

**Extract from May 2009 MTRU Report, analysing TML  
Revised June 2009**

*Use of load factors in calculating the change in HGV and LHV traffic*

The current average load for HGVs is calculated as 13.1 tonnes, compared to a maximum payload of 25.8 tonnes. It is assumed that LHVs will first carry the loads which filled HGVs. Thus the LHV load factor would be 100%, while the HGV load factor would fall. This is true for some commodities, but not all. However, the assumption can be tracked by extracting data from the TML report.

What is extremely unlikely, however, is that LHV load factors will always be 100%, no matter how much is transferred from HGVs. Nor is it likely that, as more traffic is transferred, that HGV load factors will stay the same. Logically, both should fall as more traffic is transferred.

Again this is complicated by the fact that goods vehicles may be fully loaded when they leave their depot, but make more than one delivery. Overall, the assumption that LHVs will always be fully loaded, but capture an increasing share of all freight transport, is unlikely. One crucial factor will be that when operators need to replace an HGV, they will have to choose between an HGV of the same size or an LHV. Evidence is that many will choose the largest possible vehicle they will ever need. This reduces the ability of the total fleet to match vehicle size to customer demand, particularly for non-bulk commodities. In turn this makes the achievement of high load factors (including back loads) more difficult.

The assumption of load factors is critical to any prediction of the impact of LHVs. They will vary by commodity and area and have had a relatively low level of attention in the study of road freight transport.

The assumptions used by TML are shown in the following Table.

**Table 3  
HGV and LHV load factors with different LHV road freight share**

	Static approach			Dynamic approach		
	HGV Load in tonnes	LHV Load in tonnes	LHV tonne kms	HGV Load in tonnes	LHV Load in tonnes	LHV tonne kms
Reference case (no LHV)	13.1 (51%)	-	-	13.1 (51%)	-	-
Scenario 2 + low elasticity	11.2 (43%)	38.7 (100%)	634.63	11.2 (43%)	38.8 (100%)	949.77
Scenario 2 + high elasticity	11.2 (43%)	38.8 (100%)	653.37	11.2 (43%)	38.8 (100%)	992.71

Source: TML report, Tables 18 and 19

From the above it is clear that the dynamic approach has 50% more tonne kilometres transferred to LHVs but they retain a 100% load factor. The HGV load factor does not fall, despite a transfer of over 250 billion more tonne kilometres.

Despite this assumption, there is no reduction in vehicle kilometres from HGVs + LHVs in the static approach at high or low elasticity. It only occurs in the dynamic approach when:

- access to the road network for LHVs is increased to 94%,
- haulage operators increase in size, and
- companies adapt their operations to be 80% compatible with LHVs.

This is shown in the following Table.

**Table 4**  
**Vehicle kilometres with different LHV road freight share**

	Static approach			Dynamic approach		
	HGV Vehicle kms	LHV Vehicle kms	Total Vehicle kms	HGV Vehicle kms	LHV Vehicle kms	Total Vehicle kms
Reference case (no LHV)	178.87	-	178.87	178.87	-	178.87
Scenario 2 + low elasticity	164.11	16.38	180.49	140.91	24.51	165.42
Scenario 2 + high elasticity	168.95	16.86	185.81	147.28	25.62	172.90

*Source: TML report, Tables 18 and 19*

In order to assess the sensitivity of these results to the load factor assumptions, MTRU has produced the following analysis. In the dynamic case it is assumed that LHVs start to capture HGV loads which are not simply bulk flows from one origin to one destination (such as coal to power stations), where the bigger the lorry the fewer are needed.

Instead, it is assumed that the LHVs over and above those in the static approach will achieve the same load factor as HGVs do today (51%). Thus it still allows for 100% load factors for most of the LHVs. The overall LHV load factor is therefore still about 60% - higher than that achieved by HGVs at present. If this reasonable assumption is applied, the results would change significantly, as shown in Table 5 below.

**Table 5**  
**Change in vehicle kilometres with new LHV load factor**

	Dynamic approach					Static (Table 4)
	HGV vehicle kms	Original LHV veh-kms	New LHV veh-kms	New Total veh-kms	Increase over original	
Reference case (no LHV)	178.87	-		178.87	-	-
Scenario 2 + low elasticity	140.91	24.51	40.44	181.35	+1.4%	+0.9%
Scenario 2 + high elasticity	147.28	25.62	42.77	190.05	+6.3%	+3.9%

Source: TML report, Tables 18 and 19, MTRU calculation

TML have now responded and recognised the need to adjust their table. They suggest that instead of reducing LHV load factors, HGV load factors should be reduced. Applying this instead produces the results shown in Table 5a below. There is clearly only a minor difference between these and the original Table 5, so the conclusions in the original MTRU report still hold (see below).

**Table 5a**  
**Change in vehicle kilometres with new HGV load factor 10.1 tonnes**

	Dynamic approach					Static (Table 4)
	HGV vehicle kms	LHV veh-kms	New HGV veh-kms	New Total veh-kms	Increase over original	
Reference case (no LHV)	178.87	-		178.87	-	-
Scenario 2 + low elasticity	140.91	24.51	156.06	180.57	+1.0%	+0.9%
Scenario 2 + high elasticity	147.28	25.62	163.12	188.74	+5.5%	+3.9%

The conclusion from this is that the TML method does not support a reduction in vehicle kilometres from heavy goods vehicles as a whole (HGVs + LHVs) if the unreasonable assumption about LHV 100% load factors, or the constant load factor for HGVs, is corrected.

In fact, the most likely result would be a small increase in traffic, with between 10% and 20% of the new total driven by the larger, heavier vehicles.