Estimation of the impact of LHV\textsubscript{s} on future European transport demand and modal shift

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Content

• Background
  – What’s at stake
  – Contrasting opinions

• Analytical approach
  – Road transport demand generation
  – Impact on rail freight

• Modelling approach (TRANS-TOOLS)
  – Assumptions
  – Scenarios
  – Scenario results
    • Impact on road transport demand generation
    • Impact on modal split

• Conclusions
Background

• Directive 96/53/EC
  – Length: 16.50m / 18.75m
  – Width: 2.55m
  – Height: 4.00m
  – Weight: 40t / 44t

• Exceptions: at national level only!

• Combinations of existing modules
  – Max 25.25m, 60t
  – Applied in Sweden (> 50% of TKM), Finland
  – Trials in Germany, Netherlands (400 exemptions), Denmark

• Hot-temperate debate in Europe
What about LHVsv?

- 50% more capacity
- Higher operating costs per vehicle-km
- Lower transport costs per tonne-km
- Lower energy consumption and emissions per tonne-km
- Modular concept is the dominant one: LHVsv can be converted into HGV
- Only highways are generally LHV-compatible, no regional roads
## Contrasting opinions

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<thead>
<tr>
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<th>PRO</th>
<th>CONTRA</th>
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<tbody>
<tr>
<td><strong>Fuel consumption and CO2 emissions</strong></td>
<td>At least - 10%</td>
<td>At least +5-10 % + extra empty runs by LHV</td>
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<tr>
<td><strong>Road safety</strong></td>
<td>No impact or even beneficial</td>
<td>More accidents and increased severity</td>
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<tr>
<td><strong>Road congestion</strong></td>
<td>7-10% fewer trucks; 33% fewer trips</td>
<td>Generate extra demand, no reduction</td>
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<td><strong>Payload</strong></td>
<td>Increase by 30-50%</td>
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<td><strong>Transport costs</strong></td>
<td>Reduction by 10-25%, depending on combination</td>
<td>Bridges and tunnels at risk, network not designed for &gt; 40t vehicles; high investments needed</td>
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<td><strong>Infrastructure</strong></td>
<td>7% less road wear, +15% road longevity</td>
<td>Combined transport: -14 to -55% in TKM; Single wagonload: -12 to -25% in TKM</td>
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<td><strong>Modal shift</strong></td>
<td>Max 5% overall shift; good interface with other modes</td>
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<td></td>
<td><strong>PRO</strong></td>
<td><strong>CONTRA</strong></td>
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<tr>
<td><strong>Stakeholders divided</strong></td>
<td>Road hauliers, shippers manufacturers</td>
<td>Rail &amp; combined transport operators, environmental associations, governments/administrations</td>
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<td><strong>Geographic divide</strong></td>
<td>North Europe: Scandinavia, NL and German regions</td>
<td>Central/West Europe: Austria, Hungary, regions in Germany, France (cautious)</td>
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Nature of the controversy - rail’s argument

Less means more...

How “LOW COST” trucking will make demand for road transport explode?
Impact study

- Impact study commissioned by EC in 2008
- Consortium led by TML
- Role TNO
  - Impact on transport demand generation
  - Impact on modal shift
- Two methodologies applied:
  - Analytical approach (conceptualise on aggregate level)
  - TRANS-TOOLS Modelling approach (detailed level – regional impacts)
The aggregate transport system in this study is influenced by
1. The share of goods carried out by LHVs (in tonne-km)
2. The transport cost discount of LHVs
3. Extra capacity through LHV
4. Transport demand price elasticity (concept)
5. Impact on other modes: cross-elasticity (concept)
Impact on road

Impact of LHV s on road transport demand and traffic generation

Share of LHV (in cargo tkm terms) in total road transport (discount 20% and capacity up by 50%)

% change in comparison to no LHV

- Less road vkm (price elasticity -0.3)
- Less road vkm (price elasticity -0.6)
- Less road vkm (price elasticity -0.9)
- Less road vkm (price elasticity -1.2)
- Extra road demand (price elasticity -0.3)
- Extra road demand (price elasticity -0.6)
- Extra road demand (price elasticity -0.9)
- Extra road demand (price elasticity -1.2)
Impact on rail

Impact of LHV on rail transport demand

% change in comparison to no LHV scenario

Share of LHV in total road transport (discount 20% and capacity up by 50%)
TRANS-TOOLS modelling approach

TRANS-TOOLS:
• Forecast macro freight transport flows in Europe based on global economic trends
• Widely used by EC to assess impact of future transport policies
• Maintained and further co-developed by EC-JRC (IPR free)

Classical transport model approach
• Generation
• Distribution
• Modal choice
• Assignment

Innovative elements
• Logistics module: from trade to transport
• Impact modules
• Feedback mechanism of infrastructure impact on economy
• Specific model assumptions
4 scenarios for 2020

1. Scenario 1 “Business as usual”. The directive is not changed.
   – Current limit of 40 ton 18,75 meters
   – No changes in national policies: some countries allow 44t, some 60 ton / 25,25 meter

2. Scenario 2 “LHV full option”. Europe-wide permission of 25,25 meter 60 ton LHV.
   – Road restrictions: LHVs only on certified roads
   – 50 ton extrapolation at Commission’s request

3. Scenario 3 “Corridor” or “Coalition of willing” or “Axis of evil”
   – LHVs (60 / 25,25) are only allowed in NL, BE, DE, SE, FI, DK
   – Everywhere else according to 2000 situation

4. Scenario 4 “Compromise”
   – Current limit is adjusted to 44 ton / 20,75 meters EU-wide
   – Addresses fears of rail
   – Takes into account chemical and automotive industries (clients of rail)
Impact on road

Scenario 2: ton-kilometers and vehicle-kilometers in comparison to Scenario 1

Countries

Germany, UK, France, Spain, Italy, Poland, Czech Republic, Portugal, Belgium, Slovakia, Austria, Sweden, Finland, Ireland, Greece, Hungary, Denmark, Lithuania, Slovenia, Latvia, Luxembourg, Estonia, Bulgaria, Romania

Percentages

75.00% 80.00% 85.00% 90.00% 95.00% 100.00% 105.00%

Scenario 2, tkm
Scenario 2, vkm

HVIT11 Melbourne 2010
Impact on rail and IWW

Clear Picture: Scenario 2 Rail and IWW Volumes per Country
(Scenario 1 = 100%)

Percentage

Country

Germany
UK
France
Spain
Italy
Poland
Netherlands
Czech
Portugal
Belgium
Slovakia
Austria
Sweden
Finland
Ireland
Greece
Hungary
Denmark
Lithuania
Slovenia
Latvia
Luxembourg
Estonia
Bulgaria
Romania

Rail ton volumes
IWW ton volumes
Summary of other impacts

- Less road congestion
- Less energy consumption and emissions
- Careful consideration of impact on infrastructure (e.g. bridges)
- Roads must be certified for usage of LHVs
- Road safety can be improved but requires the right countermeasures (e.g. extra safety measures and precaution)
Conclusions

• European stakeholders are strongly divided over possible impacts of harmonising weights and dimensions HGVs.

• Impacts of LHV quantified by two methods: analytical approach and modelling approach.

• Both methods show rather limited impacts on road demand generation and modal split …

• … but show considerable reduction in road traffic performance.

• External impacts are also generally positive (except for infra costs).

• TNO proposes harmonisation of European policies allowing LHV to operate borderless in Europe.