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Volvo Democenter, Göteborg

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Analysis of potential trial with
32m double trailer combinations (DUO2)
in Denmark

BACKGROUND

Political agreement regarding green transition of road transport December 4th, 2020

Task: Initiate an analysis regarding DUO2 (EMS2):

- **Curves/circulation area, hereby need for road-space**
 - **Impact on traffic-flow and traffic-safety**
 - **Technical demands for vehicles and combinations**
 - **Economical consequences for society and businesses**
 - **CO₂-reduction potential**
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- **Is it possible to establish a road net for DUO2 in Denmark?**



Analysis carried out by the Danish Road Directorate
in cooperation with the Danish Road Traffic Authority

EXTERNAL ANALYSIS

Sweco contracted to collect knowledge from European countries, with experience and interest in EMS2/DUO2-combinations (and EMS in general)

Framing of the task:

- *The analysis must examine and describe the possible and international used solutions for longer road trains of 32-34 meters, including advantages and disadvantages in relevant areas.*

However, focus must primarily be on road trains of the type DUO2 (A-double).



FOCUS AREAS

Legislation (applicable rules, standards, guidelines, etc.)

- EMS (EU-notifications – which article 4 exemptions (96/53/EC) are used)

Vehicles

- Maneuverability (turning radius corresponding to standards, etc.)
- Supplementary rules in relation to EU/1230/2012 (passive and active safety)

Infrastructure

- Traffic safety
- Adjustment / adaption of existing crossings and constructions

METHOD AND COUNTRIES IN THE STUDY

Desk-top study

- Literature study
- Questionnaires
- Interviews

Countries:

- Finland
- Sweden
- Germany
- Nederland
- Spain

• Questionnaires targeted institutions

- Similar to the Danish Road Directory
- Similar to the Danish Road Traffic Authority
- Similar to the Danish Ministry of Transport
- Interest organisations

(Low response rate – from some countries)

• Interviews with Spain and Nederland

LEGISLATION

Same as EMS 25,25 m, EMS2 will be based on EF/96/53 art. 4, part 4 or part 5

The EMS2 (DUO2):

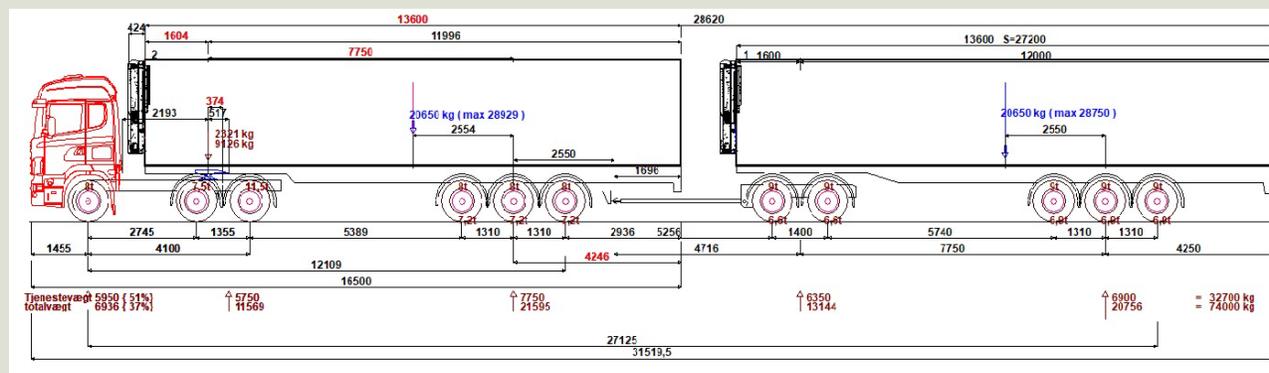
- Finland: Incorporated in "Vägtrafiklagen" (on art. 4 part 4.)
- Spain: Trials with operators on specific routes and specific vehicles (on art. 4 part 4.)
- Sweden: Special permits for operators on specific routes and specific vehicles (on art. 4 part 5.)
- Nederland: Pilot trials and studies (on art. 4 part 4.)
- Germany: Not allowed
- Denmark: Not allowed

VEHICLES USED IN EMS2 TRIALS

Similar demands to vehicles as for the EMS 25,25 m

It is assumed that type-approved vehicles are used

- Dimensions for width, length, height and allowed mass / weight
- Turning ratio (regulation EU/1230/2012)
- Demands for brakes
- Demands for traction



VEHICLES EMS2 – ADDITIONAL DEMANDS

Most common:

ATC (Automatic Traction Control)

EBS (Electronic Braking System)

ESC (Electronic Stability System)

LKA (Lane Keeping Assistant)

EBA (Emergency Brake Assist)

ACC (Adaptive Cruise Control)

Additional mirrors and cameras

VEHICLES EMS/EMS2 – WEIGHT AND LENGTH

Country	Directive 96/53	Weight	Length
Germany	Modular (art 4, 4)	40 (44) t	Max 25,25 m
Sweden	Trial (art 4, 5)	74 (90) t	Max 34,5 m ¹
Finland	Modular (art 4, 4)	76 (104) t	Max 34,5 m
Spain	Trial (art 4, 5)	70 t	Max 32 m ²
Holland	Trial (art 4, 5)	72 t	Max 32 m ³
Denmark	Trial (art 4, 5)	60 t	Max 25,25

Remarks:

¹ Pilots. Fully granted in 2030 (expected)

² Pilots on specific routes

³ Literature study closed in 2021. Pilots on standby for now.

INFRASTRUCTURE

Focus areas:

Constructions (bridges) and geometry

Traffic safety

Capacity

Weight

Driving path and demand for road-space



TRAFFIC SAFETY

Equivalent to ordinary trucks / road trains:

- Keep the different traffic users separated
- Focus on known challenges (eg. right turn)

The assessments, including accident data, tend to ensure that road safety is not impaired based on:

- Routes that are suitable for heavy vehicles
- Reduction of number of vehicles, based on experiences from EMS 25,25 (Germany and Holland)

TRAFFIC SAFETY 2



Though:

As the longer EMS and EMS2 primarily uses more secure roads, with no or very few vulnerable road users, there are little empirical data on accidents = therefore a cautious approach is needed

BRIEF SUMMARY

DUO2 is running in Finland - in Spain and Sweden as pilot-projects

Individual vehicle demands as in directive 96/53/EG

Infrastructure - some adjustments are needed

Traffic safety

- The experience from EMS 25.25 m, as well as the general driving in Spain and Finland, does not indicate increased risk (*assuming driving on the designated routes*)
- A theoretical approach, from the Netherlands, points to risks regarding city driving
The risks correspond to driving with trucks (right turns, etc.)

Economical consequences for society and businesses - positive

CO₂-reduction potential - positive

WHAT NEXT?

- Awaiting political discussion
- First brief discussions with haulers organisations initiated
- Preliminary screening of road network carried out
- Technical requirements considered





Thank you for listening

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