

Submitted by the experts from the IWG on MVC

Informal document **GRVA-04-26**
4th GRVA, 24-27 September 2019
Agenda item 8(b)

Modular Vehicle Combinations Informal Working Group (MVC IWG)

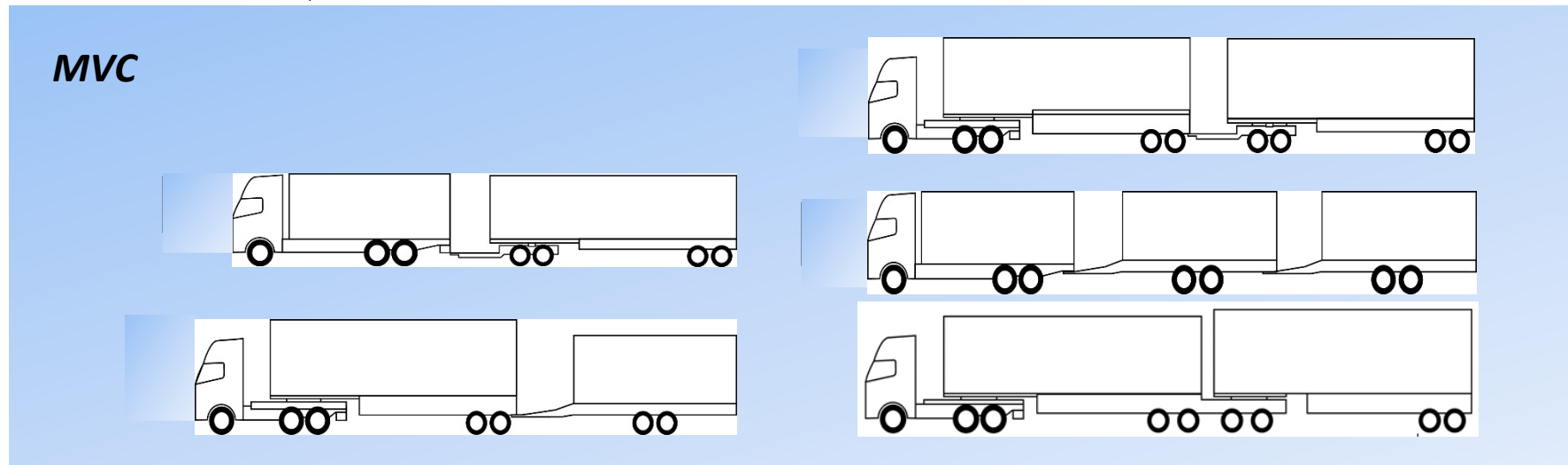
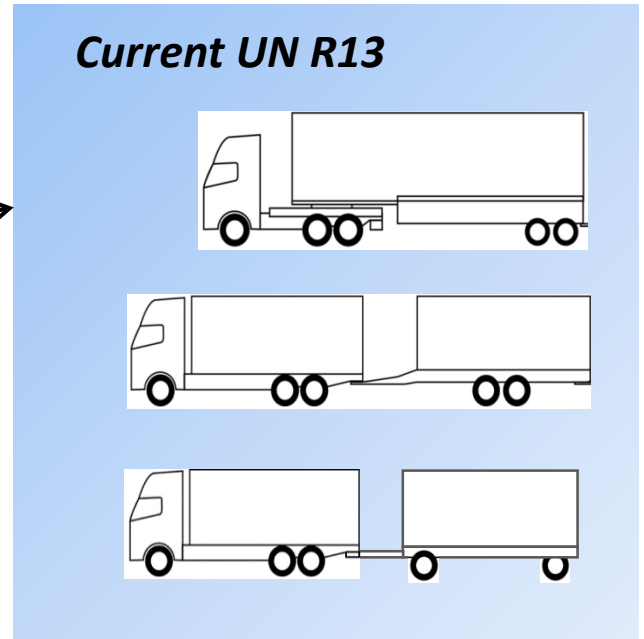
Status report for GRVA-04
September 2019

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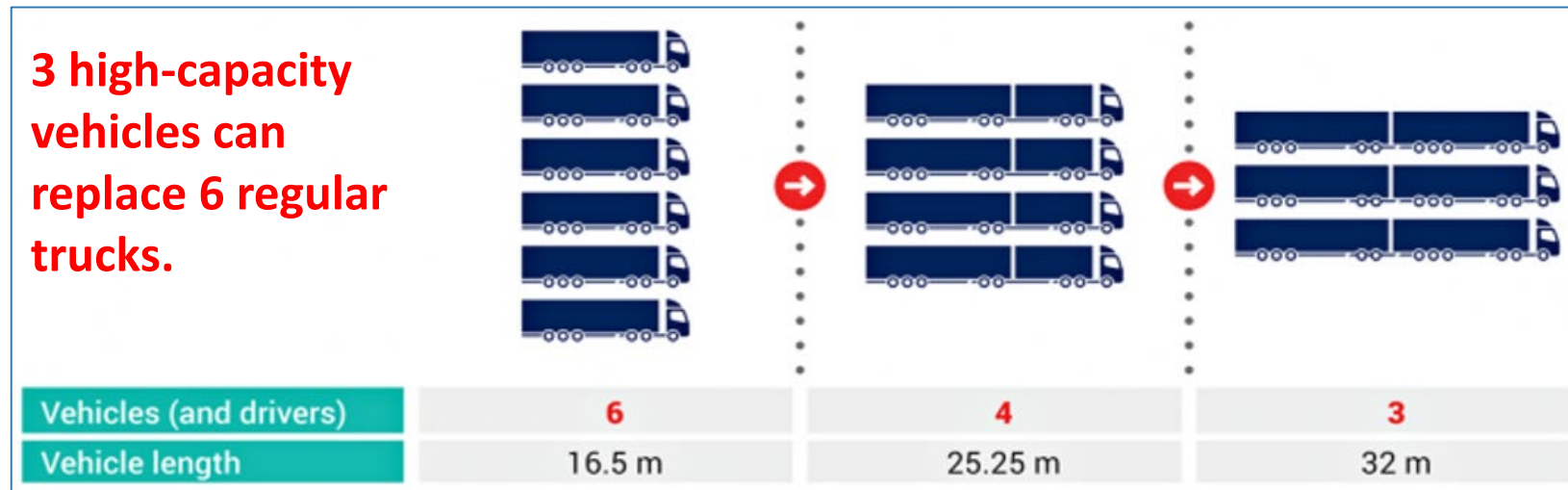
Introduction

- Current UN R13 mainly addresses the approval of single vehicles involved in single-trailers combinations.
- The objective of the MVC IWG is to add missing definitions and requirements in UN R13 for **approving single vehicles** involved in Modular Vehicle Combinations, e.g. towing trailers.



State of play on the market

- Increasing need to improve transport efficiency (payload/volume, fuel, CO2...)



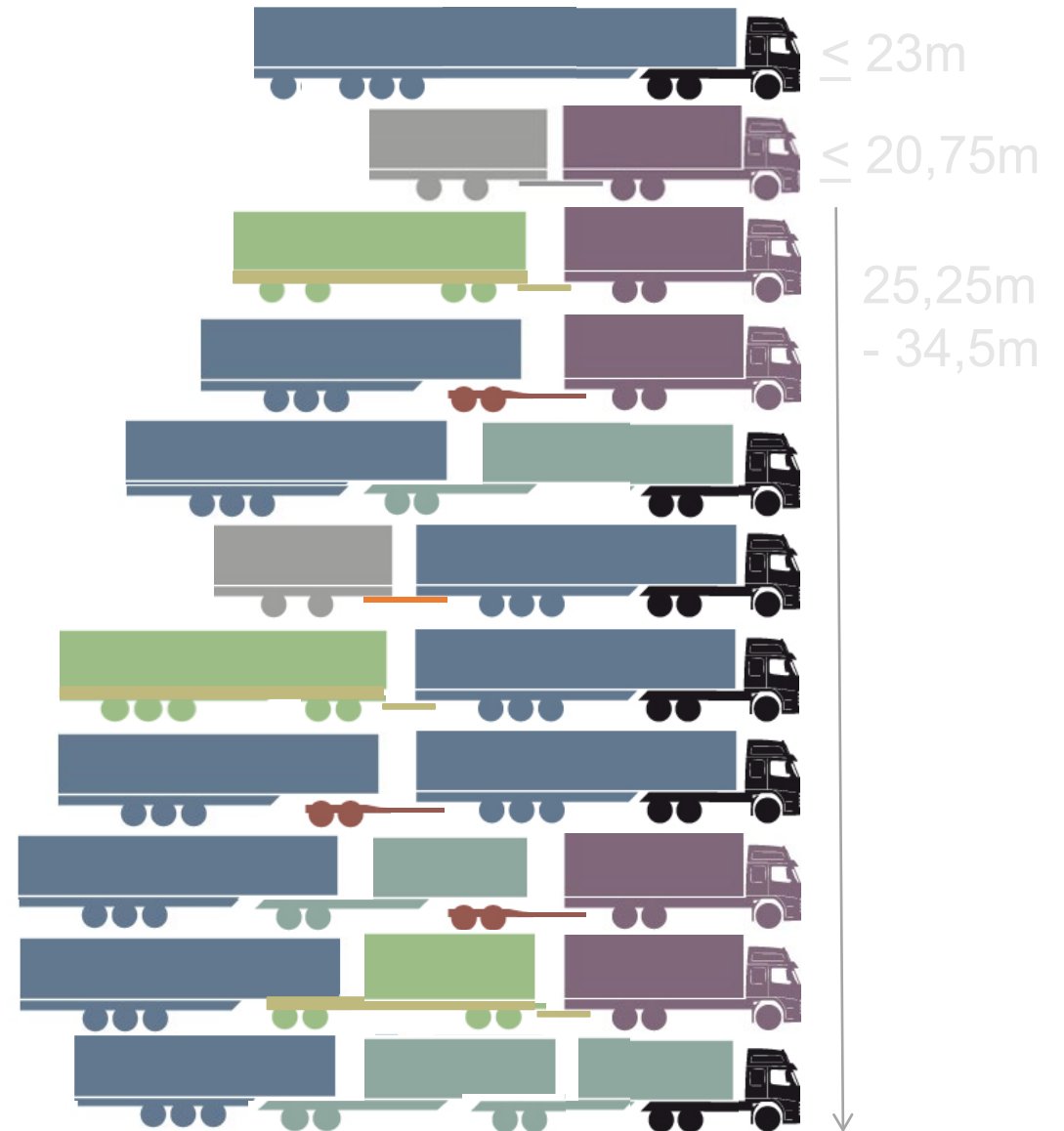
- Use of MVC / road trains allowed in US, AUS, Mexico, Brazil...
- Several national initiatives with new combinations in EU:
 - **25.25m** combination:
 - Allowed in Swe, Fin, NW, DK, Germany, NL on specific road class or dedicated roads
 - Estonia, CZK, B, Spain, Portugal with special allowance (application by e.g. the road operator)
 - On-going tests to increase length **beyond 25.25m** e.g. in Swe, Fin and Spain.
 - **34.5m** combination allowed in Finland as from January 2019.

Example: Long combinations in Finland 2019

(Proven by test)

Truck and:

1. Semitrailer
2. CAT
3. Full trailer
4. Dolly + semitrailer
5. Link + semitrailer
6. Semitrailer + CAT
7. Semitrailer + full trailer
8. Semitrailer + dolly + semitrailer (DUO-trailer)
9. Dolly + link + semitrailer (ETT)
10. Fulltrailer + semitrailer
11. link + link + link/semitrailer.



History of the MVC IWG

- In 2014, GRRF started a new Informal Group on Modular Vehicle Combinations (MVC).
- **Objectives:**
 - Enable the approval of vehicles, with regards to braking, steering, stability and mechanical couplings, which are a part of a modular vehicle combination.
 - Avoid individual approval according to non harmonized national requirements (which is limiting market competition and operation of these vehicles)
- Around 20 to 25 experts were involved in the group: Sweden, NL, Denmark, Finland, Norway, Spain, motor vehicle, trailer and system manufacturers
- The work was put on hold in 2016 after 6 meetings, due to resource issues (same experts involved in several groups like e.g. ACSF).
- The informal group on mechanical coupling **delivered** 2 years ago a supplement to UN R55 series 01 to cover MVCs.
- Decision at WP29 of March 2019 to prolong the mandate by one year **until February 2020**.

Work program

- Reminder from current TORs:

“The work program of MVC IWG is defined as follows in current TORs:

1. Amend UN R13
Identify items not addressed by the UN R55 Informal Group
2. Address these missing items in UN R55
3. Address UN Regulation No. 79.”

- Note: the item of UN R55 should be updated to reflect the new organization of WP29 implemented in 2018, which move Mechanical couplings from GRRF to GRSG.

Work program proposal

Step 1 – Feb 2020

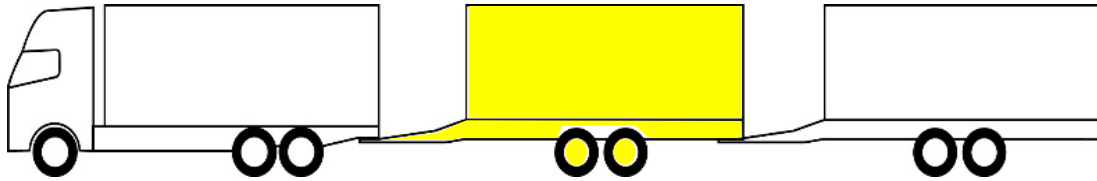
- Deliver amendments to UN R13, to cover:
 - The same combinations as the five covered in R55-01 supplement 7 (ISO 18868)
 - Dollies with rigid drawbars
- Consider the opportunity to cover “Tractor + semi-trailer + full trailer » in the step 1

Step 2 – content & lead-time tbd

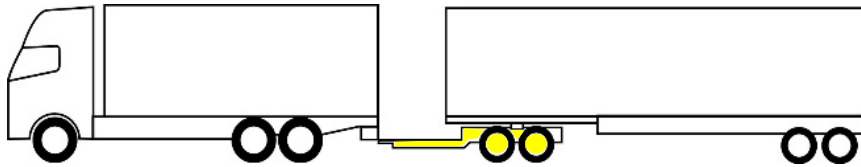
- UN R13
 - Dollies with hinged drawbar
 - Other combinations and/or other vehicle type
(e.g. combinations using full-trailers with a fifth wheel)
- UN R79: e.g. to cover steered dollies
- UN R55: Coordinate further steps with GRSG

Technical principles and open issues

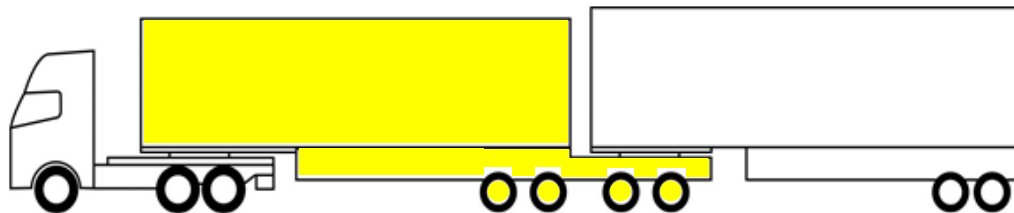
Definitions



A “**towing trailer**” is a trailer which is equipped to tow another trailer.



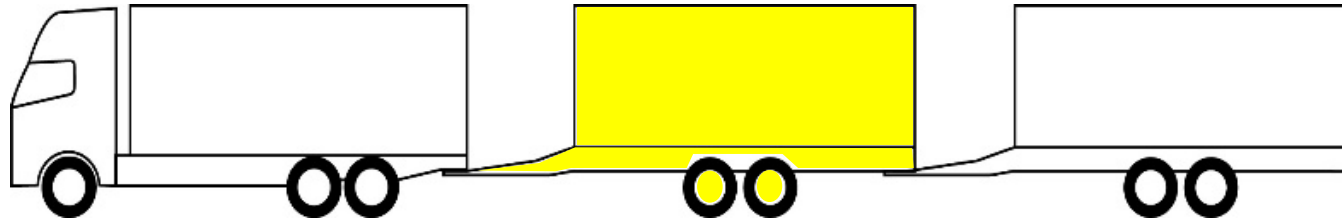
A “**Dolly**” is a towing trailer designed for the sole purpose to tow a semi-trailer.



A “**Link-trailer**” is a semitrailer equipped with a fifth wheel in its rear end enabling a second semitrailer to be towed. (Definition from R55-01 supplement 7).

Note: RE3 définitions to be reviewed?

Principles



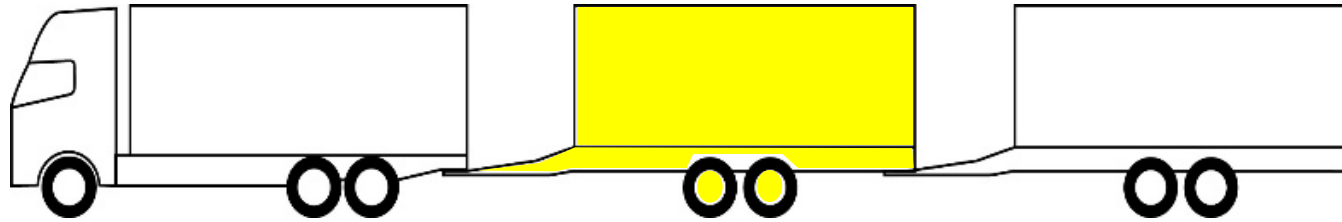
The ambition is that the truck only depends on the GCW, not on the number of trailers behind.

The specific requirements should be focussed on the towing trailers.

The ambition is that the last trailer does not have any specific requirements.

- Same braking reference for all vehicles of the combination (yellow coupling head and equivalent electronic message)
- Use of ISO 11992 standard for the communication between vehicles.
- Point-to-point connection between vehicles (ISO 11992), to clarify the use of repeaters and routers.
- Each towing trailer “gateways” the hard-wired warning signal (pin 5 of ISO 7638) from following trailers.
- EVSC on all vehicles of the combination.
- The parking brake of the truck is able to maintain the combination stationary.

Open issues



- Compatibility with existing vehicles to be considered.
- Maximum length of ISO 11992 CAN bus; point to point connection (→ router / repeater)
- Electric control line: failure detection and warning to driver.
- Response time
- Communication between vehicles: definition of mandatory messages to be routed towards truck and toward trailers
- Compatibility bands for towing trailers; carry over from current bands
- Brake performance for towing trailers (type 0)