CITY OF COPENHAGEN

Traffic 2004 & Environment Plan

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Traffic & Environmental Plan 2004

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- Building and Construction Administration
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Foreword

Air pollution from cars and busses is an area of prime concern for Copenhagen citizens when it comes to resolving the city's major traffic problems. When it comes to ranking their traffic priorities a demand for more and better cycle tracks heads the inhabitants' list followed by a demand for extended Metro facilities, air pollution limitation and improved traffic safety.

The recent positive trend in Copenhagen, with its growing population and rising employment rates means that at the same time total traffic pressure is also on the rise. The demand for accessibility and mobility is increasing, but burgeoning traffic creates new environmental challenges and more congestion, other factors being equal.

The Traffic and Environment Plan 2004 is the City of Copenhagen's proposed scheme for planning and managing traffic and traffic development in coming years so as to ensure a well functioning and efficient transport system whose environmental impact is significantly lower than today. Cycle tracks will be expanded, bus mobility ensured, transfer between public transport modes facilitated, residential areas calmed, and the adverse environmental impact of traffic reduced. The City of Copenhagen will also work to expand the Metro in collaboration with the State and the municipality of Frederiksberg.

The numerous projects and solutions proposed by the plan add up to a total of DKK 2.5 billion, covering cycle tracks, bus mobility, traffic safety, noise abatement measures and a good deal more.

In addition, it will be necessary to finance two major projects: the Metro ring in the densely built-up districts and the new road infrastructure to the dock areas.

It is important to underline that there is no advance funding for the completion of all these proposals, but the Traffic and Environment Plan includes an action plan listing 20 focus areas of vital importance to the City's efforts in the field of traffic and environment in coming years.

Copenhagen, June 2005

Søren Pind

Mayor for
the Building and Construction
Administration

Lars Engberg

Lord Mayor

Winnie Berndtson

Mayor for
the Energy, Water and Environment
Administration

Action plan

1. Establish cycle tracks still missing from the cycle track network and widen the most congested ones
2. Establish the cycle routes expected to handle the greatest volume of bicycle traffic
3. Work to establish a Metro ring in collaboration with the State and the municipality of Frederiksberg
4. Plan the public transport infrastructure to urban development areas
5. Improve bus mobility on the major thoroughfares (Nørrebrogade and Amagerbrogade) and improve facilities at stations and terminals
6. Improve traffic safety by reconfiguring intersections and road sections, provide safer routes to school, launch campaigns to promote slower driving and prevent drinking and driving
7. Work to influence the travel habits of Copenhagen citizens, particularly their choice of travel mode
8. Ensure the most expedient traffic movement on the major road network, including measures to divert through traffic away from the local streets
9. Establish 40 km/h speed limits on local streets in all residential areas
10. Work towards the establishment of an improved road connection between Nordhavnen and the Helsingør motorway in collaboration with the state
11. Study options for calming traffic in the city centre and improving motorist access to the urban development sites by establishing new road connections across or along the harbour
12. Draw up a new parking strategy that will ensure sufficient parking capacity, calm urban spaces and help reduce motorized traffic
13. Draw up local noise abatement action plans to reduce the noise level along the noisiest road sections and insulate homes against noise
14. Lay down noise reducing asphalt in connection with road maintenance in noise-plagued areas
15. Establish an environmental zone in the inner section of the city requiring the use of particle filters on heavy diesel run vehicles
16. Actively support the testing and development of environmentally friendly technologies
17. Draw up a strategy for heavy vehicles to ensure that they are diverted to the least environmentally sensitive roads
18. Initiate new studies of pedestrian travel patterns, mobility, congestion, etc. to serve as the foundation for treating pedestrian traffic on a par with other travel modes when setting priorities for organizing the city's spaces
19. Publish an annual status report on traffic and environmental progress so as to assess on an on-going basis whether things are moving in the right direction
20. Contribute to the development and clarification of the technical, administrative, legislative and political conditions for the introduction of road pricing in collaboration with the other interested parties in the capital region

Photo: Lars Gemzøe

The action plan on the opposite page lists the Traffic and Environment Plan's top priorities from its total list of possible traffic and environmental measures. The action plan was drawn up on the basis of the public hearing to the Traffic and Environment Plan and on an assessment of the traffic and environmental impact of these the measures'. On the following four pages each of the action plan's 20 points will be elaborated.

The action plan must be implemented within the budgetary framework of the Roads and Parks Department supplemented by extra funding for traffic and the environment. The budgetary framework is fixed until 2007. In the following years the Traffic and Environment Plan's focus areas will be weighed in relation to other projects, such as the Urban Space Action Plan, community traffic and urban environment plans and neighbourhood renewal projects.

It is clear that very few resources are available for the implementation of the Traffic and Environment Plan's action plan. Any significant progress will depend on finding extra funding in connection with budget negotiations.

The action plan proposes that an annual status report be drawn up summarizing both current status and progress across all modes of transport and related environmental indicators. The status report will serve as the basis for assessing the Traffic and Environment Plan's overall objectives and intermediate goals and for assessing progress within the action plan's focus areas. It is further proposed that more specific priorities should be set regarding the 20 focus areas presented in the action plan in connection with the three administrations' overall annual assessment of the Traffic and Environment Plan.

Improving cycling conditions

The objective is to increase the share of total transport held by cyclists. A significant portion of total travel in Copenhagen takes place by bicycle and bicycle traffic is on the rise. Cycling is a healthy and pollution free travel mode and virtually all Copenhagen residents and other interested parties who took part in the citizens' dialogue firmly support better conditions for cyclists. The city of Copenhagen will continue to focus on improving cycling facilities:

1. Establish cycle tracks still missing from the cycle track network and widen the most congested ones. Discrete cycle tracks are the basic element of Copenhagen bicycle traffic. Improving (including widening the most heavily trafficked cycle tracks) and expanding the cycle track network are the key elements when it comes to improving cycling conditions. The sections where cycle tracks are missing (a total of 50 km) have been identified in the city's Cycle Track Priority Plan.

2. Establish the cycle routes expected to handle the greatest volume of bicycle traffic. Certain green cycle tracks address vital transport needs, whereas other routes are of a more recreational nature. The initial focus will be on cycle routes where large volumes of bicycle traffic are anticipated. This particularly applies to routes that create new links and short cuts through town, such as the Christianshavns route, which would connect the Frederiksstad area with Holmen via a bridge spanning the harbour at the Opera. This also applies to the Amager route where it will be possible to create one continuous route linking Amager and the city centre. It is proposed that the route be implemented regardless of whether the final configuration cuts through or bypasses Svinget. Finally, the completion of the Nørrebro route in conjunction with the Frederiksberg cycle route will create a new regional cycle connection in Copenhagen.

High quality road and cycle track cleaning and maintenance is also considered a crucial factor in retaining existing cyclists, whereas there is a general feeling that more cycle parking only marginally affects cycle traffic volume, although this might resolve local urban space issues.

Improved public transport

The objective is to increase the public transport market share of total traffic in the city of Copenhagen. Public transport should be an attractive alternative to motorized, individual traffic thereby helping to improve the urban environment. Furthermore virtually all Copenhagen citizens and other interested parties firmly support improved public transport. The city of Copenhagen will continue to focus on improving public transport.

3. Work to establish a Metro ring in collaboration with the State and the municipality of Frederiksberg. The most important boost to public transport is the expansion of the Metro through the Metro ring. Past experience of the Metro's initial stages show that the introduction of the Metro has led to a major increase in total public transport use and a minor fall in car traffic in the areas served by the Metro. On these grounds the city of Copenhagen will work to expand the Metro ring.

4. Plan the public transport infrastructure to urban development areas. If an efficient traffic infrastructure to the new urban development areas is to be ensured, public transport planning must be a top priority. It is of vital importance that the basic traffic infrastructure is in place before the areas are developed.

5. Improve bus mobility on the major thoroughfares (Nørrrebrogade and Amagerbrogade) and improve facilities at stations and terminals. In the short term the main focus is to improve bus

mobility on central road sections with many passengers and high traffic density. Bus mobility may also be a lever for the general improvement of conditions in specific areas such as Nørrebrogade and Amagerbrogade which are a priority in the bus strategy of 2003. Improvement of station and terminal facilities are essential to attract as many passengers as possible and passenger conditions must become an integral part of all urban space projects.

Behaviour, traffic safety and choice of travel mode
Improved behaviour include both how you behave in traffic and what mode of transport you choose. The objective is to improve safety and a sense of security in traffic and reduce the environmental impact of traffic without reducing mobility.

6. Improve traffic safety by reconfiguring intersections and road sections, making routes to school safer and launching campaigns to promote slower driving and prevent drinking and driving. Opinion polls show that the most widely supported measure among Copenhagen citizens is traffic safety improvement. It is also essential to focus on the sense of security in traffic since a feeling of insecurity will mean fewer cyclists and walkers and more cars. On this basis, the city of Copenhagen seeks to maintain and strengthen traffic safety initiatives through physical measures, safe routes to school and educational campaigns.

7. Work to influence the travel habits of Copenhagen citizens, particularly their choice of travel mode. The environmental impact of traffic can be reduced by attitude and behaviour modification campaigns. The objective is to encourage more motorists to choose more environmentally friendly travel modes and to raise awareness of ways to reduce transport usage. The direct impact of such measures is limited for the present, but the city of Copenhagen will work towards maintaining a focus on behaviour modification.

Environmentally friendly traffic distribution and new road construction
The objective is to divert through traffic from residential areas thereby improving the local community environment. The traffic will be diverted onto the least environmentally sensitive roads thereby minimizing its environmental impact on Copenhagen citizens.

8. Ensure the most expedient movement of traffic on the major road network including measures to divert through traffic away from the local streets. Many Copenhagen citizens support traffic calming in residential areas but there was some concern about ensuring mobility on the major road network in order to keep local congestion down.

9. Introduce 40 km/h speed limits on local streets in all residential areas. The most important initiative is to implement the projected speed limit zones in the residential areas. At the same time it is also vital to ensure motor traffic mobility to the greatest extent possible on the major road network especially on the regional and collector roads so as to divert through traffic away from the local streets and prevent cut-through traffic.

10. Work towards the establishment of an improved road connection between Nordhavn and the Helsingør motorway in collaboration with the State. The city of Copenhagen is neither capable of nor interested in resolving its congestion challenges by construction, but the recent boom in urban development makes it relevant to study the feasibility of certain major road construction projects. The number one priority is to establish a road link between Nordhavn and the Helsingør motorway to ensure that Østerbro and the city centre are not burdened with traffic from the urban development site in Nordhavn.

11. Study options for calming traffic in the city centre and ensuring motorist access to the urban development sites by establishing new road connections across or along the harbour. Further traffic calming in the city centre will make it necessary to provide through traffic (including Ring 2) with alternative routes. Moreover plans are currently in preparation for major urban development in Havnestaden, Sydhavn, Nordhavn and Nordøstamager. It is anticipated that the volume of vehicular traffic generated by this development will be too high for the existing road network to handle without causing environmental and traffic problems. The overall movement of traffic in the entire city must consequently be reassessed as the basis for considering specific, new road construction.

Parking strategy

The objective is to enable inhabitants of the city of Copenhagen to park their cars near their homes (possibly for a fee). It should also be possible to visit the city by car but only to the extent that this does not create serious environmental problems. In the densely populated residential areas of Copenhagen it is often difficult to find a parking space particularly in the evening or at night. Parking regulation may also serve as a traffic calming measure.

12. Draw up a new parking strategy that will ensure sufficient parking capacity, calm urban spaces and help reduce motorized traffic. The city of Copenhagen will draw up a new parking strategy that will help calm urban space and enhance its quality by means of pricing and by shifting parking from on the street to parking structures. It will also strive to ensure good parking facilities in the densely built up residential areas for residents, local businesses and visitors by pricing and by parking supply management. The parking strategy entails marking special, free parking spaces for shared cars. In the city planning, context the parking norms for new construction currently in effect will be reassessed and special city run parking companies in charge of establishing residential parking in the different districts will be considered.

Noise abatement and pollution control

The long-range objective is that the noise level in residential, recreational or institutional areas shall not exceed 55 dB. On a short term basis, the number of heavily noise-plagued homes (over 65 dB) is to be halved. In addition, air quality in the streets will be improved and CO_2 emissions from traffic limited. All the initiatives included in the Traffic and Environment Plan seek to limit the environmental impact of traffic. However, a number of measures specifically targeting noise and air pollution are an essential supplement. On this basis, the city of Copenhagen places prioritizes on noise abatement and anti-air pollution measures highly.

13. Draw up local noise abatement action plans to reduce the noise level in the most noise-plagued areas. Local action plans to combat noise pollution will be drawn up so as to ensure a community framework and community influence over the measures used.

14. Lay down noise-reducing asphalt during maintenance work in noise-plagued areas and insulate homes against noise. The city will assess options for laying down noise-reducing asphalt when replacing road surfaces in the most noise- plagued sections and when building new roads in the urban development areas. Funding must be found for a subsidy system to insulate homes against noise.

15. Establish an environmental zone in the inner section of the city requiring the use of particle filters on heavy diesel vehicles. Air pollution will initially be combated by introducing an environmental zone focusing on particle pollution. In this environmental zone, particle filters for heavy diesel vehicles will be standard. The zone will be limited to the most environmentally sensitive area,

i.e. the densely populated residential districts and the city centre. The city of Copenhagen has applied to the Ministry of Justice for permission to introduce an environmental zone.

16. Actively support the testing and development of environmentally friendly technologies. The city will establish a resource pool to support the development and testing of cleaner technologies, e.g. in the city's own fleet of vehicles.

17. Draw up a strategy for heavy vehicles to ensure that they are diverted to the least environmentally sensitive roads. Heavy vehicles play a major role when it comes to air and noise pollution. The city of Copenhagen will devise a special heavy vehicle strategy with the aim of assessing different methods of ensuring heavy vehicle mobility while minimizing their environmental impact.

Better conditions for pedestrians

Walking is a pollution free travel mode but walkers are an overlooked road user group in Copenhagen traffic planning. As a basis for accepting pedestrians on a par with other road users, it is essential to acquire new knowledge of pedestrian travel patterns, numbers and mobility.

18. Initiate new studies of pedestrian travel patterns, mobility, congestion, etc. to serve as the foundation for treating pedestrian traffic on a par with other travel modes when setting priorities for organizing the city's spaces. The city of Copenhagen will strive to incorporate walking as a travel mode into its traffic planning and when configuring specific urban spaces.

Will we achieve our aim?

The implementation of the action plan referred to above will result in a reduction of the environmental impact of motorized traffic. If the various measures are carried out, this may also help limit any future rise in car traffic. However, car ownership and motor traffic trends largely depend on other factors. If the general economic boom continues, vehicular traffic is expected to rise regardless of the 20 priority initiatives.

19. The city of Copenhagen will publish an annual status report on traffic and environmental progress so as to assess continually whether things are moving in the right direction. It is vital to follow traffic developments closely so the need for direct regulation of motorized traffic for environmental or other reasons, e.g. by road pricing can be kept under continuous assessment. Based on the above, the City of Copenhagen will publish an annual status report on current status and progress across all transport modes, environmental indicators and the Action Plan's 20 priority initiatives.

The status report will form a basis to assess progress being made in achieving the overall and intermediate objectives in all the Traffic and Environment Plan's focus areas as well as the Action Plan's priority initiatives.

What if we don't achieve our aim?

If the Traffic and Environment Plan's aims are not achieved by the proposed measures it may prove necessary to use other means. Against this background, the city will continue to work to develop and assess road pricing.

20. The city will contribute to the development and clarification of the technical, administrative, legislative and political conditions for the introduction of road pricing in collaboration with the other interested parties in the capital region.

1. A new Traffic and Environment Plan? Why?

The Traffic and Environment Plan 2004 maps out a strategy for Copenhagen traffic development. The plan is part of the city's total development strategy for the next 20 years.

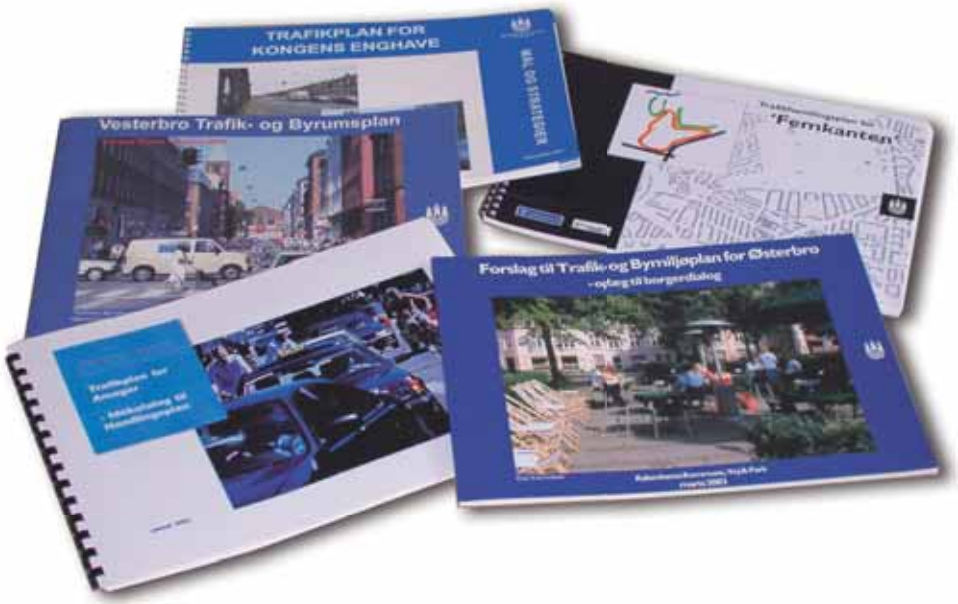
In recent years Copenhagen has been undergoing a period of rapid growth. The economic boom and the major urban development projects have created a level of activity and economic growth in sharp contrast to the Copenhagen on the brink of bankruptcy of merely 10 years ago. Copenhagen is also the hub of the growing Øresund region, where more than 3 million people live and work on both sides of the Sound.

However, the period of growth has also meant increased pressure on the Copenhagen traffic system. More of us have cars now and in many areas it is difficult to find a parking space. Taken together with the new housing and new workplaces, this spells more traffic. And the rise in traffic leads to greater environmental problems, greater congestion and over-crowded streets.

At the same time the existing traffic system is suffering from insufficient maintenance and renewal. Cycling facilities have not followed the increase in bicycle traffic, busses get stuck in the general traffic with falling travelling speeds and passenger numbers as a consequence. To a large extent, the city's streets and squares appear dilapidated, over-crowded and antiquated. Only with the Metro have Copenhagen traffic investments begun to pick up again.

On this basis in the early part of 2002 the city of Copenhagen resolved to draw up a new Traffic and Environment Plan. The Plan was drawn up in an open dialogue with Copenhagen citizens and interested parties.

The plan contains a number of proposals for a wide range of initiatives in the field of traffic and the environment. On the basis of the plan, the city of Copenhagen has drawn up a concrete action plan intended to ensure the implementation of the top priorities within the framework of the city's own budget. The Traffic and Environment Plan also includes two major projects (the Metro and the new road connection from Nordhavn to the Helsingør motorway) that



The city of Copenhagen collaborates with local citizens when preparing local traffic and urban environment plans. The figure shows a few of the plans that were drawn up.

require special financing schemes due to the scope of the investment demands. To resolve the huge traffic and environmental challenges facing the capital it is essential that the State also contributes to the financing of these projects.

What is a traffic and environment plan?
The plan maps out a strategy for traffic development in the capital giving due consideration to the reduction of traffic's environmental impact. Accordingly the aim of every focus area is to ensure that traffic's impact on the environment will be reduced.

The plan is an integral part of the city's total development strategy in coming years. It provides guidelines for supporting developments that the city wishes to promote and for countering developments that the city wishes to minimise or completely prevent.

What is its relation to other plans?
The Traffic and Environment Plan is a sector plan for traffic and traffic related environmental issues. Its objectives and the measures to achieve these objectives reflect the aims, guidelines and traffic and environmental framework of the Municipal Plan 2005 whose aims, guidelines and frameworks are elaborated in the Traffic and Environment Plan. The Traffic and Environment Plan also constitutes the overall framework for a number of intermediate policies and strategies such as the bicycle policy, the parking strategy and a public transport plan.

In addition, the Traffic and Environment Plan constitutes the general framework for local traffic plans on the district or community level. The city of Copenhagen has recently drawn up a number of district plans and traffic plans for neighbourhood boost areas. It is the city's hope that the work may continue in other districts so that in the long run every district will have its own local traffic and urban environment plan embodying the general aims of the Traffic and Environment Plan on the district level in a dialogue with the local communities.

Finally, there is also a connection to other municipal sector plans particularly in the field of the environment. The Agenda 21 plan and the CO_2 plan contain aims and guidelines for the traffic environment. These aims and guidelines are included in the Traffic and Environment Plan.

The Traffic and Environment Plan is intended to map out a long term strategy for traffic development while remaining flexible in relation to the major changes to which traffic in particular is subjected. It takes a long time to plan, decide and carry out major traffic investments such as the Metro, often a decade or more. The lifetime of these huge projects is perhaps a century, so the traffic plan must necessarily take the long view.

Traffic regulation in the city centre Nikolaj Plads

Traffic and Environment Plan of 1997

The current Traffic and Environment Plan dates from 1997
The overall aim of the Traffic and Environment Plan of 1997, which is also incorporated into the Municipal Plan 2001, is as follows: "To ensure that the city's traffic needs are served by a well-functioning transport system geared to have significantly less environmental impact than today. This implies that the total level of motorized traffic in the city must not rise and that any increase in traffic activity must be provided for by an increase in public transport and cycling".

These objectives were based on the fact that for a couple of decades traffic and car ownership levels had remained constant in Copenhagen. Thanks to the period of economic growth and general progress that Copenhagen is currently enjoying there has been a significant change in this stable pattern. In the past six years car ownership has grown by 40% and motorized traffic has increased by 15%. The plan's aim to significantly reduce the environmental impact of traffic was consequently impossible within the framework of the measures provided for.

The citizens' Traffic and Environment Plan
For this reason, the city council resolved in the early part of 2002 to draft a new Traffic and Environment Plan for Copenhagen. The plan was drawn up in a close dialogue with citizens who were engaged in setting priorities both for the issues the plan seeks to address and for the means to be used to resolve these issues. In connection with the public hearing citizens and interested parties were also actively engaged in assessing the final draft plan.

When drawing up the plan a great deal of effort, including opinion polls, public meetings and interviews with interested parties, went into arriving at a common understanding of the challenges and their solutions. This is deemed a necessary pre-condition for the plan to take hold among Copenhagen citizens and other city users. The dialogue activities are described in Chapter 3.

Aerial photo:
DDOby©, COWI A/S

2. Copenhagen strengths and challenges

The Copenhagen economy has enjoyed a period of rapid growth in recent years. This has meant a rise in car ownership and motorized traffic, more noise and congestion and less space to move about the city. At the same time, however, the majority of Copenhagen citizens are cyclists who take up less space on the street and are non-polluting.

Metro station at Kongens Nytorv

Copenhagen is currently at an environmental traffic cross roads. On the one hand, we still have fairly low levels of motorized traffic which can move fairly smoothly. On the other hand, we are experiencing a rise in environmental challenges caused by traffic. This chapter presents a brief survey of the Copenhagen traffic situation in 2003. The current traffic and environmental situation is elaborated in the discussion paper, Trafik- og Miljøplan 2003, status og hovedproblemer – oplæg til debat" (not available in English).

Copenhagen citizens are cyclists

More than 50% of Copenhagen citizens cycle on a daily basis. For purposes of comparison around 25% take the bus and 25% drive every day. 33% of commuter trips to workplaces in Copenhagen are on a bicycle, the same proportion as by car. Over the past 10 years, bicycle traffic has risen by 40% and in the densely populated districts the bicycle is often the fastest mode of travel. Cycle traffic is now so extensive that congestion on certain cycle tracks has become a problem, as has cycle parking space.

Copenhagen is growing – and motorized traffic is on the rise

Motorized traffic has risen by 16% since 1995. During the same period Copenhagen citizens have acquired more cars. Since 1995, the number of cars in Copenhagen has risen by almost 40%, the equivalent of almost 150 km of cars parked along the kerb.

In several areas residents have trouble finding parking spaces near their homes. In comparison with other major cities the car ownership rate in Copenhagen is low but if the economy continues to expand car ownership may be expected to increase further.

Traffic noise and air pollution continue to place a burden on Copenhagen citizens

A significant number of the city's homes are daily subjected to unpleasantly high and health-damaging levels of traffic noise. Car engines have become quieter but noise caused by the impact of tyres on the road surface has not dropped and the problem continues to grow as the volume of car traffic rises. Traffic noise also depends on traffic volume, speed and the proportion of heavy vehicles. New technologies have resulted in lower pollution levels. Air pollution however, continues to have a negative impact on people's health. Diesel vehicles' ultrafine exhaust particles are particularly hazardous to health. Global traffic impact in the form of CO_2 emissions also continues to soar.

More and more people commute out of the city

Changes in the Copenhagen economy have resulted in more and more Copenhagen residents working outside the city. Since 1995, commuters out of the city have increased by 23% and by over 80% since 1981. Commuters into the city have remained fairly constant over the same period. Those who commute out of the city do so largely by car, since the new workplaces in the Copenhagen environs are often situated at some distance from a station.

Bicycle traffic at Christianshavns Torv

The Metro is a success, but what about busses?
Copenhagen citizens have already embraced the Metro. 120,000 passengers take the Metro daily. 70% of Copenhagen citizens think it's important to expand the Metro by adding more lines and stations.

Bus traffic however, has lost ground in relation to private cars. Street congestion has meant that average bus travelling speeds in the densely populated areas have dropped by 15% since 1991. Rising ticket prices and cuts in service hours and schedules may further threaten bus service. It is likely that the Metro (and the Ringbane line) will help maintain the public transport market share but it is unlikely that this will lead to a reduction in car traffic.

Rivalry over street space
The historic streets of Copenhagen are the framework for all kinds of activities and a delightful outdoor life. However, it is often difficult to find space for pavements and cycle tracks, bus lanes and carriageways, parking, deliveries, recreational areas and outdoor life in the narrow streets.

The city has been successful in shifting a large amount of traffic away from the residential streets onto the major road network but opportunities for spending leisure time on the residential streets remain limited, since such streets are clogged with parked cars.

Traffic safety could be better
Although traffic volume has risen, we have been successful in reducing the casualty rate. Since 1995 the number of serious injuries has dropped by almost 20%. However, two people a day are still injured in Copenhagen traffic. And the feeling of insecurity has not disappeared with the drop in the number of casualties. School children particularly point to heavy traffic, high speeds and poor sight distances as causes of their insecurity.

'The fight for street space'. Copenhagen's old and often narrow streets have to accommodate many transport modes and all kinds of activities.

3. What do the citizens think?

The purpose of the citizens' dialogue is to ensure that the issues confronting Copenhagen citizens and other city users are debated and addressed. It is also intended to ensure that the solutions incorporated into the Traffic and Environment Plan are at once realistic and capable of gaining widespread popular support.

The Traffic and Environment Plan 2004 was drawn up on the basis of an extensive dialogue with Copenhagen citizens and other city users. In the course of 2002, traffic and environmental challenges and solutions were debated and in 2004 a concrete Draft Traffic and Environment Plan 2004 was submitted for public hearing. Attitudes and ideas, etc. were canvassed through three separate public opinion polls, in each of which 1,000 representatively selected Copenhagen respondents participated. In addition, three public debate meetings were held with approximately 100 participants each. Roughly 20 representatives of the labour market, the business community, the transport sector and civil organizations were interviewed in-depth and more than 80 comments on the public hearing request were received. The dialogue was carried out in collaboration with Institut for Konjunkturanalyse (IFKA). The results were discussed in political committees and were made public in press releases. All results and information may be viewed on the Traffic and Environment Plan homepage: www.kk.dk/trafikmiljoeplan.

The environmental impact of traffic

The primary focus area of the first opinion poll is the environmental impact of traffic. Air pollution in particular from both private cars and busses and lorries is considered a major problem. Traffic noise does not rank as high on the list of challenges but it is important to remember that even though relatively few people experience it as a major problem, it may nevertheless have serious health consequences for those affected. The opinion polls also conclude that concern for the environment is the prime motivating factor for behaviour modification.

Pollution was one of the main topics at the public debate meetings. There is a relatively high level of public awareness of the various forms of air pollution including ultrafine particles, pollution from various types of motors and from sudden stops and starts. Several interested parties pointed out the inherent dilemma between the desire for increased mobility and the desire for a better environ-

Public debate meeting, 27th September, 2004, Dansk Design Center

ment. If the environment is to be improved, traffic has to be severely limited, so the utilisation of new technologies as the solution to environmental challenges was proposed on several occasions.

Bicycle traffic

There is widespread agreement that cyclists play a central role in Copenhagen traffic. This situation must be maintained and encouraged as it is of great benefit to everyone, including other road users. Polls show that whereas almost 60% of Copenhagen citizens cycle on a daily basis, only 26% use their cars.

Attention was drawn to the fact that there are now so many cyclists that certain sections of the cycle track network have become congested. The polls show that Copenhagen inhabitants consider cycle track congestion to be a major problem. The problem is somewhat greater in the opinion of those citizens who cycle more than the average every day. A majority accordingly support widening the most congested cycle tracks, even if this is at the expense of space for cars and busses.

In addition to the congestion issue, it was also pointed out that there are large areas of the city with heavy bicycle traffic but without cycle tracks.

The large number of bicycles creates problems in relation to parking/leaving your bicycle. Walkers and business owners point to the problems caused by the large numbers of parked bicycles clogging the street space. Cyclists want good parking facilities, particularly at stations and other transport nodes. Improved opportunities for combining cycling with public transport are also cited as a means to increase the number of travellers who use bicycles and public transport.

Public transport

The opinion polls show that most Copenhagen citizens think that generally speaking the public transport system works quite well. The Metro has been well received and a large majority want it to be expanded. The business community and trade organizations also have high expectations of the Metro.

Several parties have pointed out that public transport should be an attractive alternative to the car and that accordingly public transport is in urgent need of a quality boost, as provided by the Metro, for example. Others also express the wish to maintain quality in the bus system (particularly mobility). A majority of Copenhagen citizens consider it important to improve conditions for busses thereby reducing travelling times. The introduction of trams as an alternative to expanding the Metro, on the other hand, is at the bottom of the list.

Finally it was pointed out on several occasions that the development of a system based on the Metro and special A-busses will

Citizens' dialogue

March 2002
Debate folder:Trafik-og Miljøplan 2003, status og hovedproblemer - oplæg til debat (not available in English)

March – May 2002
In-depth interviews with 17 selected interested parties

April – May 2002
In-depth interviews with citizen groups

21st of May 2002
Public debate meeting at Copenhagen Town Hall

May 2002
First opinion poll of 1,000 Copenhagen citizens: traffic and environmental issues

June 2002
Political level discussion and publication of results

October 2002
Debate folder: Trafik- og Miljøplan 2003, Problemer og hovedindsatser – debatten fortsætter (not available in English)

October – December 2002
Public debate

12th November 2002
Public debate meeting at Copenhagen Town Hall

November 2002
Second opinion poll: traffic measures

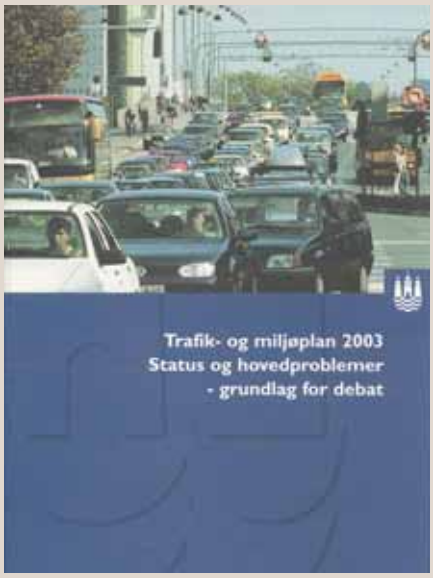
January 2003
Political level discussion and publication of results

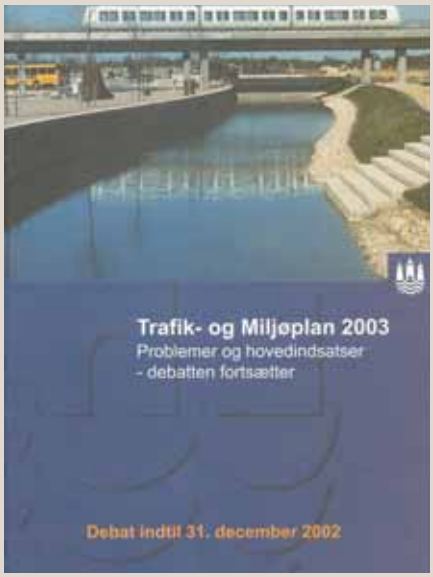
March 2003
Meeting with interested parties

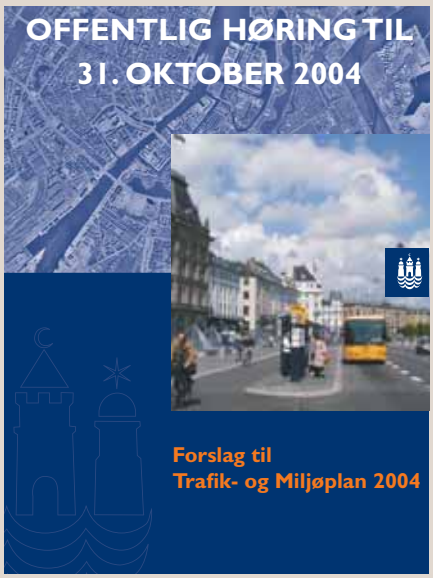
Spring 2004
Political level discussion of the Draft Traffic and Environment Plan 2004

Autumn 2004
The Draft Traffic and Environment Plan submitted for public hearing

February - April 2005
Political approval of the Traffic and Environment Plan 2004







The two debate folders of 2002 and the Draft Traffic and Environment Plan 2004 submitted for public hearing

result in a concentration of public transport supply. This poses a problem for the elderly, for example, who wish to retain a bus network that covers a broad area of the city.

Car traffic

Car traffic is crucial in any discussion of the traffic/environment challenge. The picture that emerges from the citizens' dialogue is that there is a general understanding that cars are a necessary and vital transport mode. It must also be noted, however, that only one third of Copenhagen citizens use a car on a daily basis and half of these only use their cars in their spare time, so that cars are only a daily necessity for a small section of the Copenhagen population. The opinion poll also indicates that generally speaking people understand that Copenhagen citizens are not the only ones who need to move about town.

Quite a few people feel that congestion and parking constitute a problem, while another large group of citizens are concerned about secondary problems derived from car traffic. They all agree, however, that the central issue is the number of cars on the streets.

The question is therefore how to limit car traffic. On the whole, Copenhagen citizens do not take to restrictive measures. Limiting the availability of parking spaces and introducing road pricing are measures that relatively few consider important, including the interested parties. Attractive alternatives including better public transport and better facilities for cycle traffic, on the other hand, are widely supported. Road pricing was nevertheless a major and recurrent theme at the public meetings where the measure received more support than from Copenhagen citizens generally.

Parking

Virtually everyone agrees that parking is a growing problem. Residents of the densely populated areas have begun to experience a lack of parking spaces and parked cars clog the city's streets.

The establishment of more residential parking spaces will have to be financed by the motorists themselves. In one of the opinion polls motorists were canvassed on their willingness to pay. 20% were willing to pay DKK 500 a month for better parking facilities, 45% prefer to live with the situation while the rest doesn't consider it a problem.

The polls also show that inhabitants understand that visitors need to park in town, but the idea of building multi-storey car parks for the use of city guests is not a measure many people support.

Traffic safety and traffic behaviours

The last poll showed that improvement of traffic safety is the proposal the majority consider to be most important. All of 96% of Copenhagen citizens rate the proposal good or very good. Families with children and the elderly are more likely than the average to

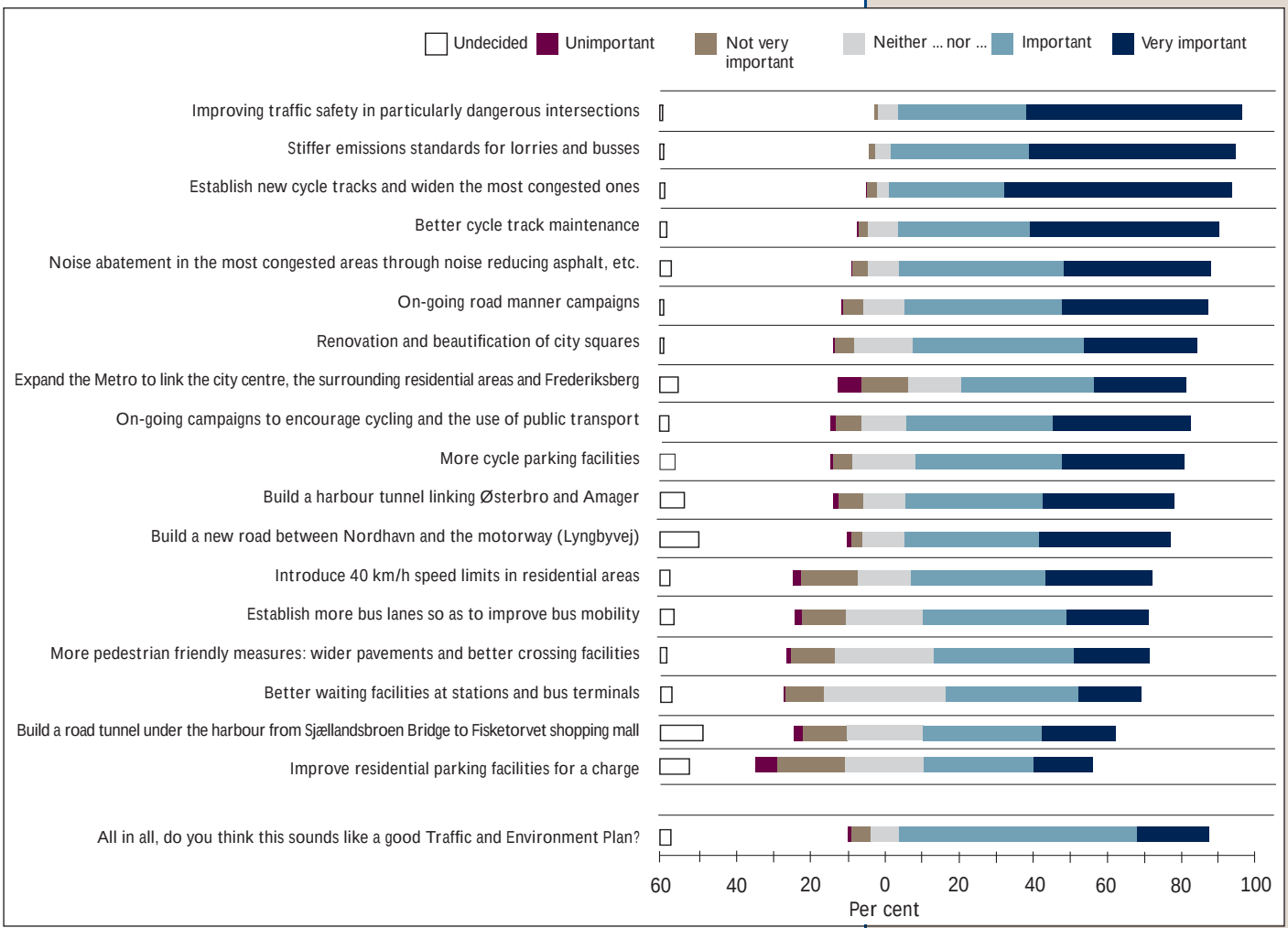
perceive the risk of traffic accidents as a problem. Furthermore, the safety issue is more critical for cyclists than for motorists.

It has been frequently pointed out that Danish (and Copenhagen) road manners are more self-centered than elsewhere in Europe. Danish motorists are more concerned with their own right of way than consideration for others. A majority of Copenhagen citizens say that what is most important to implement are campaigns urging road users to act more considerately.

Attitude to the Traffic and Environment Plan taken as a whole

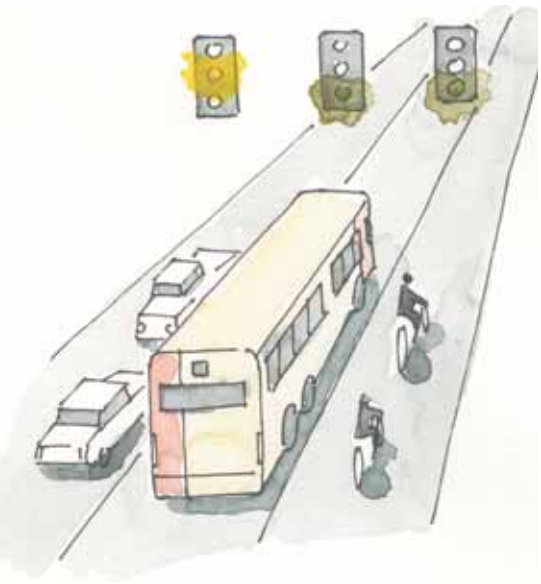
No clear picture of Copenhagen's most pressing traffic and environmental challenges emerges from the citizens' dialogue activities. The opinion polls, however, do give a fairly clear picture of Copenhagen priorities. The Traffic and Environment Plan was well received – 84% of the respondents rated the overall plan good or very good. After rating each proposal individually, the respondents were asked to name the three most important proposals. More and better cycle tracks was the proposal prioritised by most (59%), followed by expansion of the Metro (39%), air pollution reduction (25%) and better traffic safety (23%).

Opinion poll of 1,000 representatively selected Copenhagen citizens. Answers to the question: "Do you think the following proposal is good or bad?"
Figure: IFKA



4. Vision and overall aims

The overall aim of the Traffic and Environment Plan 2004:
"To ensure that the city's traffic needs are served by a well-functioning transport system geared to have a significantly smaller environmental impact than today. This means that the city must strive to provide for the increase in traffic activities by an increase in public transport and cycling."



The city will strive to provide for the increase in traffic activity by an increase in public transport and cycling.

Compared with other major European cities we have an excellent foundation to build on in Copenhagen. A large amount of bicycle traffic, good bus coverage and reasonable traffic levels mean that traffic and environmental issues do not dominate the urban picture. However, increasing car ownership and car traffic are creating problems and a further rise in car ownership is anticipated.

The model city

It is obviously impossible to define objective, tenable criteria for what constitutes a model city. One man's meat may well be another man's poison. Taken as a whole, however, it is safe to assume that a sustainable urban environment resolves more social issues than it creates, while ensuring that no section of the population is left neglected. The model city is accordingly characterized by sustainable solutions for inhabitants and users in relation to work, leisure, daily necessities, social welfare and transport. The life of the city should be able to unfold with a limited consumption of resources, few negative environmental effects and limited waste production.

Vision

The overall planning objective is to ensure a balance between commercial interests and those of the general population. It is the particular aim of the Traffic and Environment Plan to ensure that the city's traffic needs are served by a well-functioning transport system geared to help preserve the city's prosperity. The vision contained in the Traffic and Environment Plan is accordingly "to preserve and further develop a transport system that will ensure a high degree of mobility for all Copenhagen citizens and city users while ensuring at the same time that car-related transport consumption and environmental impact are kept at a minimum."

Challenges

Studies show that within the next 5-10 years a rise in car traffic of 5-10% is more or less inevitable unless road pricing is introduced. If a road pricing system is to be prepared in the coming years, the city must actively participate in the work. However, there is no immediate outlook that legislation, form, administration, etc. will be clarified in the near future. Growing car traffic means increased air and noise pollution as well as congestion and mobility problems for motorists, cyclists, public transport users and walkers.

The rise in car traffic is caused by increasing car ownership, population and workplace growth and a general increase in the individual citizen's transport consumption. Experience shows that car traffic growth can be restrained but not prevented despite extra efforts to promote cycling and public transport. For this reason, the objectives set no objectives for zero car traffic growth in coming years. One of the Traffic and Environment Plan's aims is that the city squares and street spaces shall create a beautiful and harmonious frame for human life and activity. On this basis one of the primary long-term aims continues to be that the total level of city car traffic must not continue to rise.

COPENHAGEN 2024: People dominate street life

Target Vision
Sustainability is no longer merely a planning principle. It is now also daily practice when it comes to choosing your travel mode. In Copenhagen the first priority is the environment.

Mobility is high. Since the size of the city's area is limited this means that you can reach your destination in a very short time – without traffic jams or long waits.

Accessibility levels are high. Workplaces are situated close to trains and Metro stations and near the international airport.

New era – new travel modes
With the construction of the new Metro, Copenhagen has radically renewed public transport. There are Metro stations within walking distance throughout the densely populated areas. The Metro is fast and environmentally friendly and runs 24 hours a day. Bus mobility is ensured by bus lanes and signalized intersections.

Copenhagen is the leading cycle city in Europe
Copenhagen has maintained and actively expanded her large share of bicycle traffic as a proportion of total traffic. There are discrete cycle tracks along all the busiest roads and pedestrian/cycle bridges span the harbour. Cycling is an environmentally friendly, cheap and fast mode of travel – most people's mode of choice rather than cars when it comes to short trips.

The city's space has been won back from cars
A major rise in vehicle traffic has been prevented. The city centre and the densely populated residential areas around it have been calmed. Street space is now for the use of pedestrians, children's games, outdoor cafés, street theatre, music and much more.

The rise in Copenhagen car ownership has resulted in the construction of underground parking facilities in the densely built up residential areas. Copenhagen citizens cycle or take the Metro daily, but they want to be able to use their cars in their spare time.

5. Better conditions for cyclists

Objective
Increase the percentage of cyclists as a proportion of total Copenhagen traffic through a concerted effort to improve the cycle infrastructure. Since cycling is a non-polluting mode of transport, a larger proportion of cyclists will help reduce the combined environmental impact of traffic.

Cyclists play a major role in Copenhagen traffic. Cycling is a space-saving, pollution free and healthy mode of transport. Consequently, the present Traffic and Environment Plan's top priority is to improve cycling conditions so as to increase the proportion of cyclists in relation to the total amount of traffic. Other factors being equal, a rise in this proportion means a drop in environmental impact. The city of Copenhagen has drawn up Cycle Policy 2002-2012 the aim of which is to increase the proportion of home-workplace cycle trips, reduce the casualty rate by half, as well as create a greater sense of security and increase travelling speeds.

More cycle tracks

Discrete on-road cycle tracks along the busiest roads are traditionally the Copenhagen cycle infrastructure's principal element. The cycle tracks and cycle lanes missing from the cycle track network are mapped out in the Cycle Track Priority Plan 2002-2016. According to the plan, 51 km of cycle track and fortified cycle lanes will be established. Fortified cycle lanes are a combination of marked cycle lanes, short sections of proper cycle tracks and traffic islands segregating cyclists from motor traffic.

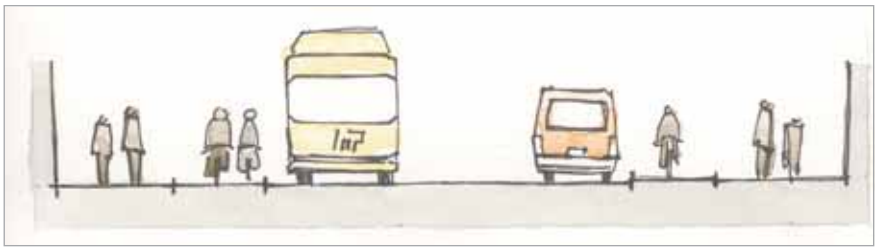
The annual budgetary framework for the Cycle Track Priority Plan is set at approx. DKK 8 million. On this basis it will take at least 20-25 years to expand the network.

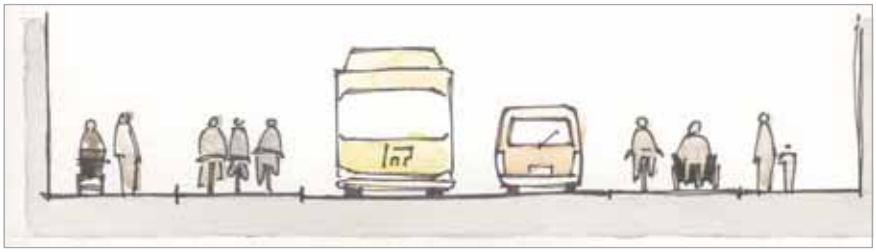
Wider cycle tracks

Some of the most heavily trafficked cycle tracks in Copenhagen are approx. 2 m wide resulting in cyclist congestion at rush hours. This reduces speed, creates a sense of insecurity and gives rise to conflicts with other road user groups. New cycle tracks and cycle routes may provide alternative routes but there will continue to be a need to increase the capacity of the busiest cycle tracks. In the initial stages this would primarily affect a total of 2-3 km on certain inner sections of Nørrebrogade, Torvegade and Østerbrogade.

Cross-sectional view of Nørrebrogade north of Fælledvej based on road user groups.

Above: Current conditions
Below: Cycle tracks widened to 3 m on each side





The new green cycle route, the Nørrebro route

If and when the target goal for bicycle traffic is achieved, widening additional cycle tracks in the course of the next 10 years might come up for consideration, i.e. parts of Amagerbrogade, the rest of Nørrebrogade and Frederiksborggade. Sølvgade, Vesterbrogade and Jagtvej might be taken up at a later stage.

On traditional cycle tracks there is space for two lanes of bicycles. Widening the track to include three lanes (3 m) will considerably increase capacity. An assessment must be made of where the extra two meters in each direction should come from. On certain roads (such as the main thoroughfares leading into the city centre) there is already a great deal of pressure on the street space since bus lanes have already been established and there are large amounts of pedestrian and vehicle traffic. Clear priorities will consequently have to be assigned to the different kinds of traffic.

More cycle routes

The City of Copenhagen has planned a network of so-called green cycle routes, which are cycle routes that are either located in green areas or on quiet streets. A total of 100 km of cycle routes has been proposed, approximately a third of which already exist.

Sections of the Nørrebro route have been established. In addition, sections of the Ørestad cycle routes are being built. In accordance with cycle policy and on the basis of anticipated traffic levels as well as the possibility of establishing new connections in town (such as new bridges across the harbour), it has been proposed that the next routes to be completed will be the Nørrebro route, the Amager route (regardless of whether the final routing goes through or bypasses Svinget) and the Christianshavn route. The latter will provide a new city transport link over or under the harbour.

Cycle parking in Antonigade

Cycle parking

Only one third of cyclists are satisfied with their options for parking their bicycles and other road users, particularly walkers, are increasingly annoyed by parked cycles. Bicycle parking is relevant in many contexts: at public transport terminals, at homes and workplaces, at shops and shopping centres and at other locations.

Both the supply and demand for cycle parking in Copenhagen is being mapped out. It was not until the early part of 2001 that the extent of bicycle parking in the historic city centre was assessed (there was a total of 2,900 spaces at the time. Since then 400 more have been established). In accordance with cycle policy, an action plan for bicycle parking will be prepared. Part of the task entails forming an overall view of the demand. This will constitute the planning basis of where and how more cycle parking might be installed. In the densely populated areas, new bicycle parking will often have to be installed inside buildings, particularly at terminals, as street space is limited.

Maintenance

Improved cycling facilities is not merely a question of new construction. The cleaning and maintenance of existing cycle tracks means a great deal for the experience and comfort of the individual cycle trip. Copenhagen citizens used to be extremely dissatisfied with cycle track cleaning and maintenance. The most recent Bicycle Account, however, shows that cyclists give the city's concerted efforts in recent years to improve maintenance a high rating. However, there is room for further improvement. The cycle policy target goal of improving cycling comfort states that cycle track surfaces deemed unsatisfactory shall not exceed 5%. Accordingly more resources must continue to be allocated to cycle track maintenance if the standard is not to gradually deteriorate. If a high standard is to be maintained the annual cleaning cost must also be increased.

Focus Area	Cost	Benefit
More cycle tracks and fortified cycle lanes (approx.50 km total)	DKK 180 million	Greater capacity, greater security
Green cycle routes (approx. 100 km total)	DKK 750 million	Greater capacity, greater security, greater safety
Wider cycle tracks (initial km)	DKK 25 million.	Greater capacity, greater security, better mobility
More cycle parking	DKK 100 million	Easier to combine cycling and public transport, increased satisfaction, better urban space
Better maintenance	Extra DKK 4 million p.a.	Greater comfort, better mobility, greater satisfaction

The map shows existing cycle tracks and the missing sections according to the Cycle Track Priority Plan 2002-2016.The map also shows the total green cycle route network, established and planned.

6. New rail lines

Objective
Increase the public transport share of total Copenhagen traffic by expanding the Metro as a high quality, rail borne transport offer. The Metro provides a more environmentally friendly form of transport than individual car traffic and will accordingly help reduce the total environmental impact of traffic.

Nørrebro Station is one of the Ringbane line stations where a sharp rise in passenger numbers is anticipated

It is vital that the city of Copenhagen has a well functioning public transport system. Only one third of Copenhagen citizens have the daily use of a car. The city is not made for large numbers of cars and not everybody has the opportunity to cycle. Nevertheless, public transport's market share has dropped in recent years. If the environmental impact of traffic is to be reduced in Copenhagen it is crucial that public transport offers an attractive alternative to the car. The backbone of the collective transport system is the rail network consisting of suburban S trains, regional trains, intercity IC trains and the new Metro. Continued expansion of the rail network will result in a quality boost to the entire public transport supply. The aim is to increase the public transport share of total traffic thereby reducing environmental impact.

Ringbane line scheduled to open in 2005-2006
The Ringbane is a new S-line cutting across the city between Hellerup and Ny Ellebjerg Station with many departures. With its total of 13 stations it provides good transfer options to all areas covered by the S train, to the Metro at Flintholm Station (and later at Nørrebro Station as well) and to several regional trains and a number of bus lines.

The Ringbane will consequently considerably enhance the infrastructure and cohesiveness and integration of the regional public transport system. In addition, the line will service the densely populated urban areas. Construction started in the fall of 2000 and the new line opened in January 2005 to Gammel Køge Landevej (temporary station). The terminus Ny Ellebjerg, which will also be the transfer station to the Køgebugt line, is due to open at the end of 2006.

Over the longer term, Flintholm Station will become one of the city's main terminals. With large numbers of passengers transferring between the Frederikssundbane line, the Ringbane line and the Metro, the station will be the third largest in Denmark in terms of passenger numbers, after Nørreport and the central station. Easy transfer to the bus lines on ring 2 will also be established.

Ny Ellebjerg Station between Ellebjerg and Sjælør stations on the Køgebugt line will be the transfer station between the Køgebugt line and the Ringbane line. It will also be possible to transfer to several bus lines. The station is expected to handle up to 40,000 passengers on weekdays and is due to open at the end of 2006. Until then a temporary station will be established at Gammel Køge Landevej

The Metro's initial three stages due for completion in 2007
The new Metro provides rapid and efficient transport and its mobility does not depend on city street traffic. For this reason, the Metro is an attractive alternative to busses, bicycles and cars. If the Metro system is extended as planned to cover the entire densely built up urban area (the area within the Ringbane) it will be able to offer a majority of Copenhagen citizens rapid travel options for shopping or going to school or work. Travel speeds will typically be twice as fast as by bus. Outside commuters will also greatly benefit from

Flintholm Station, 1st of April 2004.
Photo: Aerodan Luftfoto

the Metro system by transferring between S trains and the Metro at the central station and at Nørreport, Østerbro, Nørrebro, Flintholm and Ørestad stations.

The experience of the Metro's initial stages (between Amager and Frederiksberg-Vanløse) has been highly positive. More than 120,000 Copenhagen citizens use the Metro daily. A traffic census of passengers crossing the central harbour (around Langebro Bridge and Knippelsbro Bridge) showed that the number of passengers crossing the harbour in all forms of public transport rose by 35% in the autumn of 2004 compared with the time preceding the Metro's October opening. During the same period,the number of car passengers dropped by 4% and the number of cyclists rose by 3%.

The third stage of the Metro from Lergravsvej along Amager Strandpark to Kastrup Airport will be under construction until 2007. It will terminate at Kastrup Airport, Terminal 3. The Metro's initial three stages are expected to result in 250,000 passengers a day.

The fourth stage is a Metro city ring running under the city centre and the densely built-up residential areas around it
The Metro's fourth stage is still in the planning stages. The city of Copenhagen in collaboration with the municipality of Frederiksberg and the Ministry of Transport is studying a number of different ways of routing a Metro city ring through the city centre, Østerbro, Nørrebro, Frederiksberg and Vesterbro. The 15-16 km inner ring line, along with the existing rail lines and the Metro's initial

Nørreport Metro station
Photo:Teit Hornbak

stages, will cover almost the entire densely populated section of the city so that there will be a Metro station within walking distance (700 m) virtually everywhere.

Routing decision makers place great emphasis on the new line serving as many homes and workplaces as possible and on locating stations so as to provide easy transfer to and from other modes of public transport. In other words, one of the main aims is to maximize passenger potential and potential revenue base.

It is anticipated that in the course of 2005 negotiations may be initiated with the State among others concerning possibilities for financing and constructing a Metro city ring based on jointly defined routing. If it is decided to commence work on the fourth stage in extension of the present work with the Metro's third stage, it will presumably be possible to complete the entire Metro city ring by 2015 roughly. The Metro city ring as a whole is expected to carry up to 300,000 passengers a day.

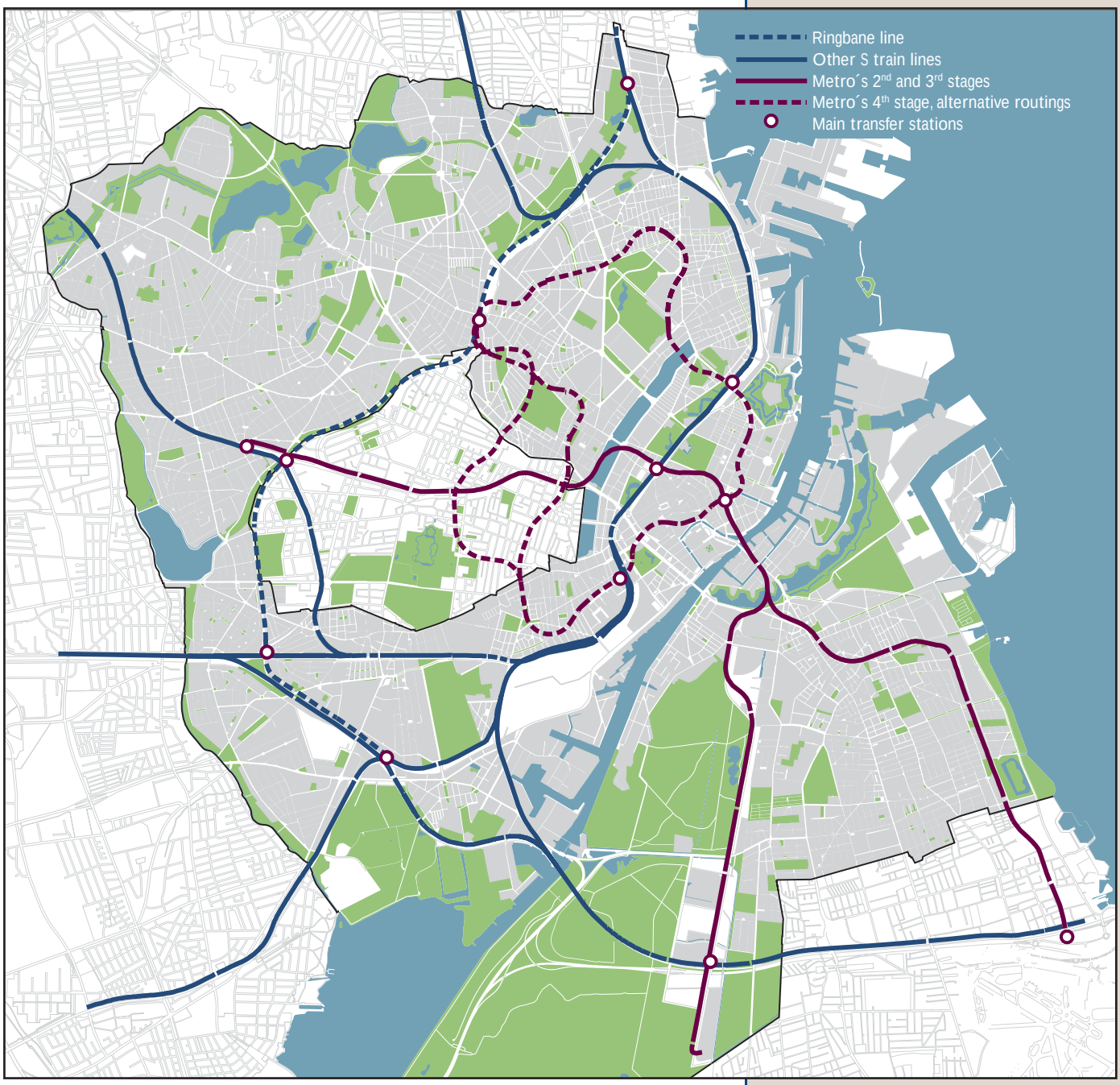
Light rail or modern tram
In connection with the studies pertaining to the construction of the Metro ring a Copenhagen Public Transport Plan Report was

Focus Area	Cost	Benefit
Metro city ring	DKK 10-15 billion	High quality public. transport covering the entire built-up urban area, high mobility independent of vehicle traffic
Ringbane front areas	DKK 70 million	Easy transfer between bus and train, good bicycle parking facilities

prepared. The Plan Report was drawn up in the spring of 2005 in continuation of the public hearing procedures relating to the Draft Traffic and Environment Plan. The report is partially based on previous studies and partially on current data from other European cities, primarily comparable cities that have either chosen to supplement a metro system with a light railway or a light railway system with metro lines.

The report outlines plans for integrating public transport across the Copenhagen region into a cohesive whole and the difficulties this entails. In addition, the report sets forth the possibilities – and consequences – of replacing or supplementing the projected Metro ring with a rail service in the form of a light railway or a modern tramway. Finally, the report illustrates different kinds of feeder lines to the Ringbane and the Metro ring.

City of Copenhagen rail lines including the coming Ringbane and routing proposals for the Metro's fourth stage



7. Improved bus service

Objective
Increase the public transport share of total traffic in the city of Copenhagen by improving bus travelling speeds, scope of operations and transfer facilities. Busses provide a more environmentally friendly means of transport than individual car traffic and will accordingly help reduce the total environmental impact of traffic.

The Metro and the coming Ringbane will give a quality boost to public transport, but there is still a need for an extensive and attractive bus network to supplement the rail lines. The objective is for public transport to gain a greater market share of total passenger transport.

Mobility and speed
Busses are delayed by other traffic in unobstructed areas primarily by vehicle traffic. Bus mobility must not be allowed to deteriorate and mobility must be improved on the major bus routes. Mobility may be ensured and improved by giving busses priority in signalized intersections and by special bus lanes in areas with heavy bus traffic. Bus lanes already exist today in Copenhagen, but should be expanded to cover all streets with large amounts of bus traffic, such as all roads with major A-bus routes. However, many of these roads also have to contend with heavy bicycle and car traffic and parking. If space is to be found for bus lanes, clear priorities must be given to the different types of traffic.

On average, one fourth of bus travelling time is spent waiting for the bus to leave the bus stop so measures that would speed up the process would significantly help reduce journey times. Allowing passengers to enter and exit through all doors, revised ticketing procedures, non-indented bus bays making it easier for busses to merge back into traffic are possible options.

Scope of bus operations
Falling market shares, fewer passengers and increasing operating costs have resulted in a growing need for operations subsidies. Moreover, the Metro will replace some of the most heavily used bus routes. Net expenditure cuts of DKK 140 million on bus operations resulted in operations cutbacks of approximately 9% in Copenhagen and Frederiksberg in 2004.

Bus terminal at Town Hall Square

Bus lane on Amager Boulevard

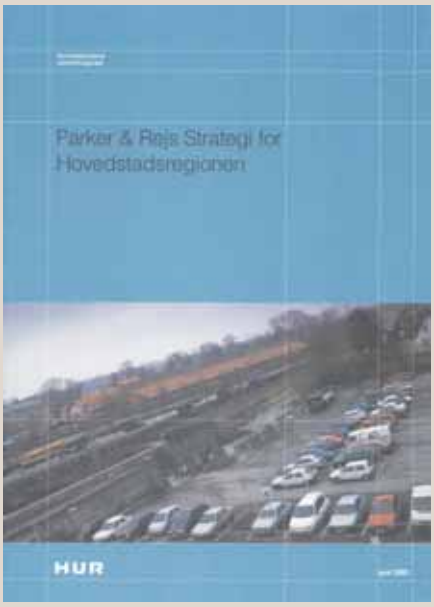
The cutbacks have led to a deterioration in the total public transport supply thereby weakening public transport's competitive edge. If busses are to provide an attractive alternative to car travel, the scope of operations should rather be increased. Initially, maintaining the present scope of operations would be desirable. An unchanged scope does not mean an unchanged bus network since in any event the bus network has to be reorganized to integrate with the Metro. A shift in operations might include new bus routes, more frequent departures on certain bus routes and less frequent departures on others.

However, it is important to note that an increased scope of operations means considerable annual operations expenditures. This is not a question of a one-time expenditure such as the construction of a bus lane or a bus stop, but of a fixed annual increase in the operations budget.

Terminals

Busses, trains and bicycles are all environmentally friendly modes of transport which is why it is an advantage to integrate them. Better cycle parking facilities at public transport terminals, perhaps in a covered, locked or monitored area, are an option. Steps might also be taken to encourage cycling at the destination, such as company bikes (for home-workplace trips) or possibly renting/leasing.

Easy transfer (bus-train or bus-bus) and pleasant waiting facilities would also provide a quality boost for the total journey. Time spent waiting is experienced as time wasted. HUR, the regional traffic planning council, is working to integrate bus and train schedules



HUR Park and Ride strategy in the Copenhagen region

and the Metro runs so frequently that waits are kept to a minimum. Stations and other junctions must be designed so that the distance between the station and the bus stops is not too great and that the way between them is safe and comfortable. The main focus areas are at Nørreport and Nørrebro stations, the new Metro and Ringbane stations and the A-bus terminals.

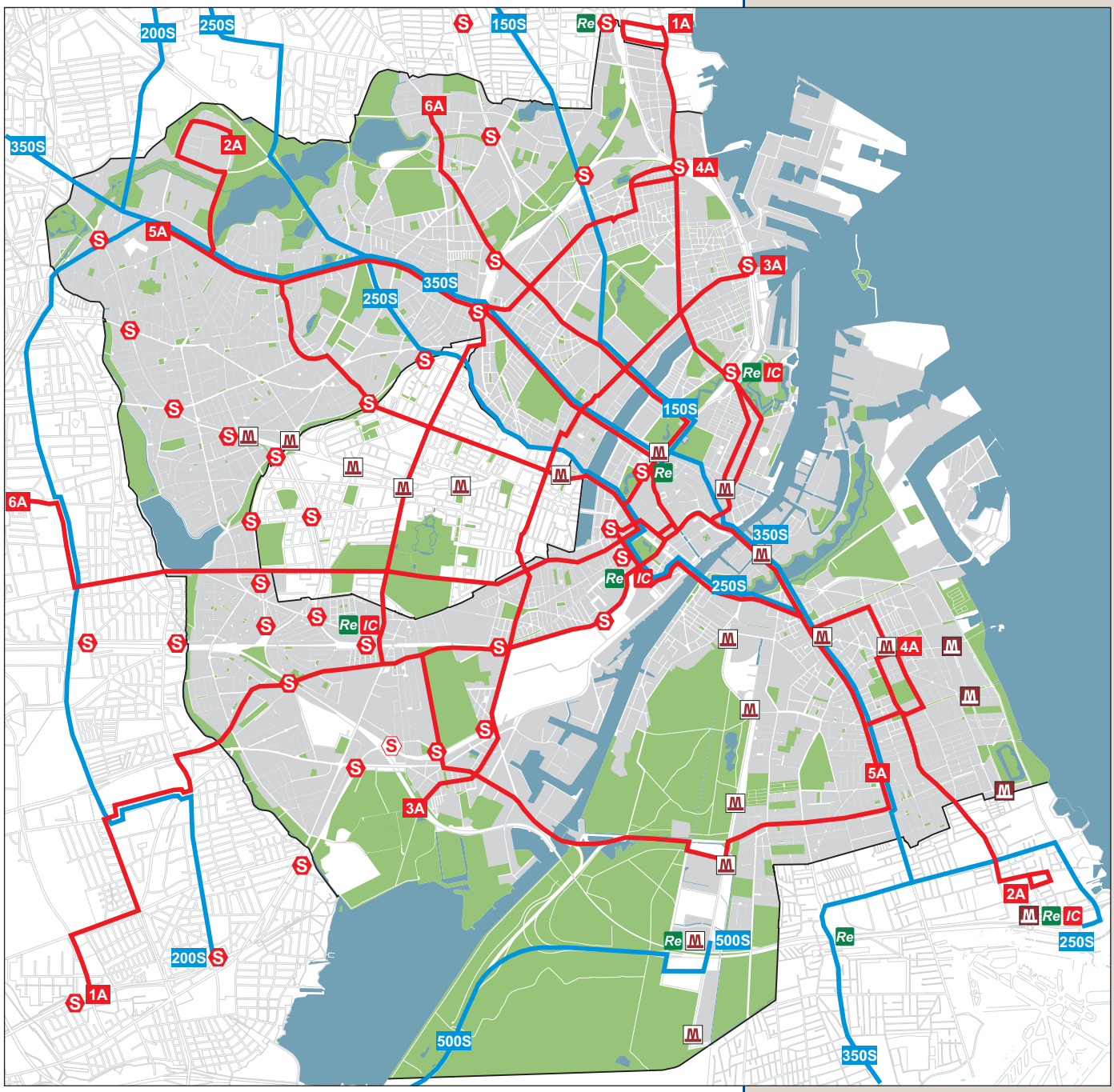
Park & Ride

Car traffic in the inner section of Copenhagen might be reduced by making it possible for motorists to park at stations and continue their journey by high quality public transport. As yet, the impact of park and ride facilities is limited in the Copenhagen area but experience from abroad indicates a certain potential. The existing park and ride facilities are located at S train stations situated at a distance from Copenhagen, a strategy which the city of Copenhagen supports.

The question of placing park and ride facilities at stations (S train and Metro) near the city limit or closer to the centre has been studied. Ørestad station near the Øresund motorway, where a private car park has already been built, might be relevant. Other locations under consideration are Ryparken Station near Lyngbyvej and Ny Ellebjerg Station near Holbæk motorway/Gammel Køge Landevej. However, the cost of establishing a major car park is relatively high and the facility itself would occupy valuable space on the attractive sites around the station. Shifting travellers away from cars and into public transport so close to the city centre is considered unrealistic and its utility limited. For this reason it is recommended only to proceed with work on park and ride facilities at stations in the outlying environs of Copenhagen.

Focus Area	Cost	Benefit
Mobility (bus lanes, signals, etc.)	DKK 150 million	Shorter travelling time, improved mobility
Entry and exit through all doors	—	Shorter travelling time, stopping time at bus stops cut in half
Increased scope of operations (equal to projected cutbacks)	DKK 50 million p.a.	Unchanged scope of operations compared to pre-Metro. New routes, more departures on existing routes
Stations and terminals	DKK 300 million	Easier transfer, shorter travelling time, better waiting facilities

A-bus system's 6 routes, S-bus routes and train stations.
Mobility measures will be initially concentrated in A-bus serviced areas



8. Behaviours and traffic safety

Objective
Encourage a sense of security and reduce the number of traffic casualties in Copenhagen. The objective is to be achieved independently of any rise in traffic volume

The number of traffic casualties has dropped in recent years but continued efforts are necessary to reduce the number of accidents and encourage a sense of security in traffic. It is the stated objective of the city of Copenhagen to reduce the number of people killed or seriously injured in Copenhagen traffic by at least 40% by the end of 2012 compared with the 1998 figures.

Traffic behaviour campaigns and information

The opinion polls show that Copenhagen citizens give campaigns to improve traffic behaviour top priority. It is frequently pointed out that Danish (and Copenhagen) road manners are more self-centered than elsewhere. Road users are more focused on their own right of way than on being considerate of others. This applies to all road user groups, including cyclists and walkers.

The city of Copenhagen will give high priority to road user behaviour modification campaigns, such as campaigns targeted at specific situations (cyclists and motorists in intersections, parking on cycle tracks, cyclists in pedestrian areas, driving speeds, driving in residential areas, etc.). The campaign work will later include a broad-based collaboration within the city, with other municipalities, counties, organizations (the Danish Road Safety Council, the traffic safety council for the greater Copenhagen area (Storkøbenhavns Trafiksikkerhedsråd), etc.), the police and other relevant authorities.

Speed reduction

The negative relationship between speed and accidents has been established beyond any doubt today. Accordingly, one of the best ways to reduce the number of casualties is to reduce the speed limit. The city of Copenhagen has a speed plan according to which speed limits in residential areas will be reduced from 50 km/h to 40 km/h.

The major road network is not included in the general speed reduction. Speed measurements on the major road network show that speed limits are violated by a significant number of motorists in many areas. The city of Copenhagen feels that the best way to reduce driving speeds is to encourage motorists to respect the speed limit. In addition to police monitoring this will be done through educational campaigns supported by physical road reconfiguration where speeding violations are greatest.

Black spot intersections

One of the most widespread methods to improve traffic safety is the identification of problem or black spot areas, in other words putting a focus on areas where a disproportionate number of casualties take place. The city of Copenhagen places great emphasis on improving black spot areas. Work is being done to address intersections with the highest casualty rates and intersections with the highest casualty rates in relation to the amount of traffic. The specific measures include new road markings, revised signal cycles, reconfiguring traffic islands and kerbs, etc.

Photo collage from the school competition "Going to school safely", Østerbro, (3rd grade, Kildevælds School)

Pas på Laura, hun er ny i trafikken

Hovedstadens Udviklingsråd - udvikler din region HUR

STORKØBENHAVNS TRAFIKSIKKERHEDSRÅD

"Mind Laura, she's never been out in traffic before!"

Pedestrian crossings on long roads

One of the greatest traffic safety challenges especially for the elderly is crossing a street where the traffic is heavy but which frequently has to be crossed due to the large amount of homes and shops along the road, for example. The city of Copenhagen has established center medians on Frederikssundsvej enabling pedestrians to cross the road in two stages. It is not yet possible to assess the project's impact on the accident figures, but the inhabitants are generally satisfied with the measure. Another method is to establish kerb extensions, or bulb-outs, and refuge islands enabling the walker to stand closer to the carriageway for a better view of oncoming traffic.

Traffic accident registration

Accident registration is based on police registration. It has long been common knowledge that the police do not register all traffic accidents. Nobody knows the actual figure, but it is considerably larger than the figure reported to the police. Injury accidents are the most important type and emergency department reports show that a very large group of accidents are not reported to the police.

Emergency department reports give a more accurate picture of the extent and nature of accidents, but police reports are by far the best means of establishing where and how the accident took place. The city of Copenhagen wishes to acquire more accurate information on accidents that are not reported to the police by collaborating with hospitals. Accordingly hospital staff must be trained and given sufficient resources to accurately register where and how the accident took place thereby making it possible to use this information preventatively.

Focus Area	Cost	Benefit
Campaigns	DKK 1 million	Fewer accidents, greater sense of security (could be the job of the Campaign Secretariat – see next chapter)
Black spot identification, pedestrian crossing points, etc.	DKK 100 million	Fewer accidents, greater sense of security
Accident report team (accident registration study)	DKK ½-1 million	Accurate emergency dept. data, preventative use of data
New accident registration techniques	DKK ½-1 million p.a.	Improved accident registration, preventative work improved, more accurately targeted campaigns

9. Choice of travel mode

Objective
The environmental impact of traffic must be reduced without impairing mobility. Transport habits will be influenced through education and campaigns encouraging the sensible choice and use of travel mode.

Better transport habits mean shifting your travel pattern from private cars to a more environmentally friendly means of transport (such as cycling or public transport), or minimizing your transport consumption through car sharing, working from home, etc. The aim is to improve the environment without impairing mobility. The focus areas are to a large extent the same as the campaign measures proposed in the CO_2 plan of 2002.

Company transport plans

A transport plan is a scheme for making the firm's transport consumption (goods and staff) more environmentally friendly, for example by providing good cycling facilities, easy access to public transport, company bikes, company commuter busses, car sharing databases, flexible working hours, working from home, changes in working arrangements, etc. A transport plan benefits both the company and the staff through lower parking and travel expenses, improved staff health, and a "green" image. The city of Copenhagen wishes to encourage businesses to draw up transport plans. Guidance and counseling will be offered to businesses that wish to prepare a transport plan. (HUR, the regional traffic development council, has already taken steps in this direction). In addition, steps should be taken to draft transport plans for selected city departments or offices. Finally the feasibility of reviewing parking requirements for new buildings in connection with company transport plans should be studied.

Car sharing systems

A number of Danish municipalities are collaborating with the Danish Road Directorate and Krak, the Danish map publisher, on an internet-based commuter database called pendlernet.dk. The commuter can enter a searchword for partners with the same driving needs as themselves. Other Danish towns have twice as many registered users as Copenhagen where approx. 0.5% of in-coming and out-going commuters have signed up as yet - with no effort on the part of the city, let it be noted. However, the impact of the system is expected to grow as streets become increasingly clogged and finding a parking space increasingly difficult.

Collaboration with pendlernet.dk is an inexpensive means of reducing car travel. It is proposed that the city of Copenhagen sign up, that resources be allocated to promote the system and that the city should incorporate the system into its staff services and information policy.

Traffic information

Easily accessible public transport information (for example www.rejseplanen.dk) helps make public transport more user friendly. By the same token, bicycle promotion campaigns (cycle track maps, information, cycle parking facilities and better integration with bus or train travel) help increase bicycle traffic. Route planning instruments might also be developed for cycle traffic. When it comes to cars, parking information might reduce time spent looking for parking spaces in the built-up urban districts and driving time information on the city approach roads might give motorists an incentive to choose alternative travel modes.

Breakfast rolls were handed out on Dronning Louises Bro as part of the "We bike to Work" campaign in 2001.

Eco-driving

Special campaigns should be implemented to encourage motorists to pay more attention to the environment. Courses on energy efficient driving techniques show that fuel savings of 5-15% are apparently achieved by using the appropriate driving techniques. This not only results in environmental improvements (particularly in terms of CO_2 emissions), it also represents a direct saving for motorists and road transport operators in the form of saved fuel. For this reason information and possibly courses on energy efficient driving techniques, or eco-driving, should be included in the campaigns.

Traffic Environment Week

In recent years the city of Copenhagen has arranged a Traffic Environment Week in September. The primary aim of traffic environment week is to turn the spotlight on city traffic development and encourage and make visible environmentally friendly transport behaviours for the benefit of those who live and move about in town. During the week there are demonstrations and discussions of how travel needs may be addressed with due consideration for the environment and people's health. Traffic Environment Week consists of a large number of local community events, activities and pilot trials of specific measures, including car-free days. In fact, one of Traffic Environment Week's main purposes is to annually test specific traffic measures in the local community in collaboration with a large number of local organizations and associations. For this reason Traffic Environment Week is considered a key campaign activity and its continued existence is a top priority.

The Campaign Secretariat

It is proposed that a campaign secretariat be established to coordinate and manage the activities mentioned above. The secretariat is to be in charge of implementing and coordinating city campaigns targeted at citizens, business concerns and the city's own institutions to help ensure that transport becomes more efficient and less environmentally damaging. The city already participates in a number of different campaigns: Traffic Environment Week, We Bike to Work, traffic safety campaigns, etc. The existing activities may be advantageously integrated with the new activities mentioned above thereby making it possible to develop and enhance the city's educational efforts and their impact.

The rickshaw or pedicab is a new mode of travel in Copenhagen

Focus Area	Cost	Benefit
Campaign Secretariat	DKK 4 million p.a.	Information, campaigns, reduced air and noise pollution, reduced car traffic
Traffic Environment Week	DKK 4 million p.a.	Information, campaigns, test trials, increased public awareness
Annual transport accoun	DKK ½-1million p.a.	Overall view of progress across all fields of transport, on-going target-fulfillment assessment

10. Environmentally friendly traffic distribution

Objective
Through traffic must be diverted around the residential areas. The local community environment will thereby be improved and streets and squares calmed.

Vehicular traffic must be funneled onto roads where its negative impact is kept to a minimum. The aim of environmentally friendly traffic distribution is to improve the community environment (noise and air pollution) in areas where many inhabitants are negatively affected by motorized traffic. Traffic distribution per se has no impact on overall traffic levels and consequent fuel consumption or on environmental issues in general.

The road hierarchy

In the city plan, the major road network is defined as consisting of regional roads, collector (or distributor) roads and residential (or local) roads. The major road network ensures that through traffic may move freely throughout the region, from one urban district to another and within the urban district. All bus schedules follow the major road network. Local streets, or side streets, make up the remainder of the road network. Attempts will be made to calm the local streets to the greatest extent possible particularly in residential areas so as to enhance the local environment by limiting and slowing down traffic. The classification of individual road sections may be debated but it is essential to maintain and reinforce the principles underlying the road hierarchy. This means that on the major road network attention must be paid to vehicular traffic mobility to prevent it from moving onto the local side street network. At the same time specific measures must be taken to ensure the calming of residential streets. New roads may help relieve and calm existing roads.

Traffic movement on the major road network

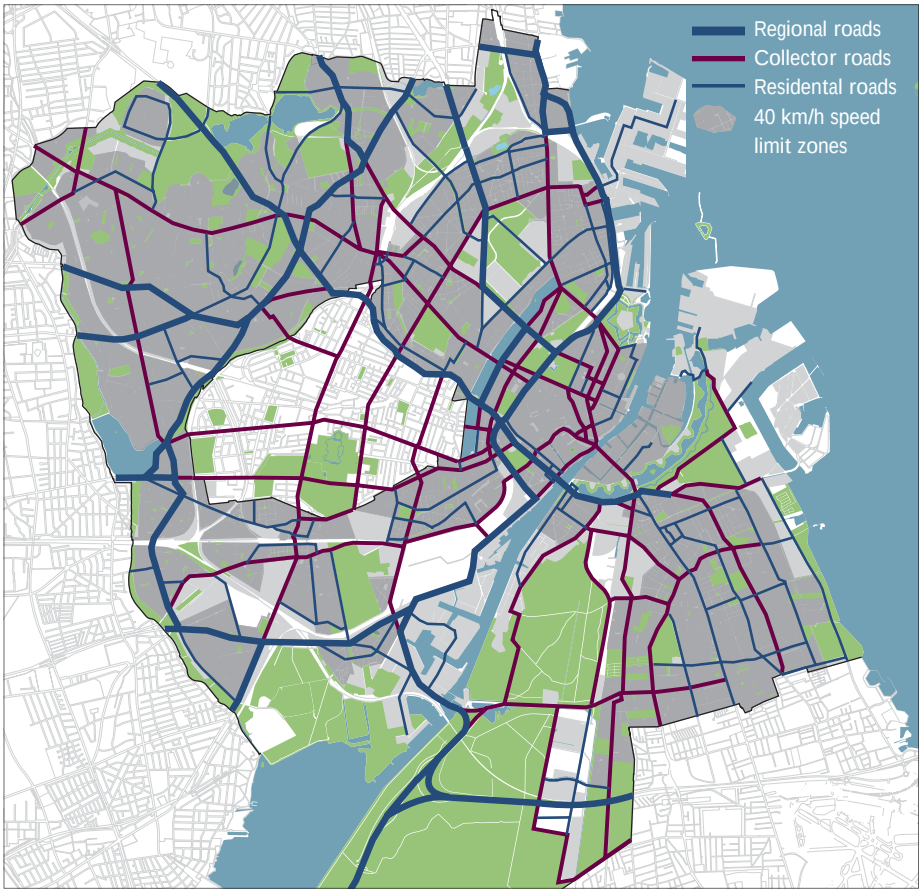
The major road network is assessed on a continual basis and individual road sections change categories as a consequence of traffic reorganization. On the *major approach* roads capacity is adjusted in relation to the amount of traffic that in practice can move on the city's street network. On the *regional roads* the smooth and expedient flow of vehicle traffic must be ensured while simultaneously ensuring traffic safety and pedestrian friendly crossing points. Many regional roads handle 30,000-40,000 cars on an average day and several roads handle up to twice as much traffic. Other factors being equal this means that a great deal of attention must be paid to car and bus mobility. At present, tests are being carried out on introducing a so-called adaptive or traffic responsive signal system on the central artery. The system is intended to ensure maximum traffic movement with due regard to traffic flows from all other directions. Intersection capacity

Focus Area	Cost	Benefit
Physical measures on major road network	DKK 450 million	Improved traffic safety, pedestrian friendly crossing points and traffic movement on the major road network
Introduction of speed limit zones	DKK 30-40 million	Improvement of local environment on residential streets (reduced noise, congestion and air pollution)

is expected to increase by 5-15% depending on the number of pedestrians. *Collector roads* ensure the connection between districts and are typically used by 15,000 – 20,000 cars per day and by cyclists and busses. They are accordingly configured with regard to cycle and bus traffic as well as vehicular traffic. On the *local residential roads* equal or higher priority is given to bus and cycle traffic than to vehicle traffic and these streets may be configured accordingly. The city will strive to keep through traffic at a minimum on residential roads. Approximately 5,000 cars drive on a typical residential road over a 24 hour weekday period. On certain roads (i.e. the major thoroughfares leading to the centre) the improvement of cycling and bus facilities will make it necessary to assign sharper priorities to the different kinds of traffic.

Calming the residential side streets

As a means to calm the residential areas the city of Copenhagen has decided to introduce zones in which the maximum driving speed allowed is 40 km/h. The zones cover all residential areas in the city and will be implemented as community traffic plans or specific district projects are drawn up. Speed limit zones will be posted with traffic signs and there will also be public information campaigns. In addition, physical measures may also prove necessary, for example when there is a risk of through traffic or where special conditions call for extra measures. Physical measures may include curb extensions, entry treatments, medians, landscaping, crossing point reconfiguration, gateways, speed bumps, closed carriageways, etc. Many residential side streets in the city of Copenhagen are private roads where the general rule is that the homeowner is responsible for the building and upkeep of the road.



The major Copenhagen road network (cf. Municipal Plan 2001), distributed onto regional roads, collector roads and residential roads. The map also shows the projected 40 km/h speed limit zones in residential areas.

40 km/h speed limit zones have been established in parts of the city centre

11. New road construction

Objective
The new urban development sites must be accessible to vehicular traffic. The new road infrastructure must ensure the quality of the local environment by keeping the local areas and districts free of through traffic.

Generally speaking the city's aim is to gear traffic to the city as it exists. Nevertheless it may be relevant to explore the option of constructing new connecting roads. The aim is to ensure traffic movement on the main road network thereby improving the local community environment by diverting through traffic around it. It is of vital importance to follow up on the newly constructed roads by introducing traffic calming measures on the connecting roads they replace so as to achieve the desired calming effect.

The Lyngbyvej-Nordhavn connecting road
A connection between Lyngbyvej and Nordhavn is an essential component of the regional road network and this road is the city's number one road construction priority. The road in conjunction with a road connecting Lyngby and Motor ring 3 near Vintappersøen in Lyngby will connect the northern section of Copenhagen with the rest of the region and create a route for heavy vehicles which today are largely forced to drive through the city centre.

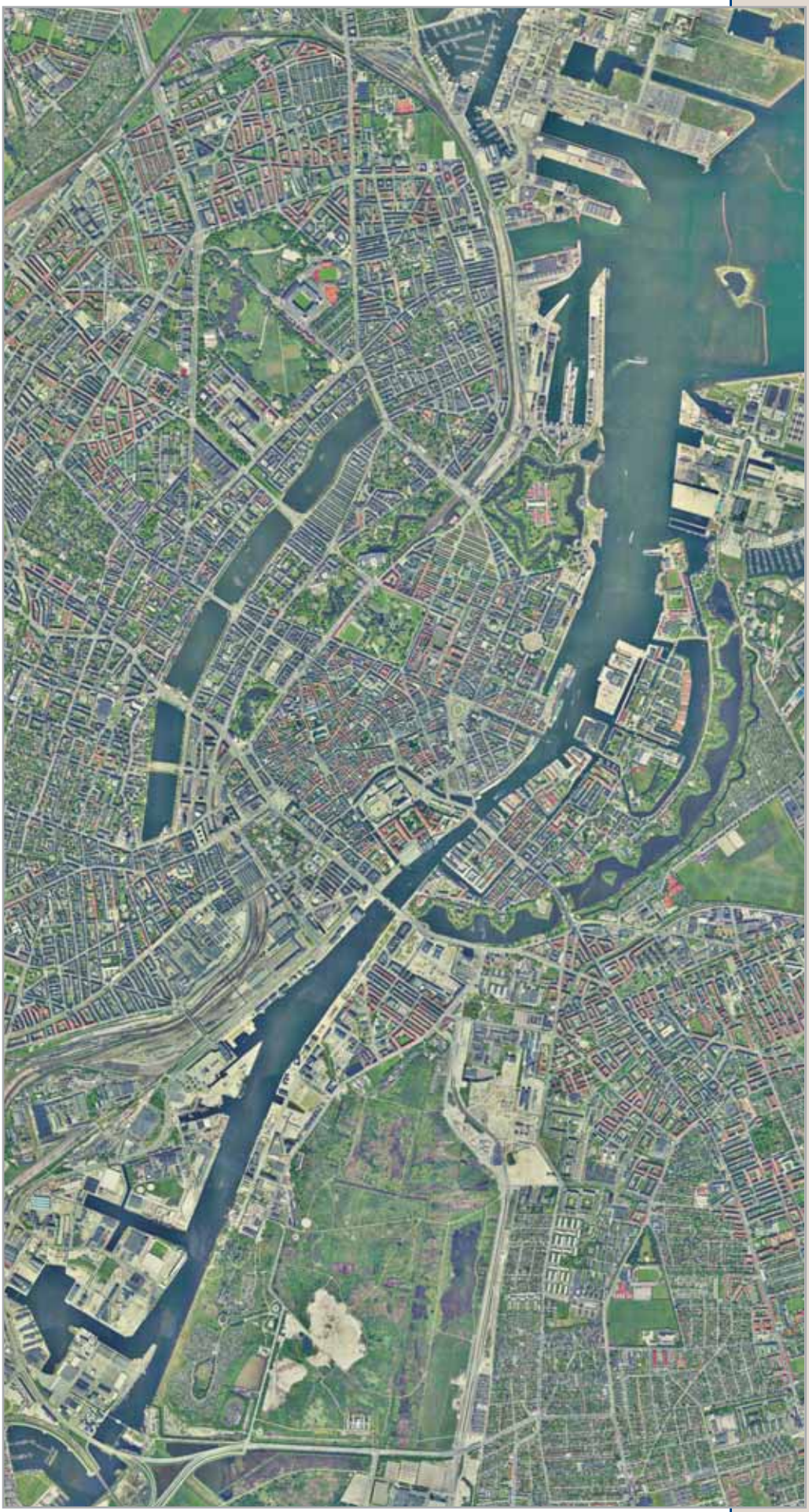
Traffic volumes are also on the rise in the Nordhavn area's mix of homes, businesses and port activities. Today a large portion of this traffic is funneled through the city centre. Plans are in preparation for shifting parts of the Nordhavn area away from port activities to a mixture of homes and businesses. Although great emphasis is placed on establishing supplementary public transport and good cycle links, the development of the site will nevertheless inevitably result in a rise in vehicular traffic which will be moved via Kalkbrænderihavnsgade.

The urban development of Nordhavn is at present at a standstill pending a clarification of traffic conditions. A connection to Lyngbyvej is a prerequisite for Nordhavn's continued development.

In order to prevent major congestion in the area with the resulting risk of motor traffic moving into the rest of Østerbro a connection to Lyngbyvej is crucial. The connection will replace the section of Ring 2 that today runs on Strandvænget, Strandøre and Tuborgvej. The traffic from the Nordhavn area headed for Amager has a negative impact on the city centre and Christianshavn. Through traffic could be diverted around these districts by means of a harbour tunnel and the Lyngbyvej connection is a prerequisite for the later establishment of a harbour tunnel.

It is anticipated that the road section between Lyngbyvej and Nordhavn will be used by approx. 24,000 cars per day by 2010 and will result in improved environmental conditions on Tuborgvej, Jagtvej, Strandøre, Strandpromenaden and Strandvænget, etc.

Eastern harbour tunnel
Vehicle traffic creates a number of problems for the city centre and Christianshavn. Congestion makes it difficult to move about town, the large number of cars takes up street space and noise and air pollution have a negative impact on inhabitants, shoppers, tourists and everyone else with business in the central part of Copenhagen.



The inner section of the port of Copenhagen
Aerial photo: DDOby©, COWI A/S

A harbour tunnel linking Østerbro with Amager would calm the city centre by diverting through traffic around it. Heavy vehicle traffic in particular places an undesirable burden on the city centre. In 2000, on the basis of extensive studies the city council estimated that a harbour tunnel would create more problems than it would solve and stopped all further work on the project.

If the idea of relieving traffic pressure in the city centre and Christianshavn by building an eastern harbour tunnel should at any time be revived, new plans for connecting roads would have to be prepared. The previously proposed connection point north of Kastellet has been built up in the mean time. On the Amager side, the harbour tunnel could connect at Forlandet and Kløvermarksvej, but from that point on the route south remains unsettled.

The eastern harbour tunnel, apart from relieving traffic pressure in the city centre, is a prerequisite for urban development on Refshaleøen. The expansion of Refshaleøen is not considered relevant until 2013 at the earliest, but it is vital to plan for good public transport service when developing the area. The eastern harbour tunnel would play a major role in providing expedient traffic access to the new residential areas.

Amager motorway-city centre road connection

Major urban reconfiguration has been projected and is currently being implemented in the Sydhavn area. When completed it is anticipated that the site will be able to contain several thousand new workplaces and up to 5,000 new homes. There is traffic access to the area via the existing central artery (from Sjællandsbroen, Scandiagade or Vasbygade). Sections of the Sydhavn site are located near Dybbølsbro and Sydhavn stations. Serious attention must also be given to minimizing vehicular traffic, supplementing public transport and establishing good cycle connections.

The central artery is already strained to near capacity and an expansion of the Sydhavn site will further increase motor traffic levels. Add to this the traffic headed towards the city centre from the new Ørestad area. Finally, there is also a good deal of through traffic on Ellebjergvej and P. Knudsensgade in the area. Calming P. Knudsensgade etc. is a top priority community request as d in the local Kongens Enghave traffic plan.

As a consequence, a new central artery might be an option worth considering. The goal is to create a greater degree of internal integration in Kongens Enghave and to ensure traffic access to the urban development site in Sydhavn. The new connection would connect the Amager motorway with Kalvebod Brygge via a tunnel under the harbour at Sydhavn. It would subsequently be possible to downgrade the present central artery to a collector road primarily serving Sydhavn and Kongens Enghave.

The impact of a possible southern harbour tunnel on traffic has not been studied in depth, but the number of cars that would use such a tunnel is estimated at around 30,000 a day.

Harbour tunnel the length of the port of Copenhagen
Preliminary studies have been initiated of options for creating better road access to the centre and for relieving the traffic burden on the central urban areas in the form of a harbour tunnel running under the length of the port from Nordhavn to Sjællandsbroen. The preliminary studies also clarify options for establishing an underwater car park with a view to relieving central Copenhagen of the burden of unnecessary parking and vehicular traffic. The preliminary study may serve as the basis for a future political decision whether to continue with more in-depth studies of the options for and consequences of such a road.

Urban areas with reduced traffic burdens
Road connection with increased traffic
A New road connection to Lyngbyvej
B Eastern harbour tunnel
C Southern harbour tunnel
Road connection with reduced traffic

12. New parking strategy

Objective
To make it possible to live in Copenhagen and own a car and also make it possible to visit the city without all open spaces being clogged with parked cars

Increasing car ownership makes it necessary to revise present parking policy. It must continue to be possible to live in Copenhagen and own a car, but on the other hand the streets are now more or less filled up. At the same time, the growing number of cars makes it impossible to use the city's spaces for other purposes than parking. Not only city inhabitants need to park in Copenhagen, however. A number of commuters and guests come to town by car. On this basis, it has been proposed that a general Copenhagen parking strategy be drawn up.

New parking strategy vision

Like all other Danes, Copenhagen citizens should be able to own a car and park near their homes. The demand for resident parking should be given higher priority than commuter or visitor parking in public areas and in public car park facilities, if necessary.

In the long run, a situation should be established in which local communities are not noticeably affected by cars looking for parking spaces. Resident parking should not necessarily be free, but may reflect the cost of establishing new parking spaces. In this context, it is an important condition that residents' cars do not occupy the areas that are well suited to recreational purposes. In addition, there must be a certain amount of space available for visitor parking. City guests whether they come to shop, for business, for cultural activities or to visit friends in the city should be able to drive to town and park for a fee that matches the market price for parking in the area.

The number of visitors who wish to park in the city centre is noticeably higher than in other parts of town. For this reason parking spaces should be gathered in large units so that guests may be guided directly to an available parking facility by means of the parking information system. The number of cars driving around the streets looking for a parking space would accordingly be reduced. As parking facilities are established the amount of on-street parking should be reduced. The relationship between newly established parking facilities and

Parking information Nørre Søgade

abolished on-street parking spaces will be decided on an individual basis since the need for removing on-street parking varies considerably in the city centre.

New parking strategy focus areas

A new parking strategy must cover parking in the city centre, the densely built-up residential areas surrounding it and the rest of the city.

The short term strategy might be to provide the inhabitants of the city centre and surrounding residential areas with more legal parking spaces, including:

- Limiting non-residential parking on public roads by introducing parking fees and parking meters
- Issuing resident and business permits
- Assessing feasibility of angle or perpendicular parking in a dialogue with local citizens
- Studying feasibility of doubling up the use of private parking facilities (which are primarily used during the daytime)

If the number of cars in Copenhagen continues to grow, it may become necessary in the long run to erect more parking facilities in the built-up areas. New parking facilities would provide space for the new cars and shift a portion of the existing cars away from the streets and squares, thereby opening up the area to other activities. Decisions must be made regarding the location and financing of the new off-street parking, but the basic premise is that users/car owners share the cost.

Parking norms (today there is a standard requirement for at least one parking space per 100 sq meters of floor space) must also be revised on the basis of city location. This would be applicable, for example, to locations near S train or Metro stations. The current practice by which the building's owner is responsible for implementing and financing required parking facilities at any time in the future must also be revised.

Generally speaking when establishing new parking facilities it is important to bear in mind that available parking spaces lead to increased vehicular traffic, other factors being equal, which in turns means a rise in environmental problems. Accordingly it may be necessary to limit the number of parking spaces for environmental or capacity reasons. However, it is city policy – and to a large extent the attitude of the citizens – that car ownership should be an option and that environmental measures should primarily be targeted at car use.

Shared car parking

Shared car schemes may contribute to the better use of cars thereby reducing the pressure on on-street parking in residential areas. As part of its parking strategy the city of Copenhagen will accordingly mark special parking spaces, free of charge, reserved for shared cars.

Parking solution in the built-up residential areas: 2 hour parking zones and resident permits

13. Intensified noise abatement efforts

Objective
The long term target goal is that the noise level in residential, institutional, recreational areas, etc. may not exceed 55 dB.

The most pressing noise challenge in Copenhagen is that slightly under 50,000 homes are heavily burdened by noise levels exceeding 65 dB, including approx. 8,000 that are burdened by levels exceeding 70dB. Another problem is that approx. two thirds of the city's 280,000 homes today have a noise level exceeding 55 dB, which is the maximum allowable value for acceptable traffic noise levels in residential areas.

For a number of years the city has sought to funnel traffic onto the major roads so as to calm the local residential areas. This means that the majority of the seriously noise-plagued homes are located on the major road network. The rise in traffic means a simultaneous rise in the burden of already noise-plagued homes. It is estimated that the number of heavily noise-plagued homes has grown by approximately 4,000 compared with 1995.

Noise is a health issue

Noise is a terrible nuisance in daily life. Noise, which is defined as undesirable sound, affects sleep, rest, spare time activities, learning and other forms of concentrated work. Noise can have an impact on people's health, ability to function and well-being in the form of stress, headaches, increased blood pressure and ensuing complications, and cardio-vascular disease.

Extra efforts are necessary

The city is working on an on-going basis to resolve the noise challenge in its general physical planning, in local community planning, in new construction, urban renovation, the calming of residential areas through traffic reconfiguration and speed limit reduction, etc. In addition over 1,000 homes have received noise insulation grants from the *Aftalt Boligforbedring* scheme.

However, at the present rate the city plan's target goal of cutting the number of noise-plagued homes in half by 2012 is not realistic. The city will have to make a special effort and allocate funds for this purpose.

Guiding principles for noise abatement

Noise abatement should be based on traffic measures or changes in traffic volume. However, on the major roads where traffic is on the rise these techniques are not sufficient to achieve an acceptable noise level. Cost-intensive measures will also have to be applied such as ensuring high-quality, even road surfaces on all streets as well as laying down noise reducing asphalt when relevant. In addition, insulating homes against noise may ensure acceptable noise levels within doors.

The first priority is noise reduction in the most heavily noise-plagued residential areas ie, those areas with levels exceeding 70 dB. Subsequently the focus will be on lowering the noise level to under 65 dB in as many homes as possible. At the same, steps must be taken to ensure that no residential area is burdened with a noise increase.

Noise screen - Bispeengbuen

Noise reducing asphalt on Øster Søgade

Noise reducing asphalt

Noise reducing asphalt today is a technically tested measure that will often be cheaper than insulating homes against noise. Noise reducing asphalt lowers the noise level arising from tyre contact with the asphalt, resulting in significant noise abatement both indoors and out. In 2004, the city of Copenhagen laid noise reducing asphalt on a section of Lyngbyvej and in 2005 will lay noise reducing asphalt on part of Vigerslevvej. Noise reducing asphalt should be used to the greatest extent possible on major roads where it is not possible to reduce noise levels solely through the use of traditional traffic measures. The option of laying down noise reducing asphalt should be assessed in connection with major road network maintenance, new road construction and when designing the infrastructure for the new urban development sites.

Insulating homes against noise

Insulating homes against noise primarily by window replacement is effective when it is a question of reducing indoor noise levels by closed windows, but has no impact on outdoor noise levels in open spaces. Insulating homes against noise is accordingly considered the last resort, to be used only when achieving acceptable noise levels by other means is impossible.

How changes in noise level are perceived

1 dB:
The smallest unit of perceptible change

3 dB:
Clearly audible change in noise level

8-10 dB:
Perceived as a doubling/halving of the noise level

Noise abatement impact of a given measure

5 - 15 dB
Insulating homes against noise

5 - 10 dB
Noise screens

3 - 5 dB
Noise reducing road surfaces

3 dB
Halving the amount of traffic

1 - 2 dB
Even road surfaces

1 - 2 dB
Removing heavy vehicle traffic

1 - 2 dB
Speed reduction incl. control

Starting in 1999, the Aftalt Boligforbedring scheme granted approx. DKK 60 million to reduce the noise level in roughly 1,000 homes on particularly noise-plagued streets. The money was distributed to cooperative housing associations and private tenement houses. The new urban renewal law of 2003 however, abolished the *Aftalt Boligforbedring* scheme.

As a replacement for the scheme, the city will allocate grant money to insulate homes against noise. This may also be spent on improving other noise sensitive areas such as institutions, schools etc.

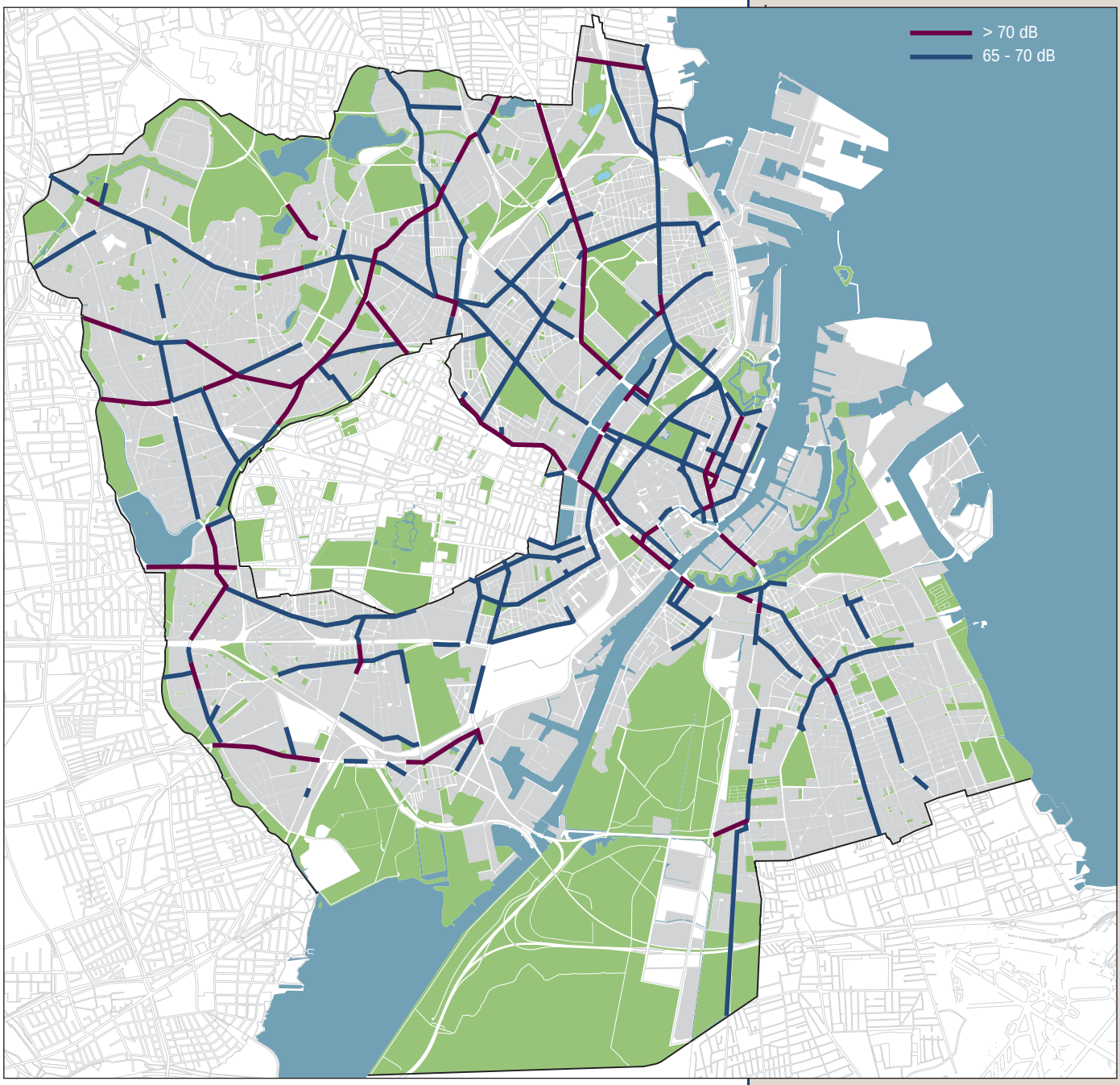
Speed reduction
The city has decided to introduce speed zones as a means of calming residential areas. In addition the city will reduce the speed limit along the major road network in order to reduce the noise burden. This may also result in improved safety and make it easier to cross the road (reduced barrier effect).

Community noise abatement action plans
In neighbourhood boost projects and community traffic and environment action plans, the noise issue is often only included in the general survey of problem areas. For this reason the city will prepare noise abatement action plans for specially burdened residential areas or road sections. A community noise abatement action plan should present proposals for noise abatement in the area and for (partially) financing and implementing the projects in order of priority. Such plans should be solidly anchored within the local community, like the neighbourhood boost schemes and the local traffic and environment plans.

In the autumn of 2004, the city of Copenhagen initiated the first local noise abatement action plan as a pilot project. In addition a recent EU directive has set the stage for having large cities map out noise levels and draw up noise action plans. The directive was implemented in Denmark in 2004.

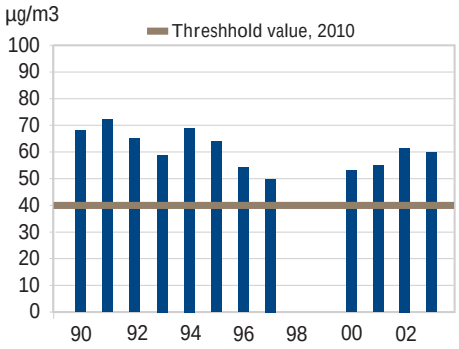
Focus Area	Cost	Benefit
Noise reducing asphalt	DKK 200 million.	Noise reduction in over 10,000 homes
Noise insulation of windows	DKK100 million	Reduce indoor noise levels in 3,000-4,000 homes
Community noise action plans	DKK 50 million p. a.	Systemic noise reduction in particularly noise plagued residential areas and road sections in approx. 2,000 homes

Roads where homes are burdened by traffic noise levels exceeding 65 dB and 70 dB



14. Air pollution and CO_2 emissions

Objective
Improvement of air quality on the streets and limitation of CO_2 emissions from traffic.



Annual average values of nitrogen dioxide, NO_2, on H.C. Andersens Boulevard

NO_2 pollution
On several of the city's heavily trafficked streets, the levels of NO_2 in the air exceed EU threshold values, which must be complied with by 2010. However, it will not be possible to meet the threshold standard on the most heavily trafficked roads by 2010 unless special measures are initiated.

Vehicular traffic is by far the greatest air polluter on the city streets. Nevertheless, despite the burgeoning traffic of recent years, air quality has generally improved. Air pollution continues however, to have an impact on human health. The kind of pollution caused by particles and nitrogen dioxides is a particularly serious health hazard.

EU threshold values for particles and NO_2 will enter into effect in 2005 and 2010 respectively, but it is anticipated that compliance with these regulations will be impossible on a large number of Copenhagen streets. Nor is there any indication that the technological improvement of vehicles will resolve the problem in the foreseeable future. In order to achieve an acceptable level of air quality improvement technological developments must continually be followed up by other measures, such as the reduction of motor traffic and the introduction of measures to control diesel traffic in particular.

$C0_2$ emissions in the transport sector
In the fall of 2002, the city council approved a plan to limit CO_2 emissions in Copenhagen. The plan contains a total reduction target of 35% in energy consumption, transport and waste management as well as a proposal for initiatives to limit new emissions. Moreover, the city council resolved that the new Traffic and Environment Plan should define standards for limiting CO_2 emissions in the transport sector.

The principal means of reducing transport sector emissions are: limiting the number of kilometers driven, increasing capacity utilization with regard to passenger and freight traffic and improving the energy efficiency of vehicles. The Traffic and Environment Plan deals with all the city's traffic measures, schemes and focus areas, i.e. improvements for cyclists and public transport, encouraging new traffic behaviours and choice of travel mode, etc. All these measures will help get things moving in the right direction but in the final analysis it will be necessary to limit the number of kilometers driven by increasing fees, charges and taxes on travel modes and introducing road pricing.

Environmental zones
Environmental zones are geographically defined areas in which special regulations or restrictions on vehicular traffic apply with a view to reducing traffic's environmental impact. The city of Copenhagen has applied to the Ministry of Justice for permission to establish an environmental zone covering the inner section of the city with the purpose of limiting air pollution. In the environmental zone, for instance, all vehicles over 3.5 tons will be required to be equipped with particle filters. Pending the consent of the Ministry of Justice, the city of Copenhagen will establish the environmental zone on a three year trial basis. Depending on the outcome of the test trial, permission will be requested to make it permanent.

CityGods goods delivery scheme in the city centre
Starting in February 2002 a pilot project was conducted in the historic city centre involving compulsory certification of environ-

mental standards for goods and lorry traffic. The aim of the scheme was to improve mobility and enhance the area's environment. The pilot project terminated in October 2003.

Electric powered vehicles

The advantage of electric cars is that they do not pollute street space and are less noisy than petrol or diesel run cars. For a number of years, in order to encourage the use of electric cars the city has made free parking spaces available to electric cars. Recharging facilities are also available. The city owns 50 electric powered vehicles which serve as company cars. Within the next four years the city will purchase 50 more electric cars to replace petrol and diesel cars if financing can be found.

Fuel cells, etc.

A possible future technology is a hydrogen based energy system. Use of hydrogen as a fuel for vehicles instead of petrol and diesel will reduce CO_2 emissions if the hydrogen is produced from biomass or water. The technology is still in the testing stages. The city will follow developments in the area and if possible participate in development projects with a view to expediting and supporting cleaner, new technologies.

Environmental standards for construction machinery

In 2002-2003 two city administrations carried out pilot projects for environmental standards for construction machinery so as to limit particle emission from heavy duty construction machinery.

Particle filters on city diesel vehicles

The city of Copenhagen decided that by 1st July, 2004 particle filters would be standard on the city's own diesel vehicles weighing more than 3.5 tons and on construction machinery with an engine power over 75kW.

Company bikes for city employees

Another measure the city might introduce is the company bike. In certain institutions all staff that work off premises receive a bicycle for their daily work (for example in home care services). An increased use of company bikes would replace trips taken by taxi or in company cars.

Some of the City's company cars are electric. Here is one of them on Nørrebrogade

Focus Area	Cost	Benefit
Environmental zones	DKK 2 million/p.a.	Reduced air pollution in densely built-up areas and the entire city
Cleaner technology - electric cars, environmental standards for construction contractors, company bikes for city employees, fuel cells, etc.	DKK 50 million	Reduced air pollution from city vehicles and from city operations and construction projects

15. Better conditions for pedestrians

Objective
It should be possible for everyone, including the elderly, the mobility impaired, and other groups with special needs, to move about Copenhagen safely and securely.

Walking is a healthy and pollution free mode of travel. It is also the travel mode where you experience most along the way. Furthermore, walking is the main travel mode for a number of people and pedestrian traffic also plays a major role in connection with public transport. In coming years the city of Copenhagen wishes to focus sharply on walking, including the issue of accessibility for everyone. For this reason an overall pedestrian policy must be drawn up. The aim is that it should be possible for everyone to move around Copenhagen safely and securely.

How many pedestrians are there?

Pedestrian census counts are not carried out on a regular basis like the cyclist and motor traffic census. A census is only taken on the pedestrian streets in the historic city centre once every five years. As the basis for planning pedestrian policy, pedestrian traffic should have a more prominent position in the city's census counts and assessments. By the same token, it may also prove necessary to gather information on pedestrian traffic patterns (walking distances, destinations, etc.) and carry out mobility and accessibility assessments.

Accessibility

When working with pedestrian traffic it is of vital importance to remember the road user groups with special needs, such as the mobility impaired, the visually impaired, those with impaired hearing, and the mentally challenged. Accessibility for all should be the guiding principal of all open space projects in the city of Copenhagen. The city of Copenhagen has drawn up an accessibility policy containing a large number of specific measures in this field.

Car-free zones and pedestrian streets in the city centre

By far the largest continuous car-free zone in Copenhagen is to be found in the historic city centre. The historic city centre and the rest of central Copenhagen have gradually developed over the past 40 years from a city of cars to a city of walkers. In connection with the calming of the city centre it may be possible to further extend the pedestrian areas. For example, virtually all the streets in the historic city centre regardless of whether the harbour tunnel is built might be reconfigured as special pedestrian friendly streets where cars are allowed (Strædet is an example). In connection with Traffic Environment Week, the city of Copenhagen arranges car-free days in the city centre. This test trial helps provide actual experience for assessing a more permanent car-free historic city centre.

Major residential roads and other main shopping streets

Outside the city centre, the major residential roads and other main shopping streets are considered to be the main pedestrian connections in the district. Steps must be taken to improve pedestrian mobility and accessibility. Mobility may be improved through wider pavements. On the residential roads there is often rivalry over a limited amount of street space since cycle traffic and public transport have to compete with walkers as well as with cars and the loading and unloading of goods.

The reconfiguration of Gammel Strand has improved conditions for walkers.

Kongens Nytorv/Nyhavn

At the same time the street space that is reserved for walkers is used for many other purposes than pedestrian traffic, including shop displays on the pavement, outdoor café furniture, and street furniture in the form of benches, bus shelters, advertising pillars, landscaping, phone boxes and road signs. Parked cycles also clog the pedestrian areas. To ensure mobility the walking lines must be kept free, not least out of consideration for wheelchair users and other walking-impaired citizens. Standards for the display of goods, outdoor cafés, street furniture, etc. must be defined with due regard to pedestrian mobility and opportunities for movement and recreation.

Other pedestrian connections in town

Paths, promenades and roads with a special pedestrian focus constitute a third group of pedestrian connections. The green cycle routes (discussed in chapter 5) consist of cycle tracks as well as footpaths and accordingly form an integrated system of pedestrian connections. The promenade along the harbour and the new pedestrian bridges crossing the harbour and canals also provide pedestrians with new connections.

Planning for pedestrian connections should be based on the special conditions of the local community, such as schools and routes to school, institutions for the young and the elderly, parks and squares, libraries, sports facilities and the like, public transport terminals (stations and main bus stops). Routes may also be based on features of particular recreational or local interest in the districts, "local culture routes", etc.

Focus Area	Cost	Benefit
Draw up a pedestrian policy plan	DKK 2.5 million	Acquire necessary data, overall plan of focus areas
Pedestrian access measures	DKK 100 million	Better accessibility, more paths and pedestrian connections, better mobility

16. Better Urban Spaces

Objective
The city's squares, parks and street spaces should form a beautiful and harmonious framework for human activities and experiences.

Although traffic takes up an exorbitant amount of public urban space it is of vital importance to bear in mind that urban spaces have many other functions than to keep traffic moving. Copenhagen is an old city with narrow streets and many buildings and urban environments of special historical or architectural interest. The city's parks and other green environments are also essential components of urban space. It is the city's stated objective that the city's squares, parks and urban spaces shall form a beautiful and harmonious framework for human activities and experiences.

Urban space action plan

The city of Copenhagen is drawing up an overall Urban Space Action Plan. The Urban Space Action Plan contains an overall strategy whose aim is to create a European metropolis. The Urban Space Action Plan also contains proposals for modifying methods of planning and designing urban space as well as specific examples of reconfiguring the city's squares and urban spaces. The action plan should result in a clear set of priorities for the reconfiguration of the city's squares and other urban spaces.

Parks policy

The city of Copenhagen has drawn up a parks policy, Green Copenhagen. The purpose of the parks policy is to ensure that green spaces in Copenhagen are recognized and given priority as valuable and indispensable resources, both in relation to the city's general development and to the individual citizen's health and quality of life.

The parks policy contains a number of focus areas, target goals and specific measures which can be summed up under three main headings:

- Protection and development of the most distinctive green features
- Sufficient amounts of green areas at a reasonable distance from town
- Beautiful parks, challenging opportunities for play and for experiencing the outdoors all year round

The Harbour Park and the Harbour Swimming Facility at Islands Brygge have provided new opportunities for the use of the city's spaces and harbour. Summer, 2003

Kongens Have

The parks policy was approved in 2003 and has subsequently been the guideline for planning future green areas in the city of Copenhagen. The parks policy will be followed up by green district plans indicating specific measures.

Greening the streets

Street trees may bring a long street together to form a harmonious whole. Beautiful trees may enhance the street space's architectural value and add a new dimension to the district and the city as a whole. Throughout the changing seasons trees make the townscape a richer experience. Different species of trees provide variations of colour, light and atmosphere adding to the sensuous feeling of the city. Moreover trees bring an element of nature into the city providing an antidote to all its man-made features.

The elm disease of the 1990s made it clear exactly how much street trees mean to the city. In order to replace the trees that were gone the Road and Parks Department's tree planting strategy, *Grønne gaderum, en strategi for Københavns gadetræer,* was politically approved in 1997.

Focus Area	Cost	Benefit
Urban space action plan	DKK 2.5 million	Assessment of urban spaces arranged in order of priority
Reconfiguration of squares and urban space	DKK 250 million	More beautiful and more functional squares

17. Overall strategy

The Traffic and Environment Plan contains proposals for a number of different initiatives all of which contribute to the overall aim: to ensure a well-functioning transport system whose environmental impact is considerably lower than today. A few of these initiatives are huge individual projects (the Metro and the new road construction) that demand a considerable capital expenditure requiring special financing schemes and state co-financing. The present chapter defines the total strategy and action plan for the Traffic and Environment Plan's other initiatives.

Overall strategy

The table on the opposite page shows the city's total long term strategy which contains construction projects totaling more than DKK 2.5 billion.

In addition to the overall strategy entailing construction projects, the Traffic and Environment Plan also contains proposals for activities that will increase operations expenditures in the range of DKK 14 million per annum, covering improved maintenance, campaign and educational activities and various environmental initiatives.

The city of Copenhagen's annual budgetary framework for traffic and the environment is approx. DKK 70 million. Part of this (approx. DKK 30 million per annum) is spent on renovation, reconfiguration and beautification of the city's spaces, particularly its squares. These initiatives have no direct impact on the Traffic and Environment Plan objectives since they affect neither the environmental impact of traffic nor traffic movement. Nevertheless it is of vital importance to maintain and reinforce such initiatives so as to ensure the continual renewal of the city.

The remaining annual budgetary framework resources have been prioritized until 2007. Subsequently it will be possible to allocate resources for the measures called for in the Traffic and Environment Plan; but there are also other activities that have to be carried out. The Urban Space Action Plan will contain proposals for a large number of specific investments. Some of these contribute to achieving Traffic and Environment Plan objectives, but there are also others of a more esthetic or recreational nature. The budgetary framework must also finance a number of measures in connection with neighbourhood renewal in the Øresundsvej and Mimersgade districts.

For this reason only a limited amount of resources will be available to implement the Traffic and Environment Plan. The action plan presented at the beginning of the present Traffic and Environment Plan should be seen as the order of priority for any funds that might be made available in the fixed budgetary framework or in the event that the traffic and environmental issue is allocated an extra appropriation.

Overall strategy	
Improved cycling conditions (cycle tracks, cycle routes and cycle parking)	DKK 700 million
Better public transport (bus mobility, terminals and stations)	DKK 450 million
Improved behaviours and traffic safety (traffic safety measures)	DKK 100 million
Traffic calming in residential areas (speed limit zones, reconfiguration of major thoroughfares)	DKK 500 million
Overall parking strategy (self financing)	-
Special measures to combat environmental issues (noise-reducing asphalt, noise insulation, cleaner technologies)	DKK 400 million
Other measures (pedestrian policy, accessibility, Urban Space Action Plan)	DKK 350 million
Total	**DDK 2,500 million**
Increased operations expenditures	
Increased cycle track cleaning and maintenance	DKK 4 m/p.a.
Campaign Secretariat	DKK 4 m/p.a.
Traffic Environment Week	DKK 4 m/p.a.
Transport Account and accident report team	DKK 1 m/p.a.
Environmental zones	DKK 2 m/p.a.
Total	**DKK 15 m/p.a.**
Total annual expenditures 2005-2006	
Present budgetary framework	approx. DKK 70 m/p.a.
- major maintenance	approx. - DKK 30 m/p.a.
Extension of the framework	fx DKK 100 m/p.a.
Traffic and Environment Plan recurring expenditures	approx. - DKK 15 m/p.a.
Total annual budgetary framework	**approx. DKK 125 m/p.a.**

18. Impact Assessment

Focus Areas	Environmental and Health Consequences
Improved conditions for cyclists • More cycle tracks (DKK 180 m) • Green cycle routes (DKK 400 m) • Wider cycle tracks (DKK 25 m) • Improved cycle track maintenance (DKK 4 m/p.a.) • More cycle parking (DKK 100 m)	The proposed initiatives (particularly new cycle tracks and the improvement of existing ones) will help ensure that a larger proportion of the total number of kilometers travelled will be by bicycle. This will mean that the total traffic impact on the environment will be reduced.
New rail lines • Metro ring (DKK 15 bn) • Improved Ringbane front areas (DKK 70 m)	The Metro ring will replace a number of busses and some cars thereby reducing local air and noise pollution since metro travel is significantly cleaner, safer and more energy efficient per number of kilometers travelled per person than car or bus travel.
Improved bus service • Better mobility (DKK 150 m/p.a.) • Increased scope of operations (DKK 50 m/p.a.) • Better transfer facilities (DKK 300 m)	The proposed measures will help retain bus passengers and reduce pollution levels since bus travel is significantly cleaner, safer and more energy efficient per number of kilometers travelled per person than car travel.
Improved behaviours and traffic safety • Campaigns (DKK 1-2 m/p.a.) • Black spot identification, pedestrian crossing facilities, etc. (DKK 100 m) • Improved accident registration (DKK 1 m/p.a.) • Accident report team (DKK 1 m)	The proposed measures will result in fewer accidents and encourage a greater sense of security among walkers and cyclists in particular. This will have no impact on noise and air pollution levels.

Consequences for the transport system	Citizens' dialogue
Improved conditions for cyclists	
Expanding the cycle track network and improving and widening existing cycle tracks will increase capacity, encourage a greater sense of security and provide better mobility and comfort. Certain cycle routes may be expected to address pressing transport needs whereas other routes are of a more recreational nature.	*Opinion polls:* According to the polls, citizens give top priority to expanding the cycle track network, widening existing cycle tracks and better cycle track maintenance and also to improving intersection safety. At the *public meeting* and in the comments to the hearing request there was widespread support for improving daily conditions for cyclists. Cycle routes, however, were generally considered a luxury and there was a general feeling that discrete cycle tracks along the roads should be established first.
New rail lines	
The Metro does not take up space in the urban environment and offers rapid and efficient transport. The Metro ring will give a quality boost to passenger transport in the city and improve mobility for cyclists, walkers, busses and cars on the roads where the Metro replaces bus services.	*Opinion polls:* Implementing the Metro ring is the second highest priority of all the plan's proposals. At the *public meeting* and in the comments to the hearing there were those that support the Metro, others that consider it too costly and still others that oppose it in favour of a modern tram system. There was general agreement that Metro expansion must not result in bus service cut-backs.
Improved bus service	
Improving bus travelling speeds and transfer facilities will give a quality boost to bus traffic.	*Opinion polls:* The proposal to improve bus traffic is not a priority area. (This may be due to the fact that people are already fairly satisfied with public transport). At the *public meeting* and in the comments to the hearing there was widespread agreement on the desirability of improving public transport, although there was disagreement as to how this was to be achieved. It was generally agreed however, that travelling by public transport is too expensive and that it ought to be cheaper.
Improved behaviours and traffic safety	
The proposed measures will have no impact on the transport system.	*Opinion polls:* According to the polls, improved traffic safety and campaigns encouraging road users to behave more considerately are a priority area. At the *public meeting* traffic safety and particularly road manners were serious concerns. Both at the public meeting and in a number of comments to the hearing proposals were made to reduce driving speeds in order to improve safety.

Focus Areas	Environmental and Health Consequences
Choice of travel mode • Campaigns (DKK 4 m/p.a.) • Traffic Environment Week (DKK 4 m/p.a.) • Annual Environment and Transport Account (DKK ½-1 m/p.a.)	Citizens' travel habits may be modified to a certain extent through targeted educational campaigns, particularly in connection with major transport initiatives (expanding the Metro, better bus traffic, more cycle tracks, etc.). For this reason, it is anticipated that the proposed initiatives will encourage some people to choose to cycle or take the bus rather than drive. This in turn will have an impact on the environment and on public health.
Prioritized traffic distribution • Physical measures on the major road network (DKK 450 m) • Speed limit zones (DKK 30-40 m)	These measures will improve traffic safety and reduce the barrier effect and noise and air pollution particularly in residential areas. However, this will also make it extremely difficult to address the existing environmental problems on the main thoroughfares.
New road construction • Lyngbyvej – Nordhavn (DKK 1 ½ bn) • Eastern harbour tunnel (DKK 3.6 bn) • Amager-city centre motorway (DKK 3 bn) • Traffic calming on Østerbrogade, central artery and P. Knudsens Gade (DKK 300 m) • Traffic calming in city centre (DKK 500 m)	In densely built-up areas such as Copenhagen major expansions of the road network through tunnels and motorways will result in a growth in vehicular traffic thereby increasing its environmental impact. The pressure on certain residential areas and local side streets will be relieved but not to an extent that is equivalent to the increase on the major road network. The new road that would cause the least environmental damage is the road connecting Nordhavn and Lyngbyvej. Calming measures would reduce the noise burden on the sections mentioned.
New parking strategy	
Road pricing	Depending on the level this will reduce traffic and, other factors being equal, also reduce pollution.

	Consequences for the transport system	Citizens' dialogue
Choice of travel mode	Campaigns to shift travel from cars to walking, cycling and public transport will reduce the rise in motorized traffic thereby benefiting mobility across all modes of transport.	*Opinion poll:* The campaigns are generally supported. At the *public meeting* and in the comments to the hearing the idea received support, but it is not a high priority area. The predominant view is that the campaigns should be followed up by more direct methods such as police control and road pricing, etc.
Prioritized traffic distribution	The initiatives will funnel even more cars onto the major roads thereby calming the residential areas. The traffic burden will increase on the main thoroughfares, although marginally, since the main thoroughfares already handle large traffic flows..	*Opinion poll:* Speed limit reduction in the residential areas is not widely supported.
New road construction	The capacity of the major road network will increase, thereby speeding traffic movement.	*Opinion poll:* Building a road between Nordhavn and Lyngbyvej and a tunnel linking Østerbro and Amager is a mid-range priority on the initiative priority list. A southern harbour tunnel is at the bottom of the list. At the *public meeting* there were those that responded favourably to road expansion while others felt that tunnels and road expansion would result in increased traffic. The comments to the hearing request were both pro and con with regard to expanding the road network. Some felt that new road construction is completely unnecessary, others said it would merely aggravate the problem. A few wanted to implement all measures right away.
New parking strategy		*Opinion poll:* Better parking facilities near home is the plan's lowest priority initiative. At the *public meeting* the reaction to resident parking was generally positive, but this did not include commuter parking or any other kind of non-resident parking. It is apparent from the comments to the hearing that many residents, particularly in the densely built-up areas, find the lack of parking spaces a problem.
Road pricing	Better mobility for all modes of transport.	*Opinion poll:* 51% rated it as a good or a very good proposal. At the *public meeting* a majority supported the idea of reducing motorized traffic by road pricing (9 out of 11 groups cited it as a high priority initiative).

Focus Areas	Environmental and Health Consequences
Intensified noise abatement efforts • Local action plans to reduce noise (DKK 50 m/p.a.) • Noise reducing asphalt (DKK 200 m) • Façade insulation (DKK 100 m)	Noise is a great daily nuisance. Noise affects sleep, rest, spare time activities and other pursuits. The proposed initiatives will reduce noise levels in approximately15,000 homes.
Air pollution • Environmental zone in half the city (DKK 2 m/ p.a.) • Cleaner technologies resource pool (DKK 50 m)	Air pollution caused by traffic, nitrogen dioxide and particularly particles is a Copenhagen health hazard. An environmental zone will significantly help reduce the ultrafine particles in street air thereby improving the health of the city's citizens.
Better conditions for pedestrians • Draw up a pedestrian policy (DKK 2 m) • Initiatives to promote accessibility (DKK 100m)	
Better urban space • Urban Space Action Plan (DKK 2 m) • Reconfiguration of squares and urban spaces (DKK 250 m)	Improving urban space has no direct impact on the environment or on public health. But in overall terms more beautiful and more functional urban spaces will encourage outdoor activities and citizens' general well-being.

Consequences for the transport system	Citizens' dialogue
Intensified noise abatement efforts The proposed initiatives have no general impact on the traffic system, but a number of streets will experience a greater degree of comfort as a consequence of the new road surfaces..	*Opinion poll:* There is widespread support for the idea of combating noise pollution on heavily trafficked roads, but this is not a top priority on the list of initiative priorities. At the *public meeting*, the idea of intensifying efforts to abate noise was positively received, but the groups did not feel it was a priority issue. In the comments to the hearing there was widespread agreement that efforts should be made to limit noise.
Air pollution Establishing an environmental zone will have no impact on the transport system	*Opinion poll:* Limiting air pollution is the number 3 priority proposal in the plan. At the *public meeting* and in the responses to the hearing request the proposal to limit air pollution received widespread support.
Better conditions for pedestrians Implementing the proposals will make pedestrian travel routes easier and improve accessibility..	*Opinion poll:* On the whole citizens react positively to the ideal of improving walking conditions, but it is one of the low priority areas on the list of initiative priorities. At the *public meeting*, the idea of improving pedestrian conditions was positively received, but it was not a priority area. In the responses to the hearing there was general agreement that walking areas were simply not good enough. Old and uneven pavements, dangerous intersections and routes to school were particular areas of concern.
Better urban space	*Opinion polls:* Citizens generally react positively to the proposals for improving urban spaces, but this is not a priority area on the list of initiative priorities. At the *public meeting* many people expressed satisfaction with urban space renewal to date, but it was not a priority area (it is more important to resolve current traffic problems first). A number of comments to the hearing touch upon the topic. All in all, the comments take a favourable view of the idea, but state that provisions should also be made for squares and open spaces.

19. Will we achieve our aim?

Citizens, politicians, the business community and the city's guests all want a city with high mobility and accessibility, attractive urban spaces, less transport and considerably fewer environmental and health challenges than today. This is the main conclusion that emerges from the citizens' dialogue and the opinion polls completed by the city in the past year.

Another central conclusion is the inherent conflict of interest between the different players: cyclists want more cycle tracks, shopkeepers want fewer traffic queues and more parking spaces, the elderly primarily want to be able to move through city traffic safely and securely and everybody thinks the city's guests ought to have easy access.

The Traffic and Environment Plan translates these viewpoints into the following overall aim: to service the city the plan must ensure a well-functioning transport system whose environmental impact is considerably lower than today. This implies that any rise in transport consumption must be compensated for by cycling and the use of public transport and that environmental problems must be kept at a minimum.

What will we achieve by the plan?

The following new focus areas are the main features of the plan's long term strategy:

- More cycle tracks, routes and other improvements of cycling facilities
- Improved bus mobility and improved station and terminal facilities
- Behaviour modification campaigns
- 40 km/h speed limit zones in all districts and reconfiguration of main roads
- Parking strategy making it possible to live in town and own a car (although parking on the street where you live may not be possible). In addition visitors should still be able to drive to town without too much difficulty
- Major new construction in the form of a fourth Metro line and a road connection linking Nordhavn to Lyngbyvej
- Extra environmental measures such as environmental zones
- Noise abatement measures in almost half the seriously noise plagued homes (noise levels over 65dB)

These initiatives total DKK 2.5 bn. The measures will improve conditions in a large number of areas and taken as a whole will mean a better transport system than today. However, they will neither achieve all objectives nor resolve all challenges.

New measures are necessary

If we are to achieve the stated objectives, it is necessary to carry out further costly public transport investments and at the same time limit vehicular traffic.

The Metro at Ørestad Station
Photo: Søren Hytting

Motorized traffic may be limited by increasing user charges such as parking fees and road pricing as well as by traffic regulating measures.

Making parking more expensive would limit vehicular traffic. However, there are limits to what can be achieved by extending parking fee zones and raising parking charges without unfortunate consequences for citizens and businesses. In the long run however, parking fees are expected to double at least.

Road pricing may have a direct impact on motorized traffic. The introduction of road pricing as a means of limiting car traffic requires a new legislative basis and the widespread acceptance of the population. These conditions have not as yet been fulfilled. The city will closely follow the situation and contribute to the development of the technical, administrative and legislative basis while assessing the necessity and expediency of introducing road pricing as a means to achieve the stated environmental traffic aims.

Traffic & Environment Plan 2004

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