Experiences with Longer and Heavier Vehicles (LHV’s) in the Netherlands

Marieke Honer

25 Augustus 2010
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• LHV regulation
• LHV\'s and road infrastructure
• LHV\'s and traffic safety
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Introduction
Introduction

- Ministry of Transport, Public Works and Watermanagement (Ministerie van Verkeer en Waterstaat -DGMO)

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- Directorate General for Public Works and Watermanagement (Rijkswaterstaat)

  Marieke Honer – Research advisor - Marieke.Honer@rws.nl
Reason for using LHV's in the Netherlands (I)

- Two can do the job of three
Reason for using LHV\textsc{s} in the Netherlands (II)

To reduce the amount of truck-kilometres needed for transporting goods.

\textbf{Consequences}
\begin{itemize}
  \item Less traffic
  \item Less pollution
  \item Less noise
  \item Less costs
\end{itemize}

\textbf{Background:}
Continuing expansion of freight transport in the Netherlands (from 31,561 million loaded tonnekilometres in 2000 to 34,344 million in 2008)
Three LHV pilots in the Netherlands

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Initial small-scale pilot</td>
<td>Evaluation</td>
<td>2. Second, more extensive pilot</td>
</tr>
<tr>
<td>• 4 participants, 4 LHV</td>
<td>• Start: 66 participants, 100 LHV</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td>• End: 76 participants, 162 LHV</td>
<td>3. Third pilot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 196 participants, 429 LHV</td>
</tr>
</tbody>
</table>
Types of LHV in the Netherlands

- Five types, dimensions follow the modular structure of the European Modular System (EMS)
- Maximum length 25.25 metres (regular trucks 18.75 metres)
- Maximum weight 60 ton (regular trucks 50 tons)
LHV-network in the Netherlands

- Basic network (e.g. motorways)
- Core areas (e.g. industrial area)
- Connecting roads (e.g. roads managed by provinces)
LHV regulation
LHV-regulation in the Netherlands

- LHV-regulation in the Netherlands is exemption-based

- Exemptions are subject to certain conditions. These conditions have been laid down in the policy rule 'Policy regulation on approvals and exemption permits empirical phase LHV 2009'.

- Conditions:
  - Requirements for drivers
  - Requirements for freight
  - Requirements for vehicle
  - Requirements for the conditions to operate an LHV (weather, road design)
LHV-exemption request procedure

Step 1. Exemption Request by transport company

Step 2. RDW reviews exemption requirements

Step 3. Application review by regional road management authority

Step 4. Road administrator allows RDW policy discretion

Step 5. Issue of exemption by RDW

LHV-exemption issued to transport company
Technical vehicle requirements for LHV

There are requirements for:

- EMS-concept
- Axle loads
- Braking performance
- Acceleration
- Vehicle Stability
- Swept path
- Blind spot
- And other additional vehicle requirements (for traffic safety)
Road infrastructure

- Road infrastructure requirements leading for use of LHV's
  -> LHV's should fit within the existing infrastructure

Consequence:
- In general LHV use no impact on road design, except the parking spaces in the rest areas (too small).
Enforcement of LHV-exemptions (I)

1) Periodic, retrospective monitoring through administrative systems by Inspectorate for Transport, Public Works and Water Management (IVW).

<table>
<thead>
<tr>
<th>LHV-passages at WIM-VID points in total vehicle load</th>
<th>2009-07</th>
<th>2009-08</th>
<th>2009-09</th>
<th>2009-10</th>
<th>2009-11</th>
<th>2009-12</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of passages</td>
<td>2292</td>
<td>1635</td>
<td>1650</td>
<td>2745</td>
<td>2347</td>
<td>2357</td>
<td>100.00%</td>
</tr>
<tr>
<td>Under 30 tonnes</td>
<td>1247</td>
<td>1129</td>
<td>1001</td>
<td>1349</td>
<td>1160</td>
<td>1137</td>
<td>52.45%</td>
</tr>
<tr>
<td>between 30 and 40 tonnes</td>
<td>563</td>
<td>414</td>
<td>554</td>
<td>953</td>
<td>833</td>
<td>851</td>
<td>31.82%</td>
</tr>
<tr>
<td>Between 40 and 50 tonnes</td>
<td>248</td>
<td>170</td>
<td>174</td>
<td>211</td>
<td>145</td>
<td>155</td>
<td>8.20%</td>
</tr>
<tr>
<td>Between 50 and 60 tonnes</td>
<td>107</td>
<td>100</td>
<td>126</td>
<td>203</td>
<td>169</td>
<td>199</td>
<td>6.72%</td>
</tr>
<tr>
<td>Above 60 tonnes</td>
<td>27</td>
<td>22</td>
<td>13</td>
<td>19</td>
<td>12</td>
<td>15</td>
<td>0.80%</td>
</tr>
</tbody>
</table>

- WIM: 92.5% weigh less than 50 tonnes
- 2008: inspection of 100 of the (then) 120 LHV-companies on compliance with exemption requirements for LHV. Results: Exemption holders generally comply with the rules and IVW does not expect any problems moving forward.
Enforcement of LHV-exemptions (II)

2) Everyday road use by traffic police and National Police Agency

- 2009: the National Police Agency (KLPD) ‘LHVs stand out in a positive way’
  - Equipment is generally in order
  - LHV-drivers are considered to be very responsible
LHV's and road infrastructure
LHVs and road infrastructure

Pavement
• LHV-use does not have a negative impact on pavement quality (when < max axle load):
  – impact LHV with 5 axles -> to equal regular truck
  – impact LHV with more 5 axles -> less than regular truck

Bridges and structures
• (60 ton) LHV-use on bridges and structures does not cause a more negative effect than conventional 50-tonnes combinations (provided that the weight is distributed proportionally across the length of the vehicle)
LHV's and traffic safety
Objective traffic safety: few accidents with LHVs

- **Condition for trials with LHVs:** Ministry of Transport, Public Works and Water Management stipulates that traffic safety may not be affected in a negative way.

- There have been no major accidents during the Second Pilot (2004-2006).

- From 2007 to mid 2009, 11 accidents occurred involving an LHV:
  - only material damage and no vulnerable road users were involved.
  - most of them were typical truck accidents.
Subjective traffic safety

- Surveys among 1000 motorists in 2005 and 2009 indicate that there is little resistance to LHV's and that motorists do not usually feel unsafe when they encounter LHV's in traffic.
Policy

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Effect of LHV on sustainability

- If market potential for LHV in the Netherlands is fully used, a reduction of 4% for CO2-emissions and 6% for NOx-emissions can be achieved.
Modal split

- Dutch transport policy promotes co-modality. But that does not mean that government measures should lead to a reverse modal shift.

- Macro analysis included in the Second Pilot shows that a limited reverse modal shift from water to road is possible in theory. Theoretical maximum shifts:
  - 0,2/0,3% less inland shipping
  - 1,4/2,7% less railway

- Stakeholders (e.g. LHV companies and inland terminals): ‘a reverse modal shift is not very likely to happen’
  -> reason: current segmentation in the transportation market has a very practical and logical background
  -> Only a shift from regular truck combinations to LHVs.
Practical experience with LHV use in business

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Use of LHV is becoming more popular

- Since start of trials (4 companies, 4 LHV’s) the number had grown to (June ‘10):
  - 490 LHV’s
  - 212 companies
Reasons for companies to use LHV

Reasons for company to use LHV:
• less transportation costs (by carrying more volume per trip)
• CO2 emission-reduction

Other important factors:
• very regular flows of goods
• between two or more fixed locations
• this flow should be guaranteed for the mid-to-long term
Sectors that use LHV’s in the Netherlands (sept 09)
Most popular LHV’s in the Netherlands (June ‘10)

1) D

2) A

3) B
Newest development: City trailers

- two interchangeable 10.60 metre city trailers
- maximum load capacity of 84 rolling containers or 40 block pallets
- for distribution of retail products
- 1) leave one trailer at a coupling station on the outskirts of a city
   2) take the other trailer into town for loading/unloading
   3) return to exchange trailers for a new drop-off.

- Two can do the job of one!
Future
Future (I)

Current LHV companies:
• If possible: about 3/4 of the companies would like to use LHV internationally
• Expect to start using more than 300 extra LHV’s in next 5 years

Directorate General for Public Works and Watermanagemen
(Rijkswaterstaat )
• Aim: to make sure LHV’s manoeuvre safe and smooth in traffic

• Na major changes, some attention points:
  – Incident Management
  – Traffic diversions
  – Parking spaces in the rest areas
Future (II)

Ministry of Transport, Public Works and Watermanagement (Ministerie van Verkeer en Waterstaat - DGMO)

- LHV’s are here to stay
  - Proven position in daily traffic
  - Proven results for efficiency (even short distances)
  - Political support

- Review of conditions (research possibilities)

- International use of LHV’s
  - Belgium, Germany
  - Europe
Overview differences in LHV access policies
Overview differences in LHV access policies I

**Question: Information up-to-date + Finland?**

<table>
<thead>
<tr>
<th></th>
<th>Denmark</th>
<th>The Netherlands</th>
<th>Norway</th>
<th>Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exemptions</strong></td>
<td>No exemptions required</td>
<td>Exemptions required</td>
<td>No exemptions required</td>
<td>No exemptions required</td>
</tr>
<tr>
<td><strong>EMS routes</strong></td>
<td>Limited number of EMS routes</td>
<td>Extended number of EMS routes</td>
<td>Limited number of EMS routes</td>
<td>No restrictions</td>
</tr>
<tr>
<td><strong>Allowance to drive EMS</strong></td>
<td>Normal truck driver’s license</td>
<td>Normal truck driver’s license + EMS-certificate</td>
<td>Normal truck driver’s license</td>
<td>Normal truck driver’s license</td>
</tr>
<tr>
<td><strong>Marking</strong></td>
<td>At the rear of the EMS-combination a sign, indicating the length of the combination</td>
<td>At the rear of the EMS-combination a sign, indicating the length of the combination</td>
<td>At the rear of the EMS-combination a sign, indicating the length of the combination</td>
<td>No extra demands</td>
</tr>
<tr>
<td><strong>Side visibility</strong></td>
<td>No extra demands</td>
<td>Markings at the side (for visibility at night)</td>
<td>No extra demands</td>
<td>No extra demands</td>
</tr>
<tr>
<td><strong>Turning points</strong></td>
<td>Maximum of 2 turning points</td>
<td>Maximum of 2 turning points</td>
<td>Maximum of 2 turning points</td>
<td>Maximum of 2 turning points, but it is (actually a speed requirement; maximum speed for two trailers, independent of the length, is otherwise 40 km/h</td>
</tr>
</tbody>
</table>

Rijkswaterstaat

25 augustus 2010
Overview differences in LHV access policies II

<table>
<thead>
<tr>
<th></th>
<th>Denmark</th>
<th>The Netherlands</th>
<th>Norway</th>
<th>Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maximum load length</strong></td>
<td>No maximum</td>
<td>Maximum loading length 21.82 m.</td>
<td>No maximum</td>
<td>Maximum loading length behind the cabin 22.9 m (incl the &quot;in between distance&quot;)</td>
</tr>
<tr>
<td><strong>Minimum load length</strong></td>
<td>No minimum</td>
<td>Minimum load length behind the cabin 18 m.</td>
<td>No minimum</td>
<td>No minimum</td>
</tr>
<tr>
<td><strong>Turning circle</strong></td>
<td>No extra demands</td>
<td>Turning circle with outer radius 14.5 m and inner radius 6,4 m</td>
<td>No extra demands</td>
<td>Turning circle with outer radius 12.5 m and inner radius 5,3 m</td>
</tr>
<tr>
<td><strong>Sight/mirrors</strong></td>
<td>Latest EU regulations for sight</td>
<td>Latest EU regulations for sight</td>
<td>Latest EU regulations for sight</td>
<td>Latest EU regulations for sight</td>
</tr>
<tr>
<td><strong>Engine</strong></td>
<td>No extra demands</td>
<td>Minimal engine power = 5 times maximum load (E.g. for 60 ton you need 300 KW.)</td>
<td>No less than 5.15 kW (7hp) pr. ton total weight EMS combination. 206 KW ECE is sufficient for 60.0 ton total weight</td>
<td>No extra demands</td>
</tr>
<tr>
<td><strong>Brakes</strong></td>
<td>ABS, EBS or max 6 years old vehicle</td>
<td>ABS, EBS</td>
<td>All EMS modules must have ABS brakes</td>
<td>ABS on all units</td>
</tr>
</tbody>
</table>
# Overview differences in LHV access policies III

<table>
<thead>
<tr>
<th></th>
<th>Denmark</th>
<th>The Netherlands</th>
<th>Norway</th>
<th>Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Driving device</strong></td>
<td>No extra demands</td>
<td>Double drive allowed or a driving device as in 97/27/EG annex I, point 2.14.</td>
<td>Driving device as in 97/27/EG</td>
<td>No extra demands</td>
</tr>
<tr>
<td><strong>Vehicle permit</strong></td>
<td>Pulling vehicle and pulling semitrailer need approvals to drive in EMS combinations</td>
<td>Pulling vehicle and trailers need permits to drive in EMS combination</td>
<td>No extra demands</td>
<td>No extra demands</td>
</tr>
<tr>
<td><strong>Type of cargo</strong></td>
<td>No dangerous goods except for type 1 (truck dolly semitrailer)</td>
<td>- No dangerous goods or hazardous materials - No liquids tank of more than 1000 liter - No hanging loads (like clothes or meat)</td>
<td>No dangerous goods or hazardous materials</td>
<td>No dangerous goods (as is regulated by the ADR)</td>
</tr>
<tr>
<td><strong>Weather conditions</strong></td>
<td>No restrictions</td>
<td>Not allowed to drive in bad weather conditions (sight less than 200 metres / when it's slippery)</td>
<td>No restrictions</td>
<td>No restrictions</td>
</tr>
<tr>
<td><strong>Overtaking</strong></td>
<td>No restrictions</td>
<td>Overtaking prohibition, only allowed to overtake vehicles that drive 45 km/h or less</td>
<td>No restrictions</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>