

Position paper

Prise de Position – Stellungnahme

NOVEMBER 11

“A comprehensive approach for bus systems and CO₂ emission reduction”

1. Executive Summary

In view of ongoing discussions at European level to decarbonise transport (Transport White Paper) and related initiatives to prepare eventual legislation on CO₂ emission reduction from heavy duty vehicles (HDV), the European bus sector (public transport undertakings and bus manufacturers¹) organised in UITP would like to highlight the following:

- A comprehensive approach for reduction of CO₂ emissions from buses is needed
- Attractive bus systems are a key solution (and not a problem) to achieve low-carbon urban mobility
- Promoting bus systems and modal shift to high quality multimodal and integrated public transport systems have very high impacts to reduce CO₂ emissions in urban transport
- Increasing the commercial speed and reliability of bus systems is a key strategy to reduce CO₂ emissions from buses
- When developing new legislation for CO₂ emissions from HDV, already existing legislation on CO₂ emissions for buses such as the “Green Public Procurement Directive” 2009/33/EC should be taken into account. UITP has developed further bus tender recommendations on the basis of this Directive.
- In view of a possible CO₂ + HDV legislation, the European bus sector is open to future CO₂ declaration (calculation based on passenger km)
- Further funding and support from the European Institutions is needed to develop attractive bus systems and to carry out future research. The large European R&D project EBSF (European Bus System of the Future) should be considered as a “lighthouse” project. The ERTRAC/EBSF roadmap gives important recommendations for future research for bus systems and the European bus sector is committed to contribute in the coming Framework Programme “Horizon 2020”
- Employment in public transport should be recognized as Green Jobs

¹ This position paper was developed by the UITP EU Committee, the UITP Bus Committee and Bus Manufacturers organised in UITP.

2. Introduction

In its Transport White Paper², the European Commission has put forward the concepts of decarbonisation as well as the increase of resource-efficiency in transport. Low carbon mobility with low energy consumption is essential for a sustainable future and competitive cities where people, businesses and culture can thrive.

UITP has welcomed this concept and supports the decarbonisation targets in the Transport White Paper in a recent position paper on “decarbonising urban mobility”³. In its position paper, UITP outlines the major role of public transport to help achieving these targets and identifies areas for action at European level. In particular, the paper recalls that in June 2009, UITP set out an ambitious aim for the sector, namely to double the market share of public transport worldwide by 2025⁴.

This following position paper complements these recommendations putting a specific focus on bus systems which are a key solution to urban mobility related challenges as well as to reduce CO₂ emissions. In Europe, bus systems and the bus as mode of transport are sometimes still seen as less attractive than other modes of transport. At the same time buses have been in the focus of various EU legislation in the past and further initiatives of the European Institutions are expected to come.

In this paper, European public transport undertakings and bus manufacturers organised in UITP jointly present their position on ongoing initiatives at EU level related to “decarbonisation of transport” and GHG emission reduction influencing public transport bus systems as well as make recommendations for further actions in order to support sustainable and innovative bus systems in the future.

3. Key facts on urban bus systems and the European bus market

- Urban and regional bus systems transport around half of all public transport passengers (30 billion per year) in the EU. In relation to that it is interesting to know that only 800 million passengers travel by air.
- Buses and coaches are already amongst the most environmentally and energy efficient passenger transport modes:
 - Low levels of local emissions
 - Low CO₂ and other GHG emissions even with an load of 20% (see graph below)
 - Low energy consumption (see graph below)
 - Low space consumption

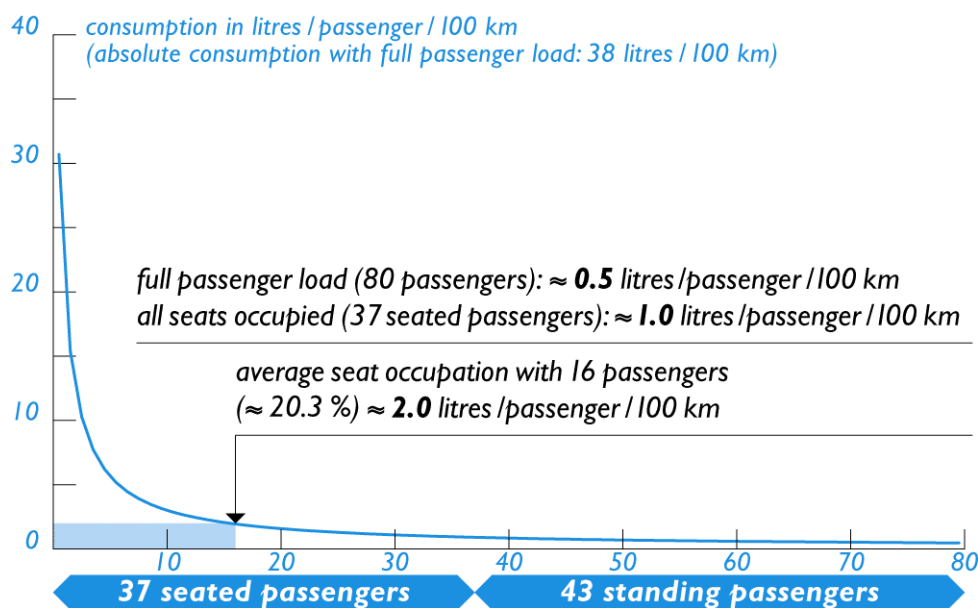
² White Paper “Roadmap to a Single European Transport Area? minus 20% CO₂ emissions in the transport sector until 2030 (compared to 2008 levels) and minus 60% CO₂ emissions until 2050 (compared to 1990 levels)

³ <http://www.uitp.org/mos/positionspapers/128-en.pdf>

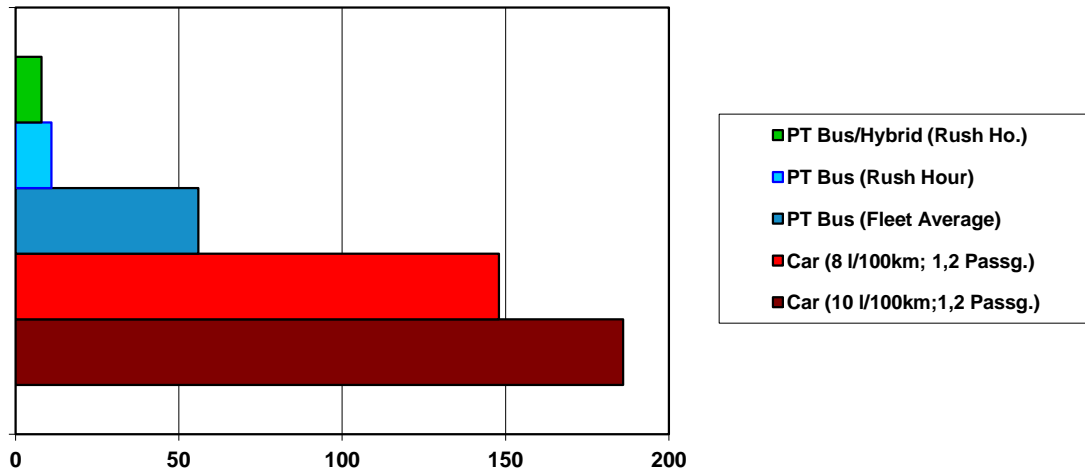
⁴ Against this context as well as clear indications in the Transport White Paper giving public transport a more important role in the future particularly in urban areas, UITP has doubts about the figures on the evolution of the European bus market presented in the LOT1 study “Reduction and testing of GHG emissions from HDV” which has been commissioned by the European Commission. On page 207 and 211 of the LOT1 report it is stated that from 2010 till 2030 the stock of buses will decrease by 9%. On this basis the evolution of energy consumption and GHG emissions have been further estimated. UITP could not find any explanation in the report which would justify this estimation.

- Excellent accident records compared to other passenger transport modes.
- The majority of buses and coaches are built by the same manufacturers as trucks. There are a lot of similarities, but at the same time many differences which have to be taken into account especially when it comes to (legislative) initiatives which are targeting both trucks and buses. In addition city buses are mostly tailor-made products with big variations across Europe with an average order size of around 5 units.
- A 40.000 buses/year in EU are registered. This is about a 100 times lower volume than cars and about a 10 times lower volume than heavy trucks. The administrative cost for each homologation is considerable for each bus. In addition these figures also should be kept in mind when the European Institutions propose any kind of legislation on buses.
- Today the European bus manufacturing industry is highly competitive and exports also in other parts of the world.

Following graph: Energy consumption and GHG emissions of urban buses depending different loads⁵ (source: Verband Deutscher Verkehrsunternehmen/VDV)



⁵ CO₂ calculations are based on buses run with fossil diesel fuel. Further reductions can be achieved by running busses with renewable fuels.



CO₂ emissions for buses and cars in g/passenger 100km (calculation basis for urban buses see graph above, source VDV)

4. What has been achieved so far in the bus sector

Buses and bus systems have already been the target for various EU environmental legislation in the past. Both, bus manufacturers as well as public transport undertakings have made considerable efforts in cleaning up bus fleets and ensuring that travelling by bus today is "green mobility". This fact should be taken into consideration if eventually further legislation on CO₂ values for buses is proposed.

As a consequence of regulation 1999/96 local emissions from buses have been reduced considerably. Today public transport undertakings purchase very clean EURO V or EEV buses and regulation 595/2009 on the introduction of EURO VI for heavy duty vehicles will result in another reduction of emissions close to the detection limit. Especially the step from Euro V to Euro VI will require considerable investments for manufacturers as well as for public transport undertakings and bind huge resources on the side of bus manufacturers. The implementation of Euro VI itself will not reduce fuel consumption/CO₂ emissions. To try to compensate the efficiency penalties by Euro VI additional vehicle and drive train related measures are necessary. Against this background also any eventual further legislation on limitation of pollutants from HDV engines (Euro VII?) should be seriously questioned.

Directive 2009/33/EC on the promotion of clean and energy efficient vehicles ("Green Public Procurement Directive") is currently being implemented by the sector and valuable experiences are made. The Directive obliges public transport undertakings to take into account energy consumption, CO₂ emissions as well as local emissions over the operational life-time when purchasing buses.

The requirements of this Directive have been integrated in the UITP Bus Tender Recommendations jointly developed by public transport undertakings and bus manufacturers⁶.

The measurement and reduction of energy consumption in urban bus systems, however, is already a long-time existing issue for the bus sector. Under the umbrella of UITP, public transport undertakings and bus manufacturers already developed the UITP SORT (Standardised On-Road Tests) Cycles in 2004 (updated in 2010) in order to better identify fuel consumption of urban buses. Based on real operation conditions meaningful simplified test cycles had been developed to compare the fuel consumption of different buses in a best possible way under certain conditions⁷. The SORT recommendations have been taken up by most public transport undertakings when issuing tenders documents.

5. New clean technologies often come with a higher prize tag - key strategy to reduce CO₂ emissions from buses should be modal shift

Moving the composition of the European bus fleet towards a cleaner profile will need a comprehensive approach and should not only focus on a possible mandatory certified CO₂ declaration for HDVs, including buses.

Many UITP members have made significant efforts to decrease the average age of bus fleets and to introduce a variety of cleaner fuels and new technologies. UITP has carried out a survey on the present situation of the bus fleet in Europe (2005) and would be happy to share this data⁸.

It should be noted that many of the cleaner technologies come with a higher price tag than the improved clean diesel internal combustion engine. However for many local authorities/public transport undertakings these newer technologies are still unaffordable, and strict limits may result in lower service levels making individual car use the only option. Any labeling or classification should not, therefore, send the wrong signals to policy and decision makers. A standard diesel city bus is still the backbone of most public transport networks and already delivers low carbon CO₂ trips per capita. **The key strategy to reduce CO₂ emissions therefore should be to make more passengers shift to public transport and bus systems.** It would rather be counterproductive if local authorities/operators would cut services in order to compensate increased costs for a reduced number of buses equipped with the newest technologies.

Financial support for the purchase of new cleaner buses including new technologies such as hybrid buses etc. as well as bus infrastructure would therefore be welcomed (for instance the use of unspent EU funds of the European Energy Programme for Recovery, EEPR⁹).

⁶UITP Tender Structure for the tendering of buses and related services, <http://www.uitp.org/publications/index2.cfm?id=6>

⁷ UITP Project SORT, <http://www.uitp.org/publications/index2.cfm?id=1>

⁸ Latest figures on the urban bus fleet in the European Union was published in 2007, based on 2005 figures.

Source: www.uitp.org/mos/pics/stats/survey_bus_fleet.pdf

⁹ <http://eeef.lu/>

6. Possible future legislation on CO₂ from Heavy Duty Vehicles (HDV) – how to take into account the bus?

As high fuel costs add significantly to the overall operation costs fuel efficiency is an important element for public transport undertakings. While as consequence the market itself drives the most efficient fuel and CO₂ reduction it is also an important competitive element for bus manufacturers. In the past the manufacturers themselves in cooperation with their suppliers have been very successful to reduce the vehicle related fuel consumption significantly. In addition, public transport undertakings have made large efforts to reduce the fuel consumption e.g. by driver training or optimized operation planning.

Regarding the started CO₂ legislation process for HDV, public transport undertakings as well as bus manufacturers are positive to apply the currently developed methodology for calculating CO₂ emissions from HDV also for buses:

- The fuel efficiency/CO₂ calculation has to be related to the “work done”
- The fuel efficiency/CO₂ evaluation has to be based on computer simulation
- The fuel efficiency/CO₂ values have to be as close as possible to reality

According to the purpose of a bus the CO₂ emissions should be calculated in gram per passenger-km.

Because of the huge number of vehicle configurations and different missions also for buses a computer based simulation is the most valid and applicable way to ascertain the fuel consumption and CO₂ generation. By computer simulation the different vehicle configurations can be calculated in a reasonable way with a high degree of precision while using acceptable simplifications. On road tests should only be used to generate input data for the simulation tool.

To be as close as possible to reality it is very important to factor in the specificities of the different vehicle types and mission profiles: “a bus is no truck”. Also because of the today’s and future possibilities of computer simulation a rework of the actual SORT cycles is started to get fuel consumption/CO₂ values with a still increasing accuracy and repeatability. Bus manufacturers, transmission suppliers as well as public transport undertakings are once again working together on this issue. The methodology for the data generation is equal to the SORT cycle definition but with an extended data base.

7. Further recommendations to the European Institutions

- Officially **support sector initiatives that will help deliver the targets set by the Transport White Paper**. In June 2009, the International Association of Public Transport (UITP) set out an ambitious aim for the sector, namely to **double the market share of public transport** by 2025. Many cities have already taken up the challenge and are working towards this goal, in line with their specific political, geographical and

historical contexts. Those efforts should be officially recognised and promoted by the European Institutions.

- **This implies that strong modal** shift ambitions are needed, as technology alone cannot deliver the required change within the time frame. This option will also generate a number of additional benefits in terms of employment, congestion, accidents and energy supply.
- **Support measures that will lead to increase commercial speed and reliability for bus systems**, like priority at traffic lights and reserved corridors/lanes. This is not only vital to reduce GHG and local emissions, as well as to attract more passengers and thereby improve the load of vehicles. An increase of 5 km/h in buses' commercial speed on a busy line leads to 20% less energy consumption. To promote this, the European Institutions should propose guidelines for local authorities on low-carbon urban mobility such as to develop and implement sustainable urban transport plans which could contain specific targets e.g. on the increase of commercial speed in a given bus system.
- **Earmark more resources for the development of sustainable urban mobility** based on high quality bus networks, in particular within the possible future European Transport Fund, the Cohesion and Structural Funds and the next Framework Programme for Research.
- **Provide adequate support to Research and Development programmes based on coherent roadmaps recognised and developed by the sector.** The project European Bus System of the Future (EBSF) as the European "lighthouse project" in this area is here of particular importance. Within this project and in cooperation with ERTRAC, the EBSF/ERTRAC roadmap for urban bus systems was developed in order to help to further develop innovative and attractive urban bus systems. For any further research in this area, the EBSF/ERTRAC roadmap should be taken as **the** reference. Major areas for further research have been identified:
 - Bus system integration in new urban scenario
 - EBSF ICT platform integration
 - Sustainable bus system (Energy efficiency, Environmental performances, Electrification of bus systems)
 - Innovative vehicle technologies
 - Modularity
 - Mobility challenges of an ageing society
- **Employment in public transport and the bus sector should be recognized as Green Jobs.** Most jobs in public transport and the bus sector are local jobs which cannot be delocalized and, according to the definition created by UN; "*contribute(s) substantially to preserving or restoring environmental quality*".

UITP (International Association of Public Transport) is the international network for public transport authorities and operators, policy decision-makers, scientific institutes and the public transport supply and service industry. It is a platform for worldwide cooperation, business development and the sharing of know-how between its 3,200 members from 90 countries. UITP is the global advocate for public transport and sustainable mobility, and the promoter of innovations in the sector.

Key facts for public transport in the EU 27:

Passenger journeys: 60 billion/year, more or less equally shared between road modes (mainly bus) and rail modes (urban, suburban and regional rail)

Economic value of public transport services: € 130 - 150 billion/year or 1 – 1.2% of GDP

Employment

- Direct employment **1.2 million**
- Indirect employment **2 - 2.5 indirect jobs** for each direct job on average
4 indirect jobs in countries with high investment in public transport, such as Switzerland