



## A low carbon future with public transport

**THE CONTRIBUTION PUBLIC TRANSPORT MAKES TO REDUCING CARBON USE AND THE MITIGATING THE RISK OF CLIMATE CHANGE; THIS PAPER WILL PROVIDE A SHORT BACKGROUND ON GREENHOUSE GASES (GHG), DETAIL THE SHARE AND RESPONSIBILITY FOR PUBLIC TRANSPORT; AND PROVIDE RECOMMENDATIONS.**

### Background

Man-made emissions and increasing levels of carbon dioxide are altering the natural climate cycles; bringing extremes in weather all over the world. The extent of the impact and how reversible these effects are may still be unknown, but the direct and indirect consequences of the changes that we are already experiencing present risks that should not be ignored. For example, the weather-related economic losses of hurricane Katrina, which hit the United States in summer 2005, are estimated at US\$200 billion<sup>1</sup>. As global warming continues the annual toll could reach US\$150 billion in the next 10 years and US\$300 billion by 2050<sup>2</sup>. Reducing the risk of extreme weather and insurance costs caused by climate change is therefore of crucial importance.

### What is the Greenhouse Gas effect?

The earth is protected from the sun by a blanket of gases. Some of the sun's energy penetrates this layer and the reverse allows energy to escape into space. Excess GHGs change the balance of this naturally occurring process and alters the thickness of this layer, meaning that more heat/energy is trapped and the temperature around the planet increases. The Intergovernmental Panel on Climate Change (IPCC) believes that the warming of the Earth should be limited to 2°C<sup>3</sup>, this means limiting the concentration of CO<sub>2</sub> in the atmosphere to 550 ppm<sup>4</sup>.

<sup>1</sup> Source Sustrans UK

<sup>2</sup> Munich Reinsurance - Annual Review of natural catastrophe 2003 published 2004

<sup>3</sup> UITP gave support to this with the WWF at the UNFCCC Conference of the Parties meeting (2003)

<sup>4</sup> PPM – parts per million

2005 has officially become the warmest year on record in the Northern Hemisphere with temperatures 0.65°C above average. At present rates the Arctic ice cap could completely disappear by the year 2030. Australian average temperatures have risen by 0.7°C over the last century, and a 50% drop in water supply to the reservoirs supplying Perth, Western Australia has been recorded since the 1970s.

*Source : UNHABITAT and National Snow and Ice Centre, Colorado, USA*

The three key GHG are Carbon Dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>) and Nitrous Oxide (N<sub>2</sub>O<sub>x</sub>). CO<sub>2</sub> is by far the most important GHG for the transport sector as it accounts for over 4/5ths of the total GHG from industrialised countries and most comes from burning fossil fuel. Atmospheric levels of CO<sub>2</sub> will probably double from pre-industrial levels during the 21st century

*Forecast of CO<sub>2</sub> emissions caused by burning oil, coal and gas*

Year	Billion tons CO <sub>2</sub>
1990	21,21
2003	25,02
2010	30,35
2015	33,65
2020	36,74
2025	40,03
2030	44,66

Changes in the climate due to increased emissions are difficult to measure but scientists unanimously agree that GHG emissions are accelerating any natural change cycles. Natural inertia and fluctuations associated with the greenhouse effect also mean that CO<sub>2</sub> concentrations remain in the atmosphere for as much as 150 years; thus we are only experiencing today the effects of CO<sub>2</sub> increases from the last century.

### An increasingly urbanised World

The impact of increased urbanisation cannot be ignored as more people migrate to cities. By 2010 more than 50% of the world's population will live or work in urban areas, and China will have 10 cities the size of London or Paris. In addition, more than half the world's

population now lives within 60km of the sea and three quarters of all large cities are located on or near the coast, putting them and the associated transport infrastructure at increased risk from flooding.

As urban areas increase, emissions from transport now contribute significantly to the overall greenhouse effect. However, dense urban areas are exactly where rail and public transport perform best and by forming the backbone of any sustainable transport network can thus reduce the carbon footprint of these fast growing metropolitan areas.

As more than 50% of urban trips made by car are under 5km, many could be changed to more sustainable modes such as public transport, walking or cycling. If one or two trips a month were changed, congestion, air pollution and energy use per capital in cities could be noticeably reduced.

London's congestion charging scheme has reduced CO<sub>2</sub> emissions by 19% in the charging zone.

*Source: TfL congestion charging – impacts monitoring report 2005*

A combination of measures to lower the per capita emissions from transport is now urgent, with every citizen recognizing their responsibility for their transport choices and taking actions to reduce their individual carbon use. Governments and local authorities can stimulate these actions but without attractive alternatives and an integrated approach to land use planning and energy policies; this will not become a sustainable reality.

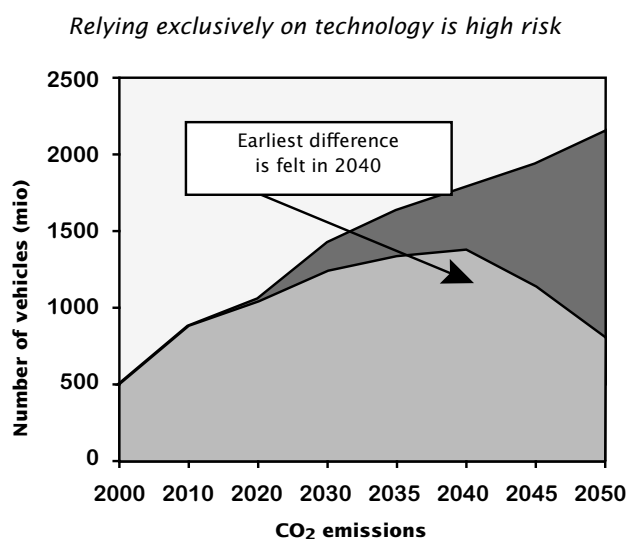
**Society must reduce its dependence on car use and encourage the use of public transport as a key tool to combat global warming.**

This was the message that was delivered on behalf of Jean-Paul Bailly, UITP President to the United Nations Conference on Climate Change in Kyoto on 5 December 1997 at the beginning of the Kyoto Protocol. With emissions from transport growing annually, there has been little progress in nearly ten years.

## GHG Emissions from transport

Globally emissions of carbon dioxide from transport are growing faster than for any other sector and now represent around 26% of the total global emissions (UNFCCC<sup>5</sup>). Furthermore, GHG's from transport are negating the efforts being made by other industries to reduce their emissions.

A range of policies need to be put in place in the transport sector to deliver reductions in transport emissions including behavioural, physical and fiscal measures that will help bridge the transition period until cleaner technology matures. There is also scope for accelerating the implementation of some new technologies.



Source: *Facts and Trends to 2050 Energy and Climate Change*.  
*WBCSD 2004*

## Technology will only make a difference by 2040

Predictions of 1.6 billion cars by 2030 and the present focus on fuel and propulsion-based improvements will help but not deliver the required change within an appropriate time frame without other measures and changes in our mobility behaviour.

Today about 750 million Light Duty Vehicles (LDV vehicles include cars and vans) contribute around 50% of the transport sectors emissions<sup>6</sup>. Even if zero carbon vehicles were introduced starting in 2010 with 200,000 units, and growing by 20% per annum thereafter, it would still take until 2030 for there to be a significant drop in emissions from road vehicles.

New engine technology, better fuels and other improvements have not had the required significant overall impact on reducing GHG as these gains are offset by the sheer growth in traffic, particularly in urban areas. Higher comfort levels in many vehicle specifications such as air conditioning and GPS<sup>7</sup> also increase energy consumption and therefore increase emissions as well.

Taking an average occupancy of 25 % for public transport, the primary energy (and GHG emissions) consumption per passenger per kilometre of public transport is only one third when compared to the private car, even with the many recent improvements in automotive technology. In peak hours when most transportation problems in urban areas occur, public transport has an advantage of as much as 10:1 over the private car<sup>8</sup>. Despite this, it is still necessary for public transport to demonstrate that it is also working on minimising its impact on the environment.

As it takes around 20 years to renew a national vehicle fleet, transition technologies and modal shift must bridge the gap. Urban sprawl makes all transport less efficient but **shifting more trips** to public transport (bus, and rail), walking and cycling from individual car use can help reduce national CO<sub>2</sub> levels and stop the worsening trend.

## Impact on the Public Transport sector

Probable impacts resulting from climate change will have major influences on the sector through capital, operational and maintenance costs and increased insurance risks. Climate change must be considered as an additional risk in normal decision making and decisions taken based on the perceived severity of risk exposure. Companies must then implement those actions to ensure they can manage the likely impacts of climate change on their business.

<sup>5</sup> UNFCCC – United Nations Framework Convention for Climate Change

<sup>6</sup> The remaining 50% come from maritime, aviation and other transport sources.

<sup>7</sup> GPS – Global Positioning Systems

<sup>8</sup> IFEU (2001): Bus, Bahn und PKW auf dem Umweltprüfstand, average occupancy car: 1,2 persons, bus: 16 persons

## Global Measures to support Low Carbon Transport

### Carbon Trading

Methods should be developed to better calculate GHG emissions on regional and local basis and investigate the connection between local urban transport policy and GHG emissions, comparing the different performances of modes more cheaply and easily. It is important to adapt the present schemes used for carbon trading such as the Clean Development Mechanism (CDM) to stimulate building efficient transport networks in developing countries and to improve public transport generally.

### The co-responsibility of the developing world

Much of the growth in energy use will come from the developing world – with India and China becoming the highest users. At present only 10% of urban citizens living in the developing world own cars – yet there are already high levels of local pollution, congestion and wasted energy by this small percentage of the population. In many Asia cities mechanized two wheelers already pose a real threat to city life. There is therefore an urgent need in the developing world for affordable, low-carbon transport alternatives and for it to recognize the potential of public transport to provide sustainable solutions for urban mobility.

### Putting people first

The developed world must not only set an example but they must also encourage developing countries to quickly use new clean technologies and fuels, and encourage a high level of patronage by all members of society for public transport. This can only be done by putting the citizen, and not the car, at the centre of urban development creating sustainable communities designed around walking, cycling and collective public transport.

## The Way Forward – the Responsibility of Public Transport

There is joint responsibility for all transport actors to play a role in reducing their carbon imprint. Public transport authorities and operators must increase their commitment to energy-efficiency and lowering emissions not only from their operations but also from all installations such as maintenance and office

facilities. Systems that operate from the electricity supply grid (most rail-based transport plus trolley buses) should work towards the increased use of power generated from non-polluting and renewable sources. Other systems (predominantly buses and marine transport) must focus on improving the efficiency of present-day energy sources and, in the longer term, working towards more advanced forms of propulsion such as hybrid drives, fuel cells, electrical storage, induction systems and so on.

Climate change must be considered as an additional risk in normal decision making and of prime importance for each actor in the public transport sector, addressing climate risk through assessment, disclosure and solutions as follows:

- i) Assess: Seek expert advice, conduct risk assessments and exchange best practise;
- ii) Disclose: Issue a public statement, disclose the risks publicly, account for carbon dioxide emissions and maintain stakeholder dialogue
- iii) Manage solutions: develop investment strategies, invest in clean energy and support actions for CO<sub>2</sub> reduction
- iv) Become a signatory to the UITP Sustainable Development Charter and international network to bring value to the contribution of public transport on this issue.

The UITP Sustainable Development Charter has been signed by more than 120 public transport actors worldwide. Signatories have committed to ensure that their activities fulfil sustainability criteria including measures to reduce GHG emissions and to improve energy efficiency. More information from UITP's Mobi+ electronic documentation centre.

## Recommendations

UITP, the international association of public transport recommends:

### International agencies and bodies

- Strengthen international and national agreements to bring down the overall emissions from transport and keep both local and greenhouse emissions under control.
- Build more cross sector, multistakeholder alliances between international agencies and all public transport actors that can influence and increase the awareness of the positive contribution that public transport and citizens behaviour changes can back during the transition period until technology can bring really effective change mainstream.
- Identify key business and investment risks and opportunities.

### National and regional governments

- Strengthen institutional frameworks and incentives for change and higher energy efficient transport such as environmental tax measures and/or road charges in urban areas targeting at increasing the costs of private car use.
- Increase transparent disclosure of urban transports sectors' share of GHG production and the measures being taken to mitigate those impacts.
- Invest and allocate funds from taxes to public transport with priority given to high energy efficiency and low GHG emissions.
- Stimulate the market for alternative energies and clean, low emission technologies.

### Local Authorities

- Increase the introduction of polices and measures to shift more trips to public transport.
- Invest more strongly in making urban areas more energy efficient and providing better infrastructure for public transport to increase its energy efficiency and general attractiveness.
- Improve the general awareness of local citizens of the impacts of their transport choices; giving priority and promoting public transport.
- Educate citizens on climate change, and the risks and responsibilities of present transport models and choices.

### Operators (all modes)

- Declare climate action policies and evaluate the risks of inaction. Assess the risks of climate change for operations and integrate climate polices into key operational planning to maximize opportunities and minimize risks.
- Communicate the benefits of public transport as a way to reduce GHG emissions from urban areas more concretely to all stakeholders.
- Gather credible data and monitor operating performance in terms of reduction of GHG.
- Replicate best practices that reduce CO<sub>2</sub> emissions more actively as part of transport planning.
- Manage and monitor fuel switching capabilities and the introduction of new or alternative low carbon intensive fuels for operations.

## Industry (manufacture and supply)

- Assess, disclose and report on the production of GHG caused by manufacturing.
- Implement an active plan to reduce GHG emissions.
- Increase the overall fuel efficiency of vehicles and powertrains as present improvements in fuel efficiency are being outweighed by worldwide growth in personal and freight transport.
- Introduce viable transition technologies, more clean fuels and the widest possible variety of measures and incentives.
- Reduce the overall weight of vehicles.
- Work with all actors to bring costs down for alternative or cleaner energy use;

## Scientific Community

- Help clarify the scientific evidence and make it more transparent.
- Play a more proactive role with politicians and help them make informed decisions based on scientific knowledge.

## All Citizens

- Make conscious decisions to reduce the overall number and to change trips that can be made by public transport, walking and cycling
- Be more aware of the risks of climate change

## Related UITP information

Fuel choices for public transport. Environmental demands and efficiency (November 2006) – UITP position prepared by the Bus Committee

The role of public transport to reduce climate change and improve energy efficiency UITP's European position on climate change and energy prepared by the EU committee (January 2006)

An annex to this position with complementary information on transport and climate change can be downloaded from the UITP web site [www.uitp.com](http://www.uitp.com).

This is an official position of UITP, the International Association of Public Transport. UITP has over 2700 members in 90 countries throughout the world and represents the interests of key players in this sector. Its membership includes transport authorities, operators, both private and public, in all modes of collective passenger transport, and the industry. UITP addresses the economic, technical, organisation and management aspects of passenger transport, as well as the development of policy for mobility and public transport world-wide.

This Focus Paper has been prepared by the UITP Sustainable Development Commission and has been approved by the UITP Policy Board.

**Contact:**  
[heather.allen@uitp.com](mailto:heather.allen@uitp.com)

Downloadable in EN, FR, DE, ES at [www.uitp.com](http://www.uitp.com)

Responsible editor:

UITP  
Rue Sainte-Marie 6  
BE-1080 Brussels  
Belgium

Tel: +32 2 673 61 00  
Fax: +32 2 660 10 72  
[info@uitp.com](mailto:info@uitp.com)  
[www.uitp.com](http://www.uitp.com)

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