



# Multidisciplinary approach of super-trucks in Belgium

Wanda DEBAUCHE

- Centre de Recherches Routières  
Belgian Road Research Centre
- Responsable du Département Mobilité  
Responsible for the Mobility Department
- [w.debauche@brrc.be](mailto:w.debauche@brrc.be)



# Context

## Overview:

- **Context**
- Legislation
- Mobility and Environment
- Economic aspects
- Infrastructure
- Road safety
- Fiscal and social aspects
- Balance and prospects

- **Working group LHVs**
  - Belgian Ministry for Mobility and Transport
  - Road administrations
    - MOW (Flemish Region)
    - AED/BUV (Brussels Capital Region)
    - MET (Walloon Region)
  - Several Research Institutes
    - IBSR/BIVV
    - ITR/IWT
    - BRRC (chaimanship)
- **Formed late in 2005**

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- **Aim:**
  - A multidisciplinary approach of LHVs: at a technical + scientific level
    - European experiments with LHVs
    - Own simulations, questionnaires and analyses
  - Contribute to the debate

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- LHV: 25,25 m and 60 t
- Standard modules
- Many configurations possible

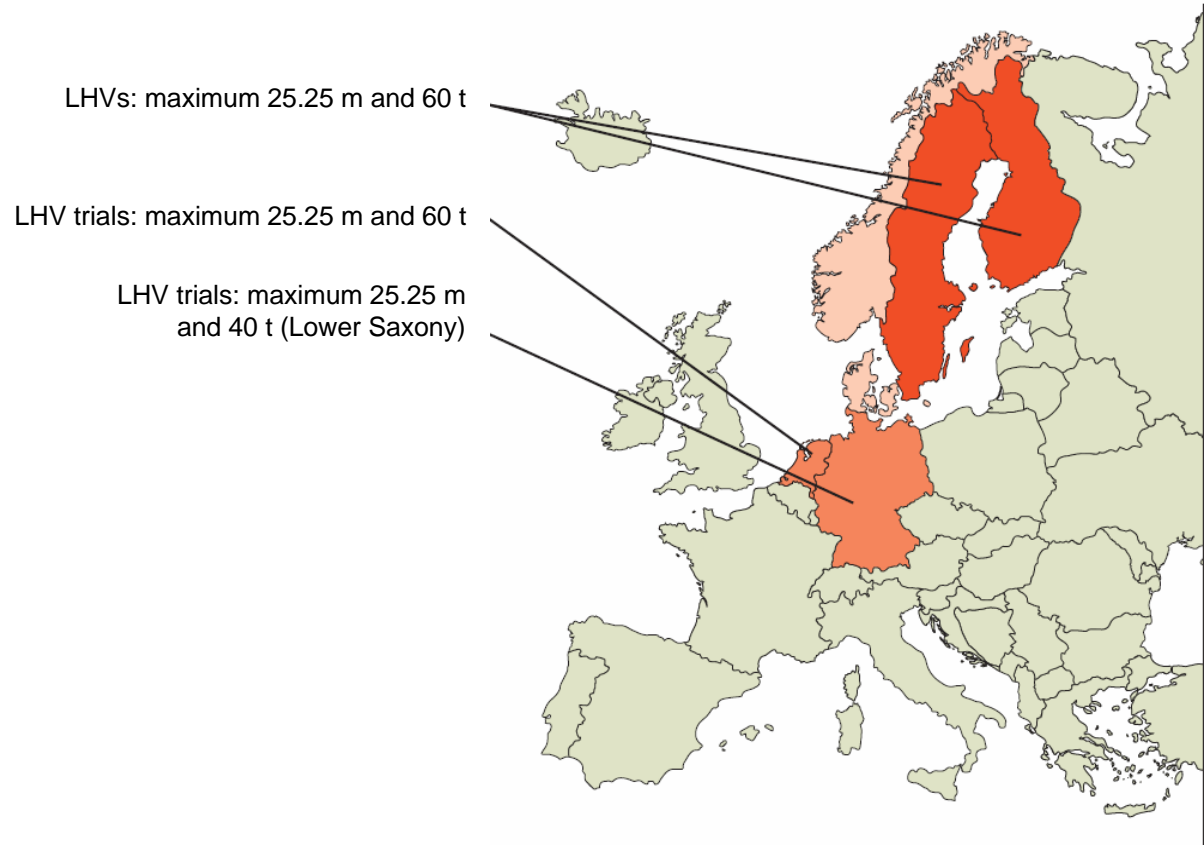


- Several scenarios can be imagined!

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- Requirements related to the vehicle, the cargo, the drivers, the routes and/or the driving conditions.
- Differ widely from one region / country to another

# Legislation

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- **Technical regulations (Royal Decree of 15 March 1968)**
  - MAW (maximum authorized weight) : 44 ton
  - maximal length: 18,75 m (road trains) or 16,5 m (articulated vehicles)

- **Exceeding of these limits**



- **ABNORMAL TRANSPORT**  
=  
• **for indivisible loads**

# Legislation

- Directive 96/53/EC

«Member States may allow vehicles or vehicle combinations used for goods transport which carry out certain national transport operations that **do not significantly affect international competition in the transport sector, to circulate in their territory with dimensions deviating from those laid down**».

«Member States may allow vehicles or vehicle combinations incorporating new technologies or new concepts which cannot comply with one or more requirements of this directive to carry out certain local transport operations **for a trial period. Member States shall inform the Commission hereof**».

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## Recommendations:

- **Separate category for LHVs**
  - Own technical requirements
    - (RD of 15 March 1968)
  - Traffic regulations (RD of 1 December 1975)
- **Special transport permit**



# Mobility and environment

## Increase in road transport efficiency

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Technical vehicle characteristics	Lorry + trailer (18.75 m / 44 t)	LHV (25.25 m / 60 t)	Gain in load capacity (%)
Deck length (m)	15.65	21.4	+37
Payload (t)	29	40	+38
Load space (m <sup>3</sup> )	112	156	+39
Load space (europallets)	38	53	+39

Technical vehicle characteristics	Motor vehicle + semitrailer (16.50 m / 44 t)	LHV (25.25 m / 60 t)	Gain in load capacity (%)
Deck length (m)	13.6	21.4	+57
Payload (t)	29	40	+38
Load space (m <sup>3</sup> )	97	156	+61
Load space (europallets)	33	53	+61

# Mobility and environment

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- **Reduction in the emission of harmful substances (including CO<sub>2</sub>)**
  - Fuel consumption measurements Dutch test: average saving of 33% per tonne-kilometre
  - Emission of harmful substances: decrease of 10 to 25% per tonne-kilometre  
(Ministerie van Verkeer en Waterstaat – The Netherlands)
- **No observable change in noise nuisance**

# Mobility and environment

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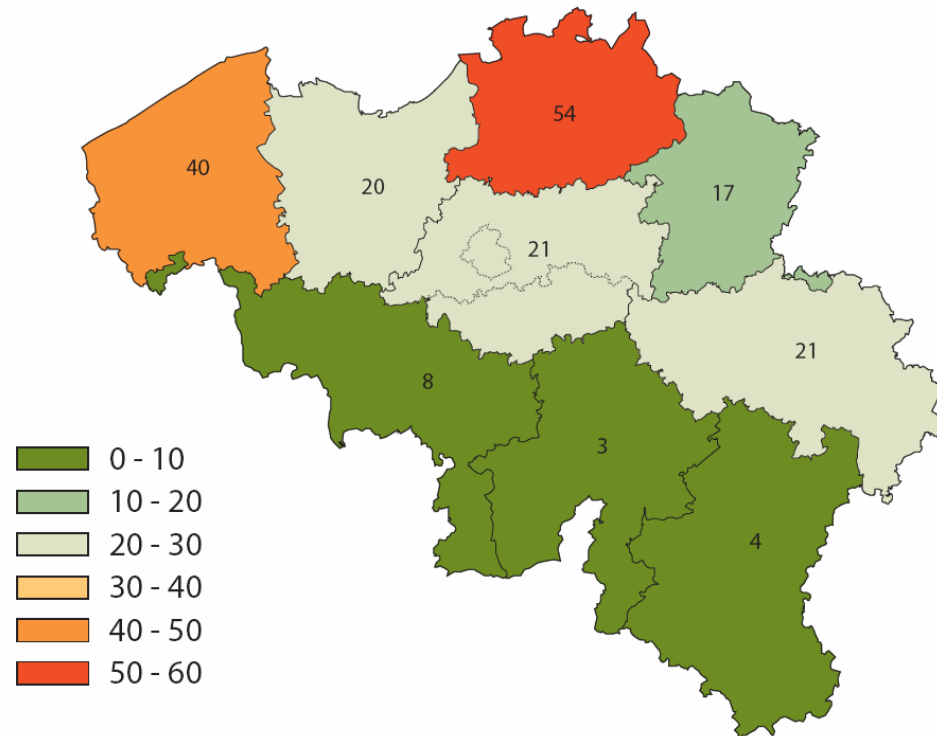
- **Modal shift?**
  - Use of LHVs (in The Netherlands)
  - Shift limited
    - \* 0,2-0,3% inland waterway transport
    - \* 1,4-2,7% domestic rail transport
  - National versus international transport
- **Need for a clear and well-based analysis at Belgian level**

# Economic aspects

- Questionnaire: interests in LHV combinations for carriers

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Carriers transporting goods for hire (at least six tractor units)  
+/- 400 replies  
53% practicable

## Legend:

Total: 207 (LHV is an alternative)

187 (LHV is no alternative)

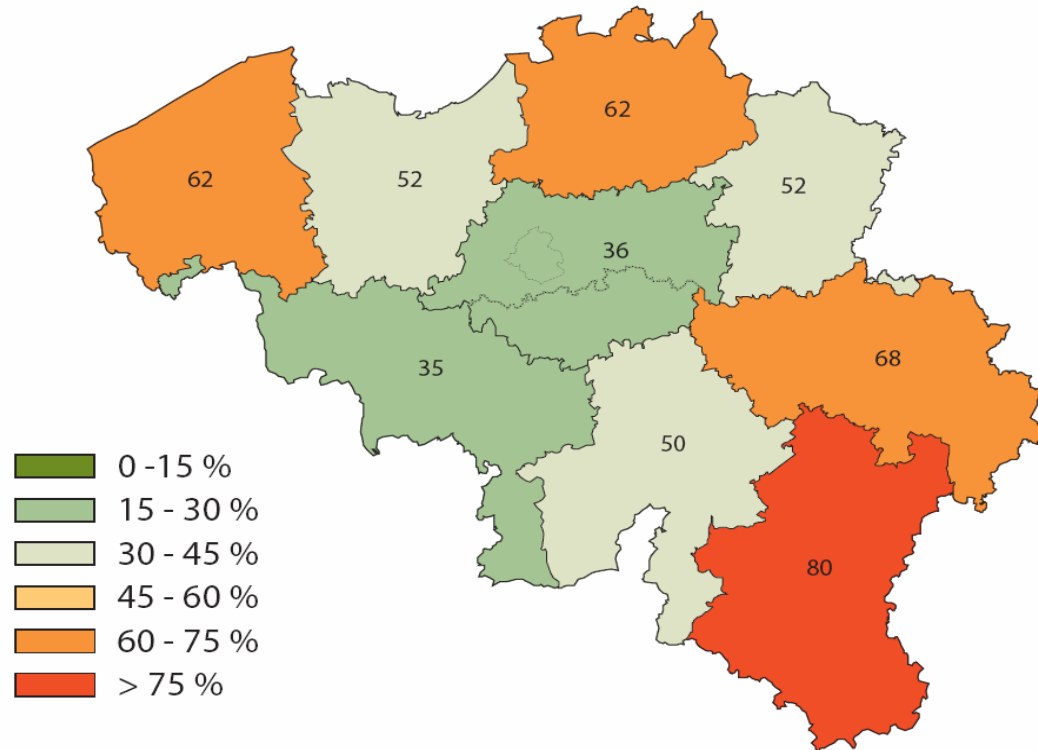
Unknown place of business with interest in LHV: 17

# Economic aspects

- Questionnaire: interests in LHV combinations for carriers

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## Legend:

Total: 53 % (LHV is an alternative)

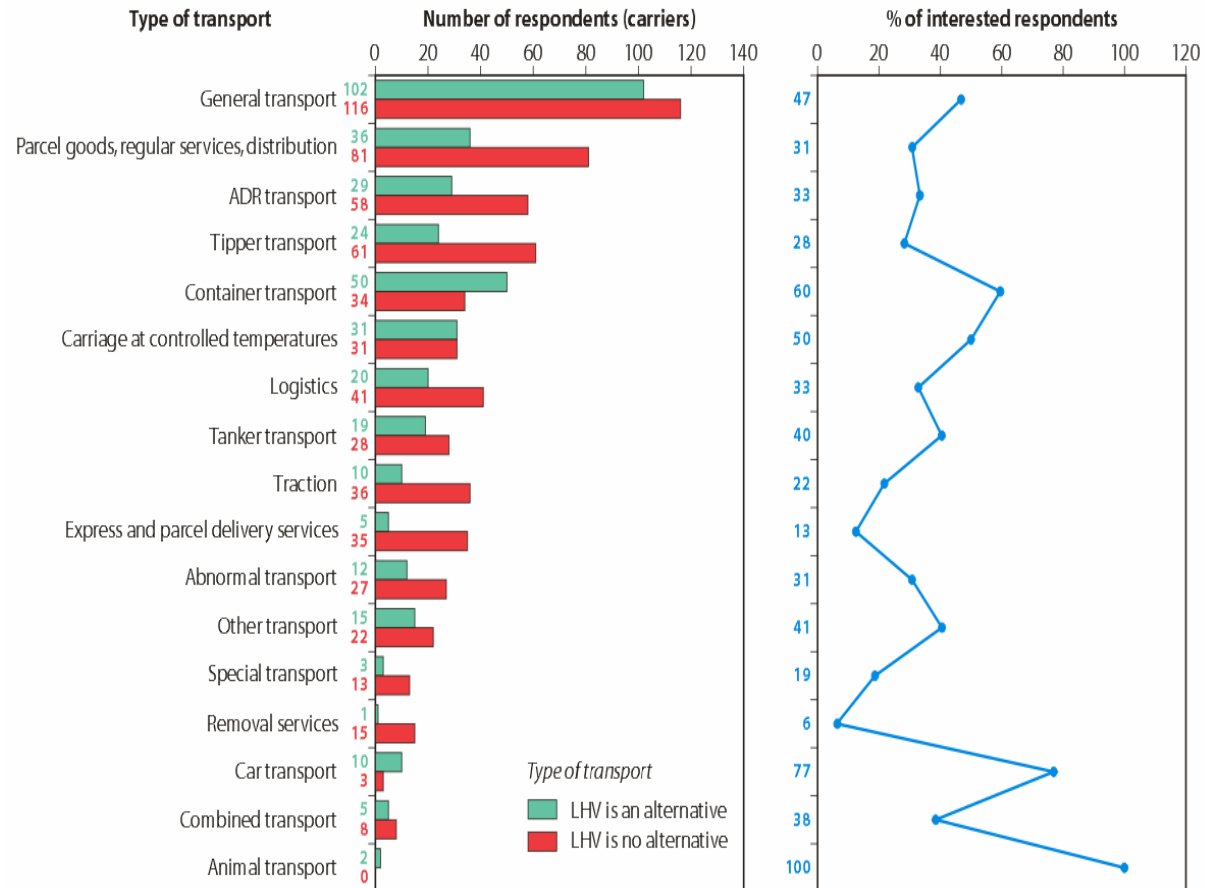
47 % (LHV is no alternative)

Unknown place of business with interest in LHV: 40 %

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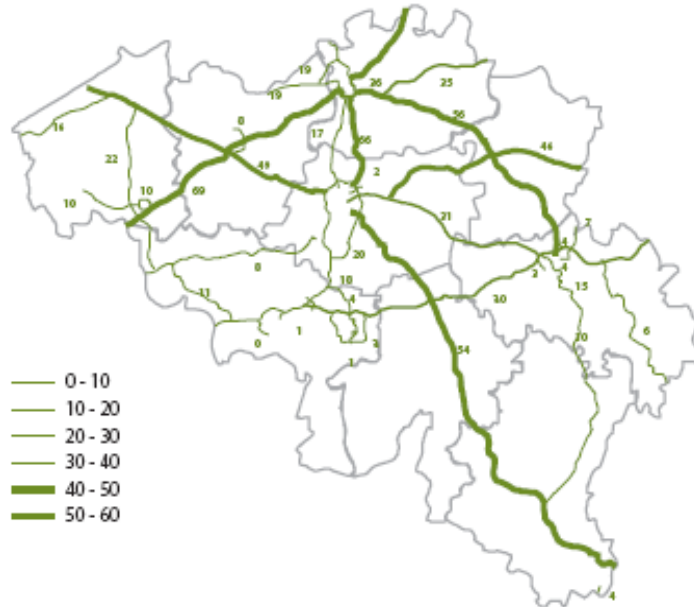
- Impossible to differentiate by type of goods to be carried (NST-R classification)
- Lack of interest among the uninterested respondents can be explained mainly by infrastructural and company-specific features

# Economic aspects

- Questionnaire: interests in LHV combinations for carriers

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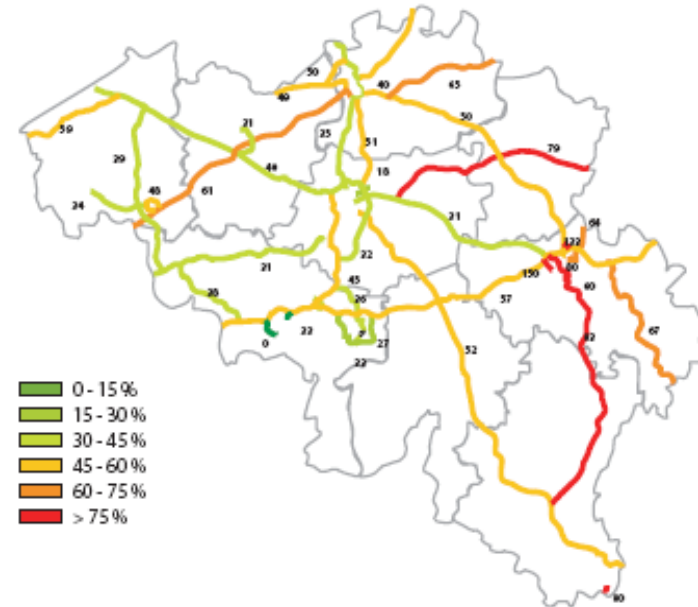
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## Legend:

Total: 286 valid replies  
157 (55%): LHV is an alternative

- Benefits deriving from savings on the number of km travelled
- Constraints (requirements) limiting the usage will determine the actual interest of carriers



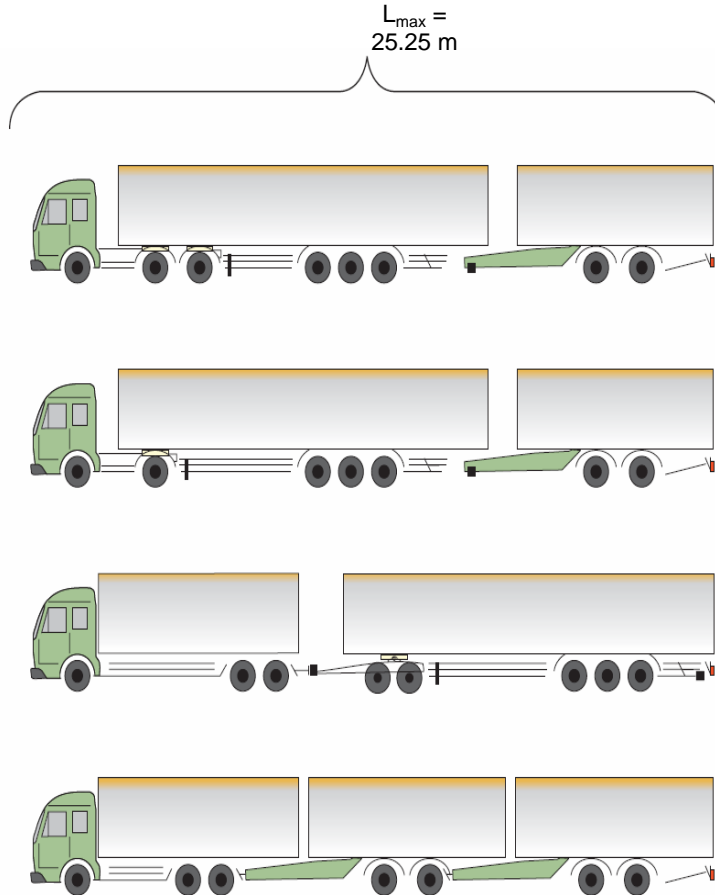
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MST<sub>33</sub>: motor vehicle (three axles) – semitrailer (three axles) – trailer (two axles)

MST<sub>23</sub>: motor vehicle (two axles) – semitrailer (three axles) – trailer (two axles)

LDS: lorry (three axles) – dolly (two axles) – semitrailer (three axles)

LTT: lorry (three axles) with two trailers (two axles each)

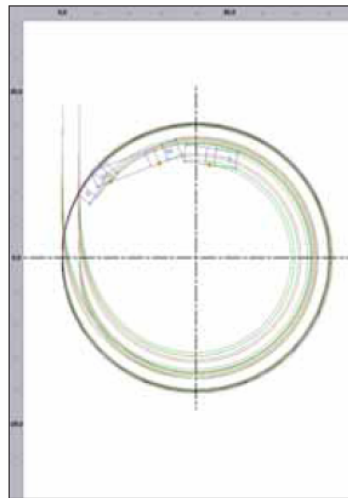


# Infrastructure

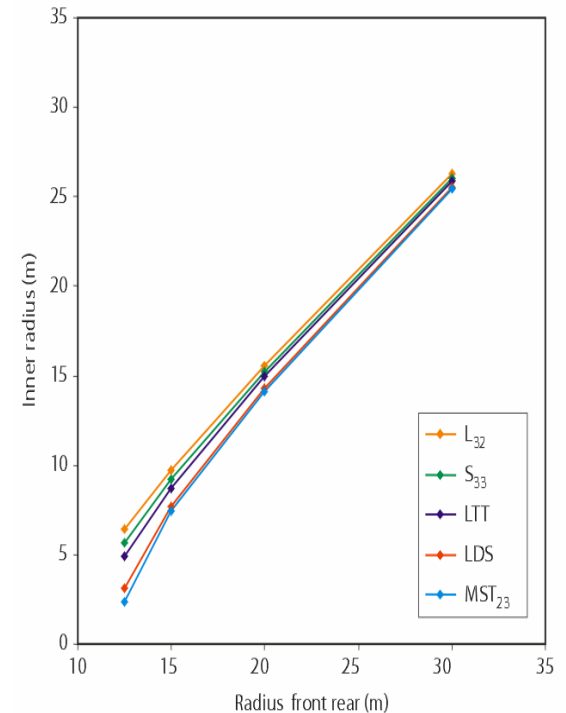
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- Manoeuvrability
- No or slight difference in behaviour on grade-separated interchanges and on entry and exit slip roads of motorways
- Problems may occur on lower-category access roads (crossroads and roundabouts)



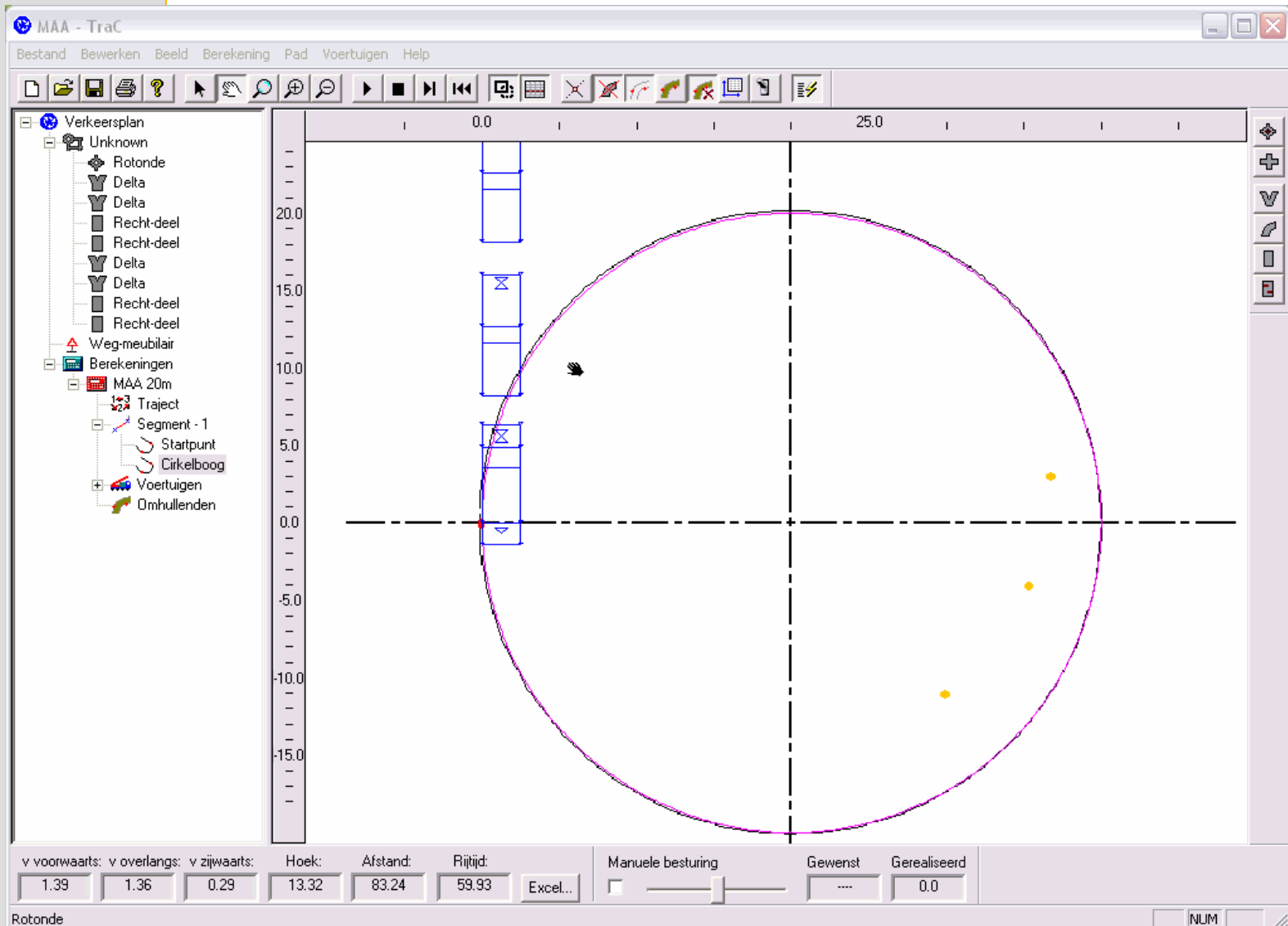
## Circular movement



## General rules:

- Bends: radii of min. 15 m
- Roundabouts: min. 18-20 m for a straight-through movement, min. 20-22 m for a three-quarter movement

# Infrastructure



# Infrastructure

## Effects on road pavements

- Aggressiveness: construction and maintenance of the road infrastructure

$$K = \bar{n} \cdot \alpha \cdot \sum_i f_i \times \left( \frac{P_i}{P} \right)^\gamma$$

Where  $f_i$  = number of occurrences of load  $P_i$  in the spectrum of loads;

$\bar{n}$  = number of axles per goods vehicle;

$\alpha = 0.143$  for flexible pavements;

$\alpha = 1$  for other road pavements.

	Relative aggressiveness (in comparison with an $S_{23}$ )			
	LDS	MST <sub>23</sub>	MST <sub>33</sub>	LTT
Flexible pavement	0.96	1.24	0.79	1.26
Semirigid pavement	0.09	1.00	0.0003	0.09
Rigid pavement	0.49	1.02	0.06	0.59

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# Infrastructure

## Effects on bridges (computer programme ROUTING@)

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- In **most cases**: the limits of NBN 5 (1969, 4th edition) are sufficient
- Bridges/components of bridges with short span lengths (< 12-16 m): they must meet the requirements laid down in the technical regulations of 1968, amended in 1985

For MST (but not for LTT or LDS) bridges or components of bridges with a span length of about 21 m must meet the requirements of the standard NBN 5 of 1952 (convoy of 60)

# Road safety

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- **Data is lacking**
- **The Netherlands**
  - Objective road safety: under the conditions adopted in the experiment LHVs do not have a higher safety risk
  - Subjective road safety: little difference in safety perception
  - LACK OF DATA
- **Thorough analysis of technical aspects (blind angle mirror, braking system, etc.)**
- **Importance of safety audits**
- **Experiments: to be conducted under strict conditions**

# Fiscal and social aspects

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- **Fiscal aspects**
  - Possibilities of extension at the level of the vehicle tax but not the Eurovignette
- **Social aspects**
  - Flexibility of the transport sector
  - Difficulty in finding drivers
  - Need of training schemes for LHV drivers. Training varies widely.

# Balance and prospects

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In view of the **contrasted picture** presented above and the lack of data on fundamental aspects such as road safety, mobility and the environment, it would be premature to pass a final judgment on LHVs at this stage.

An experiment conducted under strict conditions would enable us to collect more information and to gain a better understanding of the issue.

**With these reservations, and in spite of its intrinsic limitations, an experiment appears to be the best way – to be travelled with the necessary caution and circumspection – to get hold of the necessary data for making a decision in the light of sustainable mobility.**

Thank you for your attention



For any comment or question, please contact us :

**Mobility department  
Belgian Road Research Centre  
w.debauche@brrc.be**