

# **Briefing: Low Carbon Transport in London**

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**The transport sector is proving to be the most difficult sector to move towards carbon efficiency. A ‘trend-break’ is required through a combination of behavioural change, technological innovation and robust policy implementation. The VIBAT London project<sup>1</sup> illustrates the potential options and pathways for reducing transport carbon dioxide (CO<sub>2</sub>) emissions in London. It calls for a wider and transparent public discussion of potential future options if low emission lifestyles are to be ‘owned’ and climate change to be effectively addressed.**

Transport CO<sub>2</sub> emissions are forecast to continue to rise under business as usual (BAU) projections, at the UK level and also in cities such as London. Whilst domestic and industrial emissions are being reduced, the difficulties in the transport sector mean that strategic targets are likely to be missed. The Department for Energy and Climate Change has recently adopted a cross-sectoral 80% CO<sub>2</sub> emission reduction target against 1990 levels – achieving this is likely to be very difficult without concerted action in the transport sector.

Within London, the ground-based transport sector is responsible for around 9.6 MtCO<sub>2</sub> (million tonnes of CO<sub>2</sub>), 21 percent of total emissions. Road transport accounts for much of this, generating around 80 percent of the total. Projected population and employment growth to 2025 means that transport emissions, under the current BAU policy approach, are likely to increase to around 11.7 MtCO<sub>2</sub>. The Mayor's Climate Change Action Plan adopts a very ambitious target for a 60 percent reduction in emissions by 2025. There is a huge gap between BAU projections and strategic policy aspirations. The VIBAT

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<sup>1</sup> The VIBAT London (Visioning and Backcasting for Transport in London) project has been developed by the Halcrow Group with Oxford University Transport Studies Unit and Space Syntax. It was funded by the UrbanBuzz programme ([www.urbanbuzz.org](http://www.urbanbuzz.org)). More details, including background reports, can be found on the project website at [www.vibat.org](http://www.vibat.org)

London project considers the range of policy interventions available to reduce transport CO<sub>2</sub> emissions. Over 150 policy interventions are examined and grouped together into 12 complementary policy packages, such as:

- Low emission vehicles: including hybrid technologies and, at least in the short term, dieselisation. The best hybrid vehicles emit less than 100gCO<sub>2</sub>/km, compared to the current total fleet average at around 165 gCO<sub>2</sub>/km.
- Alternative fuels: there are many options on the market, including biofuels, compressed natural and liquid petroleum gas and, in the longer term, hydrogen. Clean electric has much potential for city-based driving.
- Pricing regimes: including congestion charging, area or distance/emission-based pricing schemes, and vehicle/fuel taxes.
- Urban planning: including strategic and more local interventions, such as locating development around the public transport network, providing higher densities, mixed uses and local streetscape, layout and public realm improvements.
- Public transport, walking and cycling investment: various levels of investment can be applied, including more extensive networks, frequency of public transport service, and improved facilities for walking and cycling.
- Ecological driving and slower speeds: encouraging more fuel efficient driving styles (less aggressive acceleration, lighter loads) and slower speed limits and greater enforcement.
- Freight logistics planning: including fleet management, reduced empty running, regionalisation of operations and use of consolidation centres.

Each package gives a different level of CO<sub>2</sub> reduction potential depending on level of application. More details of potential impacts can be found in the background study reports<sup>2</sup> (Figure 1).

#### **Figure 1**

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**Caption. The transport CO<sub>2</sub> emission baseline in London and potential policy packages to help reduce emissions**

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<sup>2</sup> These are hosted on the project website at [www.vibat.org](http://www.vibat.org) and provide the detailed modelling results, including potential impacts by policy interventions and packages.

To help examine the potential contribution of multiple policy packages and pathways, the team has developed an interactive computer simulation game, called TC-SIM (transport and carbon simulator), which allows users to explore the likely impact of their implementation.

TC-SIM can be played in different user modes: for example as a 'free rider', a 'techno optimist', an 'enviro-optimist' or a 'complacent car addict', and there is also a free role. The idea is that scenario testing, using the simulation model, will highlight the utility of different policy approaches (such as a reliance on technological or behavioural options, or applying a particular level of investment), and illustrate the need to act successfully across the wide range of policy interventions available (Figure 2). TC-SIM can be used by transport and urban planners, politicians and the public to discuss and compare the impacts of future policy trajectories.

TC-SIM is web-based and offers an innovative, and potentially very flexible, means of decision-making. It is a non-real-time collaborative experience where several individual users can interact within the same model and establish a dialogue about the decisions being made. It allows strategic policy making to become much more transparent. Achieving CO<sub>2</sub> reduction targets whilst maintaining quality of life objectives (economic, social and environmental) will require this type and level of debate – the public should have a much higher level of engagement and ownership in choosing *their* most appropriate future carbon efficient lifestyles.

## **Figure 2**

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**Caption. The Transport and Carbon Simulator (TC-SIM): a tool to help decision-makers and the public more transparently discuss transport and lifestyle futures**

Whilst playing TC-SIM it is evident that the current levels of low emission vehicle fleet penetration, investment in public transport, walking and cycling, and adoption of traffic demand management measures are not nearly enough to take us towards the headline CO<sub>2</sub> reduction targets as adopted. Much greater incentives for technological and

behavioural change need to be developed. The achievement of strategic CO2 emission reduction targets is hence in very serious doubt unless more concerted action is taken.

The VIBAT London study has generated enormous interest. The team has been invited to present at a very wide range of conferences and workshops and has contributed papers to a number of publications. A series of additional VIBAT studies are also under development, including in Delhi (India) and Victoria (Canada), seeking to transfer further the lessons and skills acquired during the VIBAT London project.

The conclusions being reached during the VIBAT studies are that the likelihood of deep CO2 reductions in the transport sector are looking very unlikely, although much progress is being made in certain cities such as London. In the end, the public needs to radically change their purchasing patterns and behaviour to be more carbon efficient. The means of knowledge dissemination, communication, participation in decision-making and marketing of policy options and futures all need to be considerably enhanced. Tools such as TC-SIM, applied to different contexts, could play an important role in testing different options with a range of different users. Scenario testing offers a way forward to this future policy and lifestyle dilemma. However, there is much more work to be done. The huge challenge now is to map out and discuss a variety of policy pathways to carbon efficiency in the transport sector, and then – the difficult step – to enable and actually achieve a level of consumer change consistent with strategic aspiration.

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More details on the VIBAT series of projects can be found at [www.vibat.org](http://www.vibat.org)

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Figure  
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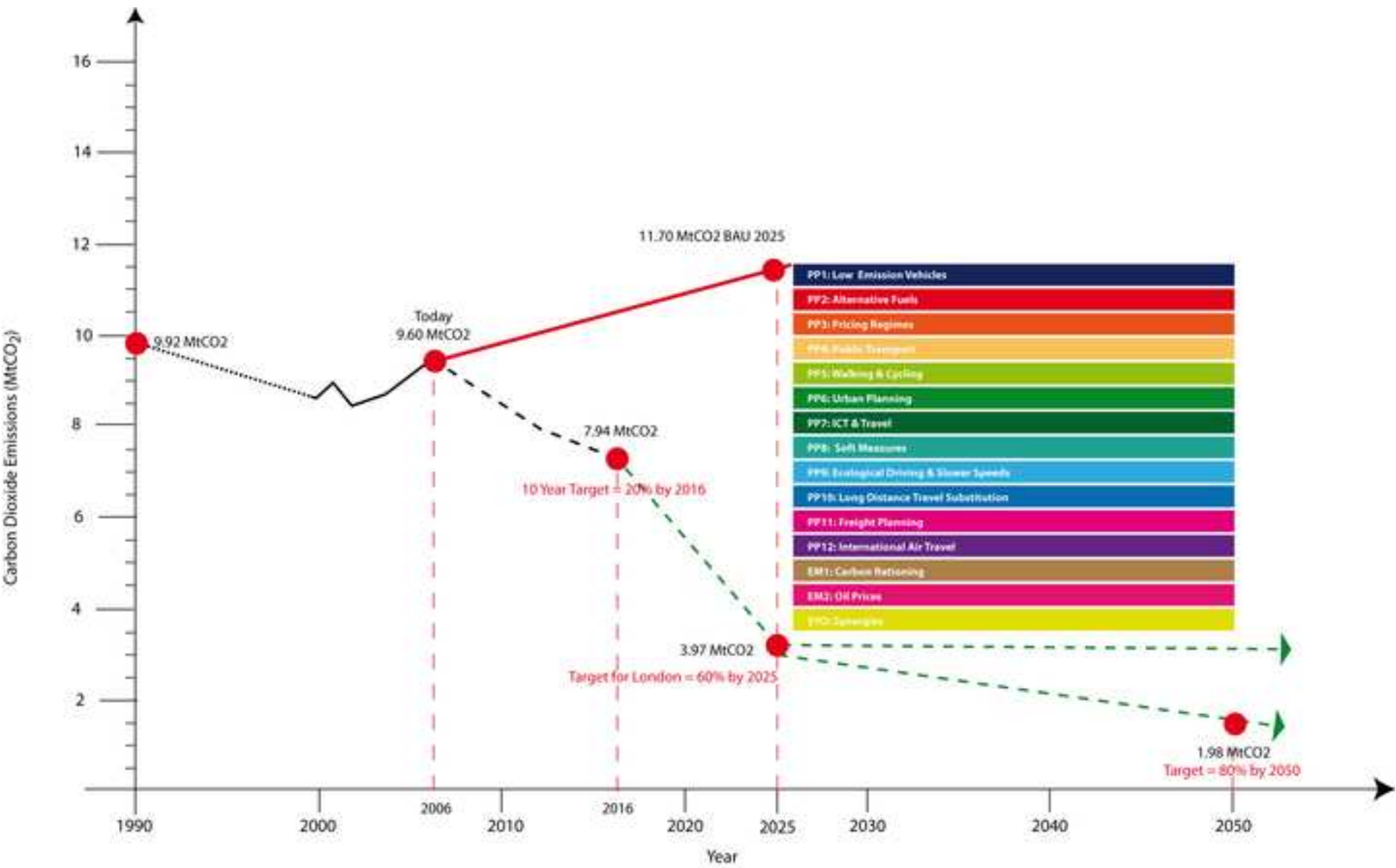
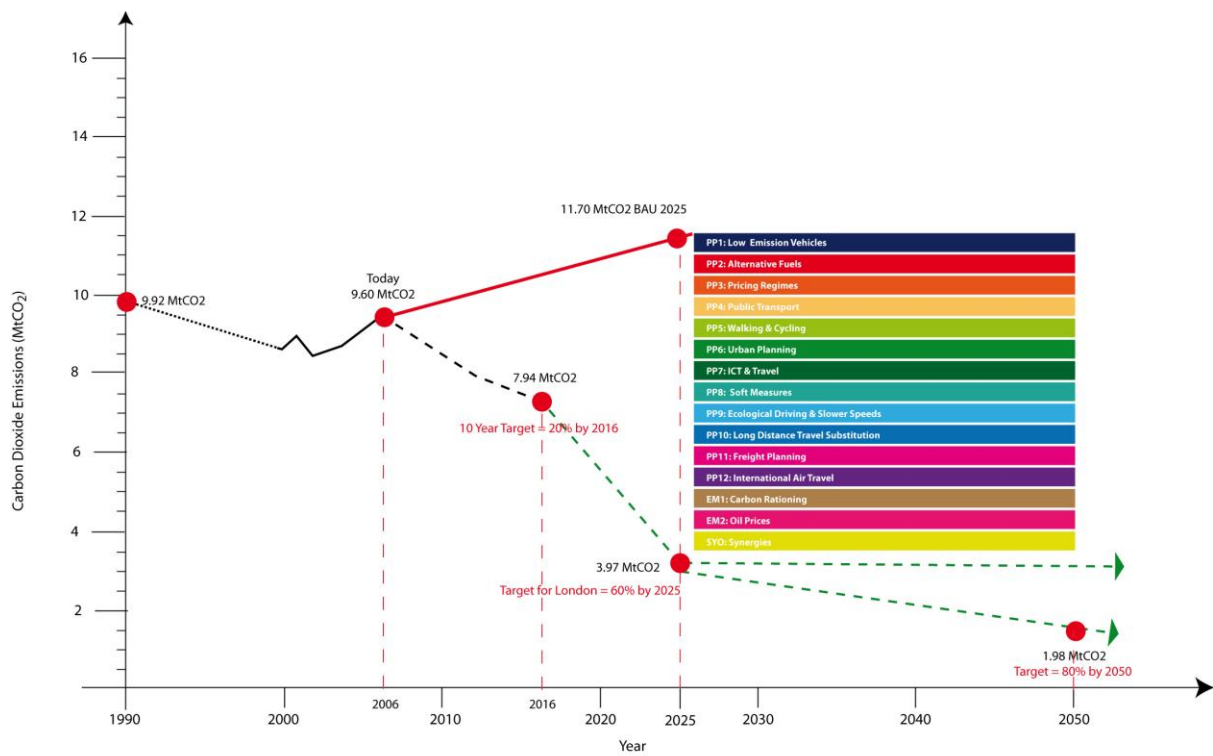


Figure 1

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**Figure 2**

**Caption. The Transport and Carbon Simulator (TC-SIM): a tool to help decision-makers and the public more transparently discuss transport and lifestyle futures**

