road users directly for the road space they use, in a way that reflects the demand for road space at that time and place. The charges for using a city centre street in the rush hour will therefore be much greater than those for a rural lane at three o'clock in the morning.

Charges for the use of roadspace have been made for many years. Parking meters were introduced onto London's streets in the 1950s and are now found in most towns. Apart from the fact that meters charge to stop on the road rather than to drive along it, the principle is the same as for 'road pricing', namely to bring demand for space into balance with supply.

Road pricing, or 'variable road user charges', has long been seen as a potentially powerful tool for alleviating urban traffic problems. Its introduction has been deferred because of perceived political and technical difficulties. Simplified variants have also been proposed, for example the imposition of a supplementary charge for entering a city centre, or toll payments for the use of certain roads at certain times, but these have not yet been tried in British cities.

An area pricing scheme was introduced in Singapore in 1975, and is now planned to be extended and converted from a manual to an electronic system. A fee is paid to enter the city centre from 7.30 -10.15 am and 4.30 - 6.30 pm. The effect on the modal split of journeys to the city centre has been dramatic.

Table 5: Modal split of traffic entering Singapore central cordon

	1974	1988
Public transport	46%	63%
Car	43%	22%
Other	11%	15%

Singapore area licence scheme gantry

Photo: K Buchan

A full variable road charge scheme was developed and tested for Hong Kong in the mid 1980s, but while technically a success, it turned out to be a political (or at least a public relations) disaster. The main problem was that the movements of individual vehicles were recorded on a central computer in order to calculate bills. Many people were angered at what they saw as invasion of privacy. However, Hong Kong still intends to introduce road pricing.

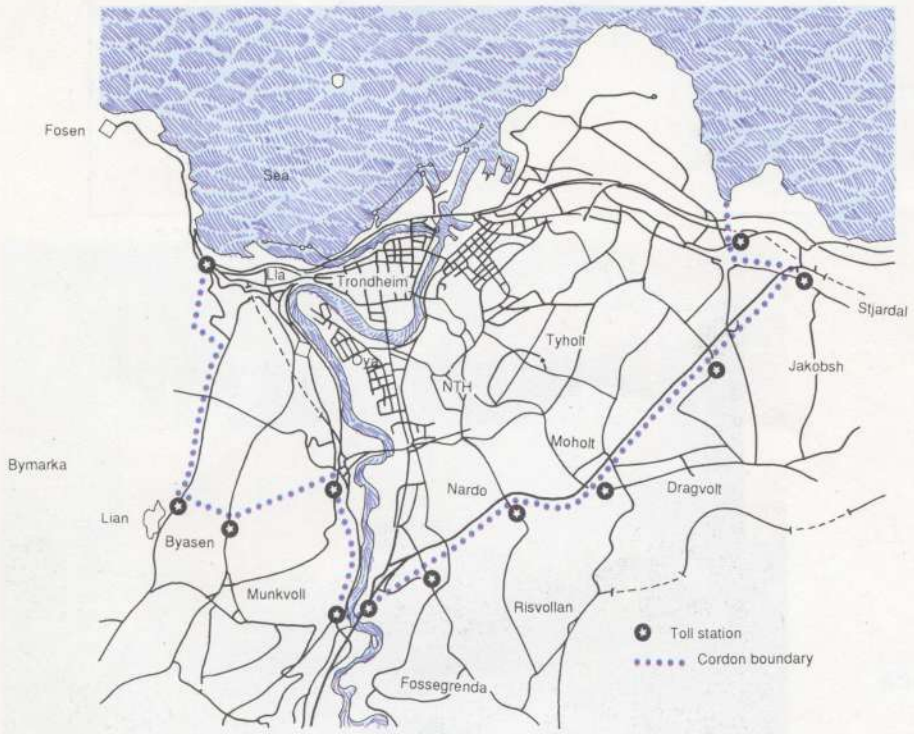
Technology has now been developed which helps to avoid the civil liberties concerns associated with the Hong Kong scheme. This consists of roadside equipment that deducts payments from pre-paid cards, working in much the same way as phone cards. This system is available as one method of payment for the toll-ring pricing systems in Oslo and Trondheim, Norway (see Figure 23). Although the primary aim of these Norwegian schemes is revenue collection, they could lead to more active traffic reduction policies. The schemes already impose higher charges at peak hours, and distribute revenues for public transport as well as simply road improvement. Trondheim also plans a second toll ring closer to the city centre which will enable charges to relate more closely to the value of roadspace. Toll collection and enforcement in Trondheim is fully automated, which reduces collection costs to about 5 per cent of revenue, and allows traffic to pass at normal speed through the toll gate, thus removing two of the objections to road tolls.

Payment methods at Trondheim Toll Ring

- Coin machine
- Deductions from pre-paid magnetic strip cards
- Central computer billing based on electronic
- Identification tag in car
- Manual (2 busiest toll booths only)

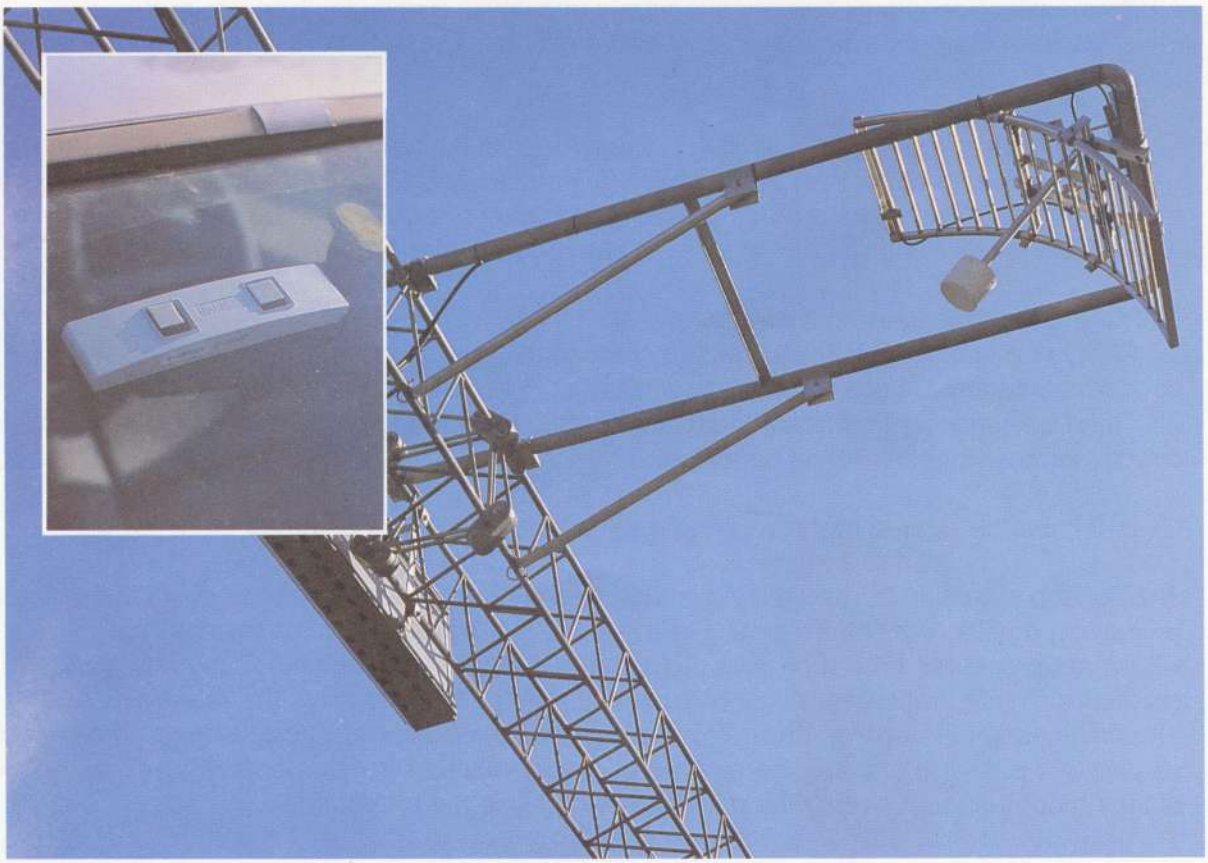
Invoice or pre-payment is expected for up to 90 per cent of users by the use of discount incentives (25 per cent peak hour, 45 per cent off-peak).

Figure 23: Toll Ring in Trondheim, Norway



Source: Trondheim Public Roads Administration

One of 12 booths in the Toll Ring scheme, Trondheim, Norway. Photo: E Baker



Electronic identification tag fixed to car windscreen. Photo: E Baker
Inset: Overhead gantry at toll booth with antenna to read car tags Photo: E Baker

Other road pricing schemes are under study in Britain.

London. A three year study of the impact of road pricing was commissioned by the Department of Transport in 1991.

Richmond (London). A 'timezone' scheme is to be tested using Council-owned vehicles. It will use pre-paid cards to charge drivers for the time they spend in the charge zone.

Cambridge City. A charging scheme has been proposed by the County Council. Drivers would incur charges (using in-car meter and pre-paid card) when delayed in traffic. This seems unlikely to gain popular support since the charges would occur unpredictably, and when the driver is already suffering from delays. Although it is proposed to use revenues for public transport improvements, this will create an incentive to retain congestion.

Operational criteria for road pricing schemes

- **Charge predictable**
- **Anonymity of user available if required**
- **Charges clearly related to costs (eg less off- peak)**
- **Charge displayed to driver at point/time of payment**
- **Charges result in quicker/easier journeys (ie effective)**
- **Simplicity of system**
- **Fraud-proof/strong enforcement**
- **Charges seen to be fair between different user groups**
- **Revenues used to improve alternatives to car**

There is little doubt that electronic road pricing is technologically feasible. However, devising a scheme which meets all operational criteria and which distributes benefits to the satisfaction of the public and politicians will be difficult. These factors in practice are closely related.

There are two main objections to road pricing. Firstly it is argued that charges will make car use relatively more difficult for those on lower incomes and those who have to pay their own motoring costs. The rich and those with company cars are unlikely to be deterred at any reasonable level of charge. There are at least three counter-arguments, however.

(i) The poorest people do not own cars.
(ii) Ability to pay distinguishes access to most goods and services; why should equity concerns arise only in relation to transport?
(iii) Road pricing would generate income for public transport improvements, and would itself directly improve bus operating conditions.

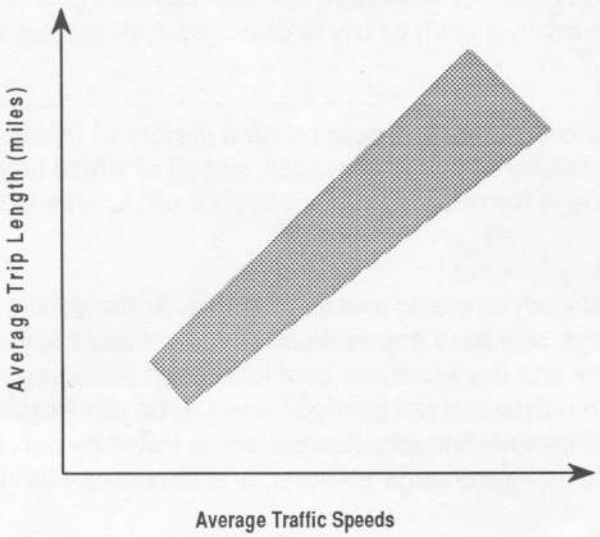
Overall it can be argued that road pricing will create better conditions for most people.

The second objection to road pricing is that, over time, people will seek to avoid the charges by moving outside the charge area. For example, it is feared that an inner-city charge area will create pressures for out-of-town shopping and employment thus creating new traffic problems. These pressures will be overcome if road pricing improves the relative attractiveness of the charge area. This emphasises the need for road pricing to be planned as part of a package of public transport and environmental improvements, as well as planning controls to prevent rival development outside the charge area.

Low design speeds

The environmental and safety benefits of lower driving speeds have already been described. Reducing journey speeds on urban road networks can also lead, over time, to a reduction in average trip lengths, and hence less traffic (See Figure 24). This will be true whether the low speeds result from congestion or planning, but clearly the latter is preferable.

Figure 24: Trip length and average speed



Note: The actual values will depend on the type of city and other factors

Note: The actual values will depend on the type of city, alternative modes and other factors.

The impact of lower speeds will favour short distance rather than longer distance traffic, and will also help to tip the balance of advantage in favour of public (especially rail) transport.

High speed roads (ie limited access, multi-lane dual carriageways, flyovers and underpasses) should be avoided in urban areas. On the existing main road network low design speeds can be achieved by, for example, bus-priority measures, frequent and phased traffic lights, narrower lane widths and road and junction layout.

Land use and activity location

"A short walk trip is the highest achievement of urban transport planning. Obviously it is not possible for all activities to lie within walking distance, but it is possible by bad planning for the great majority to lie beyond walking distance." **(Thomson, 1977)**

The aim of land use planning should be to bring activities close together and to keep distances short enough to allow travel on foot and by bicycle. Those activities that cannot be located this close to each other, should be arranged so that travel between them can be conveniently served by public transport. This is the essence of good location planning. It does not guarantee that everyone will choose to use the 'town friendly' modes of travel, but it can ensure that no-one living in a town or city is dependent on the car for their daily requirements.

Actual travel patterns and modes used will depend on a variety of factors like the relative cost, convenience and availability of different modes, not all of which local authorities can influence. Land use planning is therefore a necessary, but not a sufficient strategy for reducing traffic.

Planning must take place at both strategic and local levels. At the strategic level, new developments attracting large numbers of people, and specialized facilities, need to draw from a large catchment area and therefore are best located in town centres or near major public transport intersections. Bus and rail services need to be developed together with land use activities so that people can reasonably choose not to travel by car. For example offices can be concentrated at railway interchange stations, and shopping planned in a hierarchy of centres.

A proposal to reduce car travel generated by new development is included in the draft unitary development plan of the London Borough of Hammersmith and Fulham. Plot ratio and car parking provision standards of new non-residential developments will be related to the public transport accessibility level (PTAL) of the site. The lower the PTAL, the lower the density of development that will be allowed (London Borough of Hammersmith and Fulham, 1992).

Government can set an example in location planning. Dutch Social Ministry offices located at a rail/tram/bus interchange in The Hague, with low parking provision.

Location policy in the Netherlands

In 1990 the Dutch government adopted a strategy for *"managing mobility for a sustainable society"*. Part of this strategy aims to match the mobility needs of businesses and services with the accessibility of different locations. Developments are graded according to whether they generate passenger or vehicle traffic, while locations are graded according to their accessibility by public and private transport. Location decisions are based on the following:

"A" Locations

Accessible mainly by public transport. Suitable for businesses and services with:

- many employees in a small space and/or;
- a large number of visitors, little business-related car use;
- little goods transport.

"B" Locations

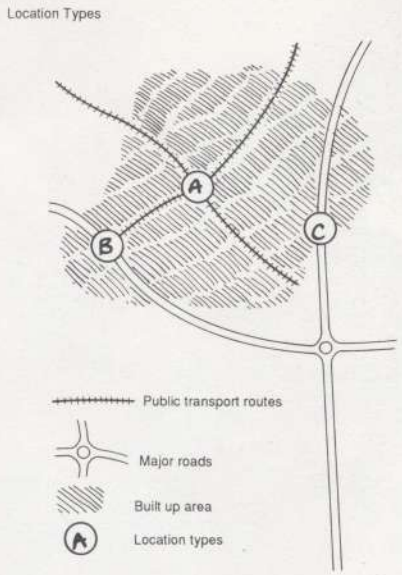
Accessible by both car and public transport. Suitable for businesses and services with:

- moderate density of employees and visitors;
- moderate business car use;
- moderate dependency on road haulage for goods.

"C" Locations

Easily accessible by car. Suitable for businesses with:

- low density of employees and few visitors;
- strongly dependent on motorized transport for people and/or goods.



Sources: Dutch Second Chamber of the States General, 1990. Dutch Ministry of Physical Planning and Environment, 1991.

A new "A" location at the intersection of two major railways is the focus for major office development in Amsterdam.

Local planning is important to ensure as many facilities as possible are available within a short walk (or cycle) trip. This will apply mainly to small or common facilities such as nursery or primary schools, clinics, convenience shops, community facilities. To achieve this objective, development must be dense and contain a mix of activities.

The traditional mix of housing and local facilities avoids car travel. Saltaire, Yorkshire.

The new town centre of Almere, Netherlands, has a mixture of housing and commercial development over the shops. High densities and mixed uses avoid motorized travel, and help to create a lively atmosphere throughout the day.

The trend towards fewer but larger facilities is at odds with this local planning objective. Larger facilities may mean better quality services for those that can reach them, but they reduce opportunities for others. The trend toward fewer and larger facilities may have arisen more because car travel is too cheap than because better services can be provided.

Goodwin (1991) calculates that a major foodstore whose merchandise is supplied by seven thirty-eight tonne lorries per day, generates ninety thousand car kilometres by customers driving to and from the store each day to collect it. Who are gaining most from this situation, the customer or the retailer? The environmental damage to the community at large is obvious.

However, there are still many areas of high density, mixed use development which need to be positively protected and enhanced to maintain their contribution to sustainable living. Many more such areas can be developed provided that car-based facilities can be resisted.

A rarely acknowledged asset in Britain is the inheritance of towns and cities which are still to a large extent capable of supporting lifestyles that are not dependent on the car. About half of all trips are made by means other than the car. More than thirty million people in Britain live each day without the exclusive use of a car. This is only possible, of course, because transport and land uses are so arranged to *make* it possible. Transport and land use planning must not therefore just devise new ways of life. It must maintain the positive aspects of existing ways of life, by improving the quality of urban living and not allowing car-based developments that undermine urban lifestyles.

In combination, the development of new employment, shopping, and other activities away from established centres, and over-generous car parking provision are presently putting a sustainable urban future further and further out of reach.

Tree planting cannot hide the fact that most people travel to out of town business and retail parks by car. Such developments have no place in a strategy for sustainable transport. Stockley Park, London.

Traffic conflict has been transferred from the High Street to the car park! Car-based shopping exploits cheap travel, and undermines town centres on which non-car users rely. Retail park, Hertfordshire.

Restricted roadbuilding

One of the most effective ways of avoiding traffic growth is simply not to provide for it. By not building the motorway network planned for London in the 1960s, the Capital has saved probably twenty five million vehicle kilometres every day. Most towns and cities have abandoned, or at least reduced their road building plans, especially in central and inner areas where the costs and destruction are highest. Plans should further be modified to limit traffic growth, for example by using lower design speeds, traffic lights rather than flyovers or underpasses, and ensuring that new roads provide substitute rather than additional capacity.

Past mistakes must end somewhere. Here a dual three-lane carriageway built in the 1970s will not be continued. Wandsworth, London.

Public protest has often halted the building of major roads, even when it is half-built, as at Corwheiler New Town, Cologne, Germany.

New choices

There will always be people who do not own cars. But the experience of not owning a car need not be negative. We need to open up new choices, and new ways of fitting the car into our lives, rather than trying in vain to fit our lives into the car. Some innovative schemes are described below.

Telecommuting

Telecommunications technology has created new opportunities for people to work at home, 'telecommuting' to the office by phone. Of course, many people besides 'teleworkers' work at home. Some studies indicate that teleworking may reduce not only commuter travel but also other travel undertaken by the teleworker and also by other members of the household (Mokhtarian, 1991).

It is possible that, freed from daily commuting, people will move further away from their office base. But so far, studies indicate that the extra distance involved is more than cancelled out by the saving of daily commuting. A tentative conclusion is that teleworking leads to a "contraction of activity space" of the household concerned. If true, this could cause a favourable shift to more local travel.

Neighbourhood transport clubs

Individual car ownership is already causing immense problems of parking shortage in older residential areas. Many people, especially as they get older, also find individual ownership of a car irksome. If people had access to a shared pool of vehicles in their neighbourhood then the number of vehicles could be greatly reduced, thus easing the parking shortage. Surveys by the author indicate that the stock of cars could be reduced by 40 per cent, even if patterns of car use remained unchanged (Pharoah, 1986).

The feasibility and commercial viability of local 'car clubs' has been demonstrated in several schemes in Germany, Sweden, Switzerland and the USA, as well as in Britain. For example, the 'Stattauto' scheme in Berlin now has forty cars serving four hundred members, of whom 40 to 50 per cent have either given up their car, or decided not to buy one. The other users are people who either cannot afford, or choose not to own a car.

Car-free residential areas

The concept of car-free housing springs from a recognition that whilst people may choose not to own a car, they cannot choose to live without the nuisance caused by other people's cars in their neighbourhood.

The idea is to provide a high-quality environment for people who elect to live without a car. The obvious places to demonstrate such a scheme would be where high quality alternatives to the car exist, and where the majority of people's needs can be met on foot. London's Covent Garden or new Kings Cross development would be suitable candidates. Such car-free housing will be important if traffic is to be removed from city centres. The author is not aware of any scheme to date, but the idea has been advocated in various quarters. (See for example, Independent Commission on Transport, 1974, the Dutch national transport plan, 1990, and Royal Town Planning Institute, 1991). Local authorities and developers could jointly devise a suitable demonstration project. Without the need to meet the usual parking and vehicle access requirements in new housing, developers (and buyers) would benefit from lower costs per dwelling.

Car-free residential areas could offer a safe and attractive environment. Amsterdam.

Promoting the personal benefits

Most of the efforts towards achieving better towns with less traffic are centred on various transport initiatives. Another approach is to focus on the individual, and to develop awareness of the personal benefits of using a car less and of not owning a car. As a pilot project, six families in Bremen, Germany, were asked to lock their cars away for four weeks, and to report on their experiences and changes in living style. Some rather surprising results were found:

- Four of the six households sold their car.
- Of the other two households, one has reduced car use, no longer using the car for work.
- Two households not participating sold their cars after talking with participating households.

People found that after some difficulty in the first week, they could adjust to alternative modes of travel. The switch to bicycle or public transport was found to be enjoyable on the personal level. They enjoyed being exposed to the weather and their surroundings, and they felt better for the exercise. They also found that instead of trying to pack more errands into the day, they became more selective in the journeys they undertook, and in the planning and combination of activities. For example, stopping on the way home from work to buy a magazine or some food was found to be much easier with a bicycle than with a car. (Krämer-Badoni, 1991)

Incentives to use 'town friendly' modes

A problem in attempting to reduce the proportion of journeys made by car is that many people use the car habitually, and rarely consider travelling by any other means, even when to do so would be convenient. This is encouraged by the way people pay for cars. Most of the costs of car ownership (purchase, tax, insurance, depreciation) have to be paid whatever use is made of the car, and car owners naturally feel that they should make as many of their journeys as possible by car to make the best use of their investment. To use public transport in effect involves paying twice for the journey. Various schemes for reducing this financial incentive to drive, and for encouraging a more selective approach to car use have been devised. For example:

Groningen Provision of a bicycle "pool" for business travel by staff of the city planning office.

Body Shop, UK Provision of company bicycles.

Netherlands Financial incentives by national government for employers to organize car sharing. The national transport plan includes a policy of raising public transport fares no faster than inflation or rises in the cost of motoring.

Freiburg 'Environment ticket'. This is like a travelcard but is multi-modal, interchangeable, and allows small groups of people to travel together in the evening and at weekends, thus removing the financial penalty associated with family public transport travel. Now available in many other areas including the Ruhr and Berlin.

Ingolstadt (Bavaria) A one-month promotion of the local public transport travelcard for a nominal 1DM (35p) in November 1991. The cost was borne jointly by the City and Greenpeace. Ingolstadt has one of the highest car ownership rates in Germany.

Tubingen University All students are charged 10 DM (about £3.50) extra fees per semester and issued with travelcards. This is to promote public transport use and to reduce parking demand at the university. The operators calculate no overall loss.

Stockholm Drivers wishing to park or (in a modified proposal) to drive in the city centre will be required to purchase a public transport travelcard. Since car use requires purchase of a travelcard, motorists would in effect be paying twice for their journey.

Northrhine-Westfalia (Germany) The state (Land) government sells travelcards to employers at a discount price. Employers then choose at what price (if any) to sell them to their employees.

Part 4 - Implementation issues - The art of the possible

Experience from cities such as Delft, Freiburg and Zurich shows that local authorities can have a significant effect on the volume of traffic, and the quality of access in a given town. But experience from other countries is often dismissed as being irrelevant to the UK: 'Britain is different; our freedom-loving people wouldn't support traffic ~~restraint~~ reduction; our local authorities haven't the powers of German Lander or Swiss Cantons'.

However, in practice, many of the initiatives taken by Dutch, German and Swiss cities could be undertaken in Britain. Already authorities such as Edinburgh, Merseyside, and the West Midlands have recognised the importance of integrated strategies. Cities like Oxford and York have had considerable success in restricting traffic entering the centre. Park and Ride schemes are becoming more widespread and effective. New ways are being sought for improving public transport, despite the handicap to integrated planning created by bus deregulation. Many cities, like Exeter, Leicester and Norwich, are also investing in the quality of their centres. These and many other initiatives demonstrate a growing willingness to tackle the urban transport problem by limiting the excesses of the car and lorry. This final section shows how and why local authorities can take the lead in implementing the new direction for urban transport based on less traffic, and do so with public support.

Public opinion

No traffic ~~restraint~~ reduction strategy can be implemented without political support, and politicians take their cue from public opinion, or at least their perceptions of it. There is growing public support for measures to free towns and cities from traffic, but many politicians have yet to recognise this change of view.

A recent survey showed that in the UK, as well as in other countries, policies giving priority to public transport, walking and cycling, were far more popular than politicians imagined. For example, 82 per cent of people thought that public transport should be promoted at the expense of the car. Politicians estimated that only 48 per cent of the population held this view. Similar discrepancies were found in relation to policies for walking and cycling.

This misreading of public feeling does not go unnoticed by the electorate: "*one in two people think that political decision makers assume that support among the population for the private car is higher than it actually is*" (UITP/EC, 1992).

Other surveys indicate considerable public support for traffic reduction measures, as Table 6 shows. Investment in public transport including park and ride, and reducing or banning traffic in city centres seem to be particularly popular. Measures which directly hit the motorist's pocket, such as road pricing or increased fuel tax, are not yet favoured by the majority of people, though support for road pricing is higher where congestion is worst, as in London. Support for road pricing seems to depend on whether people *believe* that public transport will become a reality (MTRU, 1989).

People are likely to favour traffic reductions in towns even more strongly once practical alternatives are seen to be both possible and desirable. Schemes which attract initial resistance can turn out to be popular once the benefits are clearly seen to outweigh any disadvantages. This has been a common experience with pedestrianization schemes, for example. It is therefore important for local authorities to explain the purpose of traffic reduction as part of a wider ~~version~~ vision to improve life in towns and cities.

Table 6: Some indications of public opinion

	National polls			London polls	
Sponsor: Sample	**RAC (drivers)**	**HALFORDS (drivers)**	**LEX (all)**	**WHICH? (all)**	**LPAC/LEX/ MTRU (all)**
	%	%	%	%	%
Agree with:					
Invest in public transport	88	85	-	63	-
Park & Ride	91	-	56	-	-
Ban cars from central areas	71	63	-	70	72-82
Road pricing	29	-	33	28	43-47
Could use car less	26	-	33	-	49

Note: Questions vary between surveys, so figures give only a general indication.

Sources: RAC (1990), HALFORDS (1991), LEX (1992), WHICH?(1990), LPAC/NEDO/AA (1991), MTRU (1989 and 1990).

Action in the short-term

Given sufficient and growing public support, how can traffic reduction strategies be implemented? Are local authorities able to act immediately? Do they need new powers? Or must they await action by central government?

There is considerable scope for action, even in the short term. Local authorities can draw on at least eighteen techniques for reducing traffic in their areas, without any need for further powers, amounting to half of the techniques identified in Table 7. These can be selected and packaged to meet specific targets for the town or city.

Example of a traffic reduction strategy using existing powers

Avoiding the generation of new traffic

Cancelling plans for new roads and car parks, restricting car parking in new developments; steering investments to town centres and other locations accessible by foot, cycle, and public transport; making agreements with other authorities to prevent developments which will generate new or longer car journeys, for example superstores or hospitals in off-centre locations; retaining areas with mixed activities and land use locations and densities that generate little car traffic.

Encouraging a switch from car to 'town friendly' modes

Progressively removing car traffic and parking from town centres, and investing to make them more attractive places to visit, providing better access to public transport facilities with 'off-route' improvements; providing better operating conditions for buses on the roads; reducing local traffic, such as school escort journeys by car, by introducing traffic calming in residential areas and sub-centres; building a safe network of cycle routes.

Promoting less car dependence

Campaigns to promote walking and cycling and to provide public transport information; developing initiatives which enable people to make less use of cars, such as neighbourhood transport clubs and car-free housing areas.

Action in the medium to long-term

There is no doubt that traffic reduction and urban improvement strategies could more easily be implemented if local authorities had stronger and wider powers to act, and if their strategies were reinforced by the actions of central government. Local authorities and their respective associations should therefore continue to campaign for the changes that are required.

Four areas in particular where local powers need to be broadened and strengthened are parking, pricing, public transport and strategic planning (see Table 7).

Parking

There is currently no mechanism for reducing the quantity of private parking, which often equals or exceeds public provision. The continued existence of free private car parking will severely limit the scope of traffic reduction policies. The problem can be contained, however, by restricting parking provision in new developments.

Local authorities now have more scope to control on-street parking (Road Traffic Act 1991). Agreements over parking standards between authorities are needed, preferably reinforced by strategic policies and plans.

Public transport

Present local authority powers are geared to planning roads, not public transport. As the Association of County Councils has said:

"The current legislative situation in which privatized bus operators compete in a deregulated market is not conducive to the coordinated planning of integrated public transport in the Shire Counties." (ACC, 1991)

The position in the metropolitan areas is similar. The Transport Act 1985 gives little scope for authorities to support local public transport other than for social purposes. Some have developed useful initiatives, such as Park and Ride, but for expansion of public transport on the scale required, additional powers will be required.

Strategic planning

Local authorities often experience difficulty in preventing undesirable developments by neighbouring or higher-level authorities. Mechanisms are required to resolve potential conflicts over road building, for example, and out-of-town or other car-based developments. Local policies to restrict such developments will carry little weight unless they are upheld at the county and national level.

The need for a national traffic reduction policy

The Government has already accepted that the forecast demand for road traffic cannot be satisfied in full. Yet there is no policy to limit traffic growth nationally, nor any justification for the level of demand that will be met by current roadbuilding plans. There is an urgent need to fill this policy vacuum. Current national transport policies on fuel taxation, roadbuilding and public transport finance work against the attempts of local councils to reduce traffic in their areas, and a new policy direction is desperately needed.

More rational transport planning would be possible if powers and resources are devolved for central government to local or regional authorities. This would mean, at the very least, a return to a block grant system which enables all aspects of urban transport to be planned together, by locally accountable authorities. An alternative, or additional approach would be to extend the scope of the free market, using the 'polluter pays' principle to charge drivers for the environmental damage and congestion they cause. Other areas where central government can take action to limit traffic, or reduce its environmental impact, are shown in Table 7 (page 67).

Top down or bottom up?

Meeting the target of 30 per cent less urban traffic by the year 2005 will be a challenge to which both central and local government can contribute. Measures taken nationally to reduce burgeoning traffic growth such as cutting the Trunk Road Programme, or imposing higher fuel taxes, would ease the pressure on urban areas. But whether such action is forthcoming or not, the *benefits* of less traffic can be fully realized and exploited only by action at the local level.

As the Lubeck case example has shown, it is within the individual town or city that the link between better living, economic success and less traffic will be most readily understood and accepted. This point is already reflected in opinions surveys, which show much greater support for specific improvements like traffic-free centres and light rail systems, than for general measures like higher car taxes or road pricing, the benefits of which may be neither clearly demonstrated nor guaranteed.

Local authorities therefore have the responsibility, and already sufficient powers to implement traffic reduction strategies, and thereby lead by example. Success of such local action will then provide a firm foundation for the reform of national policy.

Conclusion

We have argued that the need to reduce urban traffic is imperative. We have set a 30 per cent target reduction as a spur to action, and a yardstick against which to measure results. We have emphasized the positive improvements to urban life that will follow, and demonstrated that these will ensure popular acceptance of traffic reduction measures. The next and urgent step is for all local authorities to develop traffic reduction strategies appropriate for their areas, drawing upon the wide range of techniques and practical examples described in this guide.

If the opportunity is grasped, we can look forward to an exciting future for our towns and cities. If not, the present vicious circle of transport and environmental decline will continue. Finding a more sensible role for the car, and reducing our dependence on it will be central to the achievement of urban living conditions that are socially equitable, environmentally sustainable and economically prosperous.

What are we waiting for?

Table: 7 Compendium of traffic reduction techniques

Techniques for which local authorities have powers to act

1. Road closures, partial closures
2. Reduced road capacity
3. Area bans
4. Route restrictions
5. Congestion
6. Planned congestion
7. Low speeds (traffic calming)
8. Bus and tram priorities
9. Cycle lanes
10. Pedestrian facilities
11. Traffic calming
12. Restricting parking space (public and new private)
13. Parking controls and charges (public space)
14. Park and Ride
15. Local land use planning
16. Restricted road building
17. Promoting/advertising benefits of less car use
18. Neighbourhood transport clubs

Techniques for which local authority powers could be strengthened

19. Area permits and licences
20. Tolls
21. Vehicle metering
22. Reducing/controlling private parking space
23. Linked parking and public transport charges/permission
24. Subsidized fares
25. Two-part fares and tickets
26. Subsidized public transport capital investment
27. Subsidized public transport quality
28. Strategic land use planning

Techniques outside the scope of local authorities

29. Vehicle and driver regulations
30. Car ownership restrictions
31. Fuel tax/green tax
32. Mileage tax (freight mainly)
33. Vehicle fees and taxes
34. Concessionary vehicle fees and taxes
35. Tax incentives for not owning cars
36. Fuel restrictions

See also Thomson, 1972

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Creating an urban 'place'. After. Berlin, Charlottenburg. (Photos: C. Dyckhoff)

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£10.95

July 1992

Published by Friends of the Earth Trust Limited
ISBN 1 85750 120 9

Friends of the Earth
26-28 Underwood Street
London N1 7JQ
(071) 490 1555