Division 44

Water, Energy and Transport

Urban Transport and Climate Change Action Plans

An Overview

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Urban Transport and Climate Change Action Plans

An Overview

(Revised version of an earlier publication from April 2009)

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Authors:
Armin Wagner (previous version)
Philipp Schaltenberg
Jonathan Gómez Vilchez

Editor:
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
P.O. Box 5180
65726 Eschborn, Germany
http://www.giz.de
http://www.sutp.org

Division 44: Water, Energy, Transport
Sector Project: “Transport Policy Advisory Services”

Manager:
Manfred Breithaupt

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Preface

More and more cities around the world are developing dedicated Climate Change Action Plans to reduce Greenhouse Gas (GHG) emissions and improve the local air quality for their inhabitants. The transport sector usually plays a crucial role in any such strategy. In many cases, transportation is the primary source of CO_2 and other GHGs, contributing up to 40 percent of the cities' total emissions. The measures initiated to reduce these negative impacts of urban transport take many forms. Increasing the share of Public Transport and non-motorised modes such as walking and cycling are core elements in many emission reduction strategies, but most often they are supplemented by other short-term and long-term measures. One key feature of most actions proposed is that they provide several co-benefits: many options not only reduce GHG emissions and improve air quality, but also enhance energy efficiency and – especially in the developing world – contribute to better transport services for the poor.

This paper summarises the measures outlined in Climate Change Action Plans of more than 30 cities in all continents. Its focus is on the actions proposed in the transport chapter of the relevant plans. However, in many cases other Urban Transport Planning documents (Transportation Master Plans, Land Use Plans, etc.) play a key role for implementing specific measures, while the Climate Action Plans outline the more general goals. Where available and indicated, such documents were therefore included for the summaries below. No further research beyond the documents mentioned in the relevant chapter for each city has been done. While every care has been taken to provide accurate and up-to-date information, this paper does neither claim to be exhaustive, nor to cover all major cities world wide. Rather, it aims at providing the reader with an overview of the numerous options municipal governments have in reducing GHG emissions and thereby contributing to the fight against global warming. This might be especially interesting for stakeholders in newly industrialised and developing countries, where large cities face increasing challenges with regard to emissions, but also congestion and related issues.

For further information on GIZ and the Sustainable Urban Transport Project (SUTP), please see the text at the end of this paper.

Any municipal stakeholders in cities with transport-related Climate Action Plans not covered in this document are most welcome to contact us. We would be pleased to include your city in future versions of this paper!

Table of Contents: Climate Action Plans sorted by continent

Africa

Johannesburg

The "Air Quality Management Plan for the City of Johannesburg (AQMP)" (2003) lists several short, medium and long term goals. One of the key points is to establish an *Inter-departmental Transport Liaison Group* to facilitate information exchange and implementation of the different measures. While the short-term measures were centred on increased vehicle emission monitoring, in 2007 an integrated vehicle emissions reduction strategy was proposed for approval by the city authorities. It builds on an improvement of the institutional context (involvement of a multi-stakeholder group, inter-departmental co-operation) and a comprehensive awareness programme on issues of air quality.
The document proposes several specific actions:

- Establishing new vehicle emission standards
- Establishing an effective transport planning and management system in order to control the number of vehicles on the road (includes establishing a BRT)
- Encouraging the use of unleaded gasoline, alternative fuels (such as bio fuels), and fuel additives
- Improving tests for priority pollutants and extend inspections to Turbo Diesel and Petrol propelled vehicles
- Establishing regulations and by-laws to support the "polluter pays" principle. These are to be enforced by Environmental Management Inspectors (EMIs).

Although the AQMP per se is mainly geared at improving the local air quality and living conditions, several of its (medium-term) measures should also contribute to a significant reduction of Greenhouse Gas (GHG) emissions.
Link: http://www.joburg.org.za/content/view/961/114/

Asia

Beijing

The 11th Five Year Plan of the Beijing government was drafted with the 2008 Olympic Games in mind. In its section for environmental protection, it contains several measures in the transport sector related to a reduction in emissions and an improvement of living conditions. Most of these measures reach beyond the short-term goal of establishing a "green image" for the Olympic Games. Among the proposed actions are the following:

- Giving priority to public transportation, with an emphasis on rail transportation (metro and light rail)
- Introducing more stringent vehicle emission limits (equivalent to Euro III)
- Encouraging the use of automobiles powered by cleaner fuels, fuel cell vehicles, electricity-powered vehicles and other types of lower emission vehicle
- Converting 90% of public buses and 70% of taxis to cleaner energy by 2007
- Tightening traffic control according to different automobile exhaust levels and taking stronger measures in law enforcement
- Controlling the traffic volume on the motorway in the urban area by adequately pricing a number of parking lots in the downtown

- Banning transit vehicles from other parts of the country from entering the inner city
- Encouraging people to use public transits and bicycles

The Beijing Five Year Plan lists a relatively wide range of measures, which seem adequate to achieve a significant reduction in GHG emission, even though the document often remains a bit vague about specific actions. Not surprisingly, the Report on the work of the Beijing government for 2008 focuses on the city's achievements during the Olympic Games and mentions transportation rather seldom. Nevertheless, most of the transportation and climate goals outlined in the Five Year Plan continue to be on the agenda of the government, as published in the "Main work tasks for 2009".
Link: http://www.ebeijing.gov.cn/Government/reports/default.htm

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Hong Kong

The Environmental Protection Department (EPD) of the Hong Kong government lists the transport sector as the second most important contributor to GHG emissions in the city area. To reduce vehicle emissions, several measures are envisaged:

- Further expanding and upgrading the public transport infrastructure with an emphasis on railways
- Encouraging the use of cleaner vehicles via tax incentive schemes for environmentally friendly petrol private cars and commercial vehicles
- Promoting the use of bio diesel via duty-free arrangements for bio diesel as motor vehicle fuel

Especially interesting is the tax incentive scheme, as Hong Kong is one of the few cities worldwide which has the opportunity to design such schemes independently from a country- or state-wide regulation. Qualified for a 30% reduction in the First Registration Tax (FRT) are vehicles with a fuel efficiency of at least 40% better than the average fuel efficiency in the corresponding private car class. Vehicles, whose hydrocarbon (HCs) and nitrogen oxides (NO_x) emissions do not exceed 50% of the limits in the Euro IV / Japan 2005 emission standards and whose fuel efficiency is fulfilling the requirements are certified by the EPD. The so-called "environment-friendly petrol private car qualifying standards" are scheduled to be tightened annually in the light of technological advancements.
Link: http://www.epd.gov.hk/epd/english/climate_change/transport.html

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Seoul

Seoul created a "Low Carbon Green Growth Master Plan" in July 2009. The greater goal is to cut emissions by 40% until 2030 compared to 1990 levels and also to create one million Green jobs.
To cut emissions in the transport sector, the following measures are proposed:

- All public transportation shall be transformed into Green Vehicles. The city started the operation of electric buses in November 2010. Converting taxis into gas-electric hybrid cars is ongoing.
- The public transportation rate shall be expanded to 70%
- 207km of bike-only lanes at main roads shall be created to increase the bike ridership rate up to 10%

Together with actions in other sectors proposed in the Master Plan, the described measures will significantly reduce greenhouse gas emissions.
Link: http://www.c40cities.org/docs/ccap-seoul-131109.pdf

Tokyo

In 2007, the Tokyo Metropolitan Government (TMG) published its "Climate Change Strategy - a 10-Year Project for a Carbon-Minus Tokyo". It lists a wide range of measures, with an emphasis on industrial and household emissions. In the transport sector, relatively few actions are proposed:

- Creating rules for the utilisation of fuel-efficient automobiles in order to expand the use of hybrid cars
- Assisting voluntary activities by private companies such as Eco-Driving Campaigns

However, there are other activities of the TMG aimed at reducing vehicle emissions, some of which have been running for several years already. An example is the "*Say No to Diesel Vehicles*" campaign started in 1999. It aims at introducing more stringent standards and at replacing a large number of diesel powered cars and trucks with LPG/CNG vehicles.
Link:http://www.kankyo.metro.tokyo.jp/kouhou/english/pdf/TOKYO%20Climate%20Change%20Strategy%20200 7.6.1.pdf

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Yokohama

The Yokohama Road Map of March 2009 seeks to achieve a 30% emissions reduction below 2004 levels by 2025 and 60% below 2004 levels by 2050.
In the transportation sector, the following three major actions are proposed:

- Taking action for the review of lifestyles that depend excessively on privately-owned vehicles so that citizens will voluntarily use environmentally friendly transportation means, such as walking, bicycling, and taking public transportation
- Promoting the steady reduction of CO_2 emitted from vehicles by expanding the use of fuel-efficient and low-emission vehicles
- Improve the transportation system in order to lead to the continuous reduction in CO_2
- Facilitating coordination between traffic measures and town development, including land use regulations and development, to aim for the integration with people's travel objectives and city functions

Link: http://www.c40cities.org/docs/ccap-yokohama-road-map-part1.pdf (Road Map - Part 1)
http://www.c40cities.org/docs/ccap-yokohama-road-map-part2.pdf (Road Map - Part 2)

Singapore

The city-state of Singapore set up the Inter-Ministerial Committee on Sustainable Development (IMCSD) in January 2008 to formulate a national strategy for Singapore's sustainable development. The IMCSD is co-chaired by the Minister for National Development and the Minister for the Environment and Water Resources. Further members are the Ministry for Finance, the Ministry for Transport and the Ministry for Trade & Industry.
The general aim is to improve the use of key resources and particularly achieve a 35% improvement in energy efficiency from 2005 levels by 2030.
In the transport sector, the Blueprint announces the following ways to achieve a cleaner, greener and more convenient transport system by 2030:

- Achieve a modal share of 70% of journeys made during morning peak hours via public transport by 2020, through doubling our rail network and developing a more integrated and seamless connection between our bus and rail services

- Halving the annual vehicle population growth rate to 1.5%, refining the Electronic Road Pricing (ERP) system and improving schemes to reduce car usages (e.g. Off-Peak Car scheme and Park & Ride scheme)
- Improve the energy and fuel efficiency of both private and public transport, by implementing a mandatory Fuel Economy Labelling Scheme
- Reduce PM2.5 level from 16 µg/m^3 in 2008 to 12 µg/m^3 by 2020 with cleaner diesel vehicles
- Establish a vehicle emission test laboratory
- Encourage cycling and walking with investments in infrastructure

The Singapore approach of explicitly linking GHG emission reduction and energy efficiency clearly shows how close both issues are intertwined. A specific key feature among the measures proposed is the ability to build on the well-established ERP system, which can be a very effective instrument for regulation of private car usage.
Link: http://app.mewr.gov.sg/web/contents/ContentsSSS.aspx?ContId=1299

Mumbai

Although there currently is no explicit climate protection strategy, the Mumbai City Development Plan 2005-2025 contains a section on environment, which partly aims at improving the local air quality and thereby reducing vehicle emissions. Among the relevant measures proposed in the transport sector are the following:

- Improving fuel quality
- Extending and improving public transport (railway, bus, boat) capacity and quality
- Improving traffic management, e.g. synchronizing traffic lights

The respective Urban Transportation chapter in the Development plan supplements these measures with other actions, such as improving pedestrian walkways. Especially many of the long-term measures proposed in the Urban Transport strategy might contribute to emission reduction, while some of the short-term measures currently seem oriented towards increasing capacity for motorised individual transport (e.g. building new flyovers and other road infrastructure).
Link: http://www.mcgm.gov.in/irj/portal/anonymous?NavigationTarget=navurl://095e1c7b9486b1423b881dce8b106978#

Australia & Pacific

Melbourne

A new strategy for city development called “Future Melbourne” is currently (2009) discussed in public. The transport sector plays a major role in this plan, which aims at improving the city’s attractiveness and sustainability. Among the measures proposed in the transport field are the following:

- Increasing the capacity and quality of Public Transport
- Consolidating future metropolitan growth into existing urban centres around public transport stops
- Assuring better connection between non-motorised modes (walking, cycling) and Public Transport
- Developing an inner-city bicycle rental system comparable with the one operating in Paris
- Improving traffic/road management and safety for pedestrians and cyclists
- Promoting renting a car as required instead of buying one

- Promoting the use of more efficient vehicles

The comprehensive strategy encompasses far more aspects than only environmental and GHG issues, but many of the proposed measures will indeed lead to a significant reduction in emissions, if implemented as planned.
Link: http://www.futuremelbourne.com.au/wiki/view/FMPlan/S2G6Connected

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Sydney

The City of Sydney has developed a vision for a Sustainable Sydney 2030. In this, the following targets for the transport sector are announced:

- Reducing unnecessary travel through smart land use: every resident within a 10 minute (800m) walk to a main street and within a 3 minute (260m) walk of a continuous green link
- Lowering the role of motor vehicles and setting priorities to sustainable transport modes: 80% of city workers commuting on public transport, 10% of trips made in the city by walking and cycling
- Making cycling a first choice transport mode by providing a safer and more comfortable cycling infrastructure and promoting the benefits of cycling

The 2030 vision is a comprehensive set of principles and measures. In the transport sector, the emphasis on an integrated transport system that favours public transport and connects the city with the Sydney region promises success for increasing sustainability.
Link: http://www.cityofsydney.nsw.gov.au/2030/thedirections/IntegratedTransport.asp

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Auckland

New Zealand's largest city has initiated the campaign "Keeping Auckland's Future Bright" to develop a framework for a sustainable future, outlining fields of action for the coming 20 years. The city has identified the transport sector as the biggest single contributor to GHG emissions, which might not at least be due to the fact that Auckland has one of the highest rates for car ownership in the world. It is envisaged to achieve a combined modal share of public transport and non-motorised modes of 30% until 2026, leaving 70% to motorised individual transport. The climate strategy is supplemented by the Sustainable Transport Plan developed by the Auckland Regional Transport Authority. Measures outlined therein include *inter alia*:

- Encouraging walking and cycling, especially for short trips to school, to work, etc., and with special regard to improve walking/cycling conditions in low-income areas
- Making cycling and walking safer, e.g. via speed restrictions for cars
- Developing travel plans for schools, businesses and neighbourhoods, with the overall goal to reduce car usage
- Integrating land use and transport planning in a way that reduces the need for private vehicle travel and significantly increases the amount of travel made by passenger transport, walking and cycling
- Establishing dedicated HOV (High Occupancy Vehicle) and bus lanes

Auckland's comprehensive transport and GHG reduction strategy contains a relatively wide range of measures. The city seems determined to stop and even reverse the past car-oriented development strategies.
Link: http://www.aucklandcity.govt.nz/council/documents/bright/default.asp

Europe

Frankfurt/Main

Air quality and GHG emissions have long been an issue in the Rhein-Main area in the centre of Germany. The 2005 “Air quality plan for the Rhein-Main Agglomeration Area” as well as several other action plans issued by the City of Frankfurt and the Environmental Ministry of the State of Hessen contain a range of measures to achieve a significant reduction in vehicle emissions and an improvement of living conditions. Selected instruments and actions include:

- Strengthening public transport via improvements in quality and service as well as extensions of the existing network
- Introducing bans on certain categories of vehicles (e.g. trucks) on several streets
- Promoting and supporting cycling and walking
- Reducing the need for travelling by including transport aspects in land use planning (e.g. for new residential areas)
- Extending speed restrictions and paid parking areas
- Public Awareness campaigns, including in schools
- Establishing a Low Emission Zone (LEZ) in the city centre

The last point (also known as “*Umweltzone*”) is an instrument currently used in a growing number of German cities. It includes a ban on vehicles not fulfilling requirements concerning particulate matter (PM) emission. Especially older diesel cars and trucks will be banned from entering inner cities if not equipped with a particulate matter reduction device. The ban will be enforced in two steps starting in 2010 and 2012 respectively.
Link: http://www.frankfurt.de/sixcms/media.php/738/aktionsplan_ffm_2008_end.585953.pdf

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Hamburg

The city has developed the comprehensive “Hamburg Climate Action Policy 2007-2012”, covering a wide range of issues. In the transport sector, a large number of measures is proposed, though some are still in an early planning and evaluation phase. Selected actions are as follows:

- Improving quality of public transport, especially via extended subway operating hours
- Introducing diesel hybrid buses and taxis
- Increasing the appeal of cycling by improving the infrastructure, offering cycle carrying facilities in public transport, establishing a bike rental system, etc.
- Improving conditions for pedestrians
- Improving traffic management for motorised individual transport
- Evaluating a city toll, increased parking fees and the introduction of a Low Emission Zone
- Developing a range of Public Awareness and promotion/information campaigns
- Investing in transport infrastructure, e.g. more efficient street lighting

As with many climate action plans, one of the most important overall goals in Hamburg is to achieve GHG emission reductions via a more favourable modal split. Overall, the measures outlined in the policy seem well designed to significantly reduce emissions.
At the end of the year 2009, Hamburg released an Update 2009/2010 for its Climate Action Policy. It shows that in 2009 the transport sector obtained the highest amount of funding,

amounting to 4.6m € of total 26.7m € (17.2%). Hamburg has also been awarded the title "European Green Capital 2011" for its major achievements in environmental protection.
Link: http://www.klima.hamburg.de/index.php?id=verkehr

Munich

The capital of the State of Bavaria has established a climate alliance ("München für Klimaschutz"), bringing together more than 60 local and regional public and private stakeholders. The overall target is a 50% reduction in CO_2 emissions by 2030 (base year 1990). In the transport sector, the focus of measures proposed so far is on public awareness and information:

- Improving attractiveness and information about car sharing
- Developing an information campaign on combination of different transport modes (motorised/non-motorised)
- Developing concepts for climate-friendly travel to and from sights in Munich and beyond
- Integrating a CO_2 calculator in route planning
- Considering conversion of car parking to bicycle parking facilities at selected subway stations
- Energy saving traffic lights via LED technology

More measures are likely to be developed in the coming years. Moreover, environmental and climate aspects are included in several other municipal and regional programs/plans. As in most other large and medium German cities, Munich has introduced a LEZ in the inner city. Together with other cities and communities in the region, Munich has also developed a concept for smart urban planning ("Siedlungsentwicklung und Mobilität"). One of the key issues is to develop new residential and commercial areas around existing public transport facilities.
Link: http://www.muenchenfuerklimaschutz.de/cms/

Brussels

The capital of Belgium has started the "Bruxell'air" campaign to encourage its citizens to give up their private cars. Residents who turn in the license plates of their cars (or even scrap them) are rewarded with one or a combination of several available bonuses:

- A one-year ticket for Public Transport in the Brussels area
- A one-year subscription to the local car sharing system Cambio
- A training course for safe cycling in the city and an amount of EUR 470 to purchase one or more new bicycles and accessories

Moreover, the city also actively promotes the nationwide program which offers tax reductions when purchasing an environmentally friendly car (emitting less than 115g CO_2 per km).
Link: http://www.prime-bruxellair.be/homepage.php

Copenhagen

In its ambitious "Vision 2015" published in 2007, the Danish capital aims at becoming the world's eco-metropolis. The key issue within the transport sector is to foster non-motorised transport. Accordingly, the main goals and measures are:

- Increasing the share of people going to work by bike from currently 36% to 50%

- Reaching this target via improvements in infrastructure (e.g. cycle lanes and parking facilities) and awareness campaigns
- Thereby also improving safety for cyclists (envisaged reduction of the number of seriously injured cyclists per year by 50%)
- Improving the quality of public transport as second-best alternative to cycling
- Establishing an Environment / Low Emission Zone
- Working towards the introduction of congestion charging and environmentally friendly vehicles

While the measures outlined in the climate-dedicated "Vision 2015" statement are heavily biased towards improving conditions for cyclists, the city's Municipal Plan and Agenda 21 Plan also contain other, more broad-based actions to reduce vehicle emissions.
Link: http://kk.sites.itera.dk/apps/kk_publikationer/pdf/674_CFbnhMePZr.pdf (Vision 2015)
http://www.kk.dk/sitecore/content/Subsites/CityOfCopenhagen/SubsiteFrontpage/LivingInCopenhagen/CityAndTraffic.aspx (Copenhagen Green Urban Mobility)

London

In May 2010, London published its 'Mayor's Transport Strategy' which sets out plans for improving the city's transport over the next 20 years. The strategy has a clear vision: London's transport system should excel among those of global cities, providing access to opportunities for all its people and enterprises, achieving the highest environmental standards and leading the world in its approach to tackling urban transport challenges of the 21st century. Among the key actions are the following:

- Improving transport connectivity through enhancements of London's rail network with additional routes
- Bringing about a revolution in cycling in London
- Promoting and encouraging new, cleaner technologies such as electric vehicles
- Making more use of the river Thames for transporting people and goods
- Providing Londoners with better information to help them plan their journeys

With the measures outlined above and others, the Transport Strategy wants to achieve six major goals: support economic development and population grow, enhance the quality of life for all Londoners, improve the safety and security, improve transport opportunities for all Londoners, reduce transport's contribution to climate change and improve its resilience as well as support the delivery of the London 2012 Olympic and Paralympic Games.
Link: http://www.london.gov.uk/publication/mayors-transport-strategy

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Madrid

The Spanish capital published its "Plan for the Sustainable Use of Energy and Climate Change Prevention" in June 2008. Comprising more than 340 pages, the detailed plan not only indicates measures to be taken to reduce GHG emissions, but it also contains detailed statistics on current energy consumption and a range of future scenarios. All goals developed in the plan are to be achieved until 2012. Among the actions proposed in the transport sector are:

- Drawing up a comprehensive Urban Mobility Plan, in co-ordination with other relevant Urban Planning documentation and with several main goals such as fostering public and non-motorised transport
- Promoting alternative fuels such as bio fuels, LNG, LPG or electricity and supporting the establishment of a corresponding supply network

- Raising awareness among drivers to consider environmental aspects in purchasing new vehicles
- Setting up a Car-Sharing system
- Limiting the number of parking spaces in commercial areas
- Annual campaigns to analyse energy consumption and GHG emissions by the municipal vehicle fleet, as well as corresponding eco-driving training for municipal employees

The measures proposed seem adequate to achieve a significant emission reduction. Especially the Urban Mobility Plan currently under development seems promising, as it may be the basis for a climate friendly long-term city development.
Link: http://www.c40cities.org/docs/ccap-madrid-110909.pdf

Paris

The plan sets out the ambitious target of 75% greenhouse gas (GHG) emissions reduction below 2004 baseline levels by 2050.
In 2007, the City of Paris also adopted its Plan de Déplacement Paris (PDP, Paris Transport Plan), aimed primarily at reducing the GHG emissions due to traffic in Paris by 60% by 2020.
To achieve this target, three undertakings were decided upon:

- The introduction of a Plan de Déplacement de l'Administration Parisienne (PDAP, a Travel Plan for City of Paris Staff), applying the principles of the PDP
- The pursuit of ongoing initiatives that serve the goals of the Climate Protection Plan: reducing the car fleet, using more energy-efficient or more suitable vehicles that use less fuel, and using hybrid or electric vehicles
- These initiatives are complemented by the promotion of "eco-driving", i.e. reducing fuel-consumption by changing individual driving styles.

Link: http://www.energy-cities.eu/IMG/pdf/Paris_climate_protection_plan_2007.pdf

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Rome

To achieve the 20-20-20 target enacted by the European Parliament in 2007 and then to achieve further reductions by 2030 as suggested by the transition to the Third Industrial Revolution, Rome will need to reduce its emissions by nearly 46 percent by 2030 (compared to 2008 levels).
The transport sector plays only a relatively small role in the plan. Transport is responsible for 36% of greenhouse gas emissions in Rome and improving traffic conditions is a principal concern of the city, as existing congestion problems are expected to worsen.
The City is trying to improve this by:

- Building a new underground line and creating more cycle lanes and park and ride facilities
- Trade-in approximately half of the city's old vehicles for more efficient, newer ones and it plans to promote biking as an urban means of transportation
- Foster the use of hybrid and electric vehicles
- Foster use of hydrogen vehicles, e.g. hydrogen cell mini buses.

Link:
http://www.energy-cities.eu/db/roma_climate_change_master_plan_jeremy_rifkin_group_2010_en.pdf

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Stockholm

Stockholm published an “Action plan for climate and energy 2010-2020”. This plan sets the long-term goal of becoming fossil fuel-free by the year 2050. The transport sector plays a significant role in the plan. These are some of the ongoing and planned measures to reduce emissions from transportation:

- The city's own vehicle fleet should consist of 100 per cent clean vehicles by 2010
- Improvement of public transport, especially major railway investments
- Investments in Biogas production

In addition, the plan describes several conceivable measures that could be undertaken in the transport sector:

- Increasing the share of car-pool cars via providing specific parking spaces for them
- Creating more bus lanes and cycle zones
- Raising parking fees to set incentives for other transport modes
- More efficient vehicle fleet via increased use of bio fuels, climate tax, environmental zones and more electric vehicles

As a special feature of Stockholm’s action plan, for every single measure proposed the corresponding short- and long-term CO_2 reductions as well as the costs and cost efficiency are estimated and published.
Link: http://www.c40cities.org/docs/Stockholm%20SEAP%20English.pdf

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Vienna

The Austrian capital initiated a Climate Protection Program as early as 1999. Its goals are mirrored in the 2003 Transportation Master Plan and the 2005 City Development plan. In 2009, Vienna continued its climate protection plans with a follow-up Climate Protection Program II (“KliP II”). The numerous measures to be taken cover a wide range of fields, from Public Transport to Urban Planning. One of the major goals is to increase the modal share of public transport from currently 37 to 43% and the share of non-motorised transport from 26 to 32%. Among the measures proposed to reach this target are the following:

- Reducing travel needs with smart urban planning (e.g. better combination of residential areas and necessary facilities for shopping and other services)
- Improving conditions for cyclists and pedestrians and overall attractiveness of the inner city with the creation of parks, relevant infrastructure (e.g. cycle lanes), extended speed limits for cars and limited parking supply
- Improving the quality of Public Transport with additional stops and stations, better reliability, dedicated bus lanes and better information facilities
- Support car sharing and Car Pooling projects
- Increase public awareness with information campaigns, including mobility management training in businesses and schools
- Offering eco-driving training to municipal employees
- Acquiring fuel efficient vehicles for the municipal fleet
- Consequently accounting for external costs of the different transport modes and thereby raising awareness for total mobility costs

The City of Vienna hopes that the Climate Protection Program II will lead to a reduction in overall CO_2 emissions in the range of 21% per person by 2020.
Link: http://www.wien.gv.at/english/environment/klip/

North America

Boulder

The Boulder (Colorado) City Council approved the Climate Action Plan (CAP) in June 2006. The CAP identifies three overall strategies to reduce GHG emissions from the transportation sector: reduce vehicle miles (VMT), increase the use of biofuels, and increase the aggregate fuel economy of vehicles in Boulder. Actions proposed include:

- Implementing the new Transportation Master Plan (TMP), which aims at reducing congestion and enhancing travel options
- Developing an Individualised Marketing Campaign to facilitate increased use of alternative transportation modes
- Educating residents on driving habits and vehicle maintenance tips to increase fuel economy, as well as assisting them with information on available incentives and rebates when purchasing a fuel efficient car
- Increasing the supply and use of biofuels (Biodiesel and Ethanol)

The main goal of the measures outlined in the CAP is to cut Boulder's GHG emissions by 22% until 2012.
Link:http://www.bouldercolorado.gov/files/LEAD/climate%20and%20energy/cap_final_25sept06.pdf

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Chicago

The Chicago (Illinois) Climate Action Plan lists measures in five different fields of action, transportation being one of them. The following transport-related actions and goals are envisaged:

- Improving Public Transport (for example with an extensive BRT system) with the overall target to increase ridership by 30%
- Transit-oriented city/community development
- Doubling the current number of walking and cycling trips with dedicated Bike and Pedestrian Plans
- Increasing efficiency for car travel, e.g. with car sharing and Pooling schemes, also in co-operation with businesses
- Increasing the number of Hybrid and other fuel efficient vehicles in the municipal fleet
- Reducing emissions on Chicago O'Hare Intl'l Airport (e.g. improved traffic control for less engine idling)

The City of Chicago profits from the fact that it already maintains the second-largest transit system in the United States. With the measure outlines above, it hopes to significantly reduce GHG emissions in the transport sector, which currently make up around 21% of the city's total emissions.
Link: http://www.chicagoclimateaction.org/

In 2010, a progress report for the first two years 2008-2009 was released. The report shows that Chicago succeeded in integrating hybrid and alternative fuel vehicles but could not increase the Public Transport ridership as planned, due to budget constraints.
Link: http://www.chicagoclimateaction.org/pages/ccap_progress_report/81.php

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Denver

The City of Denver (Colorado) launched the "Greenprint Denver" agenda in mid-2006, a Climate Action Plan was finalized in October 2007. The overall goal is to cut GHG emissions per capita by 10% until 2012 (baseline 1990). Selected actions proposed by the "Greenprint Denver" Advisory Council in the transport sector – which currently contributes to 30% of the total GHG emissions in the city – include:

- Working with industries and businesses to encourage the use of alternative commuting modes (non-motorised, Car Pool, etc.)
- Encouraging the purchase of certified carbon offsets for travelling (car and airline)
- Adopting policies and incentives to centre future city growth around mass transit hubs
- Promoting and fostering alternative transport modes (e.g. Hybrid, but also Mass Transit and non-motorised)

The first measures have already been successfully implemented. The number of city employees using Public Transport for commuting, for example, has already been raised by more than 30%. New Transportation and Land Use Planning guidelines have been developed. Significantly reducing GHG emissions in the transport sector will require determined actions by the city, which saw a steadily increasing rate of transport-related GHG emissions per capita since 1990, not at least due to the increased share of light trucks/SUVs.
Link: http://www.greenprintdenver.org/about/climate-action-plan-reports/

Houston

The fourth largest city in the United States, which currently counts more than 140 million vehicle miles travelled within the city boundaries per day, published an Emission Reduction Plan in mid-2008. Its scope in the transport sector is limited to measures affecting the municipal vehicle fleet. In December 2009, an Update of this Plan was published showing the progress made in the proposed strategies. The following goals were set for the transport sector and have been achieved so far, as follows:

- Replacing traffic lights with LED technology: 84% achieved by end of 2009, estimated to be completed in late 2010
- Replacing older vehicles with modern, more fuel efficient cars and trucks: 100% completed
- Introducing Hybrid vehicles and other new technology: About 700 hybrid vehicles were in the city's fleet in 2009; this means an achievement of 80%, estimated to be completed in 2010

Although the measures outlined in the above mentioned programs might not be exhaustive, it seems that the actions currently envisaged are very narrow in scope and not adequate to achieve a significant reduction in transport GHG emissions.
Link: http://www.greenhoustontx.gov

Los Angeles

The City of Los Angeles (California) has initiated a range of actions intended to reduce GHG emissions in the transport sector. Among them are the following:

- An electric vehicle program which sets monetary incentives to switch to an electric car

- Increasing the use of fuel efficient and CNG/LPG-powered vehicles in the municipal fleet
- Promoting bicycle use, e.g. by improving infrastructure, facilitating bicycle transport in buses and bike programs (e.g. the 'bike to work' day)
- Improving Public Transport options

There may exist other programs and projects, but the information concerning targets for GHG emission reductions in the transport sector remain rather less specific.
Link: http://www.ladwp.com/ladwp/cms/ladwp000801.jsp (Electric Vehicle Program)

New York

Transportation plays an important role in New York's PlaNYC, which outlines a comprehensive strategy for a more sustainable future. The following key actions are proposed:

- Extending quality and coverage of the existing rail transit network
- Introducing and further extending Bus Rapid Transit (BRT) schemes, along with dedicated bus lanes and other improvements
- Promoting alternative transport modes such as cycling (e.g. with installation of several hundred miles of bike lanes) and ferry boats
- Initiating a pilot project on congestion pricing in the Central Business District (CBD) area
- Creating an integrated Traffic Management System

According to the 2008 progress report, the majority of actions are already being implemented. An exception is the congestion pricing project. After having been approved by the New York city council, the measure was stopped by State legislature. It remains to be seen whether this project can be implemented at a later point of time. The decision taken by the State seriously endangers New York's future Public Transport projects, as revenues originating from congestion pricing had already been included in the city's financing plans.
The latest progress report from April 2010 shows that only about half of the milestones for the transport initiatives have been achieved so far due to state or federal inaction.
Link: http://www.nyc.gov/html/planyc2030/html/plan/transportation.shtml

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San Francisco

The Climate Action Plan for San Francisco was adopted in 2004. It provides the following actions to reduce GHG emissions in the transport sector, which contributes to about 50% of the city's total emissions:

- Increase the Use of Public Transit as an Alternative to Driving
- Increase the Use of Ridesharing as an Alternative to Single Occupancy Driving
- Increase Bicycling and Walking as an Alternative to Driving
- Support Trip Reduction Through Employer-Based Programs
- Increase the Use of Clean Air Vehicles and Improve Fleet Efficiency

Link: http://www.sfenvironment.org/downloads/library/climateactionplan.pdf

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Montreal

The City of Montréal created the 'Montréal Community Sustainable Development Plan 2010-2015'. This plan followed 'Montréal's First Strategic Plan For Sustainable Development For

2005-2009'. Reducing GHG emissions by 30% by 2020 compared to 1990 is one of the primary targets of the strategy, and the transport sector plays an important role for achieving this goal as it is the largest producer of GHG emissions with 48% of total emissions. The actions proposed for transportation include the following:

- Reduce automobile dependency through encouraging sustainable transportation for commuting and provide infrastructure for cycling
- Reduce emissions of the conventional vehicle fleet: The city already enforced a law in 2008 prohibiting idling engines for more than three minutes. Now greener vehicles shall be acquired and high-efficiency technology integrated into the existing fleet.
- Promote electrical transportation: Electric or hybrid vehicles shall be acquired and recharging stations installed.

In addition to the Montréal Community Sustainable Development Plan, a Corporate Sustainable Development Plan and Local Sustainable Development Plans by local administrations shall supplement the reduction in GHG emissions.
Link:http://ville.montreal.qc.ca/portal/page?_pageid=7137,78111572&_dad=portal&_schema=PORTAL#note_bp

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Ottawa

The Canadian capital initiated the "Air Quality and Climate Change Management Plan" in 2004. The overall goal is to reduce emissions by 20% compared to the 1990 baseline until 2012. The transport sector is identified as the largest source of emissions in Ottawa, contributing to around 40% of the total. Accordingly, a wide range of measures aims at reducing emissions especially from private transportation:

- Shaping development patterns to support transportation goals (compact and transit friendly);
- Implementing TDM measures (reduce automobile dependency)
- Investing in new infrastructure and services (walking, cycling, and transit capacity and service)
- Investing in a "Rapid transit network";
- Incorporating a "Transportation system management", which includes improved signal systems, intersection improvements and queue jumper for buses
- Instituting an "Intelligent transport system" (highway monitoring and signalling)
- Using transportation models to forecast and improve transit flow

The measures are closely linked with the Ottawa Transport Master Plan, which contains detailed actions. One of the key goals is to increase the overall modal share of Public Transport from currently 17 to 30% until 2012, with more modest growth in the share for NMT (walking from 9.6 to 10%, cycling 1.7 to 3%)
Link: http://www.ottawa.ca/city_services/planningzoning/2020/air/aq_cc_mgt_plan_en.pdf

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Toronto

The transport sector plays a key role in the city's efforts to reduce GHG emissions. Actions proposed fall in the following four broad categories:

- Promoting walking, with the establishment of a dedicated Walking Strategy, investments in infrastructure and the "Active and Safe Routes to Schools" program

- Promoting cycling, with the development of the Toronto Bike Plan, improvements such as dedicated bike lanes and parking facilities and several accompanying marketing/awareness programs
- Making Public Transit more efficient and eco-friendly, e.g. with Hybrid buses, Bio fuel usage and the evaluation of dedicated bus lanes
- Reducing emissions from cars and trucks, e.g. with the Idling Control Law, increased use of Hybrid and CNG vehicles in the municipal fleet and several public awareness measures
- Including electric vehicles into a sustainable transportation plan

It may be noteworthy that, together with other Canadian stakeholders, the Toronto municipal government actively supports the development of a new, more climate and energy efficiency-oriented National Transport Strategy.
Link: http://www.toronto.ca/environment/transportation.htm

Vancouver

The city adopted the “Corporate Climate Change Action Plan” in 2003, soon followed by the “Community Climate Change Action Plan” in 2005. These strategies have since been supplemented by several transport-related documents and plans. Among the measures proposed or implemented to reduce GHG emissions from transportation are the following:

- Reducing emissions from the municipal vehicle fleet (e.g. increased use of Biofuel and fuel-efficient cars)
- Fostering non-motorised transport, e.g. via improvements in infrastructure such as bike lanes and pedestrian/cyclist crossing signals
- Co-operating with numerous local businesses and organisations to engage the public about climate change and specific actions they can take to reduce emissions
- Enforcing a by-law on engine idling
- Promoting the use of Hybrid and other fuel-efficient cars, e.g. in co-operation with taxi associations and with parking discounts for low-consumption private vehicles
- Significantly expanding the capacity of transit service, which is currently stretched to its limits
- Supporting a further expansion of car sharing

As in many other cities, Vancouver’s Climate Change Action Plans are closely linked to standard transport planning documents, which describe the actions to be taken in more detail. Moreover, Vancouver supports the use of electric vehicles by fostering the implementation of the required infrastructure.
Link: http://vancouver.ca/sustainability/climate_protection.htm

Latin & South America

Mexico City

The Mexican capital has drafted a Climate Action Local Strategy (ELAC by its Spanish acronym), thereby becoming the first local authority in Mexico to develop such a document. It features the following measures in the transport sector:

- Extending the scope of the long-running "Hoy no circula" program, which restricts usage of certain groups of vehicles on one day of the week
- Converting minibuses to CNG, and replacing a large number of such low-capacity vehicles with new, larger buses
- Replacing old taxis with more fuel-efficient ones
- Extending Public Transport (BRT, bus, tram) and evaluating financing options such as revenues from Emission Trading (proposal submitted for the "Metrobus" project)
- Improving infrastructure for cycling
- Establishing and extending pedestrian areas, especially in the historic city centre
- Gradually introducing a obligatory bus service to schools, thereby banning private transportation of students

Other more general activities include raising public awareness, especially with regard to behaviour towards non-motorised traffic (pedestrians, cyclists). The ELAC formulates important first steps to reduce transport GHG emissions, and features innovative proposals such as the introduction of emission trading as a means of financing for public transport projects.
Link: http://www.sma.df.gob.mx/sma/links/download/archivos/paccm_summary.pdf
http://www.sma.df.gob.mx/cclimatico/principal.php?op=acciones01_a

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São Paulo

The city adopted the "Municipal Act on Climate Change" in June 2009. Its greater goal is to reduce GHG emissions by 30% by 2012 compared to 2003 levels. Since 2005, a reduction of 20% has already been achieved.
The transport sector plays a significant role in the adaptation and mitigation strategies to reach this goal. Among the actions proposed are the following:

- Installation of systems for the reduction of traffic jams and fuel consumption
- Setting incentives to use public transport and non-motorised vehicles through exclusive bus lanes and parking lots for bicycles at the metro-rail system
- Making traffic more efficient through exclusive car-pool lanes
- Reducing emissions through the implementation of sustainability criteria for vehicles and services, vehicle inspection program, reduction goals for public municipal transportation, defining emission standards in the civil aviation

Combined with the actions to be taken in several other fields like renewable energies etc., the above measures can help to realize the city's reduction goal.
Link: http://www.c40cities.org/docs/ccap-sao-paulo.pdf

Buenos Aires

Although the City of Buenos Aires is not legally obliged to execute emission reduction programs, its Government assumes responsibility for the GHG emissions produced by its citizens. Thus an overall target to reduce GHG emissions by 32.7% below 2008 levels by 2030 has been set. The City of Buenos Aires strongly believes that the only way to achieve GHG emission reduction is through *Local Initiatives*, by developing local Action Plans.
The transport sector is part of the mitigation strategies to achieve the above reduction in GHG emissions. The city's action plans include key transport measures to:

- Prevent vehicles from the metropolitan area entering the inner city by e.g. building parking space in the periphery
- Improve traffic management by creating segregated lanes for public transport. The possibility of implementing a BRT system is also outlined
- Favour pedestrians, cyclists and PT passengers. The objective is to encourage a modal shift towards more environmentally friendly modes. It includes *inter alia*: priority areas for pedestrians and the extension of the bicycle network
- Improve the efficiency of vehicles. Improvements in vehicle technology and fuels are expected. It also includes the promotion of eco-driving.

Link:
http://www.c40cities.org/docs/Abstract%20Action%20Plan%20on%20Climate%20Change.doc (English Abstract)
http://www.agenciaambiental.gob.ar/areas/med_ambiente/apra/des_sust/pacc.php?menu_id=32408 (Full Plan in Spanish)

Summary of the measures outlined in the Climate Action Plans

The tables below summarise the measures proposed in the above discussed Climate Action Plans and divide them into 16 different categories. Please note:

The measures indicated below are those which are explicitly listed in the relevant Urban Transport / Climate Action Plans of the cities covered here. This list might not be exhaustive in cases where specific measures are not mentioned separately, but rather summarised in more general terms. Measures only formulated in standard, not climate/environment-related Urban Transport Planning documents may also be missing, as these documents were not the primary scope of research for this paper.

(✓) indicates a measure currently only evaluated or in a very early planning stage

Summary of the measures outlined in the Climate Action Plans

Instruments		Africa	Asia							Australia & Pacific			Europe						
		Johannes-burg	Beijing	Hong Kong	Seoul	Tokyo	Yokohama	Singapore	Mumbai	Melbourne	Sydney	Auckalnd	Frankfurt (Main)	Hamburg	Munich	Brussels	Copen-hagen	London	Madrid
Planning	Land Use Panning	✓			✓		✓	✓		✓	✓	✓			✓				✓
	Public Transport	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	(✓)
	Non-Motorised Modes		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	(✓)
Regulatory	Physical restraint Measures																		
	Traffic management Measures	✓	✓		✓			✓	✓	✓	✓		✓	✓				✓	
	Regulation of Parking Supply		✓						✓			(✓)	✓		✓				✓
	Low Emission Zone		✓										✓	✓	✓		✓		
	Speed Restrictions											✓	✓						
Economic	Road Pricing							✓				(✓)		(✓)			(✓)	✓	
	Tax Incentives			✓				✓											
	Parking Pricing		✓									(✓)	✓	(✓)					
Information	Public Awareness Campaigns	✓	✓			✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Stakeholder conferences	✓				✓						✓			✓			✓	✓
	Driver Training / Eco Driving					✓				✓								✓	✓
Tech-nology	Cleaner Technology	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓			(✓)	✓	✓
Research	Emission monitoring, Establishing a reliable database	✓			✓			✓											

Summary of the measures outlined in the Climate Action Plans (continued)

Instruments		Europe (continued)				North America											Latin & South America		
		Paris	Rome	Stockholm	Vienna	Boulder	Chicago	Denver	Houston	Los Angeles	New York	San Francisco	Montreal	Ottawa	Toronto	Vancouver	Mexico City	Sao Paulo	Buenos Aires
Planning	Land Use Panning				✓	(✓)	✓	✓			✓		✓	✓				✓	
	Public Transport		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Non-Motorised Modes		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Regulatory	Physical restraint Measures																✓	✓	✓
	Traffic management Measures			✓	✓				✓		✓		✓	✓				✓	✓
	Regulation of Parking Supply				✓						✓		✓	✓					✓
	Low Emission Zone			(✓)															
	Speed Restrictions			✓	✓								✓						
Economic	Road Pricing			✓							(✓)								
	Fuel Tax Incentives																		
	Parking Pricing			(✓)									✓	✓					
Information	Public Awareness Campaigns		✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	
	Stakeholder conferences				✓				✓	✓						✓			
	Driver Training / Eco Driving	✓		✓	✓	✓													✓
Tech-nology	Cleaner Technology	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Researc h	Emission monitoring, Establishing a reliable database			✓		✓			✓	✓			✓						✓

GIZ – Sustainable Urban Transport Project (SUTP)

Based on more than 25 years of practical experiences, GIZ hosts the "Sustainable Urban Transport Project" (www.sutp.org) with a wealth of information and knowledge on appropriate solutions, inter alia on tackling climate change in the transport sector. Through training and advisory services, decision makers in the transport sector are better informed about transport emissions and their impact on our climate. This may, for example, lead to improved urban transport systems, less traffic and better alternatives to using cars or motorised two-wheelers, which are responsible for the lion share of transport fuel emissions. A win-win-situation on the local and global levels, as transport operators and users may save on fuel and in turn reduce emissions. In a nutshell: Smarter mobility means more fresh air for people and less GHG pressure on our climate.

The flagship publication "Sustainable Transport: a Sourcebook for policy-makers in Developing Cities" compiles most international practices and provides access to numerous other resources. Materials are complemented by training courses targeted to policymakers, planners or engineers in cities, regional entities and on governmental level.

For more information on our work, please visit:

www.sutp.org
www.gtz.de/fuelprices
www.gtz.de/transport

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