

# Summary

In this literature research paper, the latest developments in road transport have been reviewed. This section will present the main conclusions that were found during the research.

## Vehicle Concepts

- Today, load volume is the main restriction for road transport. The available load volume can be increased under the current regulations by using double deck trailers, by lowering the floor, and by using modified 45 foot containers.
- To provide more transport capacity in the future, the regulations for road transport will have to be changed. The longer vehicle combinations, as already in use in Scandinavia, are the most likely combination to be introduced.
- Most new concepts are based on existing vehicles and equipment. That way, the required investments and the risk are reduced.

## Environment

- Regulations force manufacturers to reduce the emission of their vehicles. The Euro 4 specifications are now obligatory for new vehicles, and vehicles according to the Euro 5 specifications are already available. The Euro 6 specifications are not fixed yet.
- The current emission reducing systems are based on Exhaust gas recirculation (EGR) or exhaust gas aftertreatment (SCR). Euro 6 specifications will probably require a combination of these techniques. Many new techniques are in development as well.
- In the long term, the use of alternative fuels will increase. Biofuels are already in use, but a supporting infrastructure is lacking. Heavy duty vehicles for road transport are generally too heavy for efficient electric powering, but there are possibilities for city distribution.

## Driver Assistance Systems

- Driver Assistance Systems provide more comfort, more safety and often lower fuel consumption. Many advanced systems are available, up to fully automated driving. The consequences for the traffic flow, safety and liability issues are unknown yet. More research will be needed on those areas before a wide introduction of driver assistance systems.

## Safety

- Heavy duty vehicles are relatively dangerous for third parties. The latest regulations require side protection and special viewing systems. Driver assistance systems can bring extra safety, but also some unsafe aspects.

## **Fleet management and communication systems**

- Modern communication systems can help to optimise the use of the vehicle fleet. Plannings can be optimised using real time optimisation methods. For companies that operate internationally, outflagging can reduce costs. In the long term, new leasing contracts between operator and vehicle manufacturer will be introduced.

## **Loading and crossdocking**

- The Citybox concept can increase efficiency and reduce the load on densely populated areas, especially by adjusting the locations of nodes in the supply network. Advanced loading and unloading systems are available. Because of high investments, these systems are only cost effective in few applications.