

Reclaiming city streets for people

Chaos or quality of life?



EUROPEAN COMMISSION
Directorate-General
for the Environment

FOREWORD

S The quality of the environment in urban areas is of vital importance. It is one of the main factors that determine whether a city is a healthy place to live, whether we enjoy living there, and whether we want our children to grow up there.

One of the key issues affecting the quality of the environment and the quality of life in our towns and cities is road traffic. Heavy motor traffic means poor air quality, unacceptable levels of noise and a weakened sense of neighbourhood and local community. Traffic also gives rise to high costs for the economy through delays caused by congestion.

Every year more than 3 million cars are added to the car fleet in Europe. Total road traffic kilometres in urban areas will grow by 40 % between 1995 and 2030. Local authorities and citizens need to decide how to respond to these pressures and decide what sort of place they want their town or city to be in the future. One option is to try to eliminate congestion by building more roads, but the costs – financial, social and environmental – can be high and the relief short-lived. More and more cities are opting for a different approach where they work together with their citizens to ensure that they have access to the goods and services they need without having to depend on road traffic.

There are many traffic management techniques and approaches and any given city will probably need to develop a package of measures to manage traffic effectively. This new handbook sets out some case studies where road space has been reallocated for other uses. New, attractive and popular public areas can be created on sites that were once blocked by regular traffic jams. If these are properly planned, they need not result in road traffic chaos, contrary to what might be expected.



I hope that cities and their citizens will consider this approach as part of the solution to the growing levels of road traffic. This complements our earlier publications, *Cycling: the way ahead for towns and cities* and *Kids on the move*, which give examples of other case studies. I am convinced that traffic management is the key to making our cities more attractive places to live in and to improving the quality of our urban environment.

Margot WALLSTRÖM

*Member of the European Commission
responsible for Environment*

CONTENTS



IDENTIFYING THE ISSUES

The quality of life in many European cities is affected by the negative impacts of increasing traffic levels. This chapter looks at ways in which a dominance of car traffic affects our lives in urban areas, and suggests that there is a growing consensus, from the global to the local level, that the situation is unsustainable.

Page 10



FINDING SOLUTIONS

The traditional response to the problem of traffic congestion has been to increase the road space available for cars. In this chapter, the theory of 'traffic evaporation' is explored as a concept which challenges the logic of this approach. This theory supports the proposition that reducing road capacity for cars in congested city centres can represent a sustainable, efficient planning solution. In addition, once freed from domination by car traffic, reclaimed urban spaces can become accessible, vibrant 'living' places.

Page 14



PRESENTING THE CASE STUDIES

- Kajaani, Finland
- Wolverhampton, England
- Vauxhall Cross, London, England,
- Nuremberg, Germany
- Strasbourg, France
- Gent, Belgium
- Cambridge, England
- Oxford, England

This chapter presents the experiences of a small selection of European cities where urban planners, with the political support of local leaders, have had the vision and the courage (often in the face of considerable opposition) to take away congested road space from private cars. In each case study, after an initial settling-in period, the predicted traffic chaos did not materialise and some of the traffic 'evaporated'.

Page 20



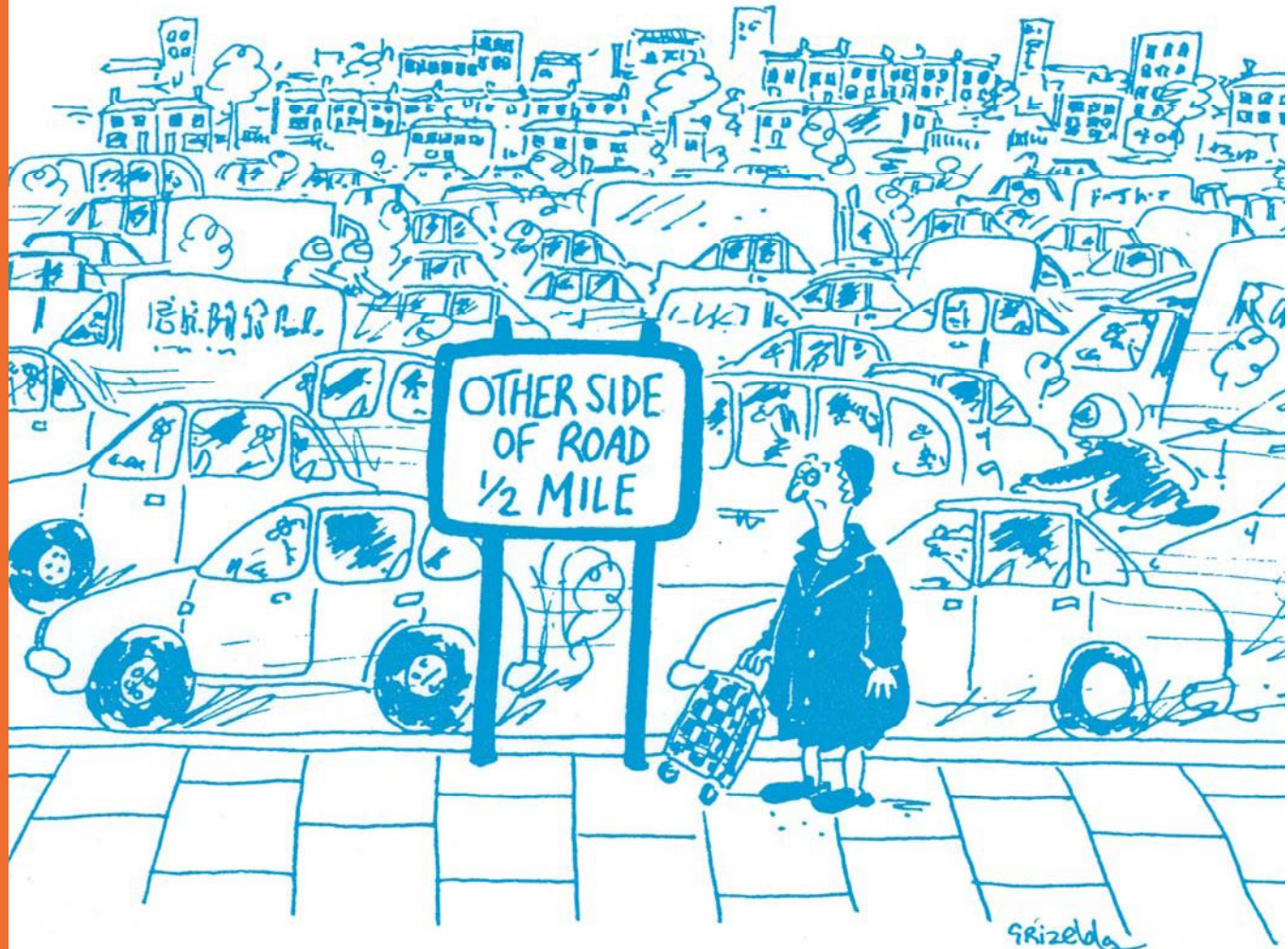
PROVIDING GUIDELINES

Redistributing road space in favour of non-car modes can represent a technically challenging and politically sensitive planning option in urban areas where road congestion is already a problem. This chapter brings together best practice from a wide range of expertise and experience in dealing with these issues, in particular that drawn from the schemes described in this document. The objective is to assist politicians and planners working to develop more sustainable transport strategies for Europe's towns and cities.

Page 50

Introduction

TRAFFIC EVAPORATION IN URBAN AREAS





The challenge facing urban planners and politicians in many European towns and cities is that of balancing the demand for increasing personal mobility and economic growth, with the need to respect the environment and provide an acceptable quality of life for all citizens.

While it is clear that provision for car-based mobility will continue to be an important part of traffic management planning, finding ways to encourage more use of alternative modes of transport (public transport, cycling and walking) is the goal of any sustainable urban policy. Where road space is restricted, providing adequate space for these alternative modes may require a reallocation of highway capacity. When the roads under consideration are already highly congested, it is typically assumed that reducing the capacity available for cars will result in increased traffic congestion in the surrounding streets. However, as the evidence in this document demonstrates, this is not necessarily the case.

The experience in a number of European cities is that:

- traffic problems following the implementation of a scheme are usually far less serious than predicted;
- after an initial period of adjustment, some of the traffic that was previously found in the vicinity of the scheme 'disappears' or 'evaporates', due to drivers changing their travel behaviour;
- as a result the urban environment becomes more liveable in many respects.

This handbook illustrates the concept of traffic evaporation using case studies from a selection of European cities. Many of these cities have gone ahead with road space reallocation schemes despite predictions that traffic chaos would result. However, in each case any initial problems of traffic congestion were short-lived, and after a 'settling-in' period a proportion of the traffic was found to have 'evaporated'.

In the attractive car-free spaces created in these cities, pedestrians and cyclists now enjoy a cleaner, quieter and safer environment. These cases illustrate the potential for more effective uses of urban road space, as 'exchange space' rather than just 'movement space', recognising the social importance of streets and squares.

Favouring more sustainable transport modes is an approach which promotes social inclusion and accessibility for the nearly 30 % of European households which have no access to a private car. Such strategies are also more equitable, for they reduce those negative impacts of urban traffic and congestion which are experienced by everyone, regardless of whether they are able to enjoy the benefits of car use.

The purpose of this handbook is to show that such schemes can be highly successful; they can represent a very positive sustainable planning option for cities. The case studies here demonstrate the importance of well planned integrated strategies, combined with effective public consultation and communication. Above all, however, they show the need for vision and courage on the part of the implementing local authority.



1

Chapter 1

IDENTIFYING THE ISSUES

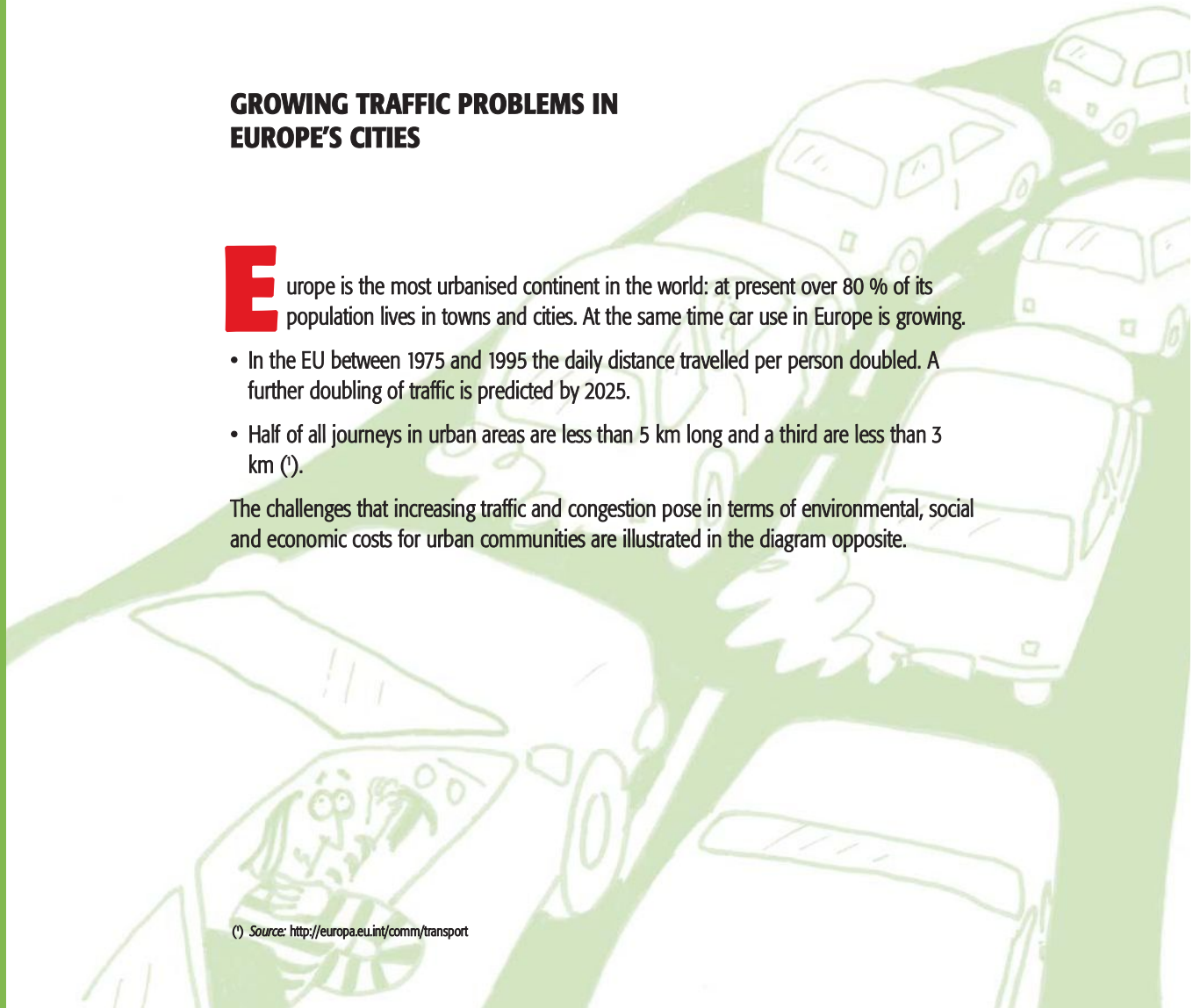
GROWING TRAFFIC PROBLEMS IN EUROPE'S CITIES

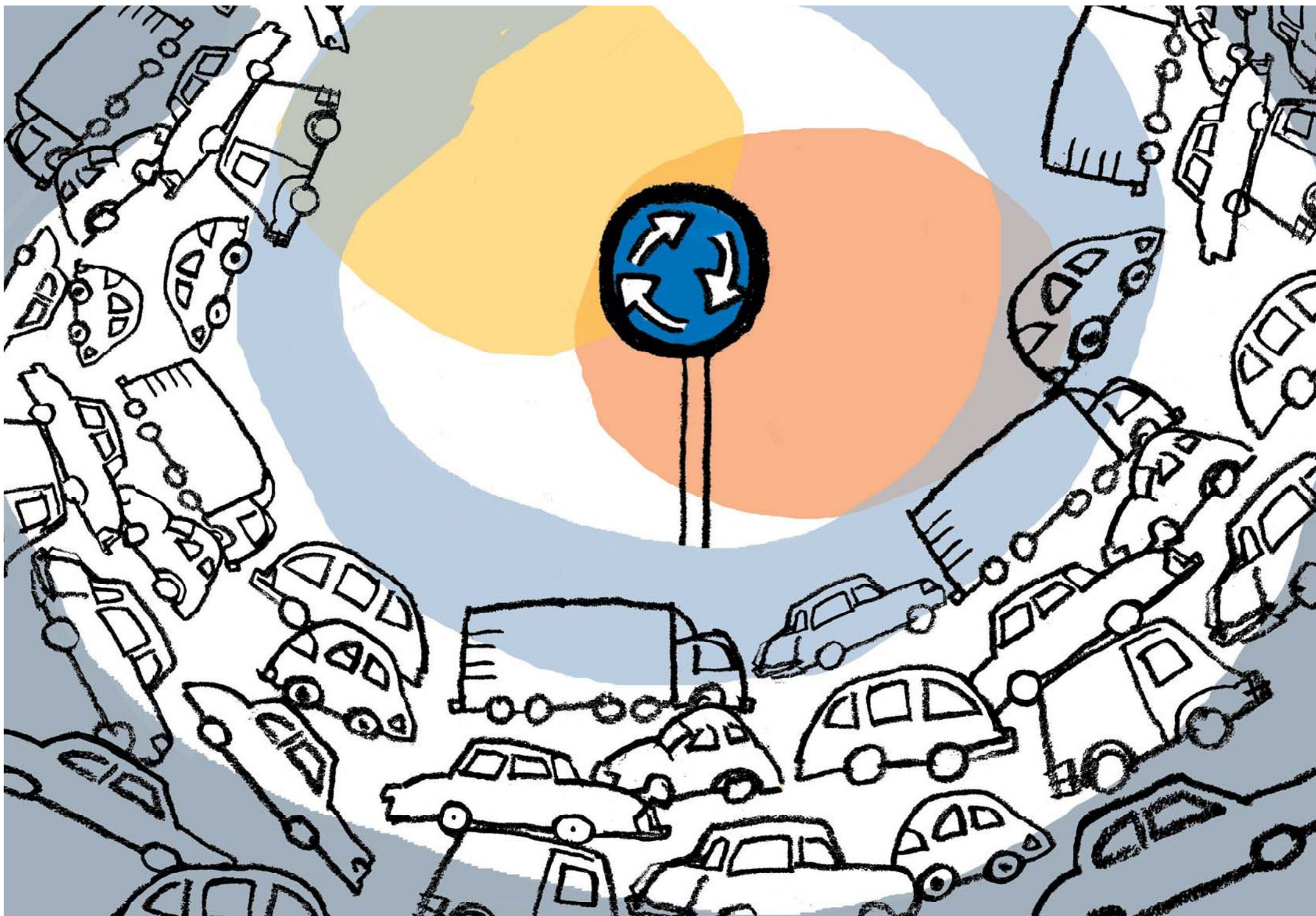
Europe is the most urbanised continent in the world: at present over 80 % of its population lives in towns and cities. At the same time car use in Europe is growing.

- In the EU between 1975 and 1995 the daily distance travelled per person doubled. A further doubling of traffic is predicted by 2025.
- Half of all journeys in urban areas are less than 5 km long and a third are less than 3 km (1).

The challenges that increasing traffic and congestion pose in terms of environmental, social and economic costs for urban communities are illustrated in the diagram opposite.

(1) Source: <http://europa.eu.int/comm/transport>







Global pressure for change

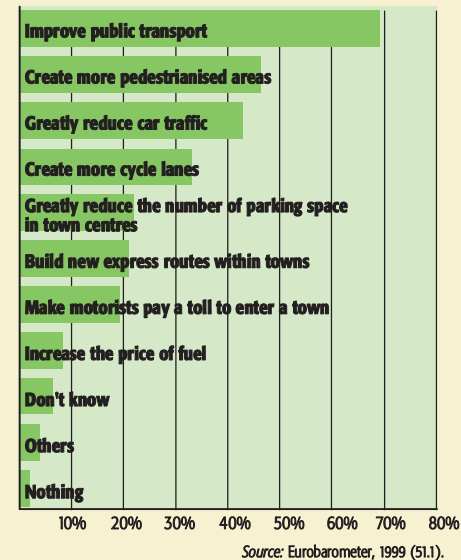
The past two decades have seen growing international concern over the impact of human activities on climate and the atmosphere. Increasing levels of greenhouse gas emissions are central to these concerns ^(*). The rapidly growing transport sector consumes an increasing proportion of total energy and contributes a growing percentage of global air emissions. More sustainable transport strategies ^(?) are needed as a matter of international priority.

Citizens in Europe are calling for change

In Europe a majority of citizens are calling for changes to promote modes of transport which are more respectful of their environment. In 1999, 70 % of Europeans said they were more worried than they were in 1994 about the quality of the air they breathe. They put air pollution at the top of their list of environmental concerns and quoted car traffic problems as the main reason for their discontent as far as the environment in which they lived was concerned ^(*).

Recent surveys have shown that most EU citizens identify as a priority the need to address the issue of too many cars in urban areas, and the pollution, noise and dangers they present. In 2002, more than two-thirds of those surveyed considered environmental factors to be the most important influences on their quality of life and half identified traffic congestion and over reliance on the car as key concerns where they lived ^(*). Furthermore, as the chart opposite

demonstrates ^(*), when people were asked to identify effective solutions to solve environmental problems linked to traffic in towns, priority was given to improving the quality of more sustainable transport modes and greatly reducing the dominance of car traffic.



^(*) The Kyoto Protocol, 1997 set the key target of the reduction of specified greenhouse gases to at least 5 % below 1990 levels by 2008–12.

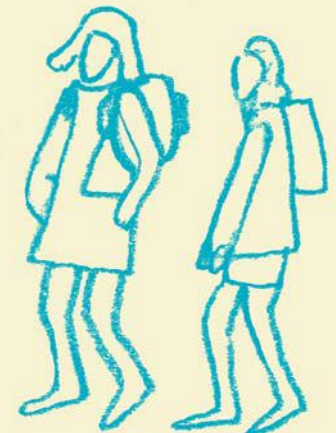
^(?) The September, 2001 EC White Paper, Communication COM(2001)370 'European transport policy for 2010; time to decide' sets out a European strategy for tackling the problems of rising personal motorised mobility.

^(*) Source: European Commission Eurobarometer, <http://europa.eu.int/comm/environment/>

^(*) Source: Flash Eurobarometer, April 2002 (EC – Environment DG).

^(*) Source: Eurobarometer 1999.

'In your opinion, which one of these would make it possible to most effectively solve environmental problems linked to the traffic in town?'



2



Chapter 2

FINDING SOLUTIONS

THE TRADITIONAL APPROACH TO THE PROBLEM

As car ownership and use have increased over the past 30 years the reaction to the pressure created by additional traffic demand has often been to increase the level of supply, in other words provide additional road space. This traditional approach of providing supply to meet demand is no longer always appropriate. There is a growing body of evidence indicating that the benefits of creating additional road capacity are not as significant as was previously believed. In extreme cases the provision of new road links may in fact increase congestion problems. This occurs through a process that is known as traffic 'induction'.

In 1994, the UK Government-commissioned Sacra report ⁽¹⁾ provided evidence on the impact of new road building on traffic levels in the area of the scheme. The report revealed that when new road capacity is provided, overall traffic levels in the vicinity of the scheme may actually increase. The evidence does not offer a reliable means of predicting the extent of this traffic increase but case studies suggest that it is typically around 10 % in the short term, and 20 % in the longer term.

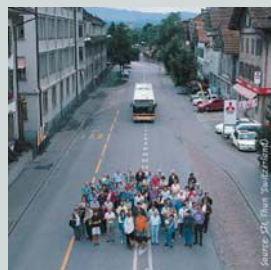
In our cities there is an additional reason as to why the provision of additional road capacity is problematic for city planners – there is simply a lack of available space in which to expand.

⁽¹⁾ Sacra (1994) Standing Advisory Committee on Trunk Road Assessment. 'Trunk roads and the generation of traffic'. Link to this report via European Federation for Transport and the Environment, <http://www.t-e.eu/links.htm>.

The waste of limited urban space



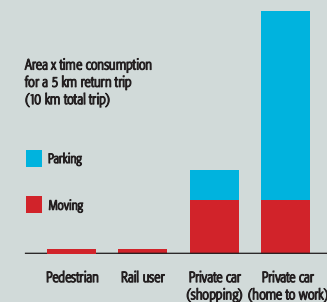
75 people are carried either
by **60 cars**



or only **1 bus**

Every mode of transport uses space for moving and parking over a period of time. Moving and parking can be aggregated into one unit of measurement: space x time expressed in $m^2 \times \text{hour}$.

The most demanding mode of transport in terms of space is the private car. For example, a journey home or to work by car consumes 90 times more space than if the same journey was taken by bus or tram.



Source: Stü, Thun, Switzerland

15

A NEW APPROACH

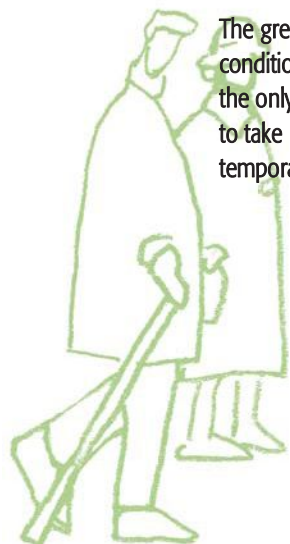
In some cities where there is enough space it may be possible to promote non-car modes of transport (e.g. pedestrianising some streets or restricting them to buses, bicycles and taxis only), without affecting the amount of road space available to private cars. It may also be possible to consider these options where traffic congestion is not severe and where taking road space from private cars will not have much affect on traffic flows even during peak hours.

However, the principal challenge for most European cities is to find ways of using the existing road capacity more efficiently. There is a growing recognition that this may require giving greater priority to more sustainable forms of transport – public transport, pedestrians and cyclists. Some pioneering cities, for example Copenhagen in Denmark, have adopted such a policy for many years with great success (see pages 16 and 17).

The greatest challenge is presented in cities or areas of cities where road conditions are already congested, in particular during peak times. In these cases the only way to provide more space for more sustainable modes of transport is to take road space from private cars, either on a permanent 24-hour or on a temporary 'shift' basis.

Taking capacity away from the dominant road user (i.e. the private car) is a brave decision for an authority to take. Logic suggests that if a network is already congested, the removal of capacity can only exacerbate the situation.

Public concerns usually focus on predictions of traffic chaos and adverse economic impacts. In the face of such reaction, planning authorities and politicians may lose courage and abandon proposals to reallocate road space. In such circumstances new ideas, such as the concept of 'traffic evaporation' (which challenges the assumption that traffic congestion will necessarily worsen if road capacity is reduced), can lend valuable support as to the technical feasibility of creative traffic management solutions.

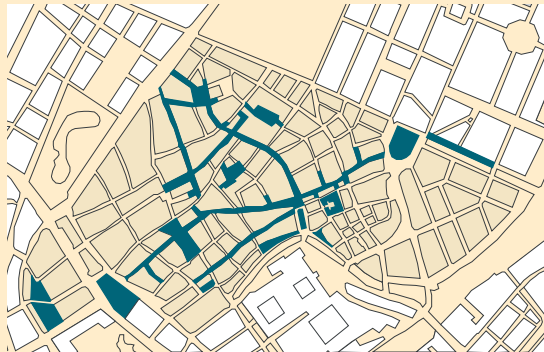


*Development of
car-free streets and
squares in
Copenhagen city
centre —1962-96*

1962 : 15 800 m²



1996 : 95 750 m²



'Instead of wide, noisy streets in and out of the city and six storey underground parking all over the city centre, Copenhagen has opted for fewer cars and an extremely attractive city centre. Copenhagen is living proof that it works'. (Jan Gehl and Lars Gemzøe 1996).

COPENHAGEN— A CITY WITH A VISION

Until 1962, all streets in the medieval city centre were filled with cars and all the squares were used as car parks. As car traffic increased, conditions for pedestrians were rapidly deteriorating.

On 17 November 1962, Copenhagen's main street, Strøget was pedestrianised. This conversion was hotly debated at the time. People argued that a pedestrian street in Denmark would never work. However although scepticism was high, the new car free environment proved extremely popular with local residents from the first day.

This marked the beginning of a gradual transformation that has continued ever since. Today Copenhagen has a vibrant city centre that attracts visitors throughout the year.

Today the city of Copenhagen has over 96 000 m² (of which 33 % is street and 67 % city squares) of car-free space.

While pedestrian traffic levels have remained largely unchanged over past decades, activities connected with stopping and staying are almost four times greater than in 1968. During the summer months many of the pedestrian streets are full to capacity with people enjoying the many outdoor social and cultural activities. In the winter months attractions include festivals, and outdoor ice skating.



Strædt before (left) and after (right) pedestrian prioritisation in 1992

As the streets and squares in the city centre have been pedestrianised and improved, the area has become more attractive yet also less accessible for the motorist. The city authority has adopted an integrated traffic management strategy for the city centre:

- limiting the number of parking spaces (charges for on-street parking are relatively high);
- reducing the number of lanes on several main routes into the city and using the space for bus and cycle lanes instead;
- restricting through traffic;
- while developing the suburban train, bus and bicycle networks.

In the city centre, 80 % of all journeys are made on foot, and 14 % by bicycle. Car traffic in the city core has been reduced and congestion is not a problem.

The key to the success of these inner city transformations was undoubtedly the gradual way these rather drastic changes were made. This incremental approach has given residents time to adapt, to change from driving and parking their cars to walking, using bicycles and public transport.



Rådhuspladsen
(Town Hall Square)
before (above) and after
(below) transformation
in 1996

Source: 'Public spaces, public life', 1996, Jan Gehl and Lars Gemzøe, The Danish Architectural Press and the Royal Danish Academy of Fine Arts School of Architecture Publishers.

Source: 'New city spaces', 2001, Jan Gehl and Lars Gemzøe, The Danish Architectural Press.

CHALLENGING ASSUMPTIONS: THE CONCEPT OF TRAFFIC EVAPORATION

There is a growing body of evidence that where well-planned measures to reduce road space for private cars are implemented in congested areas and where no alternative network capacity is available, over the long term the

predicted traffic chaos does not occur. This evidence is most notably presented in an important report ^(?) commissioned by the UK Department for Environment, Transport and the Regions ^(?) and London Transport ^(?).

'Traffic impact of highway capacity reductions – assessment of the evidence (1998)' S. Cairns, C. Hass-Klau and P. B. Goodwin

Data taken from nearly 100 locations showed traffic chaos to be limited to a 'settling-in period'.

- **Wide range of results, with a 25 % average overall reduction in traffic and a 14 % median reduction in traffic (i.e. 'traffic evaporation').**
A proportion of traffic which had previously used the affected road(s) could not be found in neighbouring streets.

Traffic evaporation is likely to occur where road space has been reduced for private cars and where, due to general traffic levels or the design and area covered, drivers cannot find:

- an alternative route, or
- an alternative time of day to travel,

without experiencing severe congestion (recognising that driver behaviour will also be affected by additional factors such as the availability of alternatives including avoiding the need to travel or making use of public transport).

Contrary to widespread assumptions car drivers adapt to changes in road conditions in highly complex ways which computer models cannot accurately predict.

Short term

- initial cramming of roads was followed by searching for alternative routes and times to travel.

Medium term

- More varied and flexible trip-planning;
- changing mode of transport;
- reviewing the need to travel;
- trip combining.

Longer term

- switching locations of activities or even home or workplace.

Individually or in combination these diverse driver responses to congestion can result in a proportion of traffic 'evaporating'

^(?) Cairns S, Hass-Klau C, Goodwin P B (1998) 'Traffic impact of highway capacity reductions: assessment of the evidence': London, Landor Publishing.

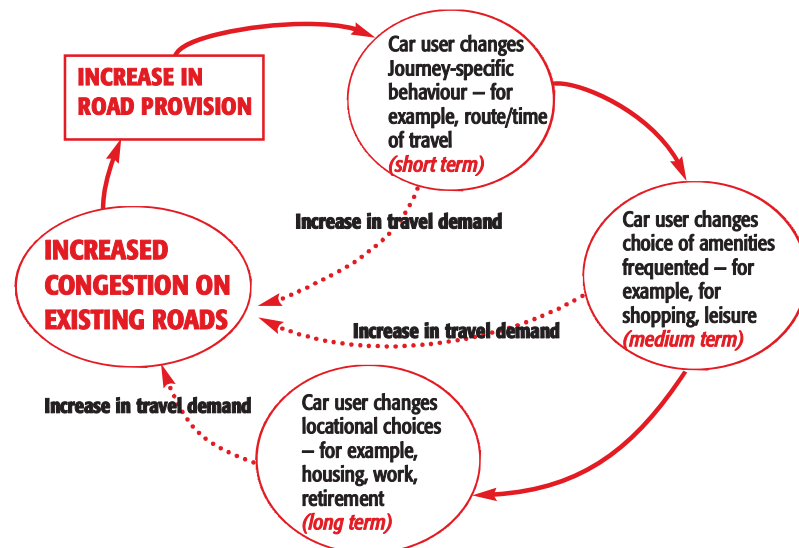
^(?) Now the Department for Transport, Local Government and the Regions.

^(?) Now Transport for London.

Support for the concept of traffic evaporation can be found indirectly in the similar, but opposite phenomenon known as traffic induction (where traffic generation occurs in response to new road provision). Whilst not proof itself that traffic evaporation will always result from road capacity reduction, this concept equally relies upon the complexity and adaptability of driver response to changes in road conditions.

The traffic induction cycle

- In the short and medium term, some people will simply use the time savings afforded by the new road to drive further – for example, to a shopping centre.
- In the longer term the road will influence people's locational decisions particularly with respect to where they choose to live in relation to their work.
- The evidence again suggests that some people will simply choose to travel further in the same time rather than 'accept' the time-saving on offer.



The capacity of individual car users to change their travel behaviour in a range of creative ways, when faced with the problem of severe traffic congestion, presents real opportunities for urban planners who seek to optimise the use of space and quality of life in the city.





Opportunities for regeneration

- Case study 1 – **Kajaani** - FINLAND
- Case study 2 – **Wolverhampton** - ENGLAND
- Case study 3 – **Vauxhall Cross – London** – ENGLAND

From urban smog to urban life

- Case study 4 – **Nuremberg** – GERMANY

Creating space for sustainable transport

- Case study 5 – **Strasbourg** – FRANCE
- Case study 6 – **Ghent** – BELGIUM
- Case study 7 – **Cambridge** – ENGLAND
- Case study 8 – **Oxford** – ENGLAND

Chapter 3

CASE STUDIES

The case studies presented give a taste of some of the innovative approaches that local authorities and politicians are taking in towns and cities in Europe to tackle the growing problem of motorised traffic. Each city's road space reallocation project has been one part of an integrated strategy with a number of complementary elements including upgrades to public transport, improvements to walking and cycling facilities, and renovation of the urban streetscape. In each case study it is possible to identify a particular benefit resulting from road space reallocation. The case studies have been divided into groups in order to illustrate the following themes:

- Opportunities for regeneration;
- From urban smog to urban life;
- Creating space for sustainable transport.

In the majority of the case studies, planners and politicians have encountered opposition on two main counts: firstly that existing congested conditions will be made worse and secondly that retail trade will suffer. In some cases the protests have been very powerful. In each of the examples, a long period of consultation and extensive communications campaigns have been undertaken, in some cases lasting many years. At the end of this consultation period, despite opposition, the road space reallocation has gone ahead. In all cases, after an initial 'settling-in' period, the predicted traffic chaos did not materialise and a proportion of the traffic disappeared. The scale of the impacts on retailers is more difficult to judge; however in the majority of cases, trade has improved.

The overriding motivation in all these examples has been a vision and commitment to finding more sustainable and socially inclusive transport solutions. The aim has been to improve the quality of life of those who visit, work or live in the city.



CAVEATS

It is important to acknowledge that for some of the case studies included in this report, the traffic data available is not always complete, or able to give a sufficient perspective through time. Some cases necessarily rely upon observations by transport department officers.

There may be a number of sources of bias in monitoring data which affect interpretation of changes in traffic volumes. Note, in particular, the following points:

- ➔ Random variations due to the 'natural' variability in traffic are not reflected in one-day traffic counts.
- ➔ Traffic counts are unlikely to take full account of longer distance detours (outside a measurement zone) made on some journeys by drivers avoiding the road measures.
- ➔ Short distance diversions within the study area will not be detected using screen line measurements which only record the number of vehicles passing – changes in the number of trips or mode of transport used will not be detected.
- ➔ Traffic growth which occurs due to non-road measure factors such as increases in income, car ownership, demographic effects or land-use changes will not be readily isolated from the actual impact of road capacity reduction. This may lead to a significant underestimation of the positive effects of road capacity reduction.

Despite these caveats, the case studies presented here confirm previous research showing that, in the majority of road capacity reallocation case studies, a significant reduction in traffic was observed, despite a broader context of rising levels of car ownership and general increasing levels of traffic in urban areas.

Case Study 1

Kajaani, FINLAND

This case study involved the closure of the main square and a section of the main high street in Kajaani to traffic as part of an integrated response to traffic congestion and urban decline.

Prior to the road reallocation scheme approximately 13 000 vehicles per day drove through the main square. Now there is no car traffic. Traffic flow in streets adjacent to the square has risen from 1 000 to 6 500 vehicles per day, while in other streets there has been no change in traffic flows (¹). Some of the traffic has 'evaporated', more trips in the city centre are now made on foot.



BACKGROUND

Kajaani lies 570 km to the north of Helsinki in north-east Finland. The city dates from the 17th century and is the cultural, industrial, administrative and commercial centre of its region.

During the early 1990s Kajaani city centre was in decline due to a combination of factors including:

- traffic congestion in the main high street, and associated problems of air and noise pollution;
- competition from supermarkets;
- net migration of population from the city;
- high level of empty properties leading to urban decay.

THE STRATEGY: HYVÄ KAJAANI 'GOOD KAJAANI'

An active strategy to regenerate the city centre was initiated in 1996 by the local authority, as part of a national initiative 'Better town centres' financed by the Ministry of Environment, the Ministry of Transport and the Ministry of Commerce.

Central to the strategy was the pedestrianisation of a section of the congested main high street and main city square in 1998. Exclusion of car traffic from the main square had been the subject of heated debate for over 20 years. It was finally made possible in 1996 with the support of an alliance of the local authority, developers, shopkeepers and residents (formalised in 1998 with the establishment of the 'city-centre society') in the realisation that action was needed to stem the decline of Kajaani city centre.

(¹) Source: City of Kajaani.

Main square
before and after
pedestrianisation in
1998



The project area has now been upgraded: the whole area is paved with stone, there are new trees, benches, lighting, a performance stage and a fountain. The integrated strategy also includes active marketing of the city centre, the development of new shopping yards, and residential properties above shops along the main street, the promotion of public transport services, some replacement parking outside the pedestrian zone, and the development of new cycle paths both to and within the town centre.

THE RESULTS

Traffic flows

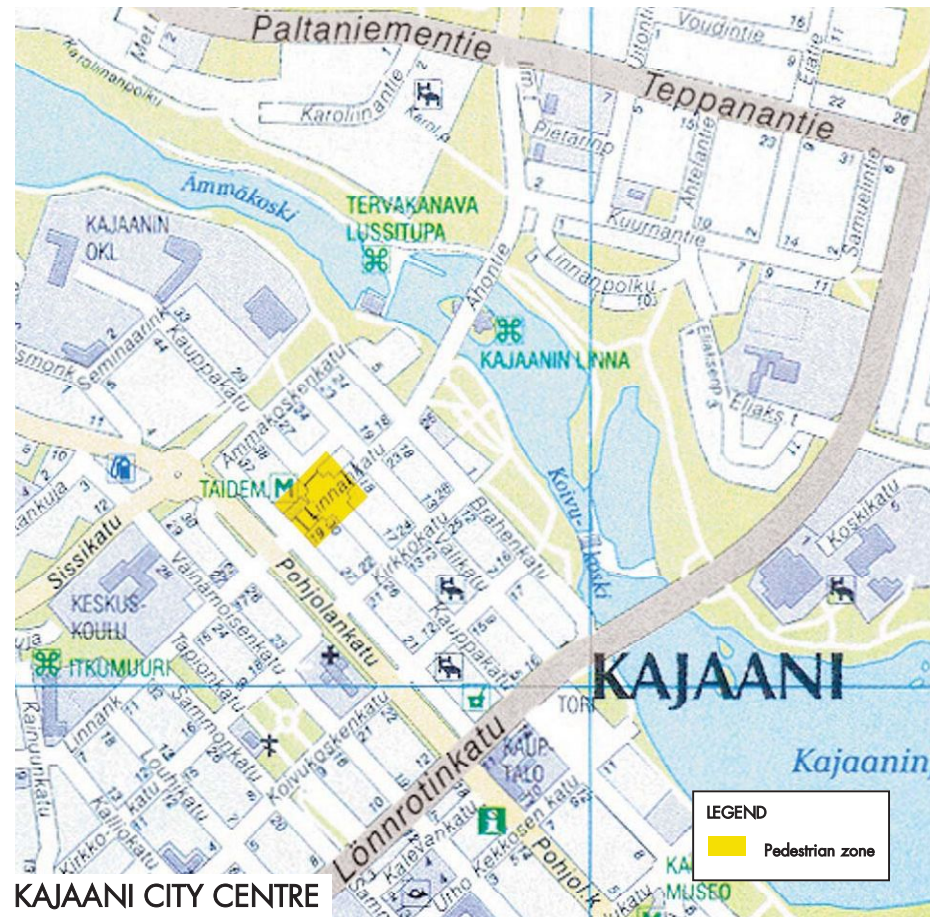
Initially traffic congestion in the project area did increase, but this did not last long. While a proposition of the 13 000 cars per day that once passed through the now pedestrianised city square did transfer to adjacent streets, this did not account for all of the previous traffic volume. Some of the traffic seems to have disappeared or 'evaporated'. There has been an increase in pedestrian journeys to and within the city centre (°).

Enhancement of public spaces and civic pride

A recent opinion poll (°) established that local residents feel that the town centre is now prettier, more comfortable and safer than it was before. The main square is now the place which is shown to visitors and of which the inhabitants are proud. Local people now think that the best way to improve the city centre is to enlarge the pedestrianised area.

(°) Parempi kaupunkikeskusta (Suomen ympäristö 186), Ympäristöministeriö, Helsinki 1998 (in Finnish).

(°) Two hundred on-street interviews were carried out in 1998 and 2000. In addition, 500 questionnaires were sent by post to inhabitants in 1977 (269 responses) and in 2000 (124 responses).





Main square

before (left) and after
(right) pedestrianisation
in 1998

Before the project: 60 % of inhabitants thought that Kajaani was a good town to live in, and 47 % of the inhabitants thought that the centre of Kajaani was beautiful. (1977)

After the project: 80 % thought that Kajaani was a good town to live in and 60 % thought that the centre was beautiful; 55 % wanted the pedestrian area to be enlarged. (2000)

Commercial activity

A survey of retailers (*) found that 52 % felt that the scheme had improved or would improve their business in the future.

KEY SUCCESS FACTORS/LESSONS LEARNT (*)

- **A partnership approach: the formation of a 'coordinating group' and a 'city-centre society' representing stakeholders (the city authorities, developers, shopkeepers and residents) to provide active support for the strategy was the key success factor in this case study.**
- **Clear political vision and commitment by the city council to solving problems of traffic congestion and urban decline, including the difficult decision to prioritise funding for the initiative over competing demands.**
- **An integrated regeneration strategy including road reallocation, improvement of urban environment and a marketing strategy for the city.**
- **Involvement of the public with surveys before and after the implementation of the project.**

(*) Source: Mr Seppo Karpinnen, Managing Director, Esisuunnittelijat Oy (Consultancy).

(*) In 2000, a questionnaire was circulated to all retailers (190 in total) occupying first floor shops in the city centre, 110 responses were received.

Case study 2

Wolverhampton, ENGLAND

This case study examines a response to intense traffic congestion, worsening environmental conditions and declining economic activity in Wolverhampton in the face of competition from other shopping centres in the city of Telford to the west, and the Merry Hill complex to the south-east, and additional planned retail centres.

In 1986, the local authority commissioned 'The Black Country Integrated Transport study' which concluded that building more roads would not solve the growing transport problems. A more effective strategy would be to give greater priority to public transport and to put greater emphasis on improving the urban environment by creating an attractive physical space that would meet the public's expectations.

The response was a four-stage strategy, central to which was the removal of approximately 8 000 through-traffic cars per day from the city centre. The predicted traffic congestion did not occur. A significant percentage of traffic appears to have disappeared from the city centre, a result which could not be solely explained by displacement to other routes.



BACKGROUND

Wolverhampton is located 15 miles to the north-west of Birmingham on the fringe of the West Midlands conurbation. During the 1980s the city experienced the decline of the manufacturing industry and subsequent high unemployment levels.

During this period the city centre was experiencing worsening environmental conditions due to increasing traffic flows, frequent traffic gridlock, decline in the reliability of public transport and reduced access to city centre locations including car parks.

The public image of the city as a shopping centre was in decline. Surveys identified traffic congestion and problems of access as having a significant detrimental impact on the retail industry in the city.

THE STRATEGY: A FOUR-PHASE INTEGRATED TRANSPORT STRATEGY

Between 1987 and 1991, a four-phase transport strategy was introduced with the aim of achieving 'a major impact not only on travel, but also on the future promotion of Wolverhampton as a subregional centre' ^(*).

Private car through-traffic was gradually removed by closing the central core roads, effectively blocking the main north-south and east-west routes through the city, and rationalising circulation within the town centre while implementing complementary upgrading and refurbishment of city centre streets. City centre access was restricted to buses, taxis, pedestrians and cyclists, with restricted access for service traffic. Specific parking spaces were provided for street traders and disabled 'orange badge' holders.

In 1991, the fourth phase was implemented which removed through traffic from the town centre. While key to the success of the overall town centre strategy, this phase was also the most contentious. In preparation for the changes, a lengthy and extensive consultation process was undertaken, backed, critically, by firm political support.

(*) Malcolm Read, Chief Engineer and Assistant Director, Highways and Transportation Division. In traffic engineering and control, 1998.



Queen's Square:
before (left) and after (right) renovation

WOLVERHAMPTON CITY CENTRE



RESULTS

Traffic flows

With each phase, after an initial ‘adjustment’ period, drivers soon became used to the new road layout and any initial congestion was short-lived.

After Phase 4 in which all through traffic was removed from the city centre, the data suggests that the traffic absent from the inner ring road cordons (which had fallen by 14 % between 1990 before the closure and 1996) appears not to have transferred to the outer ring road, where the cordon count went down by just over 1 %. Some of the traffic appears to have ‘evaporated’.

Effects of road closure on traffic flows

24-hour, two-way traffic flows	November 1990 before Phase 4	November 1996 after Phase 4	Total change
Cordon on approach roads outside ring road	222 900	220 300	-2 600 (-1.17 %)
Cordon on roads within the ring road	81 500	69 750	-11 750 (-14.42 %)

Source: Wolverhampton City Council.

Queen's Square:
before (left) and after (right) renovation



Public transport

With each phase of the scheme, public transport reliability improved. Public transport has increased its modal share of trips from 23 % in 1994 to 26 % in 2000. The current target is 29 % by 2006.

The project has been a success and has had knock-on effects in the proliferation of public transport opportunities, which were contingent on the closure of the city centre to through-traffic, including a number of priority bus lanes linking the city centre with the city outskirts, and a new city centre connection with Birmingham via the light-rail rapid transit system.

Public opinion

Initial negative reactions from the local media and some local groups became more favourable as the benefits of the scheme, a cleaner, safer and more attractive city with better access, became more apparent.

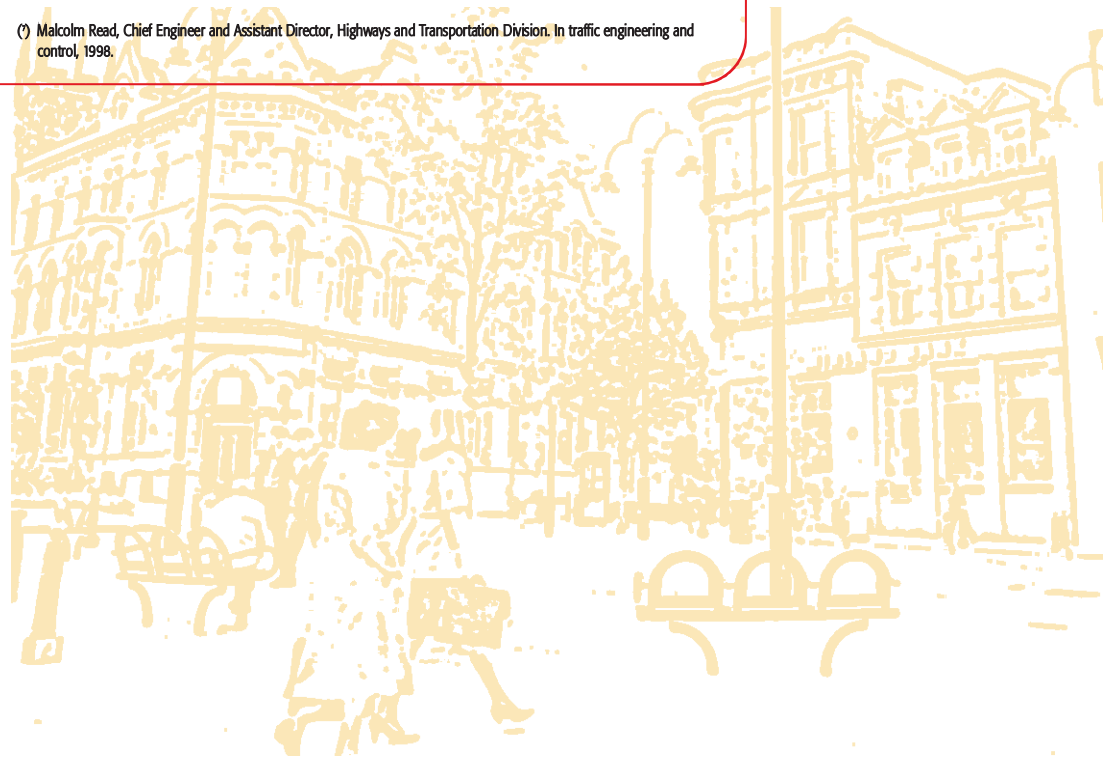
Civic pride

The improved image of the city and the enhanced shopping and general commercial environment is one of the most positive aspects of the scheme. In 1993, Wolverhampton won the 'Town-centre environment award', awarded by the British Council of Shopping Centres. Wolverhampton was made a city in November 2000. The quality of the centre continues to improve with new investment being attracted and a major phase of expansion of the city's university initiated. These improvements have been contingent upon better city centre access and environmental quality.

KEY SUCCESS FACTORS/ LESSONS LEARNT

'The principal lessons learnt have been the need to have a clear vision of the future importance of harnessing public support through high-profile publicity and consultation, and when doubts begin, of firm political support.' (*)

(*) Malcolm Read, Chief Engineer and Assistant Director, Highways and Transportation Division. In traffic engineering and control, 1998.



Case study 3**Vauxhall Cross, London, ENGLAND**

Transport planners have used the concept of traffic evaporation to win support for London's first fully integrated public transport hub at the Vauxhall Cross interchange in the south London Borough of Lambeth.

Initially computer modelling indicated that excessive congestion would occur if traffic volumes across critical stop lines at the junction were reduced by 20 %, the reduction considered necessary to provide the space and capacity needed for the proposed interchange. Vauxhall Cross experiences some of the highest peak period traffic volumes in London, 9 000–10 000 vehicles per hour.

The scheme met with considerable resistance from traffic engineers. The argument used to overcome their resistance was in part the research work undertaken by Goodwin, Hass-Klau and Cairns ('Traffic Impact of Highway Capacity Reductions', 1998), but also the quality of traffic modelling used to validate existing conditions, thereby providing confidence that the scheme designers could devise an appropriate solution.

An on-site experiment was conducted, during which road capacity was effectively reduced by 15 % through a combination of road layout alterations and traffic-light sequencing adjustments.

No significant congestion or tailbacks occurred, and the experiment appeared not to cause any significant problems in Lambeth or neighbouring boroughs. In fact a 2–8 % reduction in peak time traffic was observed and traffic queues were shorter than before.

The evidence was convincing and approval has been won for the scheme. Work on the interchange has recently begun (June 2001). In all GBP 8

Aerial view of the
**Vauxhall Cross
interchange**



million (EUR 13 million) of the total estimated construction costs of GBP 16 million (EUR 26 million) have been granted by central government. A partnership led by Transport for London, between the Mayor of London, the London Borough of Lambeth, the London Development Agency, the Cross River Partnership, Railtrack and others is to manage the way forward.

BACKGROUND

The highly congested Vauxhall Cross interchange is situated in the London Borough of Lambeth at one of the crossing points over the River Thames. The junction includes a multi-lane gyratory roundabout system and bus, underground and overground railway stations which are not linked. Pedestrians are forced to use a combination of overground and underground walkways, or to cross multi-lane highways. There is no provision for cyclists.

Local residents have one of the lowest car ownership rates in London, yet their lives are significantly affected by the negative impacts of the car, including severance to walking and cycling routes, poor air quality, noise pollution and high accident rates. The effects of excessive car traffic have a generally negative impact on the quality of life in the area. The Borough has high unemployment rates and the area is in need of regeneration.

THE STRATEGY: THE VAUXHALL CROSS PROJECT

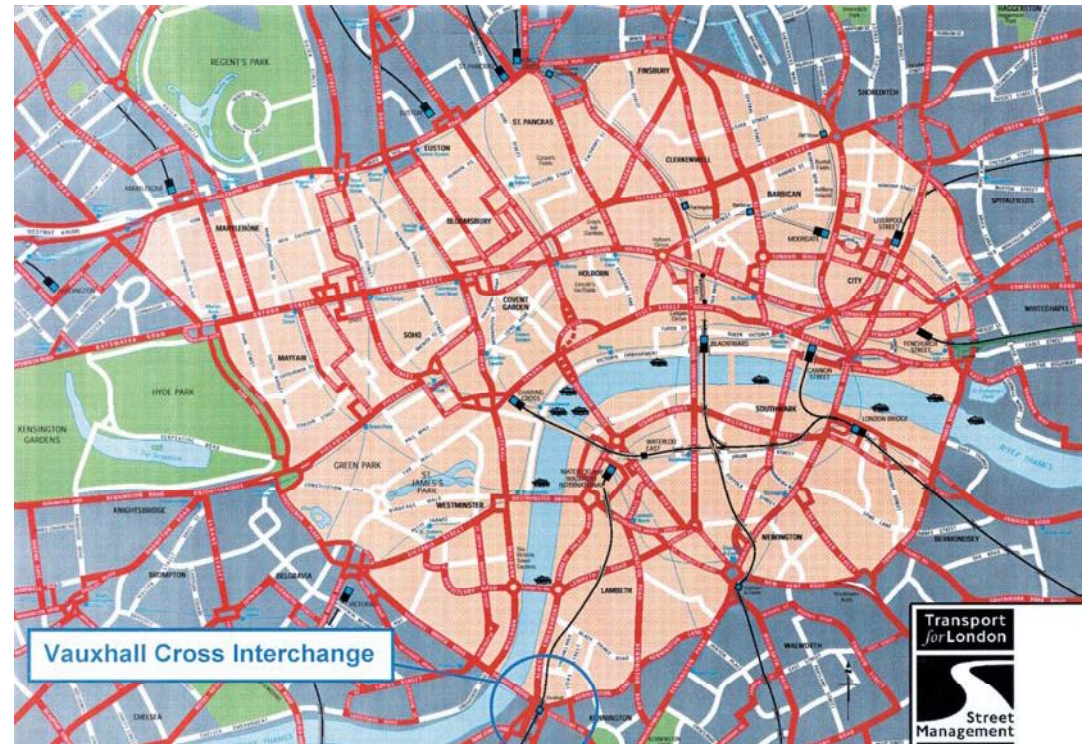
The 'Vauxhall Cross Project' is part of a planned transport-led urban regeneration scheme, the Vauxhall Cross Capital Challenge. The core objective of the strategy is to redress the dominance of car traffic, make it easier to travel into central London by bus, underground and rail, and at the same time to regenerate the local environment via local improvements in order to attract micro and macro investment to the area.

The project, which will provide a fully integrated transport interchange, will include a new covered bus station with direct pedestrian access to the railway and underground stations. The scheme also includes comprehensive safe, surface level pedestrian crossings, dedicated cycle facilities, improvements in lighting and general environmental upgrading.

The project area will be defined by a distinctive landmark feature, 'The Ribbon' (see page 30) located at the bus station

In order to win local authority approval for the scheme, planners had to prove that it was possible to reduce traffic volumes across critical internal stop lines by 20 %, thereby significantly reducing the available road capacity for car traffic. However early computer modelling using Transyt (traffic network study tool) predicted significant queuing of up to 267 % above the baseline data at the morning peak. Additional concerns were raised that congestion in the surrounding area may be worsened with further delays to bus services. The technical feasibility of the scheme appeared doubtful.

Planners turned to the concept of 'traffic evaporation' to provide an alternative hypothesis: 'the amount of space proposed to be taken away from the private car was thought to be problematic, but when the research findings of Goodwin et al. were considered, an experiment was thought fruitful, after all the prize was so great' (Brian Fitzpatrick, former project champion).



Map of Central London illustrating the position of the Vauxhall Cross interchange

Architects impression of the new integrated transport interchange with 'The Ribbon' landmark feature



Experimentation started in May 1999. Initially traffic flows across critical stop lines were reduced by 10 %, and this was subsequently increased to 15 %. Rigorous computer modelling and a scale model of the junction were also used to support the argument.

During the initial stages, the scheme met with considerable public opposition. The media were negative as it was the first traffic reduction scheme proposed on such a large scale in London and at such a strategic junction. Various organisations predicted gridlock and chaos. However cross-party political support (from the local member of parliament and local councillors) for the scheme was consistent.

A comprehensive consultation process was undertaken including all local stakeholders. Lambeth Borough Council employed a public relations company to publicise the scheme with a planned campaign in newspapers, on radio and television, and via a web site. Local traders were involved in an arts project which devised a number of products, including paper bags for goods in shops, on which were printed a description of the scheme and a freepost feedback address. A 24-hour feedback phone line was set up.

RESULTS

The predicted traffic chaos did not occur either in the immediate project area, or in neighbouring boroughs. A 2–8 % reduction in peak time traffic was observed and traffic queues were shorter than before.

It is not possible to conclude definitively that a percentage of the traffic has 'evaporated', as the route choices available to drivers in London are made many miles away from the project area. However an exploration of the theory of traffic evaporation enabled project planners to explore different solutions and to challenge traditional orthodoxies. The outcome has been successful with the recent approval of the innovative scheme in which more sustainable transport modes are prioritised.

KEY SUCCESS FACTORS/LESSONS LEARNT (*)

- **Believe in and prove your case technically; gain the confidence of partners or critics that your proposals are based on firm, technical, 'observed' evidence.**
- **Measure and monitor all possible aspects of the situation before, during and after any trial scheme. Be willing and ready to share all information, hide nothing.**
- **Consider employing a dedicated communications officer for the project. Investment in good public relations throughout what may be a long process, is vital if acceptance for a scheme is to be won.**
- **Listen carefully to both positive support and criticism, be prepared to be flexible and make adjustments in the light of all feedback.**

(*) Mr Brian Fitzpatrick, former Head of Transportation and Highways, Lambeth Environmental Services.

'Less cars, cleaner air: From urban smog to urban life'

Case study 4

Nuremberg, GERMANY

Since the early 1970s, the historic city centre has been gradually pedestrianised, in particular in an attempt to address the issue of worsening air quality. Despite many warnings from transport planners that this would cause traffic chaos in the surrounding roads, the chaos did not in fact occur.

On four occasions when heavily congested roads were closed to cars in the city, some of the traffic appears to have 'evaporated'. Traffic volumes on the other streets grew by only 20–29 % of the traffic originally on the then closed roads. At the same time, the decline in visitors predicted by retailers did not occur, in fact rather the opposite occurred in the newly pedestrianised streets (*).

Despite this experience, the trial closure of the final through-route through the city centre in 1988 met with strong resistance, in particular from shopkeepers. Forecasts predicted that the pedestrianisation of Rathausplatz/Theresienstrasse Square (thereby closing a road which carried on average 25 000 cars/16 hours) would result in traffic chaos in surrounding streets. This chaos did not materialise.

After one year, traffic monitoring revealed that overall traffic flow in the historic city was reduced by up to 25 %, and the increase in traffic in adjacent streets proved very limited, ranging between 4 and 19 %, well below experts' forecasts (in some cases a decrease was observed). Some of the traffic appears to have evaporated. Cordon counts carried out on the outer ring road to see if the 'missing traffic' had been displaced elsewhere showed that traffic counts had also fallen there.

Significant improvements in air quality have been achieved.

BACKGROUND

In the early 1970s, the city centre of Nuremberg in Northern Bavaria, with its narrow streets, historic monuments and shopping areas, was facing growing problems of traffic-related air pollution, causing decay of historic buildings, health concerns, and excessive traffic congestion in the city centre.

THE STRATEGY: 'CIVILISING URBAN TRAFFIC'

Since the 1970s, the city authorities have adopted a progressive strategy to give priority to more sustainable, less polluting modes of transport, to provide better access to shopping and offices within the area, and to improve parking space management.

The removal of car traffic from the city centre was carried out in phases, culminating in the closure of the last major traffic corridor through the city centre between 1988 and 1989. Access for public transport was still permitted. In 1989, following wide ranging consultation and a close vote by the city, the pedestrianisation was made permanent.

Over the next 10 years, the area has been transformed in six phases into an attractive pedestrian precinct, buildings have been renovated, street furniture upgraded and art works introduced. The area has become a pleasant place in which to stroll and enjoy street cafés free from pollution and congestion.

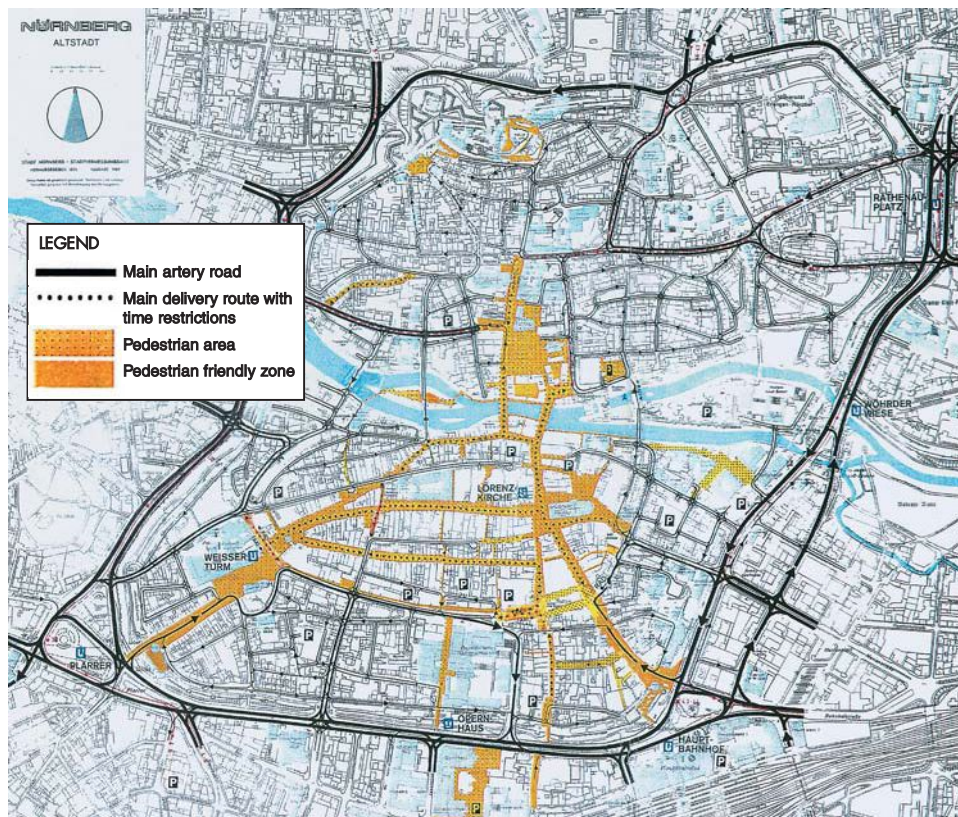
Popular support for the pedestrianisation scheme has been proved to be strong. Proposals to reopen the Rathausplatz/Theresienstrasse through road to car traffic following a change in political leadership of the city in 1996 were not realised due to public objection.

(*) Moving away from the motor vehicle, 'The German and Hong Kong Experience'. (1994) Edited by Harry T. Dimitriou. Centre for Urban Planning and Environmental Management, University of Hong Kong.

*The inner city of Nuremberg
after the renovation
Rathausplatz (left),
the central market square (right)*



NUREMBERG CITY CENTRE



Source: Stadt Nürnberg Verkehrsplanungsamt, Mai 2002

RESULTS

Traffic flow

First two months after Rathausplatz/Theresienstrasse Square closure to traffic:

- increase in traffic congestion;
- the municipality faced considerable critical opposition from the public and the media.

After 6–8 weeks

- traffic adjusted to the new situation and the congestion problems were resolved;
- support for the scheme grew as the advantages of the project became clear, especially in spring time when people could enjoy urban street life.

Extensive traffic monitoring was carried out to assess the impact of the road closure on traffic in the historic centre.

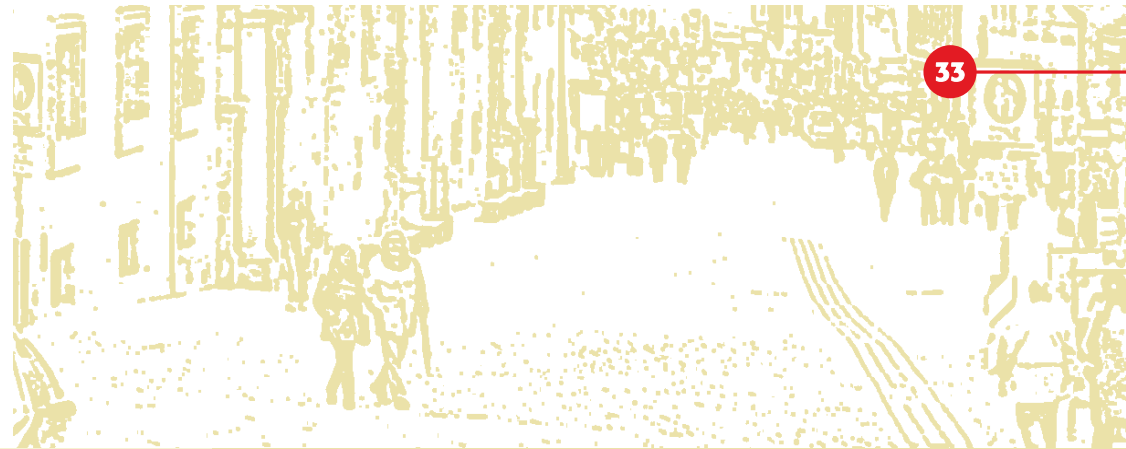
The actual traffic reduction (21 176) in the historic city centre was twice as large as that predicted. By 1993 a total of 36 044 vehicles had disappeared and figures (although incomplete for 1997) suggest a further reduction in traffic levels (see page 33).

In order to see if the 'missing traffic' was being displaced to roads inside the outer ring road, screen line counts at the city's 12 bridges were carried out (— indicates period of road closure)(see page 33).

The statistics show that rather than an increase in traffic flows, there was an overall reduction of approximately 10 000 vehicles between 1989 and 2000, despite an overall increase in car ownership during this period.



The *Theresienstrasse* after renovation



IMPACTS ON TRAFFIC IN THE HISTORIC PART OF THE CITY (*)

Traffic count total: motor vehicles/16-hour monitoring period								
Traffic count location	July 1988	Forecast changes due to road closure	Real Change	Jan 1989	July 1990	July 1991	July 1993	July 1997
Rathausplatz	24 584	-24 584	-24 584	0	0	0	0	0
Wohrder tor	15 899	-1 000 to -2 000	-1 606	14 293	14 974	13 600	10 780	9 985
Lauer tor	13 877	-4,000 to -5,000	-5 525	8 358	9 773	8 205	9 310	8 872
Maxtor	13 577	0	+540	14 117	13 538	12 819	10 033	9 384
Maxtorgraben	31 150	1 400 to 2 400	+1 446	4 596	6 447	7 098	8 136	No data available
Vestnertorgr	6 754	1 800 to 2 500	+1 389	8 143	9 692	8 726	7 804	7 738 (*)
Heubücke	9 390	800 to 1 200	-1 761	7 629	7 795	6 138	(*)	1 549 (*)
Allertor	22 369	-7 000 to -8 000	-12 259	10 110	10 727	10 099	9 761	9 013
Maxbücke	6 852	-800 to -1 300	-3 399	3 453	2 582	2 532	(*)	1 247 (*)
Total	91 868*	-9 600 to -11 400	-21 176	70 692	75 578	69 219	55 824	(47 787)

(*) This includes the traffic on Rathausplatz (24 584 vehicles), whilst the other counts in this row do not as Rathausplatz was closed. The total for the other counting locations (excluding Rathausplatz) was 67 284 prior to its closure.

(*) and (*) extension of pedestrianised area.

(*) Counts from Spitalbrücke which is next to Heubücke.

(*) Newly opened for local purposes.

(*) Counts July 1999.

(*) Source: Stadt Nürnberg 2001.

Traffic flows over 12 bridges screen line (")

Year	Total	Percentage	Road Closure
1981	224 839	100.0	
1982	220 800	98.2	
1983	234 361	104.2	
1984	237 094	105.5	
1985	239 696	106.6	
1986	244 963	109.0	
1987	249 182	110.8	
1988	253 988	113.0	
1989	241 831	107.6	
1990	245 756	109.3	
1991	245 853	109.3	
1992	244 469	108.7	
1993	238 312	106.0	
1994	236 980	105.4	
1995	229 685	102.2	
1996	229 064	101.9	
1997	231 741	103.1	
1998	231 110	102.8	
1999	230 086	102.3	
2000	231 829	103.1	

(*) Source: Stadt Nürnberg 2001.

Table showing the impact of pedestrianisation on air quality in the historic city centre of Nuremberg ^(*) ^(*)

Pollutant	Data for 1982/83 before pedestrianisation $\mu\text{g}/\text{m}^3$	Data for 1988/89 after pedestrianisation $\mu\text{g}/\text{m}^3$
Sulphur dioxide (SO_2)	33	28
Nitrogen monoxide (NO)	122	86
Nitrogen dioxide (NO_2)	100	61
Nitrogen oxides (NO_x)	139	90
Carbon monoxide (CO)	3 400	2 980
Particulate matter	77	64
Lead (Pb)	0.249	0.248

Air quality

Two months after the road closure:

- Initially air quality in the zone surrounding the project area deteriorated due to a combination of factors including unfavourable meteorological conditions (the project started in the late autumn a season characterised by poor air exchange/flows, increased emissions in the city due heating and increased Christmas traffic.

One year after road closure (see table above)

- air pollution decreased significantly in an area that correlated closely with the road closure area;
- in the historic city centre emissions of nitrogen dioxides decreased by about 30 %, carbon monoxide and particulate matter by about 15 % – this was predominately driven by pedestrianisation.

Improvements in nitrogen dioxide levels

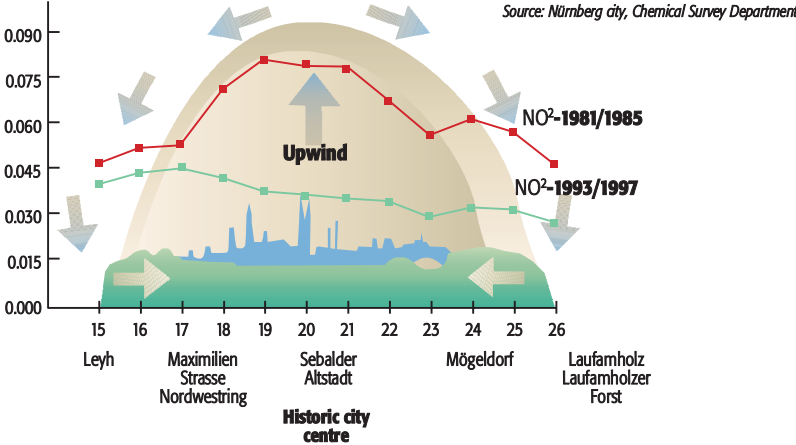
As the graphic above illustrates, there has been a fundamental change in the spatial air structure of nitrogen dioxide pollution.

During the period 1981–85 (before the road closures), NO_2 levels over the urbanised area formed a bell-jar-shaped cover. Pollution levels reached a peak in the centre of the city with annual mean NO_2 concentrations of $> 80 \mu\text{g}/\text{m}^3$ in the city centre, falling to $35\text{--}40 \mu\text{g}/\text{m}^3$ in the suburbs.

By 1993–97, following the city centre traffic restrictions, the structure of the NO_2 pollution had changed and now resembled a shallow crater-like cover over the inner city. Nitrogen dioxide levels in the city centre had fallen to levels similar to those previously found in the suburbs. Higher concentrations of NO_2 had shifted to a zone over the ring-road system.

^(*) Data collected from fixed air quality monitoring station in the Rathausplatz/Theresienstrasse vicinity, 9 stations (1x1 km grid) covering the historic city centre, another 10 stations around the project area.

Typology of NO_2 pollution in an east–west cut through the city of Nuremberg



While some of this improvement in air quality can be attributed to improved vehicle technologies, lower emissions (tighter national and EU regulations), the introduction of speed limits, and modal shift from private to public transport, the improvement in air quality in the city centre can be directly related to the closure of roads in the city centre to through traffic.

KEY SUCCESS FACTORS/LESSONS LEARNT ^(*)

- Comprehensive public consultation was vital in gaining public acceptance for the proposal.
- Step wise implementation (due to financial constraints) gave time for public acceptance and driver behaviour to adapt.
- Rigorous monitoring of the situation before and after implementation of the scheme was essential in providing evidence in support of the project.

^(*) Dr Peter Pluschke, Head of Department for Chemical Analysis, Environment Division, Stadt Nürnberg.

^(*) Pedestrianisation as a proactive instrument in urban air quality management- a case study from Nuremberg, Germany. Dr Peter Pluschke, Head of Department for Chemical Analysis, Environment Division, Stadt Nürnberg.



Case study 5

Strasbourg, FRANCE

Strasbourg's policy of removing cars from its city centre to make way for public transport, buses, new tramlines, cyclists and pedestrians began in 1992, with the implementation of the first 'plan de circulation'. The plan involved extending the traffic-free precinct in the city centre and banning private car through-traffic; access is restricted to tram, bus, taxi, bicycle and pedestrians. Two new tramlines have been built using road space previously occupied by car traffic.

Predictions of traffic chaos in the city centre, following the removal of through traffic, have not materialised. There has been a significant reduction in the number of vehicles entering the city centre.

In 1990 before the implementation of the strategy, the number of vehicles in the city centre was approximately 240 000 vehicles/day. By 2000 this had fallen by more than 16 % to 200 000 vehicles/day. Forecasts suggest that had the strategy not been adopted, 300 000 vehicles would have been anticipated in the city centre in 2000, i.e. an increase of 25 %. This success has been achieved during a period of overall increase in the weight of traffic in the Strasbourg agglomeration as a whole.

It is not possible to say how much of the traffic has 'evaporated' due to the nature of the data: some of the traffic will have been displaced to orbital routes, but a significant volume of traffic has disappeared. In addition, the strategy has resulted in an increase in cycling, public transport patronage and park-and-ride use.

'Creating space for sustainable transport'

BACKGROUND

The city of Strasbourg situated on the banks of the River Rhine is characterised by canal and river crossings and historic buildings and monuments. The city centre, located on an island, has been designated a world heritage site by Unesco.

During the 1980s, the city was facing growing traffic-related problems: frequent congestion, air and noise pollution, and high accident levels. The city centre was becoming less attractive to visitors. In addition, the scope for providing more space to accommodate growing numbers of private cars was limited due to the historic street pattern with its monuments and historic buildings.

THE STRATEGY: THE URBAN MOBILITY PLAN

The main aim of the plan was to reduce the dominance of the private car and to increase the use of more sustainable forms of transport, public transport, cycling and walking, in the city centre.

In the early 1990s, a decision was taken to build two new tramlines serving the city centre. However, in order to create the road space required, it was necessary to reallocate highway space from private car traffic to make way for the new tramways.

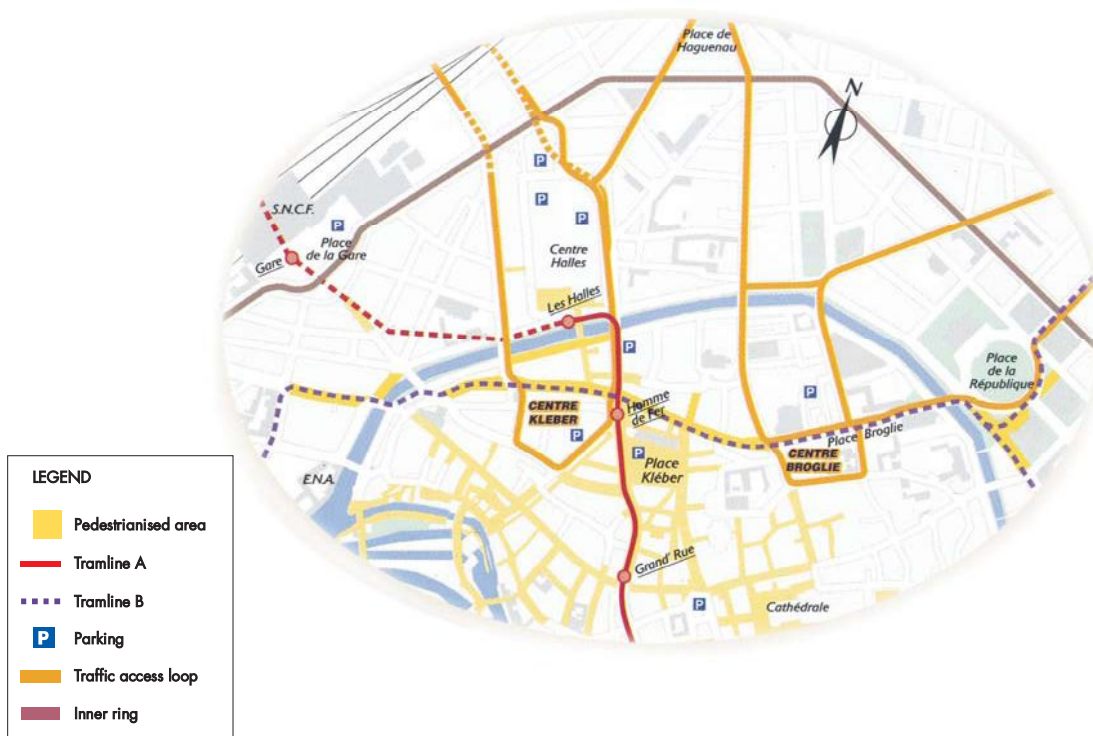
The first step was taken in 1992, and involved the extension of the traffic free precinct in central Strasbourg for a trial period. This traffic free zone was subsequently made permanent and was further extended with the construction of Tramline B.

In addition, through traffic access to the city centre, which represented almost 40 % of general traffic flows, was removed. Access to districts of the city centre and parking facilities has been made possible via a number of 'loops', however it is not possible to pass from one district to another. Through traffic is directed towards large boulevards on the outer circle or bypasses. Provision has been made for restricted local and delivery access in the heart of the city centre. Parking charges have been introduced in

Tramway A – Place de l'Homme de Fer



STRASBOURG CITY CENTRE



the city centre, resulting in a faster turnover, and therefore more efficient use of space. Cyclists and pedestrians have free access to all areas.

The first tramline, Tramline A, was opened in 1994, followed by Tramline B which was completed in 2000. Park-and-ride sites have been built along the new tramway lines, the parking ticket is also the tram ticket for all the parked car passengers. Provision for mobility impaired passengers has been made at tram stations and on tram trains.

Opposition to the scheme was considerable, in particular from retailers in central Strasbourg. They feared that during the works to install the tram, they would lose business as access was reduced to city centre shops, which did in fact occur. It was also feared that pedestrianisation of the city centre would prevent customers from visiting their shops as cars were prohibited from this part of the city. A strong anti-scheme campaign was mounted.

An extensive consultation process was undertaken with local residents, businesses and local associations, and an active awareness-raising campaign was undertaken by the city authorities in partnership with the transport operator. It was the first time that a French city of this size and importance had challenged its citizens' habits to such an extent.

A communication strategy was developed, using magazines and local daily newspapers, ('CUS' magazine, 'Dernières Nouvelles d'Alsace') and posters displayed around the city. The campaign had a symbol, 'Bruno' the bear, which served as a visual aid during the project works. 'Bruno' guided car drivers and pedestrians around the road diversions, and he also informed them about how the works were progressing. A phone centre was set up to deal with questions and complaints.

European Commission

Reclaiming city streets for people — Chaos or quality of life?

Luxembourg: Office for Official Publications of the European Communities

2004 — 52 pp. — 29.7 x 21 cm

ISBN 92-894-3478-3



***Bruno the Bear** was used as the project mascot guiding drivers during the roadworks*

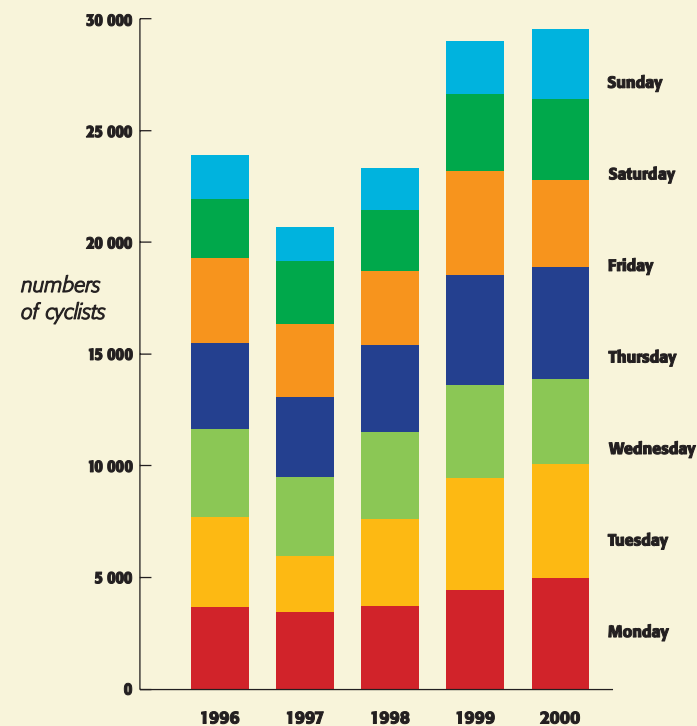
RESULTS

Traffic flows

In 1990, approximately 240 000 private vehicles entered Strasbourg city centre; in 2000, this flow was approximately 200 000. Estimates suggest that without the implementation of the mobility plan, the number of vehicles would currently be 300 000. While it is not possible to estimate how much of this 'missing traffic' has displaced to other streets, it is clear that the strategy reallocating road space to other more sustainable modes has been successful.

- The predicted traffic chaos did not occur. After an initial settling-in period drivers adjusted to the new road layout.
- Public transport services have clearly benefited. Tramline A carried over 68 000 passengers/day during its first year of operation, and it is estimated that the tram led to a 17 % reduction in traffic entering the greater Strasbourg area. Park-and-ride use has increased.
- There has been a significant shift in modal split from the private car to more sustainable modes: in 1989, 72.5 % of all trips were made by private car and 11 % by public transport; in 1999, 60 % of all trips were made by private car and 30 % by public transport.
- The number of trips made by bicycle has increased.
- The success of the strategy to date has provided the stimulus for a further two tramlines to be completed by 2010.

Numbers of cyclists using the Porte Dauphine cycle path 1996–2000



As part of the city's strategy to reallocate road space from the private car to a more sustainable mode of transport, a cycle path was built along the canal by the Porte Dauphine, which provides access to the city centre from the south. As a result, there has been an increase in cycling on most days of the week in this part of the city.

Cycle route – at the junction of Quai du Général Koenig and rue de la brigade d'Alsace Lorraine (left) **Place Kléber** – (right)



Strategy acceptance

Strong opposition to the scheme from some groups has given way to a general positive acceptance and the policy has been politically successful. The project has not resulted in any significant loss in income for retailers – on the contrary, some businesses have seen an increase in their trading figures.

Some traders and certain local residents are now asking for pedestrianisation or for parking charges in their streets. Pedestrianisation increases property values and parking charges stimulate a faster turnover of parked cars resulting in improved business.

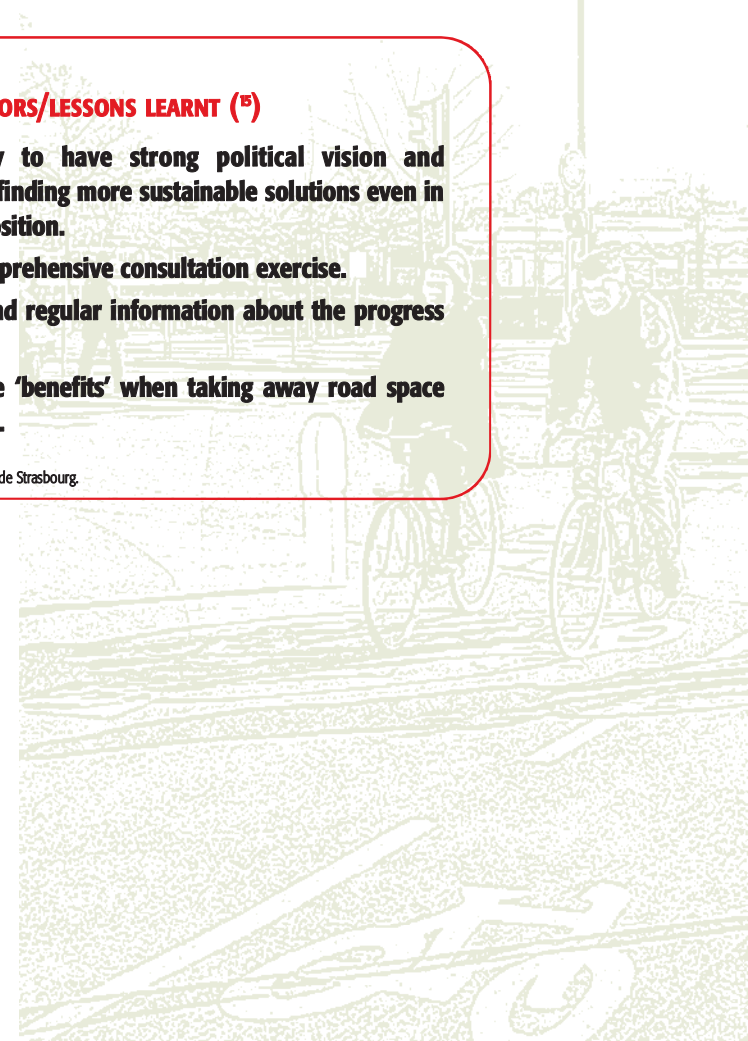
Quality of life

The removal of cars from the city centre to allow space for pedestrians and cyclists has improved the quality of life for everyone, for those living and working in the city, and for tourists. Kleber Square, the historical heart of the city, where once 50 000 vehicles per day passed through, has been restored as a major attraction. Pedestrians are able to enjoy quieter, cleaner and safer car-free spaces, where only trams and bicycles may enter (with the exception of delivery hour periods and emergency vehicles).

KEY SUCCESS FACTORS/LESSONS LEARNT ^(*)

- It is necessary to have strong political vision and commitment to finding more sustainable solutions even in the face of opposition.
- Carry out a comprehensive consultation exercise.
- Provide clear and regular information about the progress of the project.
- Provide tangible 'benefits' when taking away road space from car drivers.

(*) Source: Communauté urbaine de Strasbourg.



Case study 6

Ghent, BELGIUM

In 1997 Ghent implemented the mobility plan in the city centre with the aim of addressing the problems of excessive car traffic which dominated the city's streets and squares. The plan involved the closure of the city centre to all through traffic, as well as a number of traffic management strategies to provide essential access and improved public transport, cycling and walking facilities.

While traffic count data for this case study is not available, observations of the city mobility service confirm that the predicted traffic chaos did not occur and that some of the traffic did in fact disappear.

This case study has been included as an example of a city facing severe traffic problems, yet at the same time encountering strong opposition from some groups to any plans to tackle these issues. Despite these challenges, political support for the innovative mobility plan held fast. The plan was implemented and is generally considered a great success.

The inner city, now free from car traffic, is a vibrant place popular with residents and visitors. Public transport services are now more reliable, patronage is increasing, and more people are cycling.



Ghent historic city centre following implementation of the mobility plan – 1997 (right)
Traffic restrictions in the historic city centre (left)

BACKGROUND

The city of Ghent has a complex structure reflecting a long evolution dating back to the Middle Ages when it was the second most important city in northern Europe after Paris. The city centre covers a large area with no central focus; instead it comprises many squares and narrow streets, with the River Leie running through its centre.

During the 1980s, the city centre suffered the impacts of increasing car traffic, including congestion, air pollution and noise. Air and water pollution was degrading historic buildings and monuments in the city centre. Public transport had little or no priority and conditions for cyclists and pedestrians were deteriorating. Although accident levels were not excessively high, there was a growing general perception of a lack of security. The city's streets and squares, designed over the years to accommodate car traffic, were becoming increasingly unattractive.

Traffic forecasts predicted a considerable increase in car traffic and it was clear that action was needed. However, previous experience had shown that tackling inner city traffic presented a real challenge. In 1987, a 'traffic cell' plan was introduced but withdrawn after five months of opposition and protest by retailers.

THE STRATEGY: MOBILITY PLAN FOR INNER-CITY GHENT

The first steps to tackle urban traffic problems began in 1993 with the adoption of a cycling strategy comprising a number of measures to improve cycling infrastructure in the city. The mobility plan for Ghent city centre followed in 1997.

GHENT CITY CENTRE

**Ghent** – plan du centre-ville

The main aim of the mobility plan is to create a liveable city in which attention is given to all modes of transport and priority is given to pedestrians, cyclists and public transport. The plan includes the following elements:

- The removal of all private car through-traffic by creating a large pedestrian zone (35 ha in total) and traffic-flow measures. Pedestrians, cyclists and public transport are thereby given more space.
- A P-route (parking route) around the city centre ensures optimal accessibility to all destinations and especially to underground parking garages. A parking guidance system makes finding available parking easy.
- Traffic calming has been introduced in the city centre: speed limits in the pedestrianised area have been reduced to 5 km/hour (*) for those with permitted motorised access.
- Streets and squares have been renovated with the aim of making the city centre more attractive to residents and visitors.
- Traffic regulations are enforced by two permanent full time uniformed police who patrol the area on bicycles. Illegally parked cars are towed away.

Planning for the implementation of the strategy started in 1995. Throughout 1996 over 300 public hearings were held as part of an extensive consultation process with all stakeholders. A communications strategy was put in place providing advance information about the road closure, including radio and television commercials, posters and maps showing the proposed road layout changes which were mailed to all households (over 110 000); a telephone information line was also set up. On the third of November 1997, the city centre was closed overnight to through traffic.

The plan met with considerable opposition, in particular from retailers in the city centre and from some groups predicting traffic chaos in the streets around the road closure area. Despite this resistance, political support for the strategy was consistent. The political majority in the city was in favour of the plan, and a strong collaboration between local politicians and the city administration enabled the plan to proceed.

(*) 5 km/hour is the legal speed limit in pedestrian areas established by Belgian traffic law.



*Ghent 'P' (parking) route (left)
and car-free city centre (right)*

RESULTS

Traffic flows

Data describing traffic flows in the city centre before the closure of the area to through traffic and in the surrounding streets following the implementation of the mobility plan are not available. However, the observations of the city mobility department confirm that after a short initial period of increased traffic congestion, as drivers adjusted to the new road layout, the predicted long-term traffic chaos did not occur. While some of the traffic was displaced to neighbouring streets, some of the traffic appears to have disappeared.

'The traffic congestion that was predicted did not occur. Although traffic increased in some streets around the pedestrian area, this was really only a problem during rush hours, but this problem existed before the introduction of the pedestrian area.' (Peter Vansevenant, Director of the Mobility Service, Ghent)

Public transport

Public transport use increased by 3–5 %, an increase of 3 000–5 000 riders per day, during the first two years after the implementation of the plan. Public transport services, trams and buses, have become faster and more reliable. In all 80 % of trams and trolley buses run on separate tracks in the city centre, and circulation is now freed from the problems of parked cars and traffic congestion.

In addition, bicycle use has increased and initial monitoring suggests that accident levels have been reduced by about 30 %.

Quality of life

While some groups, most notably some retailers, continue to oppose the scheme, the implementation of the mobility plan is regarded as a success by residents and visitors.

'Despite some criticism at the beginning, the large pedestrian area in the inner city has created a pleasant and lively city centre. A lot of events (open-air arts festival, open-air music events) are now possible in very fine surroundings. The atmosphere for shopping is now better as well, as no cars can possibly bother shoppers'. (Peter Vansevenant)

KEY SUCCESS FACTORS/LESSONS LEARNT (*)

- **'Communication, communication, communication'**
- **When you remove space for private cars, immediately give back something in return – for example, nicer squares and streets, better facilities for cyclists, more reliable public transport services.**

(*) Mr Peter Vansevenant, Director of the Mobility Service, Ghent.

Case study 7**Cambridge, ENGLAND**

In January 1997, Cambridgeshire County Council introduced an 18-month experimental city-centre road space reallocation scheme, as the first stage of the Cambridge core traffic scheme. The closure of Bridge Street to through traffic involved the removal of approximately 9 000 vehicles/day. Local buses, taxis and licensed hire cars are permitted access via sets of automatic hydraulic bollards.

Despite initial opposition to the scheme on grounds of increased congestion in neighbouring streets, restricted access and loss of trade, a comprehensive review after the first year of the project deemed the experimental closure a success and subsequently was made permanent after 18 months. In August 1999, the second stage of the scheme, the closure of Emmanuel Road to private-car through-traffic, was implemented.

While it is not possible to estimate the percentage of traffic that has evaporated as a result of the road capacity reallocations at Bridge Street and Emmanuel Road, in both cases significant traffic reductions have been achieved on the closure routes (Bridge Street – 85 %, Emmanuel Road – 78 %) without causing unexpected increases on other roads in the area. Monitoring of the River Cam screen line shows that movements across the river have fallen by about 6 000 vehicles a day following the closures. Predictions of traffic chaos and worsening congestion have not materialised.

**BACKGROUND**

Cambridge is a university city with a historic centre characterised by a medieval street pattern, many college buildings with high architectural value, and narrow bridges over the River Cam. Over three million tourists visit the town each year.

The negative impacts of motorised traffic in the city centre are significant. Congestion is a frequent occurrence and public transport services are often delayed. Conditions on the roads in the city centre are considered unacceptable in terms of safety, environment and air quality. Traffic is the major source of air pollution in Cambridge with pollutants and particulates becoming trapped in 'canyon' streets. In 1999 the European guideline value for nitrogen dioxide was exceeded at 24 of the 27 monitoring sites in Cambridge.

Forecasts predicted that by the year 2016 traffic levels in the city would increase by 18 % if there was no further development of the city and its surroundings. However, with the planned development, a 27–48 % increase in traffic was predicted, a situation which was considered unsustainable.

THE STRATEGY – CAMBRIDGE CORE TRAFFIC SCHEME

The Cambridge core traffic scheme aims to reduce the impact of traffic by encouraging the greater use of public transport, walking and cycling. It does not aim to ban cars, but rather to make their use less attractive.

The demand management strategy involves restricting private car access to the city centre by the removal of through-traffic (surveys show that 50 % of all traffic in the core area does not require access). In addition parking restrictions have been imposed with increased charges making a stay of two hours cost more than a park-and-ride day return ticket ('sticks'), while providing complementary improvements ('carrots') in public transport services notably park-and-ride, infrastructure for cyclists and

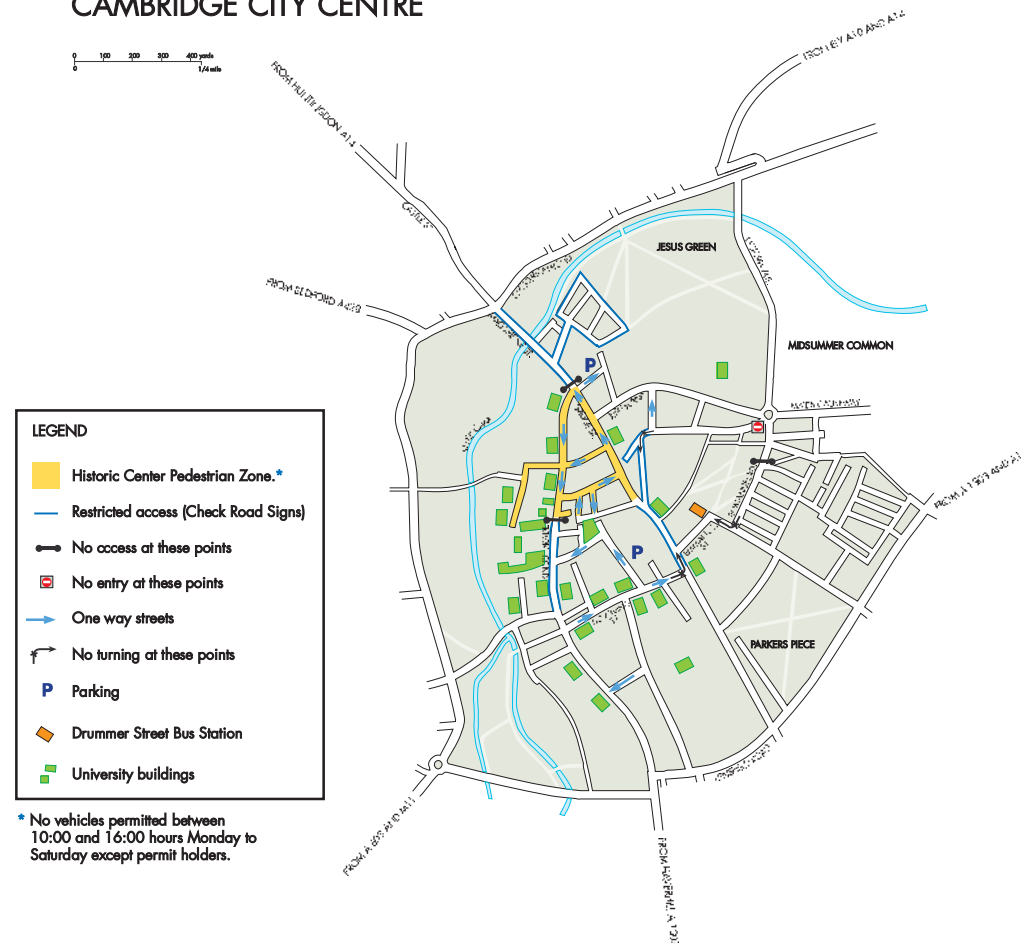
pedestrians, and upgrading of the urban streetscape to encourage the greater use of more sustainable transport modes.

The Bridge Street experimental road closure, implemented in January 1997, was the first step in restricting private car access. Computer modelling of traffic flows predicted significant increases in traffic in some neighbouring streets, and traffic light settings were altered given the new traffic patterns predicted.

An extensive consultation exercise was undertaken with all stakeholders. Public meetings, exhibitions and specific meetings with local groups were held. Leaflets were distributed to promote the scheme. While minor alterations were made to the scheme to improve local access, the meetings were used to emphasise the need to consider the longer term benefits of reduced traffic and reduced pollution as a price worth paying for some inconvenience. An active policy of supplying the media with the reasons for and benefits of the scheme was adopted to counter opposition.

Many lessons learnt during the Bridge Street closure were applied during the subsequent implementation of the second stage of road space reallocation with the closure of Emmanuel Street to private vehicle through traffic. This phase of the scheme has also been a success. As with the Bridge Street closure, opposition to the scheme was reduced as the positive benefits of the closure and associated improvements in alternative transport modes became apparent.

CAMBRIDGE CITY CENTRE





Artist's impression of refurbished Bridge Street following road closure to through traffic in 1997.

Bridge Street before traffic restrictions



RESULTS

Traffic flows

Traffic on Emmanuel Road has been reduced by about 9 000 vehicles (-78 %), and by about 5 000 (-57 %) on the adjacent Parkside as expected with the closure of the route to through-traffic. However, only 2 000 extra vehicles were recorded on the main adjacent routes (East Road and Maids Causeway).

When comparing traffic flows between 1997, pre-Bridge Street closure, and 1999, post-Emmanuel Road closure, screen line traffic counts show a reduction of 6 000 vehicles (7 a.m.–7 p.m.) crossing the River Cam (which forms a physical barrier running through the city centre). Traffic monitoring following the closure of both Bridge Street and Emmanuel Road indicates a reduction in traffic flows crossing the River Cam screen line during a 12-hour period from 77 119 vehicles in 1997, to 69 792 vehicles in 2000.

Air quality

Air quality measurements before and during the experiment indicate that between 1997 and 1999 the situation improved or stayed constant at 16 of 18 monitoring sites. It is estimated that levels of PM10s (particulate matter) have fallen by about 5 % as a result of the change in traffic levels and composition in Magdalene Street, an extension of Bridge Street.



Bridge Street after road closure to through traffic

Retail trade

While information collected by the Cambridge Retail Group showed no real evidence of a significant loss of trade resulting from the Bridge Street closure, the exercise demonstrates the problems of isolating the impacts of road closures from other trends, e.g. weather, strength of local currency (sterling), quality of products, general economic situation, etc. Opposition from traders has fallen significantly as the positive aspects of the scheme have become more evident. In particular the pedestrian area around Magdalene Bridge has become very popular with tourists; many retail units have been converted to restaurants and cafés.

Quality of life

Pedestrians and cyclists are able to enjoy a cleaner, quieter, safer city centre environment with the removal of through car traffic. Public transport users benefit from time savings due to congestion reduction and more direct routes. Upgrading of the Bridge Street streetscape in response to local residents' requests was completed in September 2001.

KEY SUCCESS FACTORS/LESSONS LEARNT (*)

- **Gather robust traffic air quality and trading statistics before the scheme to provide a strong basis for argument. Identify a good base point for measurement and set out clearly in advance what will be measured and how.**
- **It is vital to engage the media, so they understand how the road closure fits into a wider longer-term picture.**
- **Tactics are important, you may need to survive in the short term to secure the long-term benefits.**
- **Involve stakeholders and residents in the development of the scheme through extensive public consultation.**

(*) Mr Brian Smith, Director, Environment and Transport Department, Cambridgeshire County Council.

Case study 8**Oxford, ENGLAND**

On 1 June 1999, private car access to the city centre was restricted with the closure of the main High Street. This closure, as part of the Oxford Integrated Transport Strategy (OTS), in addition to a number of other traffic management changes in the city centre, represents the most significant change to the transport system of Oxford for over 25 years.

Predictions of increased traffic congestion as a result of the city centre closure did not materialise. Over the 12-month period, between June 1999 and June 2000, traffic flows on the inner cordon were down by an average of 20 %. Traffic flows on the outer cordon over the same period remained largely unchanged with a small reduction of 1.3 %. It appears that some of the traffic has evaporated. A fall in the number of cars parking in the city centre has been outweighed by an increase in park-and-ride use. Air quality has shown a marked improvement across the central city area.

Change in modal split away from the private car provides clear evidence of the success of the OTS. In 1991 the person-trip ratio (excluding pedestrians) was 54 % for private cars, 27 % for buses and 11 % for cyclists. By 2000, the modal split was 39 % for cars, 44 % for buses and 11 % for cyclists.

**BACKGROUND**

Oxford is an historic university town, with a city centre characterised by a medieval street network and buildings. The city is bounded on three sides by the River Isis. The surrounding catchment area is predominantly rural, with approximately 78 500 trips made into the city per day (12-hour period). The city is a popular tourist destination.

During the 1980s the city was experiencing worsening environmental conditions, including increasing air pollution and noise levels, as a result of increasing car traffic levels. Pollution was having a negative impact on both the historic fabric of the city and the urban quality of life. Traffic congestion was a growing problem, affecting the speed and therefore attractiveness of public transport services. Conditions for pedestrians and cyclists were negatively affected by the dominance of private motorised vehicles.

THE STRATEGY: OXFORD INTEGRATED TRANSPORT STRATEGY

In 1993, the first stages of the 'Oxford Integrated Transport Strategy' (OTS) were implemented. The aims of the OTS were to:

- reduce the problems of congestion and environmental pollution due to traffic;
- improve the general quality of life in the city centre;
- make public transport, walking and cycling more attractive alternatives to private car use;
- improve road safety;
- promote economic vitality;
- provide suitable access arrangements and improved accessibility for mobility impaired people.

A step-by-step approach to the implementation of a package of traffic management measures was seen as critical. As a result, the road closures required to improve environmental conditions in the central city area were only adopted after the implementation of a phased five-year plan which aimed at encouraging people to switch from the car to other more sustainable transport modes. These measures



included: park-and-ride expansion and enhancement, cycling facility improvements, bus priority routes, and central area parking restrictions.

In order to proceed with the next phase of the OTS, in addition to an extensive consultation process, a public inquiry was necessary due to the scale of change proposed to the road network. Approval was obtained, and work began on alterations to roads in the city centre in September 1998. On 1 June 1999, the road space reallocation was implemented, most notably the full pedestrianisation of the most important shopping streets (Cornmarket Street and the west part of Broad Street), and the removal of most traffic from High Street and St Aldates during the day. Additional traffic management changes included the introduction of bus priority routes and associated traffic calming, access and parking arrangements

In the weeks running up to the opening date a publicity campaign was organised. Leaflets, advertisements on buses and poster boards around the city provided information about the impending changes, followed by a series of press releases in the final two weeks before the OTS launch. The publicity invited people to contact the city and county council with questions about the scheme.

Opposition to the scheme was raised, most notably on the basis that traffic congestion on two key routes in the city would worsen, and from retailers concerned about delivery access and trade levels. Press coverage of the scheme raised these concerns.

Detailed monitoring of the situation was carried out. Central government approval of the OTS in 1993 was contingent upon an extension of the existing traffic-monitoring programme to include elements such as bus journey times and pedestrian flow counts in order to fully monitor the impact of the scheme. Funding support from the European Commission for the EMITS (*) project (Environmental Monitoring of Integrated Transport Strategies) through the LIFE '95 programme made it possible to monitor additional aspects of the strategy, for example, the effects on air pollution and economic vitality.



(*) EMITS Third Annual Report, 1998/99, produced by Oxfordshire City and County Councils, ESRC Transport Studies Unit, UCL, Oxford University School of Geography, and Imperial College School of Medicine. For more information: <http://www.oxfordshire.gov.uk>

Cornmarket Street – before (left) and after (right) the central area changes



RESULTS

Initial traffic levels

Initial results published in the first interim report ^(*) for the period June 1999–June 2000 identified a reduction in traffic flows of 23 % at the inner cordon during the latter half of 1999, decreasing to a reduction of 18 % in the first half of 2000 as flows increased slightly.

Traffic levels on the outer cordon during this period were largely unchanged, with a small reduction of 1.3 %. Traffic increases did occur on the 'Inner ring road' due to the displacement of some traffic from the High Street. The Marston Ferry Road experienced an increase of 12 %, and Donnington Bridge varied from 10–16 %. This increase was in line with predictions.

Inner and outer cordon traffic flow counts suggest that some of the traffic 'evaporated'. After an initial adjustment phase, the anticipated congestion did not materialise.

Traffic comparisons over 2 years

Further monitoring during 2000 allowed for more rigorous traffic data assessment by comparing data for the full calendar year of 2000 with those for 1998. This data confirmed that the reduction in traffic flows in the central area was maintained without significant, unpredicted increases elsewhere ^(*).

Traffic flows at the inner cordon were down by an average of 17 % across all cordon points comparing 2000 to 1998, with a range from -33 % to -6 %.

Traffic flows at the outer cordon were marginally down by about 0.5 % equating to approximately 500 vehicles/day. As this reduction follows the trend that has been evident over previous years it would not appear that the OTS had a major impact.

The B4495, the Marston Ferry Road, did experience an increase in traffic of 6.5 % compared with the 1995/98 average. However the average flow was still within the range seen for previous years, was below the increase predicted by the Saturn model, and is considered stable. The Donnington Bridge Road had an increase in flow of 12 % compared to 1995/98 average, slightly above the predicted increase of 10 %

Analysis of traffic flows for various locations on the ring road around the city suggest no apparent immediate impact following the 1999 city centre changes. However as the ring road is affected by a range of factors, changes may have occurred which are concealed in the average figures.

Bus passengers and park-and-ride

Results from the first interim report for the six-month period following the June 1999 measures indicated an increase in bus passenger use of 8–9 %. Up to the end of 2000 this was maintained. This increase equates to approximately 2000 additional passengers per day, a total that more than outweighed the decline in people using central area car parks of approximately 900 people per day. Use of three of the cities four park-and-ride car parks showed significant increases comparing 1998 with 2000 data.

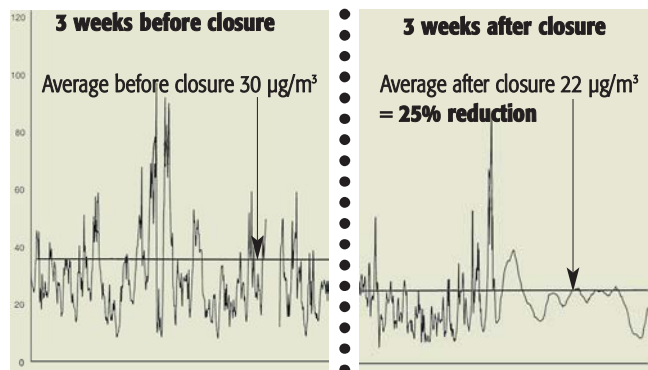
Pedestrian flow

Central area pedestrian counts for autumn 2000 indicate an increase of 8.5 % in total flow at all sites over two days of monitoring, compared with 1998, approximately 6 000 people. Annual surveys at the inner cordon show that pedestrian movements on all approaches are higher than during 1998. These increases mark a reversal of a declining trend in pedestrian numbers throughout the 1990s.

^(*) Source: Oxfordshire County Council, Environmental Services, OTS Monitoring Results, Interim Report, November 2000.

^(*) Source: Oxfordshire County Council Environmental Services, Review of impact of the central area changes, 27 July 2001.

Particulate pollution in Cornmarket Street



Comparison of particulate pollution levels in Cornmarket street before and after road closure

Source: EMTS

Modal split

Annual classified surveys show that the daytime split by mode has significantly shifted away from the private car. In 2000, the person trip-ratio (excluding pedestrians) was 39 % for cars, 44 % for buses and 11 % for cyclists. This compares with 54 % for private cars and 27 % for buses in 1991 before the implementation of the OTS (cycling as a proportion had not changed).

Air quality

Air quality which is monitored at over 40 sites across the city has improved significantly. Within weeks of the road closures, a 25 % reduction in particulate matter was observed in Cornmarket Street (see diagram above), and carbon monoxide levels showed a 75 % improvement at St Aldates. The majority of sites throughout the city show reductions in nitrogen dioxide levels.

Retail activity

A sample of nine retailers in the central area showed a decline in trade during the period June 1999–June 2000, a trend that continued throughout the rest of 2000. However, nationally most retailers have been suffering difficulties, linked in particular with the high value of UK sterling which has affected the number of foreign tourists. However confidence in the city of Oxford remains high and the vacancy rate for retail units of 1 % (2001) is very low.

Media reaction/public acceptance

Press coverage of the scheme was mixed. Traffic congestion and delays caused by the initial confusion and displacement of traffic were cited in declaring the OTS unsuccessful. However most of these problems were short-lived and media and public acceptance of the scheme has grown as the advantages of the traffic free environment, in addition to the other measures, have become apparent.

KEY SUCCESS FACTORS/ LESSONS LEARNT ⁽²²⁾

- **The adoption of a step by step, integrated approach to the implementation of the OTS was seen as critical to the success of the significant road space reallocation element of the scheme.**
- **Comprehensive monitoring of a wide range of elements before and after the road closure provided arguments in support of the scheme.**
- **The length of road dedicated to pedestrian areas is relatively short, thereby successfully retaining pedestrian and retail activity.**
- **Effective marketing of the scheme, linked with a comprehensive communications strategy, enabled transport planners and politicians to emphasise both the need for change in travel behaviours – continuing the status quo was not sustainable- and the advantages that would result from the scheme in terms of improved environmental conditions, amenity and accessibility for all.**

⁽²²⁾ Samantha Thame, Environmental Services Department, Oxfordshire County Council.

Chapter 4

PROVIDING GUIDELINES

**PRE-IMPLEMENTATION CONSULTATION AND COMMUNICATION**

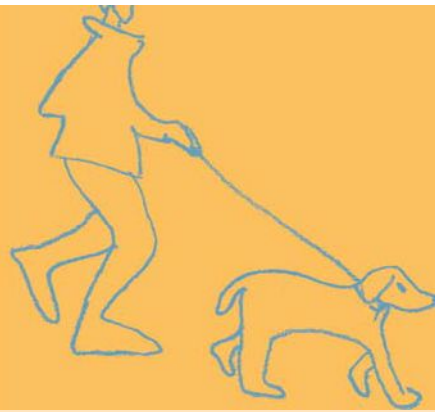
- Set up a comprehensive communication and consultation strategy from day one as reallocating road space can give rise to opposition. All the case study examples had lengthy consultation processes with all stakeholders, including public meetings and targeted meetings with different groups (such as residents and retailers). It is important to provide the public with information at every stage of the process. In the Vauxhall Cross case study, the appointment of a communications officer dedicated to the project was considered invaluable in maintaining good public relations.
- Political support for the scheme is fundamental. Engage local politicians at each stage of the process. Use this handbook to show policy makers examples where reallocating road space has been a positive policy action. It can be useful to show links between the objectives of road space reallocation schemes and national and European sustainable development policy guidelines (e.g. Plans de Déplacements Urbains in France, Local Transport Plans in the United Kingdom, and EU air quality directives).
- In order to test some measures that you are considering implementing and to communicate to the public the potential benefits of a car-free urban environment, participate in the annual European 'mobility week' and 'car-free day' (web site: <http://www.mobilityweek-europe.org>).

**DESIGN AND IMPLEMENTATION**

- During the design phase, measure and monitor the 'before' situation rigorously, including traffic flow, air quality, and retail sales statistics. Ensure that the same parameters are monitored immediately, and at regular intervals after the

implementation of a road reallocation scheme. This information may provide vital evidence in demonstrating the success of the project.

- In-depth computer modelling may help to win the argument in favour of a scheme, in particular when convincing traffic engineers. In addition, the predictions provided by the models may help modify the scheme details, as was the case with traffic light sequencing in Wolverhampton.
- Building a scale model of the proposal has proven helpful in gaining support for a scheme (e.g. Vauxhall Cross, London) enabling interested parties, who may not be traffic planning experts, to grasp the intent.
- Be flexible in the light of any consultation undertaken to adapt but not undermine the scheme. For example, in Cambridge, access rights for local residents were modified slightly and as a result public support for the scheme increased significantly.
- Road space reallocation should be seen as one part of an integrated strategy. If you take away space from car drivers, be prepared to give something back in return, for example, an upgraded cityscape, better public transport services or improved cycling conditions. Road space reallocation is not about making life difficult for car drivers, it is about improving the mobility options and quality of urban life for all.
- Explore the different implementation options in detail. The case studies show a diverse range of approach. In Nuremberg and Wolverhampton, successful implementation was achieved via a number of phases over several years. In Vauxhall Cross, Cambridge and Strasbourg, the road space reallocation was implemented for an experimental period at first, and in Oxford, Kajaani and Ghent, cars were excluded from major parts of the city centre overnight. Each approach had its merits which contributed to the success of the scheme.



- Establish a long-term strategy for the enforcement of new traffic restrictions during the early planning stages. A range of options have been effectively applied in the case studies; in Cambridge electronically-operated rising bollards restrict the entry of non-authorised traffic and in Ghent traffic police on bicycles patrol the car-free city centre.

→ ESTABLISHING PARTNERSHIPS

- Retailers are often the group with the most direct concerns. Accordingly they can be the most vociferous in their opposition. It is essential to build partnerships with local businesses that may be affected by any scheme in order to understand their needs and find ways to minimise any negative impacts on their trade. In Kajaani, the problem was resolved by establishing a 'city centre society' in which local retailers were partners, with the aim of regenerating the city centre. In Wolverhampton, the active marketing of the car-free town centre by the local authority won the support of retailers.
- Consider appointing a project champion to liaise between local residents, local commerce and the local transport authority. This was very successful in the case of Vauxhall Cross.

→ MARKETING AND PUBLICITY

- It is vital to work closely with the media. Reducing road space available for cars can provoke sensationalist, negative headlines; be warned that adverse publicity can be very hard to counteract. From the start, provide the media with all information possible and involve them in the unfolding 'story'. Brief them on all the benefits of the scheme, but also the potential problems that may arise, especially during the early stages of the scheme. If you can get the local media on your side, much of the battle is won!

- Allocate sufficient resources to fund an effective marketing strategy. Use a variety of media (leaflets, posters, local radio, television, web sites) to keep all sectors of the public informed.
- Develop a distinctive brand or image for your scheme. In Strasbourg, Bruno the Bear guided drivers through road works and kept the public up to date about the progress of changes. In Kajaani, the slogan Hyvä Kajaani (Good Kajaani) put across a positive image for the scheme.
- Take photographs which clearly show the situation before the implementation of any scheme, and where possible repeat the exercise at the same locations during and after the completion of the project. Public memories of the traffic problems that existed before a scheme can be short-lived, and images that highlight the improvements that such schemes bring can help win support for future projects.

→ POST IMPLEMENTATION

- In your planning, expect the worst! Anticipate problems in the first weeks after the implementation of each road closure as drivers adapt to changes in road layout. Good pre-closure communications, police support, and the presence of local authority personnel on-site can help to minimise this.
- 'You can't please everyone all the time'. While you will aim to satisfy the needs of all parties, it may not be possible, at least at the start, to please them all. However, in all the case studies, acceptance by the majority of parties increased significantly after the initial period.

Case study/contact information



Kajaani, Finland

Seppo Karppinen

Managing Director
Esisuunnittelijat Oy
Eerikinkatu 4 A
FIN-00100 Helsinki
Tel.: (358-9) 68 11 65 11
Fax (358-9) 68 11 65 19
E-mail: seppo.karppinen@esisuunnittelijat.fi

Wolverhampton, United Kingdom

Malcolm Read

Chief Transportation Officer
Wolverhampton City Council
Civic Centre
St Peter's Square
Wolverhampton WV1 1RP
Tel.: (44-1902) 55 57 00
Fax (44-1902) 55 56 56
E-mail: malcolm.read@dial.pipex.com

Vauxhall Cross, United Kingdom

Dave Johnson

Chief Engineer
TfL (Transport for London) Street Management
South Central/Windsor House
42-50 Victoria Street
London SW1H 0TL
Tel.: (44-20) 7941 7065
Fax (44-20) 7941 7334
E-mail: davejohnson@streetmanagement.org.uk

Brian Fitzpatrick

Business Development Manager
Mouchel Consulting Limited
Albany Place
Benwell Road
London N7 7DH,
Tel.: (44-20) 76 97 37 57
Fax (44-20) 75 27 47 64
E-mail: brian.fitzpatrick@mouchel.com

Nuremberg, Germany

Dr Peter Pluschke

Head of Department for Chemical Analysis,
Environment Division
Stadt Nürnberg
Adolf-Braun Straße 55
D-90317 Nuremberg
Tel.: (49-911) 231 21 67
Fax (49-911) 231 29 89
E-mail: peter.pluschke@ua.stadt.nuernberg.de

Strasbourg, France

Mme Odile Ausina

Service des Relations Extérieures

Mr Sandro Carafa

Service des Relations Extérieures

Direction des Transports et des Déplacements
Communauté Urbaine de Strasbourg,
1 place de l'Étoile
F-67070 Strasbourg cedex.
Tel.: (33-3) 88 60 91 81
Fax (33-3) 88 43 60 44
E-mail: oausina@cus-strasbourg.net
E-mail: scarafa@cus-strasbourg.net

Ghent, Belgium

Peter Vansevenant

Director of the Mobility Service
City of Ghent
p.a. stadhuis
Botermarkt 1
B-9000 Ghent
Tel.: (32-9) 266 77 61
E-mail: mobiliteit@gent.be

Cambridge, United Kingdom

Brian Smith

Director, Environment and Transport
Department, Cambridgeshire County Council

Richard Preston

Cambridge Projects Manager
Cambridgeshire County Council

Castle Court
Shire Hall
Castle Hill
Cambridge, CB3 0AP
Cambridgeshire
Tel.: (44-1223) 71 77 90
E-mail: brian.smith@cambridgeshire.gov.uk
E-mail: richard.preston@cambridgeshire.gov.uk

Oxford, United Kingdom

Samantha Tharme

Environmental Services,
Oxfordshire County Council,
Speedwell House,
Speedwell Street,
Oxford OX1 1NE
Tel.: (44-1865) 81 04 43
E-mail: samantha.tharme@oxfordshire.gov.uk