

# TRAFICOM

Finnish Transport and Communications Agency

## Impact of increasing truck length and weight - Finnish experiences

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# Dimensions and weights in Finland

Legislation and use in traffic



# Since 21.1.2019 in Finland

- ▶ Maximum length  
34.50 meters.
- ▶ Semi-trailer combination's  
maximum length  
is 23 meters.
- ▶ New turning rule  
and strict safety rules  
for new long trucks
- ▶ Maximum weight  
remained 76 t

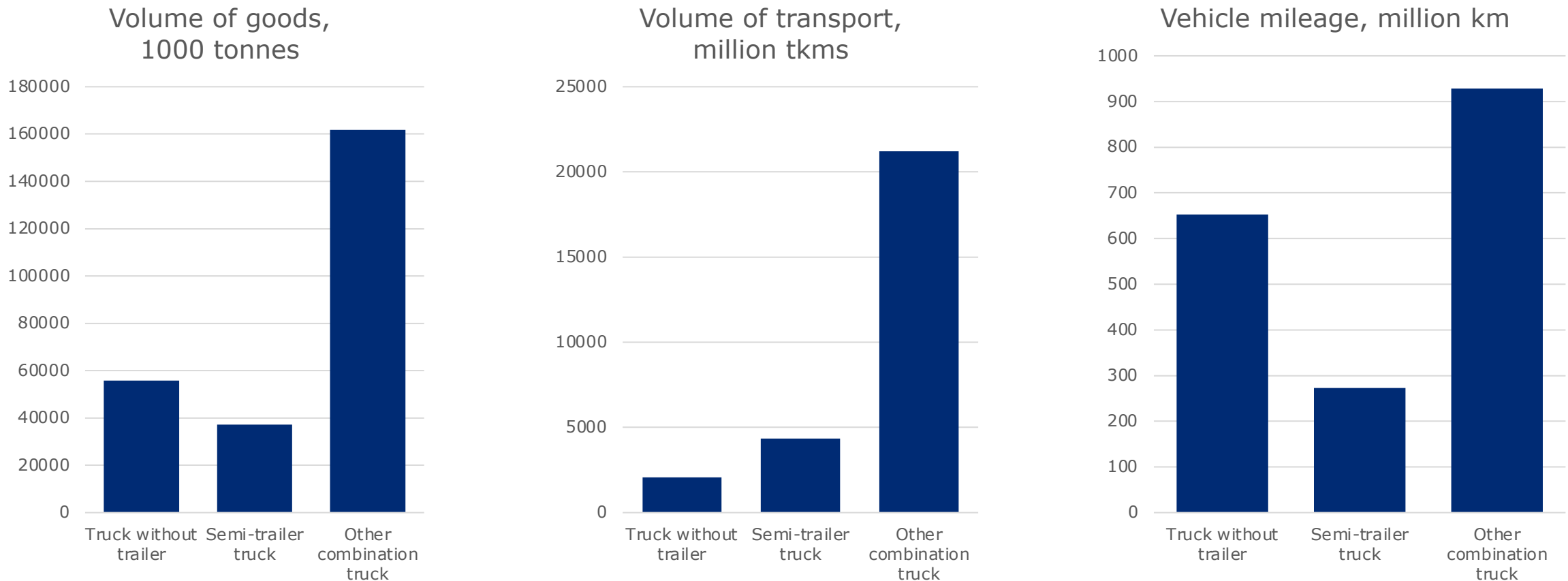


# 1.10.2013 - 20.1.2019

- ▶ Maximum length  
25.25 meters
- ▶ Semi-trailer combination's  
maximum length 16.5 meters
- ▶ Maximum weight 76 t  
(60 t before 2013)
- ▶ Maximum height 4.4 m  
(4.2 m before 2013)
- ▶ Trials with longer and  
heavier combinations  
with exemption permissions

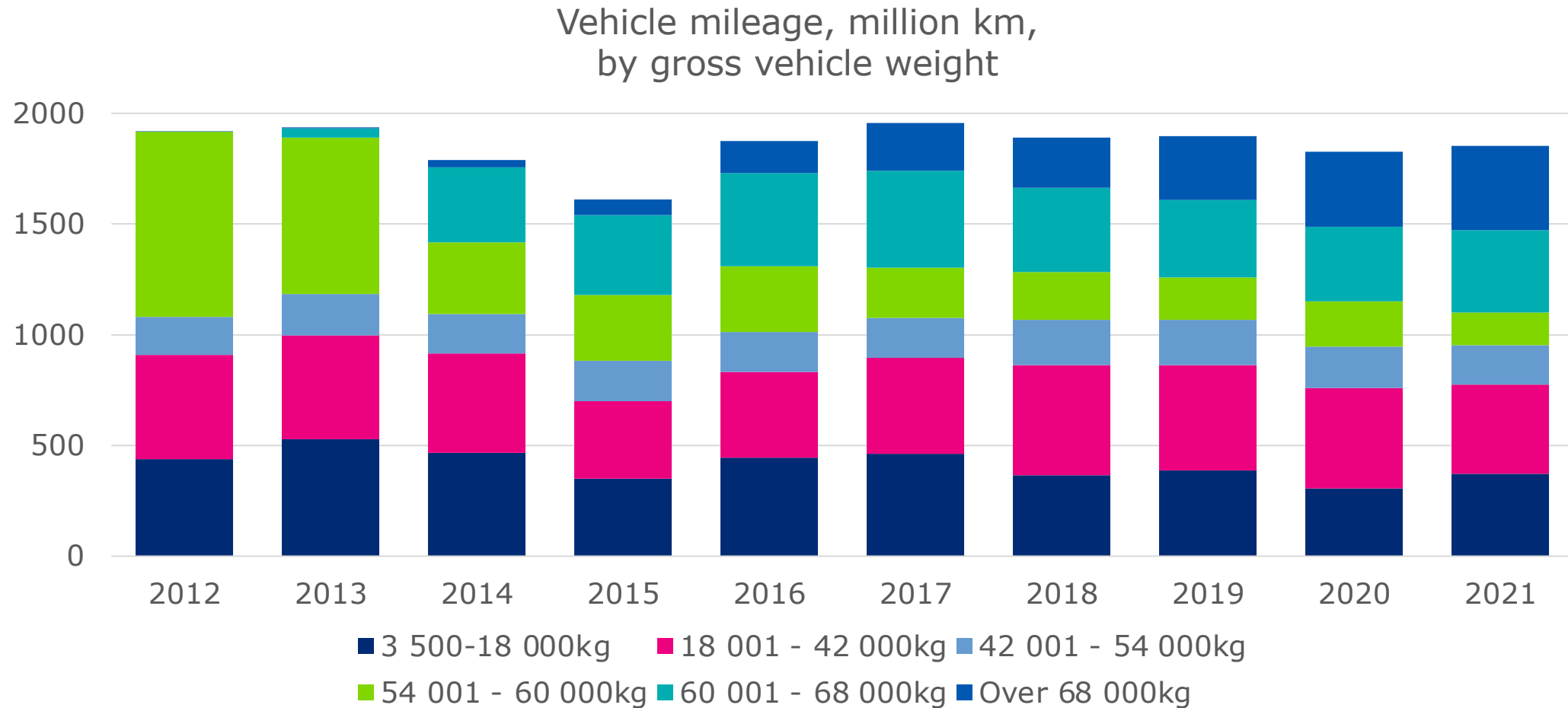


# Domestic road transport in 2021 by vehicle type



► Source: Statistics Finland. The Statistics on Goods Transport by Road. Collected by questionnaire for holders of trucks registered in Finland

# Truck weight distribution in domestic road transport

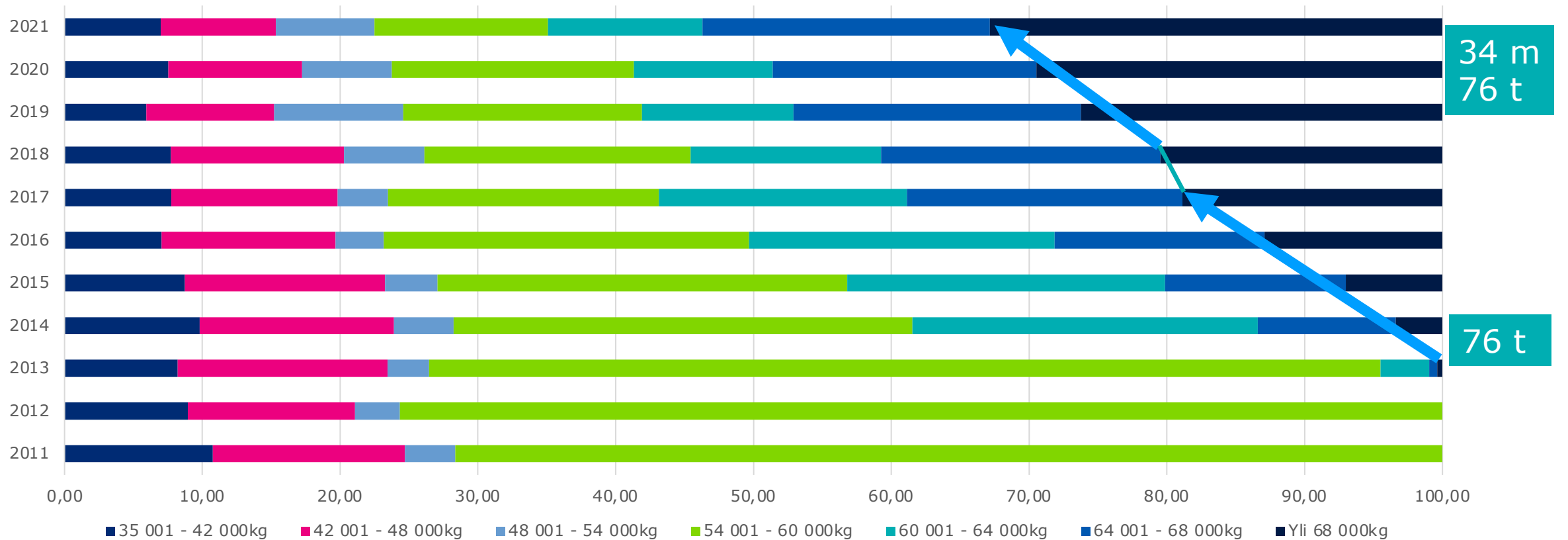


► Source: Statistics Finland. The statistics on goods transport by road. Collected by questionnaire for holders of trucks registered in Finland

# Transport sector has adopted 76 t and 34,5 m fast

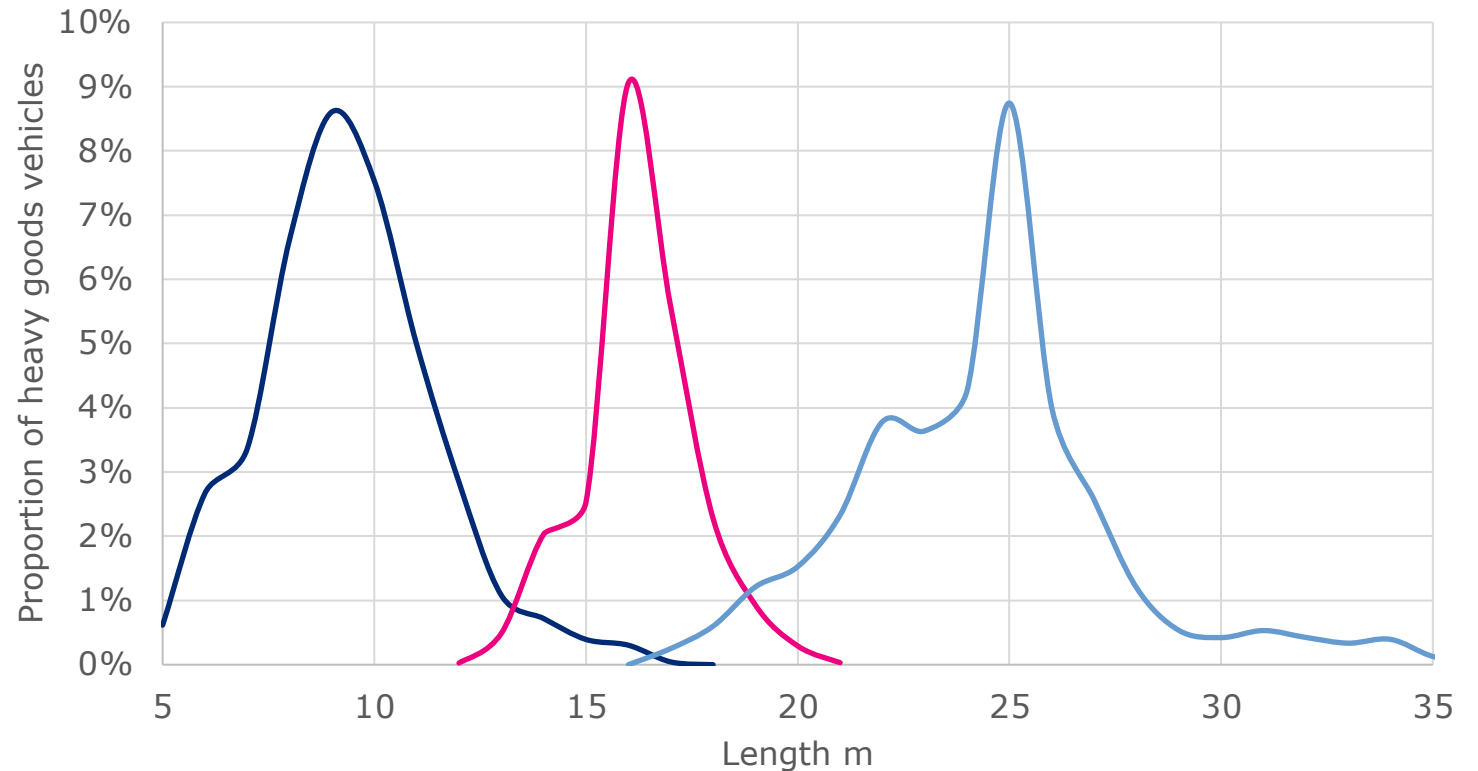
Finnish high diesel price and labor cost are probably the biggest motivation for heavier and longer trucks

Domestic traffic share in weight categories



# Truck length distribution on main roads

- ▶ Observations in September 2021 in 52 measurement points
- ▶ 35% longer than 19 meters
- ▶ 11% longer than 25 meters
- ▶ 2% longer than 29 meters



- ▶ [Source publication](#) (in Finnish)

— Truck without trailer — Semi-trailer combination — Other combination

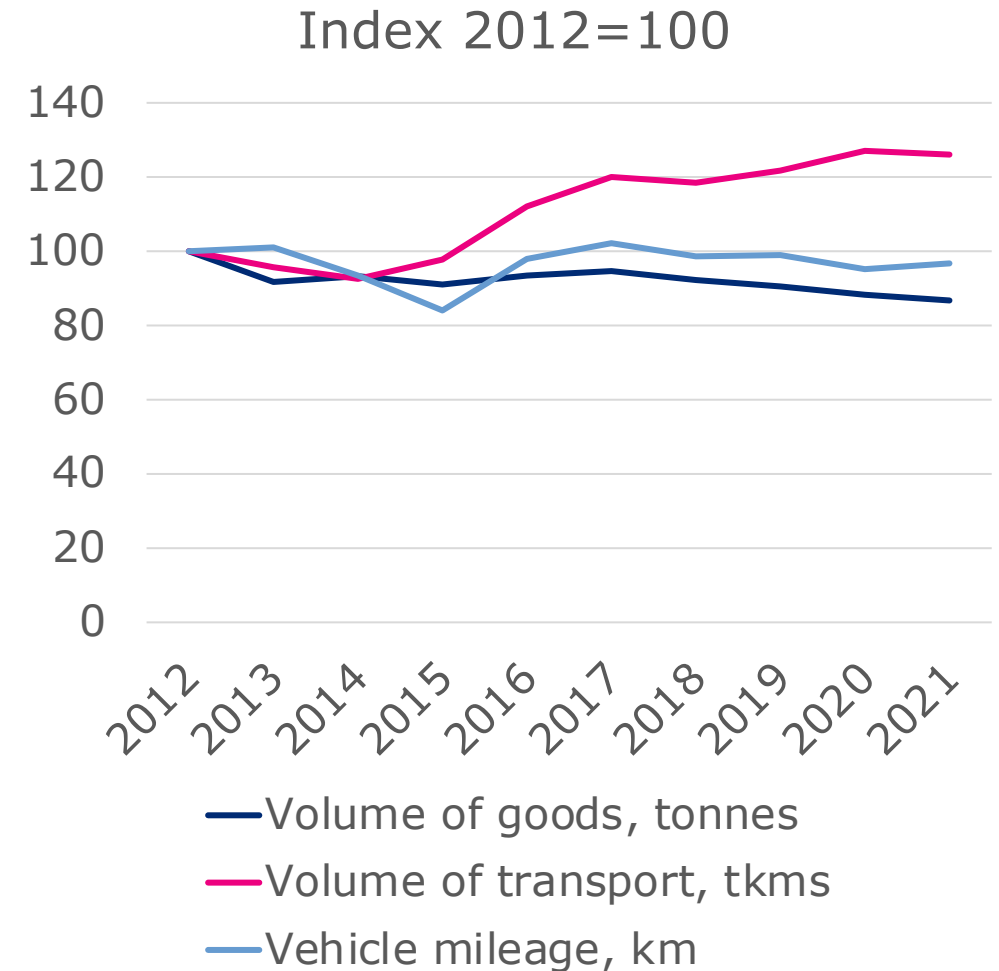


# Impact on traffic volume



# Transport volume and mileage

- ▶ In 2012 – 2021 truck traffic mileage has
  - ▶ increased 4% based on traffic counts
  - ▶ Increased 5 % on public roads for truck+trailer combinations based on traffic counts
  - ▶ Decreased 3% in domestic transport based on questionnaire study
- ▶ In the same time, volume of goods transport, in tonne kms, has increased by 26 %, based on questionnaire study



▶ Source: Statistics Finland. Finnish Road Statistics, and The Statistics on Goods Transport by Road.

# EMS2 gives biggest advantages in volume based longhaulage

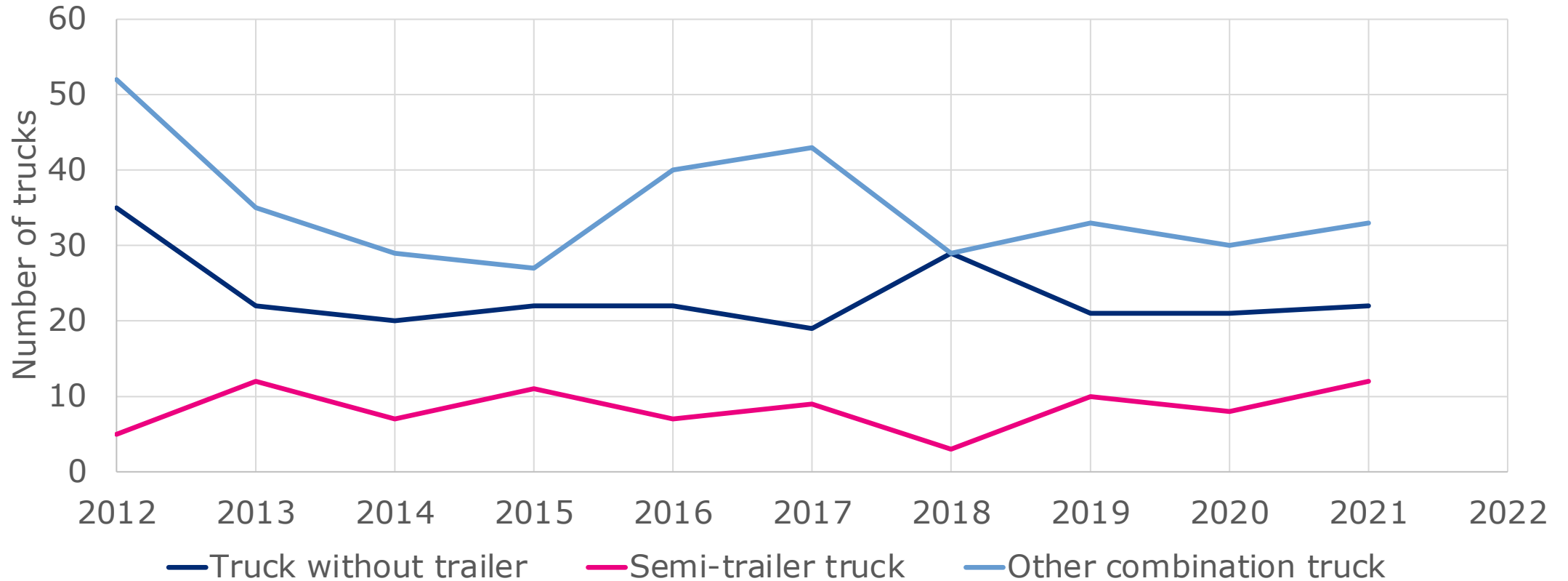
- ▶ Finnish rules enables bigger loads in many ways
  - ▶ Three modular combination types
  - ▶ Long b-doubles (2x40 ft container)
  - ▶ Long truck + full-trailer combinations
- ▶ Longer combinations take extra time in most of cases at terminal
  - ▶ With mixed goods EMS2 is better “always” when over 200 km
- ▶ EMS2 benefit is bigger in fuel economy with light goods



# The development of the number of accidents

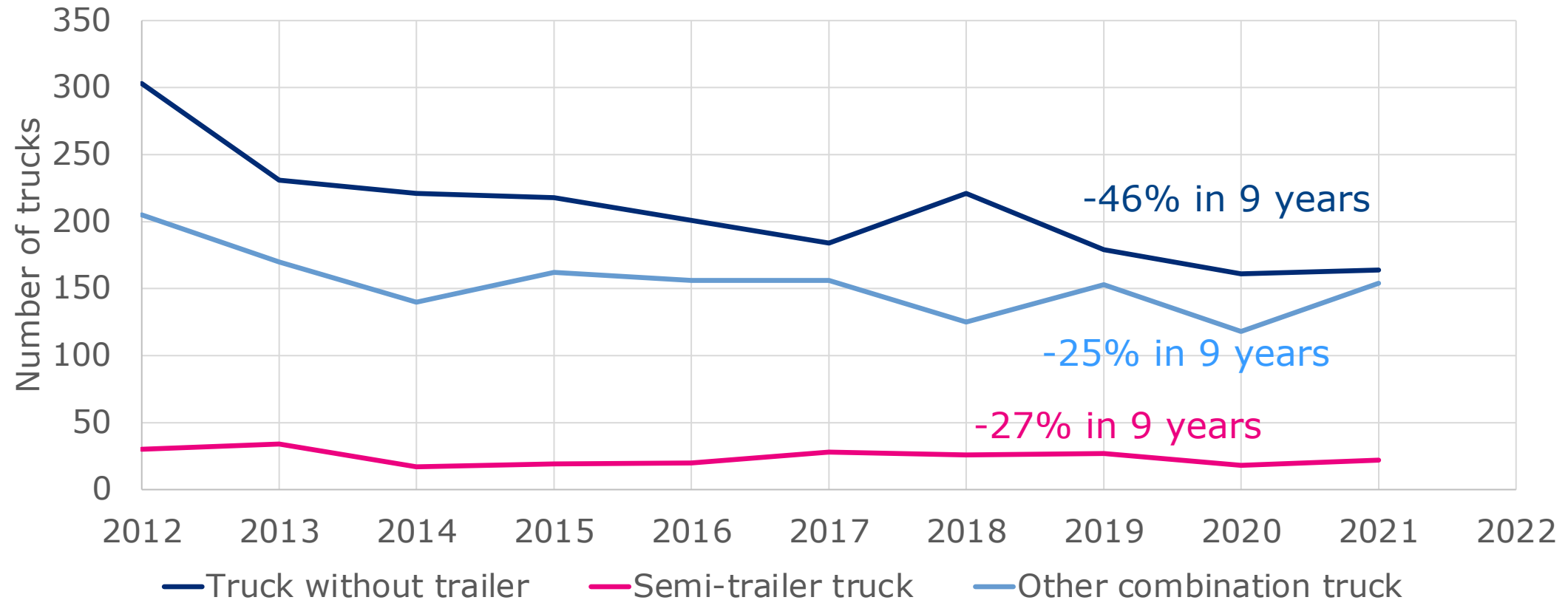


# Trucks involved in fatal accidents



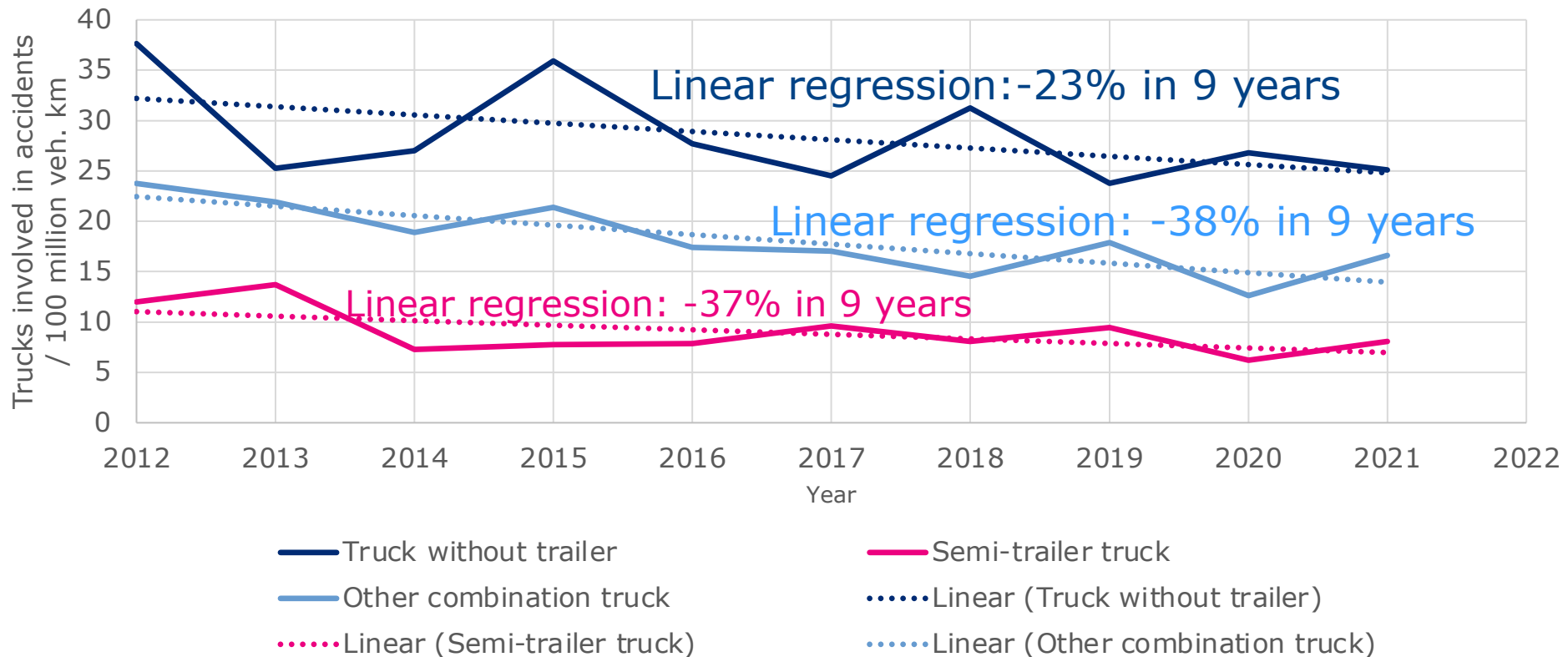
- ▶ Road accidents where some person has been killed
- ▶ Total 67 trucks involved in fatal accidents in 2021
- ▶ Source: Finnish Transport Infrastructure Agency's database

# Trucks involved in personal injury accidents



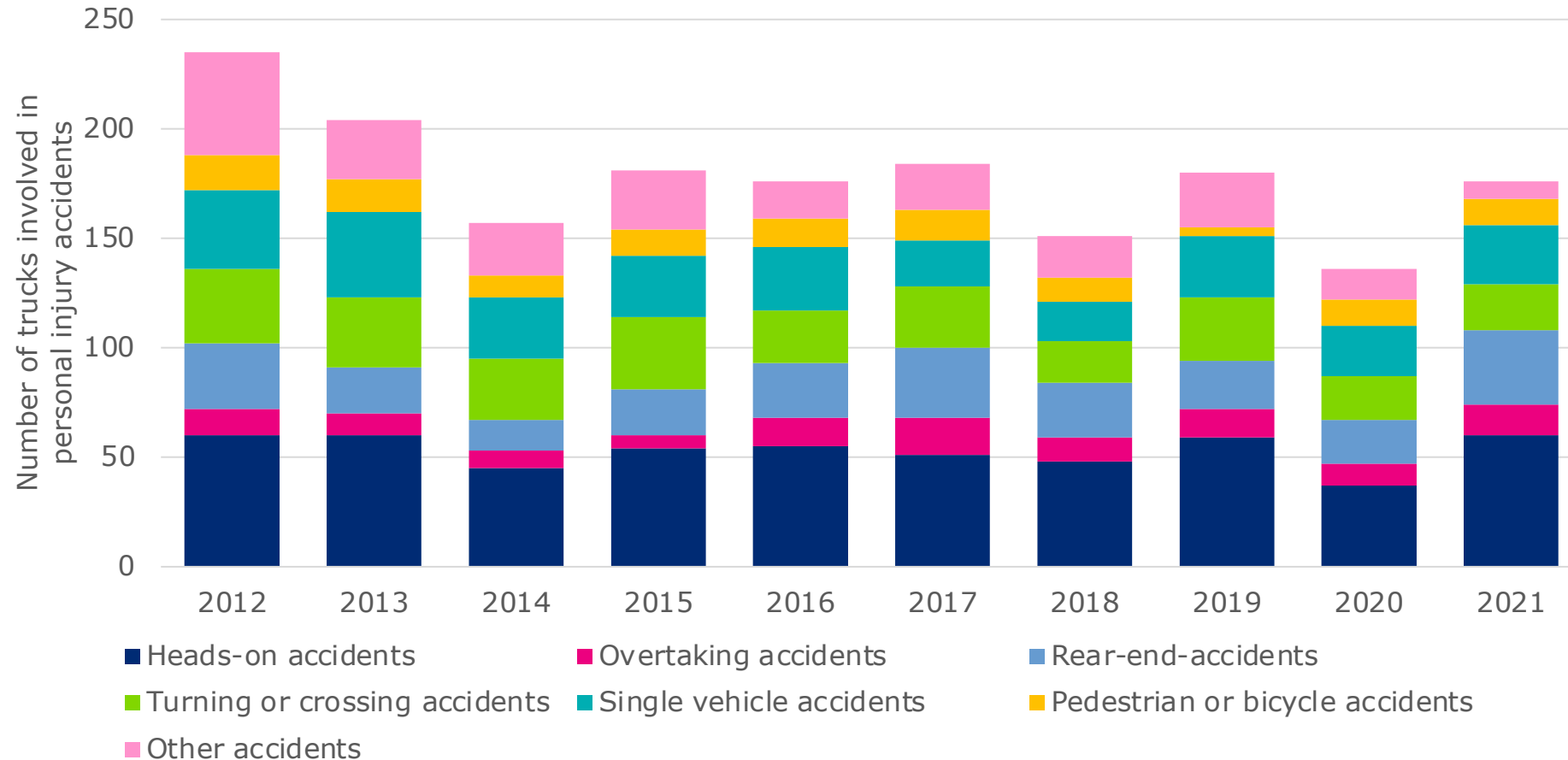
- ▶ Police-reported road accidents where some person has been killed or injured
- ▶ Source: Finnish Transport Infrastructure Agency's database

# Accident risk: accident involvement / kilometers driven



- ▶ Trucks involved in police-reported personal injury accidents, Source Finnish Transport Infrastructure Agency's database
- Kilometres driven in domestic transport, Source Statistics Finland questionnaire study

# Accident types for truck – trailer combinations

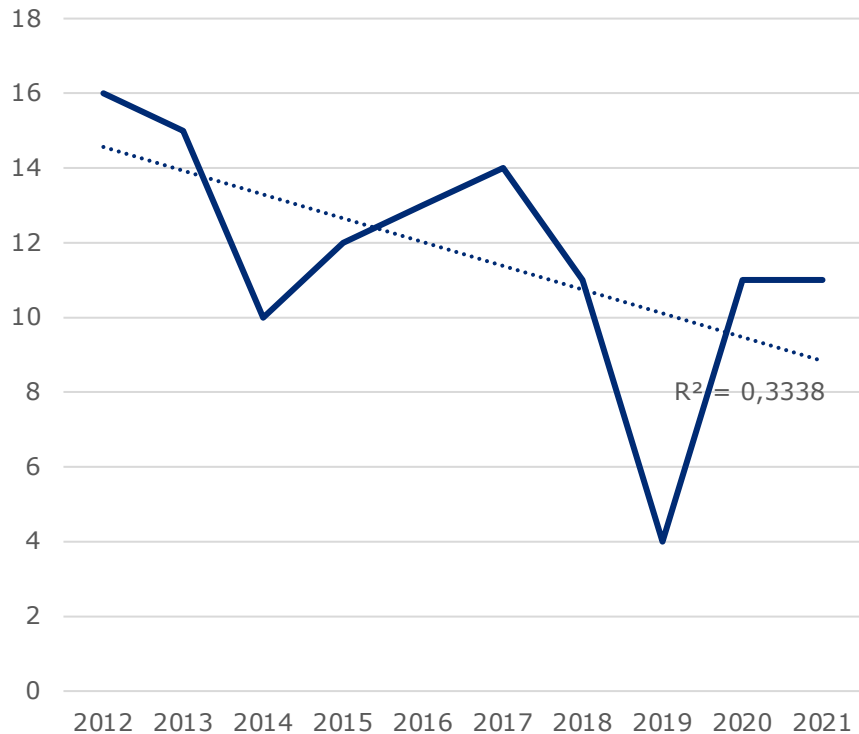


- ▶ Accident reduction was biggest for "other" accidents. Most common "other" accidents were accidents with parked vehicles, and side contact accidents which were not overtaking accidents.

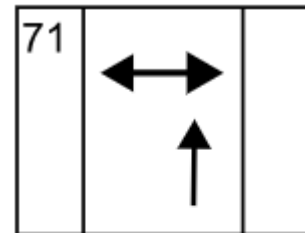


# Accidents involving a pedestrian or bicyclist and a truck with a trailer

Personal injury accidents

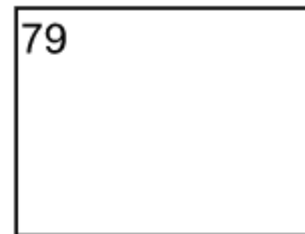


Most common accident types



15%

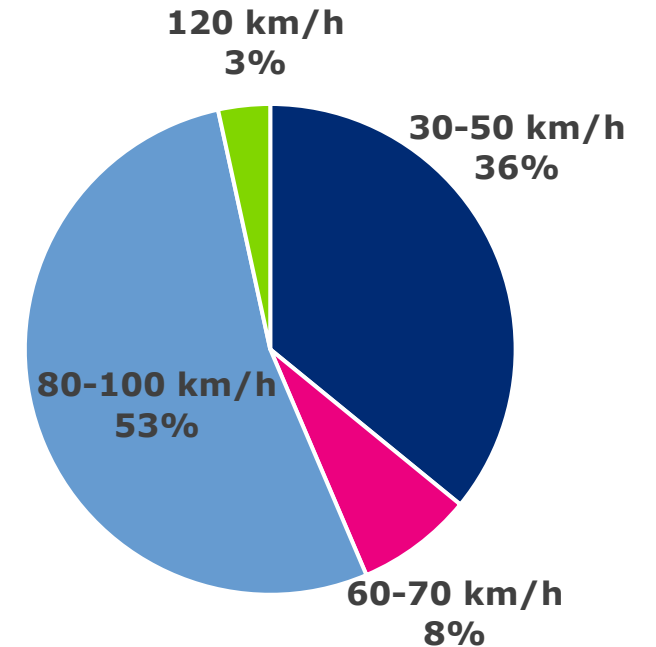
Pedestrian accident, not crosswalk.  
Pedestrian crossing roadway.



24%

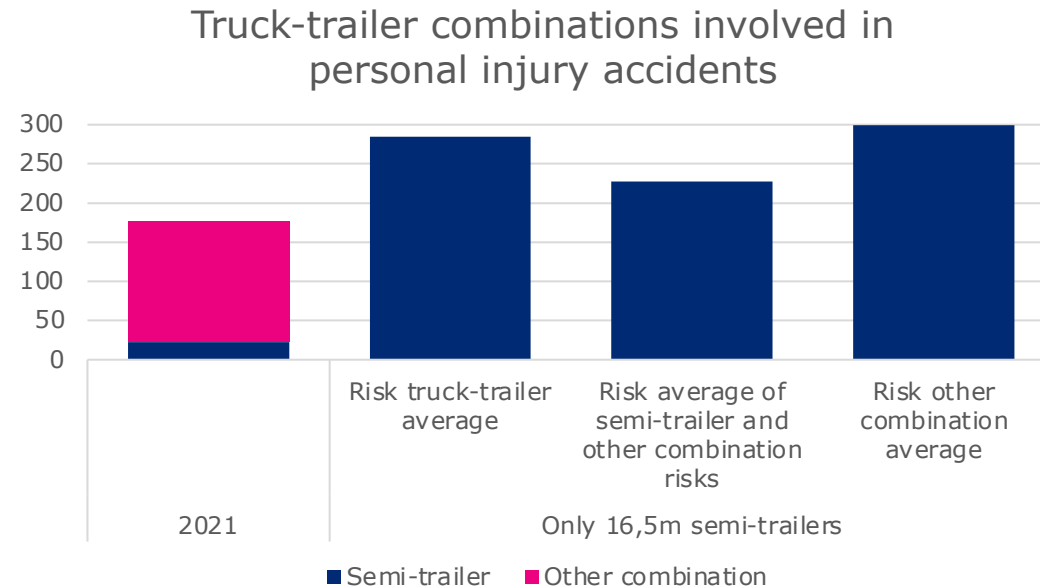
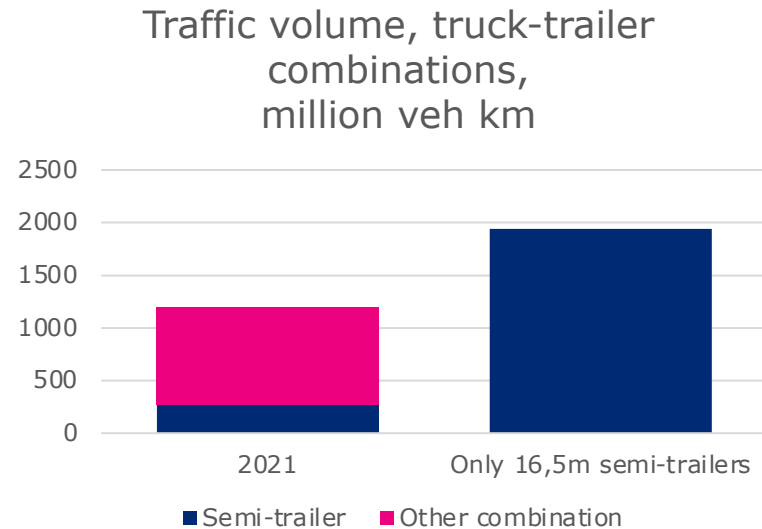
Pedestrian accident, not crosswalk. Other accident.

Speed limit



# What if the current goods transport was carried by 16,5m and 40t semi-trailer combinations?

- ▶ Truck+trailer combination traffic volume would be 740 million vehicle km per year higher (64 % higher)
- ▶ Personal injury accidents would increase by 50-120 cases / year, depending on the accident risk for semi-trailers used in this estimate

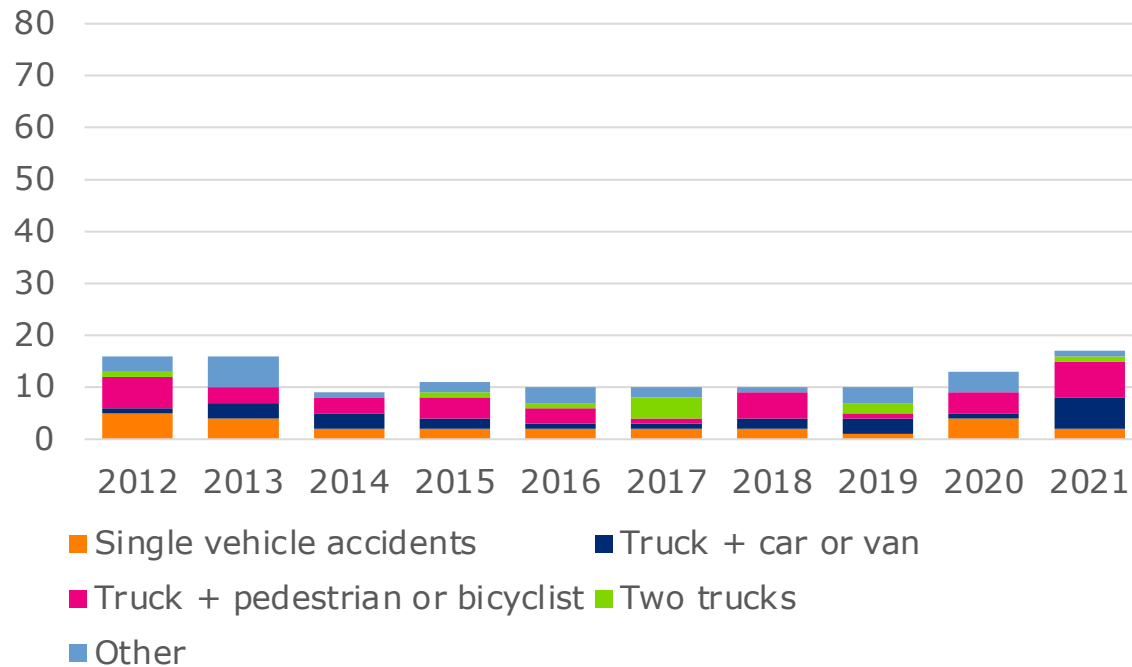


# Accidents investigated by investigation teams

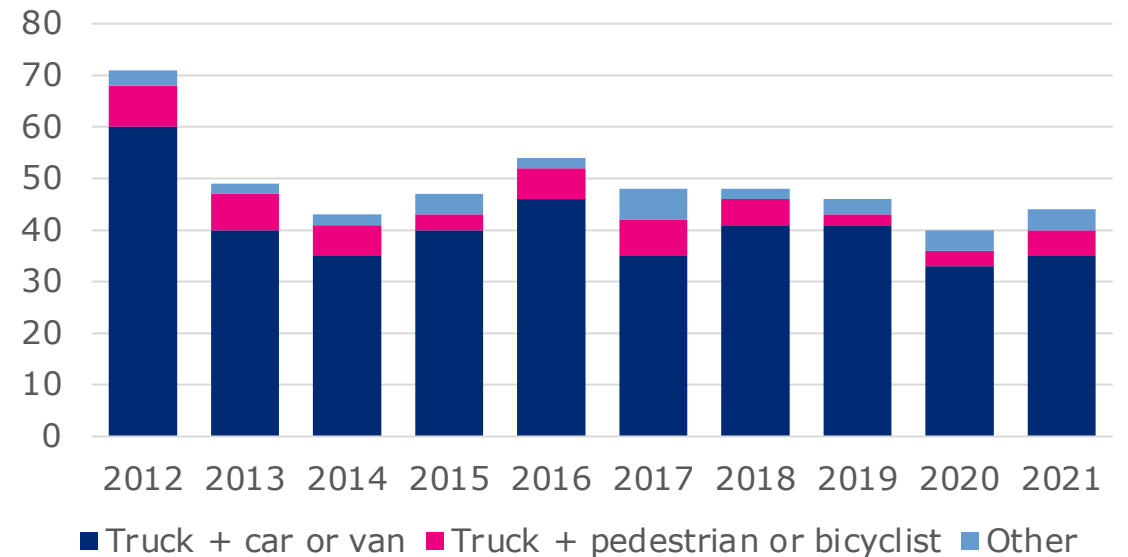


# Truck driver was the participant mainly causing the accident in 19 % of fatal accidents involving a truck

Fatal accidents caused by truck driver



Fatal accidents caused by other participant



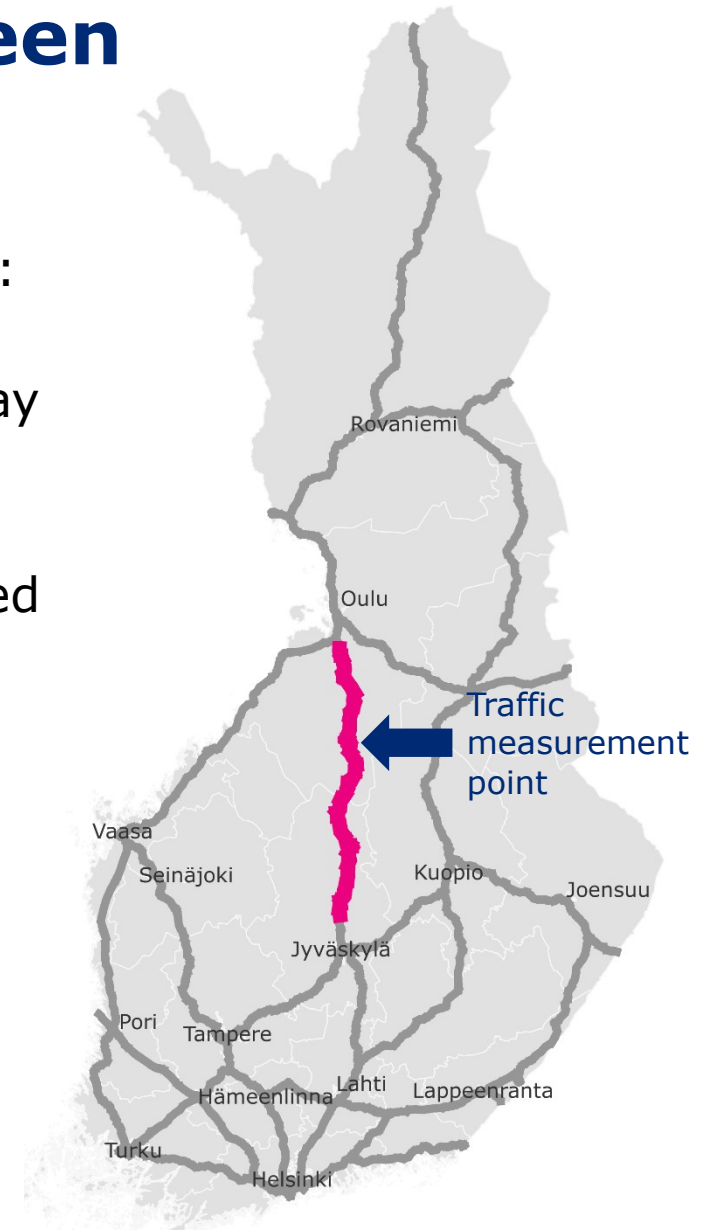
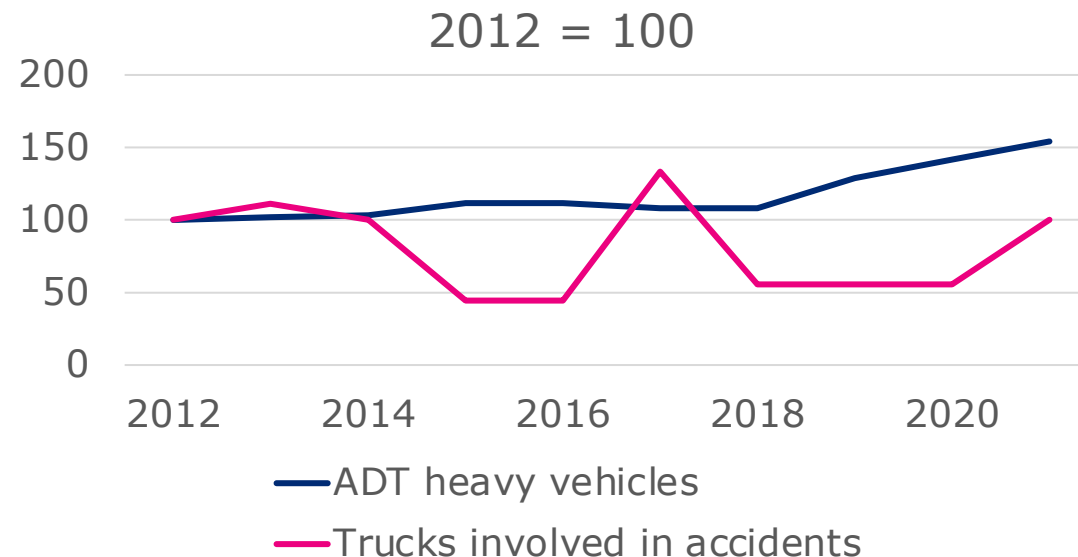
- ▶ Statistics includes all fatal accidents involving a truck investigated by investigation teams. Deaths by attack of illness excluded.

# Over 25m combinations in fatal accidents

- ▶ The road accident investigation teams investigate all fatal road accidents in Finland. In addition, the teams investigate some other accidents on a project basis.
- ▶ In 2019-2021, 6 heavy vehicle combinations longer than 25,25 m were involved in fatal accidents.
  - ▶ 2 suicides by colliding an oncoming truck-trailer-combination with a passenger car
  - ▶ 2 other head-on accidents, in which a passenger car drove at high overspeed
  - ▶ 2 accidents in which a passenger car collided with the rear of a combination driving in the same direction. Both cars drove at high overspeed.
- ▶ The length of the vehicle combination did not affect the occurrence or consequences of these accidents

# Accident numbers on main road 4 between Jyväskylä and Liminka

- ▶ Main road 4 has highest proportion of long combinations in Finland: 25 % of truck+trailer combinations were at least 27m long in September 2021. ~100 combinations with 30-36m length per day
- ▶ Heavy vehicle traffic has increased by 50% in 9 years
- ▶ Number of trucks involved in personal injury accidents has remained the same, 7 accidents per year in average
- ▶ No change in accident types either



# The effect on traffic flow



# Vehicle combination length and traffic flow

- ▶ Longest truck-trailer combinations drive slightly slower than shortest
  - ▶ Length 30-36m, average speed 82,9 km/h on motorways, 16% driving 87-90 km/h
  - ▶ Length 19-23m, average speed 83,3 km/h on motorways, 21% driving 87-90 km/h
- ▶ Small differences in overtaking behaviour: overtaking 33m vehicle took slightly longer time than overtaking 25m vehicle. The overtakers also required slightly longer gaps in the opposing traffic stream in order to overtake.
- ▶ Mean queue length behind 33m vehicle was slightly larger than behind the 25m comparison vehicle.

following to speed limits  
causes queues

- ▶ Speed: [Source publication](#) (in Finnish)
- ▶ Overtaking and queue length: [Source publication](#) (in Finnish, with summary in English)



# Conclusions

- ▶ Truck-trailer combination's maximum weight was increased 60t → 76t in 2013 and maximum length 25,25m → 34m in 2019
- ▶ Today over 60t combinations drive ~40% of truck mileage. Over 25m combinations drive ~10 % of truck mileage on main roads.
- ▶ No signs of negative road safety effects
  - ▶ Accident risk for truck-trailer combinations has decreased by 38% in 2012-2021. There is no difference between semi-trailer combinations and longer combinations.
  - ▶ Fatal accident investigations have not found any risk factors related to vehicle combination length
- ▶ If longer and heavier combinations were replaced by 16,5m semi-trailer combinations, traffic volume and accidents would increase

**Thank you!**