Summary

One of the solutions for coping with the increase in freight transport on Germany's federal trunk roads that is currently being discussed by experts and the public is the introduction of longer and/or heavier transport vehicles (LHVs). Either as new vehicle types or as modified forms of existing transport units, such vehicles could have a total length of up to 25.25 metres and have a gross vehicle weight of up to 60 tonnes. In order to assess the effects of such articulated vehicles on the road infrastructure and other road users, a working group was set up within the German Federal Highway Research Institute. This current report presents their conclusions to-date. It looks into the effects of new articulated vehicle types on the service life of roads and bridges, on road geometry as well as on traffic flow and traffic safety. This report can come to no final conclusions on any bridge related issues since the results from several research projects that have been commissioned are still outstanding.

Overall, the BASt working group's conclusions on this subject can be summed up as follows:

1 – Road network issues (ruts in the surface, road construction, road geometry) all appear to be manageable, but would require at least some additional investment.

2 – The load reserves of existing bridges would be reduced. Depending on the type of bridge, the increased stress caused by the new truck configurations would exceed the maximum design load of certain segmented bridge spans. Taking into consideration the structure's overall condition, such bridges would either require strengthening or replacing. Additional issues also need to be addressed such as a reduction of service life resulting from material fatigue and effects on bridge components (bearings, parapets).

3 – Tunnel safety equipment may also need upgrading due to the considerably increased payload of LHVs (e.g. resulting in increased fire load).

4 – It is expected that increased vehicle lengths will also lead to greater safety risks resulting from overtaking manoeuvres and longer clearance times at junctions. Higher gross vehicle weight would also lead to an increase in the severity of accidents. Safety equipment was not designed for the impact of articulated vehicles or for the higher gross vehicle weight of LHVs.

If LHVs with appreciably higher gross vehicle weight are permitted, it would be necessary to make considerable improvements to the safety devices found in current vehicles. In addition, the training given to drivers would have to be upgraded and the technical standards of the vehicles would have to be improved.