





# BPW

**BPW** is a privately owned German company, founded in 1898, and is Europe's leading supplier of commercial trailer axles and suspensions.





# BPW Transpec Pty Ltd

**BPW Transpec Pty Ltd** is a wholly owned subsidiary of **BPW Germany**, Europe's leading manufacturer of axles and suspensions for commercial trailers.

**BPW Transpec's** head office, main warehouse and axle assembly facility is located in **Melbourne**.







# BPW Transpec Pty Ltd

**BPW Transpec** also has branches with full service facilities in **Sydney**, **Brisbane** and **Perth**, and a subsidiary company in **New Zealand**, and supports the products it offers the market with a comprehensive Australia wide dealership network.



Brisbane



Perth



Sydney





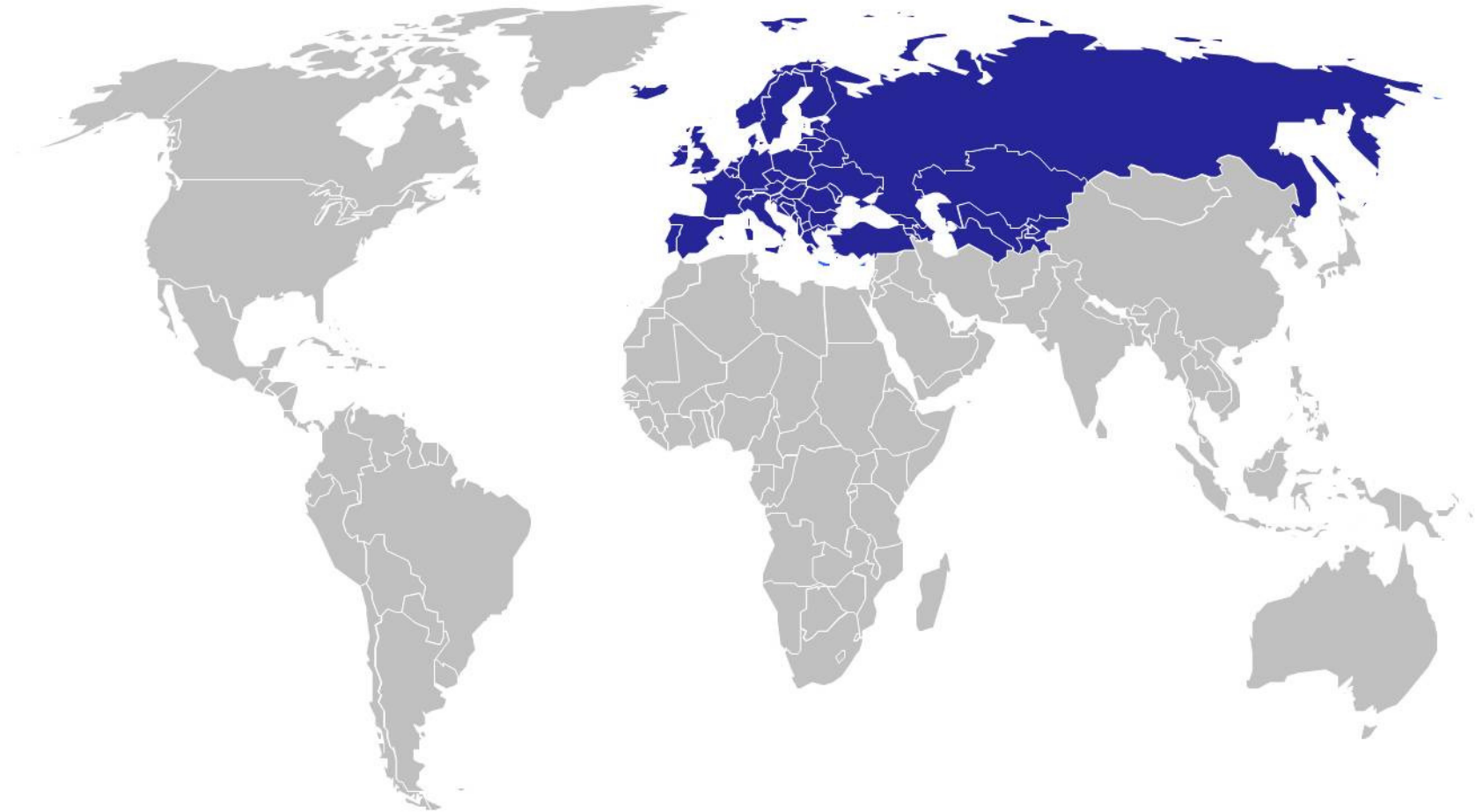
# BPW Transpec Pty Ltd

**Transpec** was founded in 1955, at that time representing **BPW**, **Edbro** and **Ringfeder**, three product groups that are still handled by **BPW Transpec**.





# European Market





# Agenda:

- **Market Details**
  - **Legal Requirements**
  - **Trailer Types**
  - **Typical European Running Gear**
  - **Future Prospects**
  - **Technical and Market Trends**
- 
- A light gray world map is visible in the background, showing the outlines of continents and countries.





# Agenda:

## ➤ Market Details

➤ Legal Requirements

➤ Trailer types

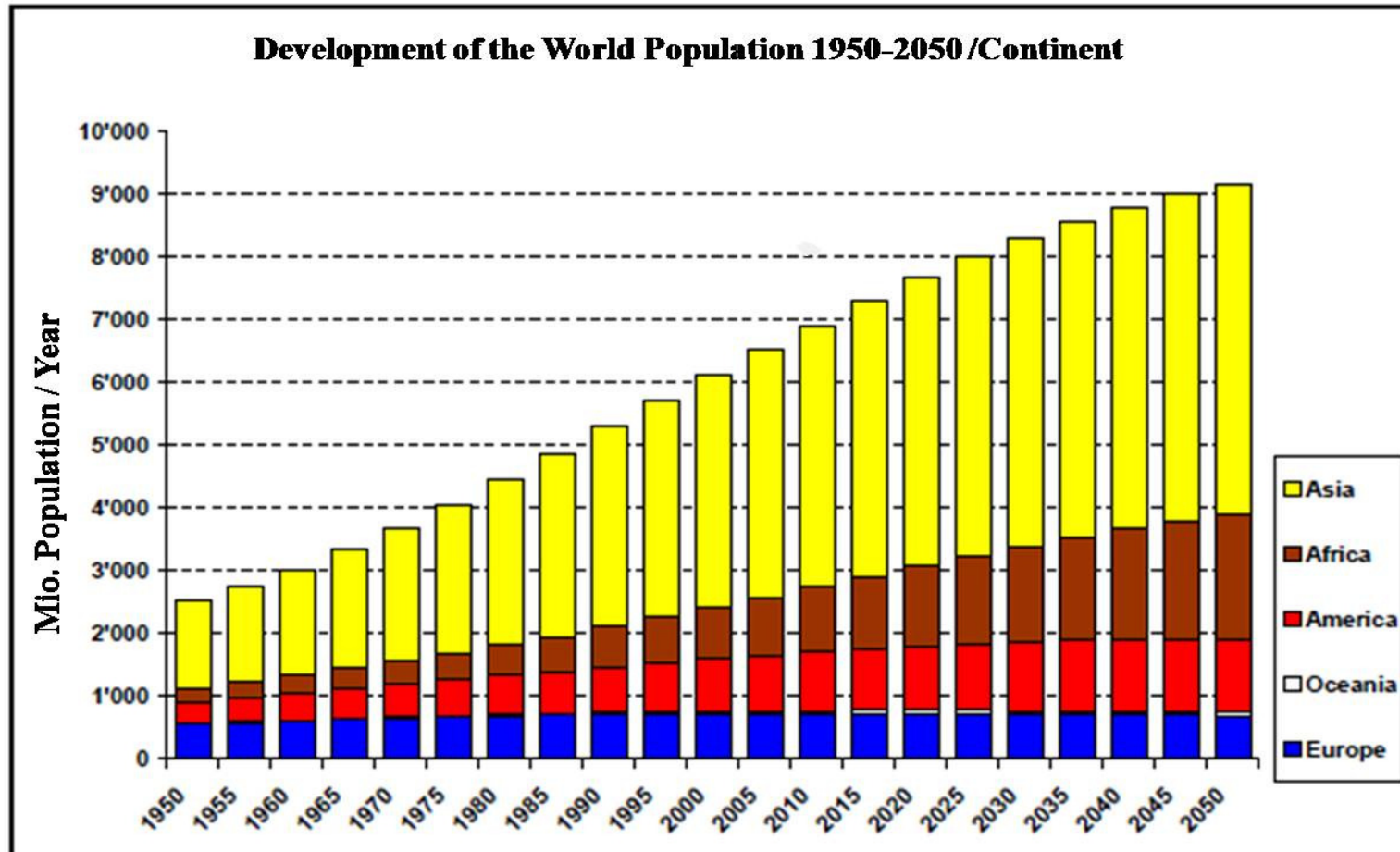
➤ Typical European Repealing Clear

➤ Future Prospects

➤ Technical and Market Trends

# Market Details

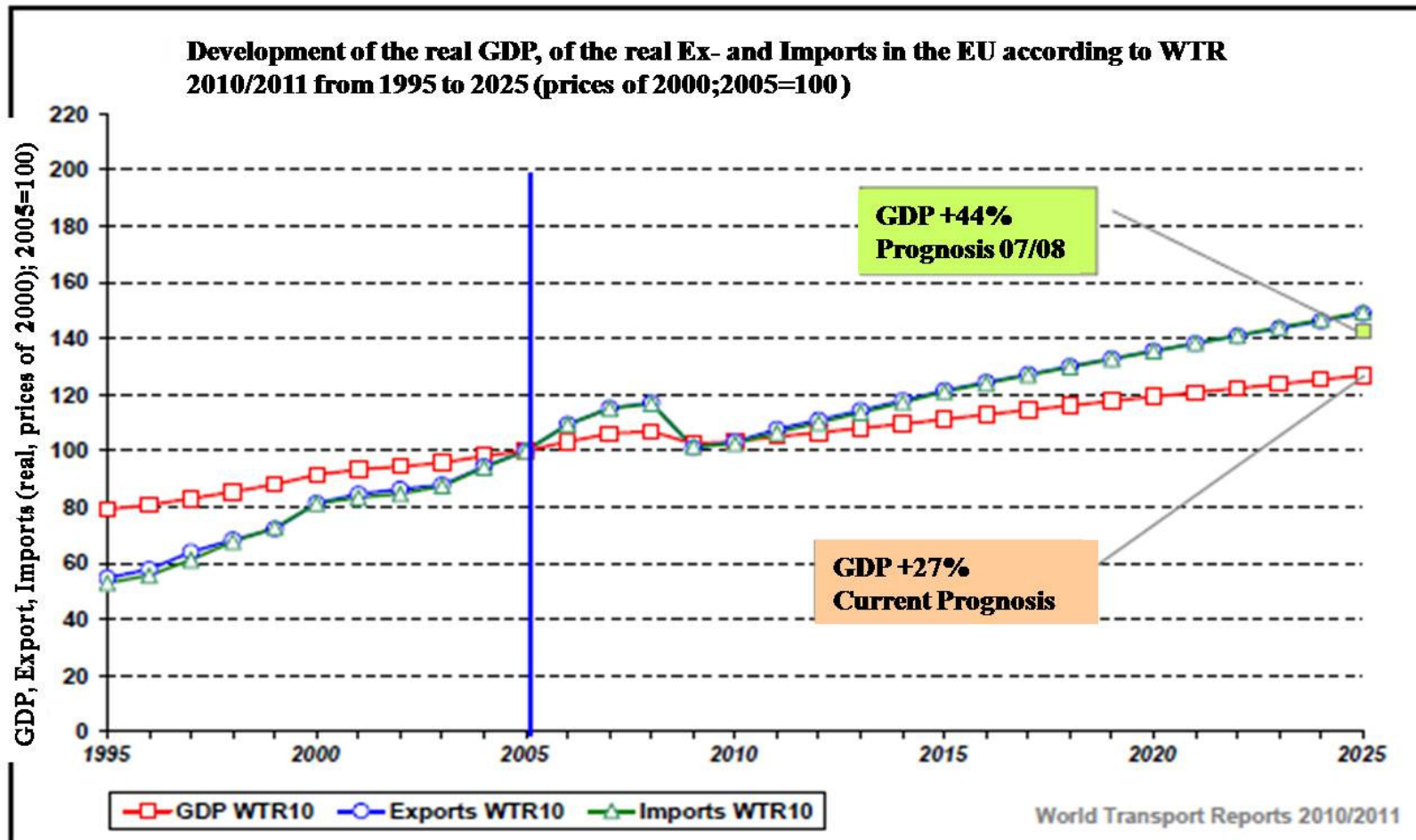
## ➤ Development of the World Population until 2050



Source UN World Population Prospects, 2008 Revision, New York 2009

# Market Details

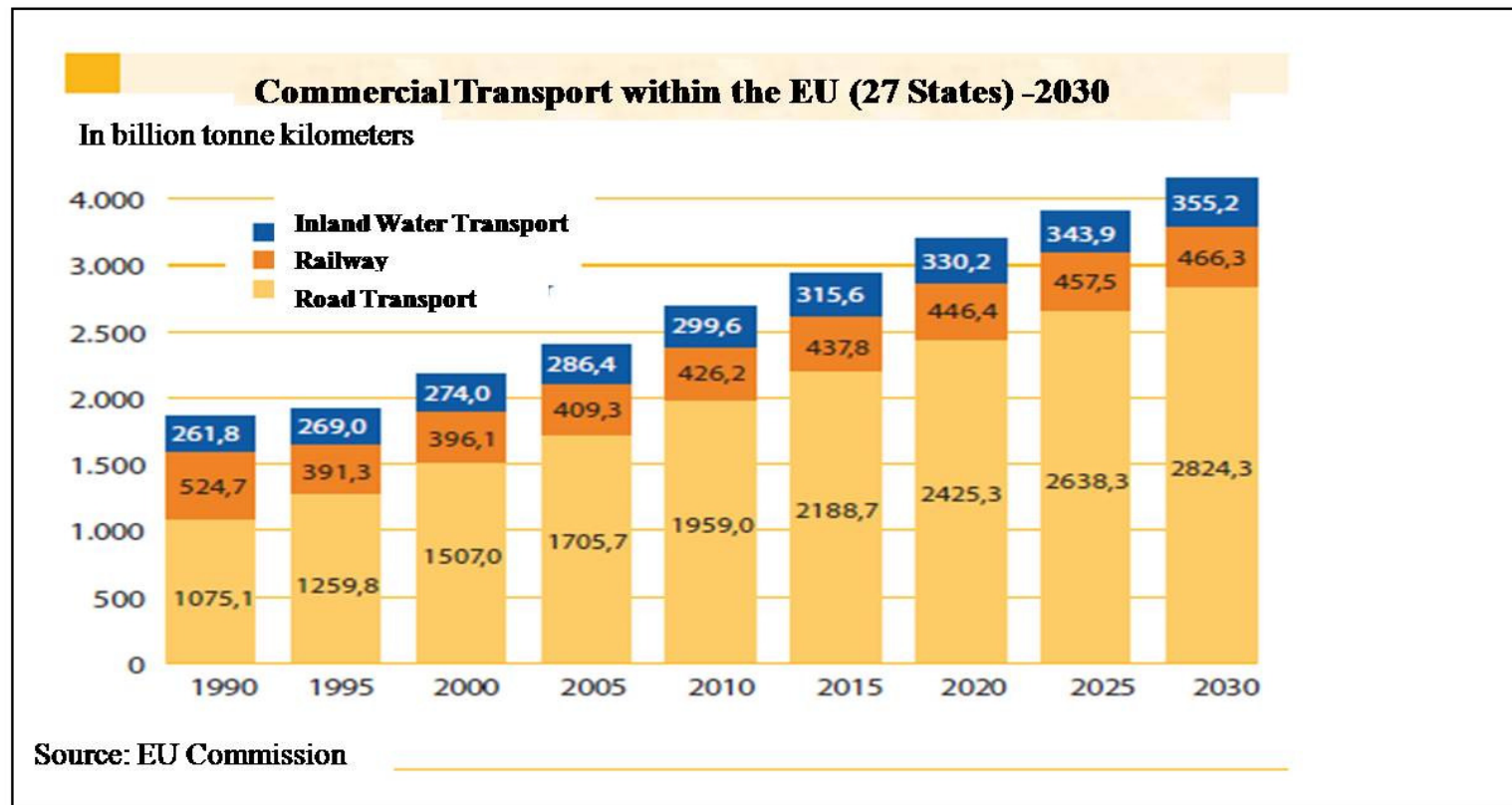
## ➤ Development of the GDP until 2025





# Market Details

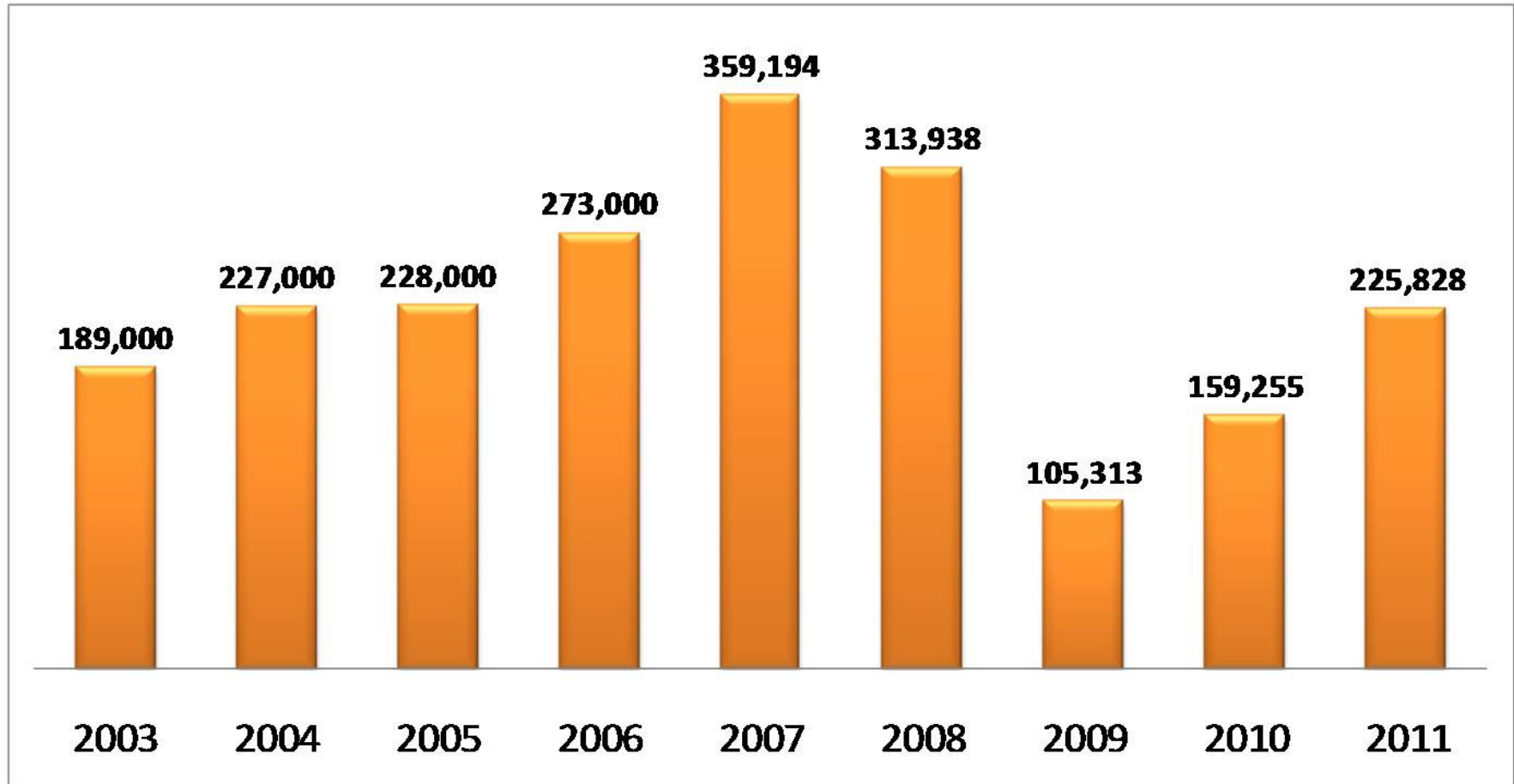
## ➤ Development of the Commercial Transport in Europe until 2030





# Market Details

## ➤ Trailer Production until 2011





# Agenda:

- Market Details
- **Legal Requirements**
- Trailer types
- Typical European
- Future Prospects
- Technical and Market Trends





# Legal Requirements

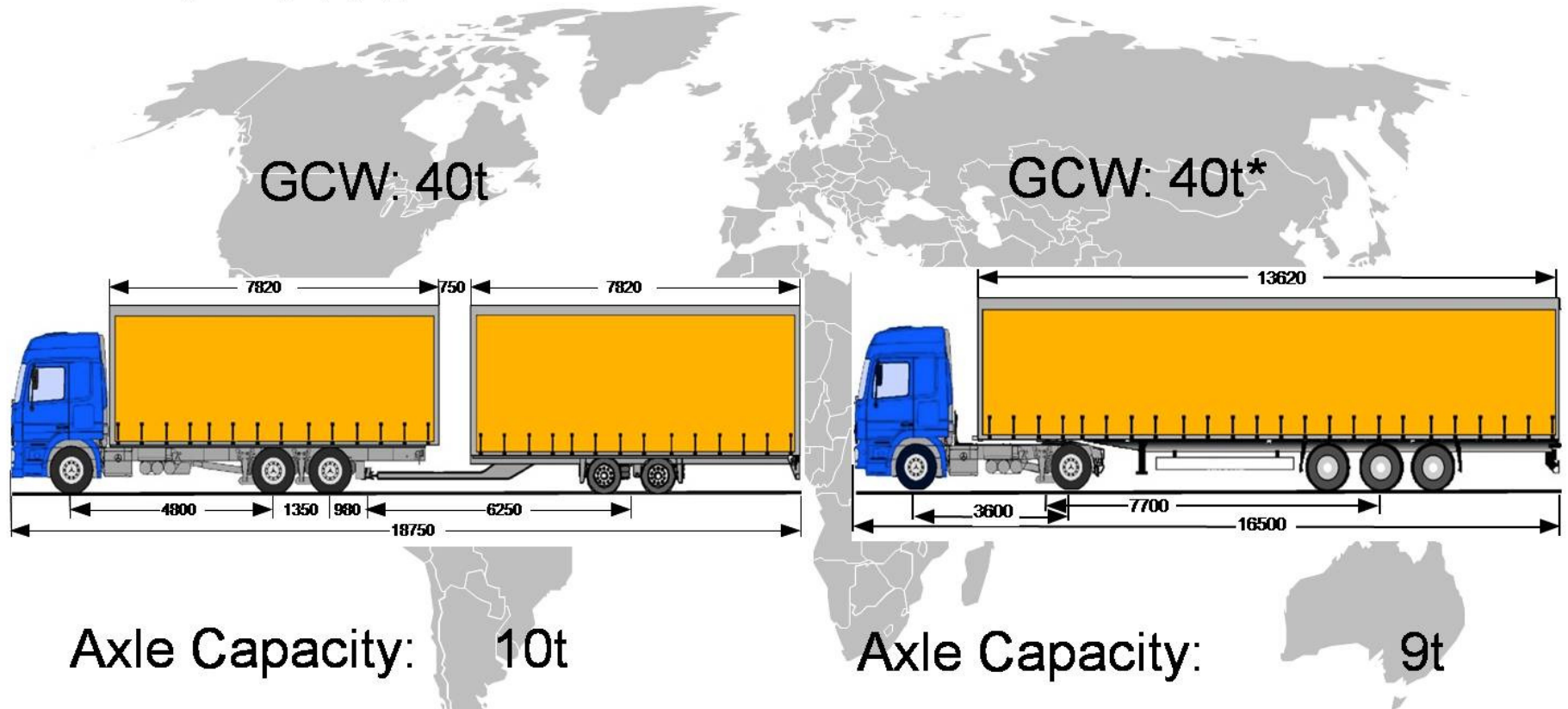
- **Dimensions and Weights**
  - **Axle Loads**
  - **Lengths**
  
- **Swept Path**
  
- **Compulsory Equipment**
  - **EBS**
  - **Lighting**
  - **Underrun Protection Device**





# Legal Requirements Standard Dimensions and Weights

## ➤ Axle Loads



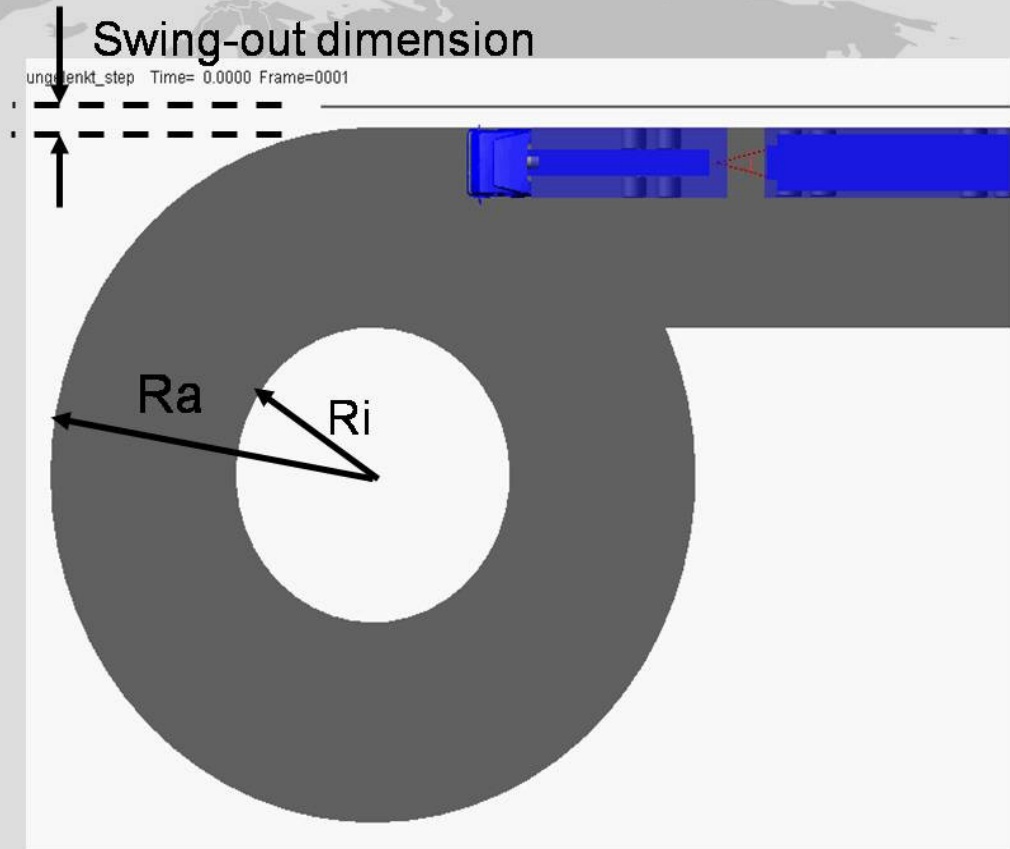
\* Exceptions: Germany: in combined transport with railway 44t  
Sweden: long vehicles 25,25 m, 60t

# Legal Requirements

## ➤ Swept Path

### Statutory requirements on vehicle manoeuvrability

- Section 7.6.1 of 97/27/EC, Section 32d of the road licensing regulations (StVZO)
- Turning area with  $R_a$  (outer radius) = 12.5 m and  $R_i$  (inner radius) = 5.3 m
- The front outermost limit of the tractor is routed along the outer circle
- If the tractor drives a complete circle ( $360^\circ$ ), it must remain within the turning area
- When entering the circle, the straight line touching the outer circle may be exceeded by max. 0.8 m (swing-out dimension)




# Legal Requirements

- **Compulsory Equipment**
- **EBS with TRS**



EBS 2S/2M m. PTC\*



The EBS (TRS =Trailer Roll Stability) is stipulated by law since **11 July 2008**, according to ECE R13, 11th series of amendments.



# Legal Requirements

- **Compulsory Equipment**
- **Lighting**

Lighting Directive according to ECE Regulation R 48



## LED Failure Detection/ Load Simulation

Vehicles, approved for public roads, need to have a failure detection for the direction indicator and brake light functionality: A malfunction of a light must be indicated, either as a visual or audible signal (or both) in the driver cabin. This law is applicable in all ECE states. Due to this the LED indicator- and brake lights need to have an integrated electronic circuit for bulb failure detection.





# Legal Requirements

## ➤ Compulsory Equipment

### ➤ Contour Marking

- Since 10th of July 2011 the Contour Marking is stipulated by the European Directive 2007/35/EG.
- Applicable for all commercial vehicles
  - > 5t gross weight
  - > 6m length and a width of 2,10 m
- The reflecting contour markings are 50 cm wide stripes, according to ECE-R 104. The fitting of these stripes are stipulated in the ECE-R 48.
- The contour markings are always on the back and on the side of the trailer.



# Legal Requirements

- **Compulsory Equipment**
  - **Load Restraint**

In Europe the load restraint gains in importance. Since 1991 the VDI directive 2700 set a requirement to secure loads.

- **Example:**

As from late 2010 beverage vehicles are required to be certified to VDI 2700 page 12.

Vehicles with additional certification in accordance with EN ISO 12642 (Muti-Safe System) are allowed to transport beverage crates / kegs **without additional load restraints** provided the vehicle has a **full load** and thus the integrity of the load is maintained.







# Agenda:

- Market Details
- Legal Requirements
- **Trailer Types**
- Typical European Recycling Cears
- Future Prospects
- Technical and Market Trends

# European Market- Trailer Types



Curtainsider / Flat Top



Dry Freight Van



Tipper

## Standard Vehicles



Refrigerated Van



Container / Swap Body



Tanker / Bulk Trailer



Car Carrier

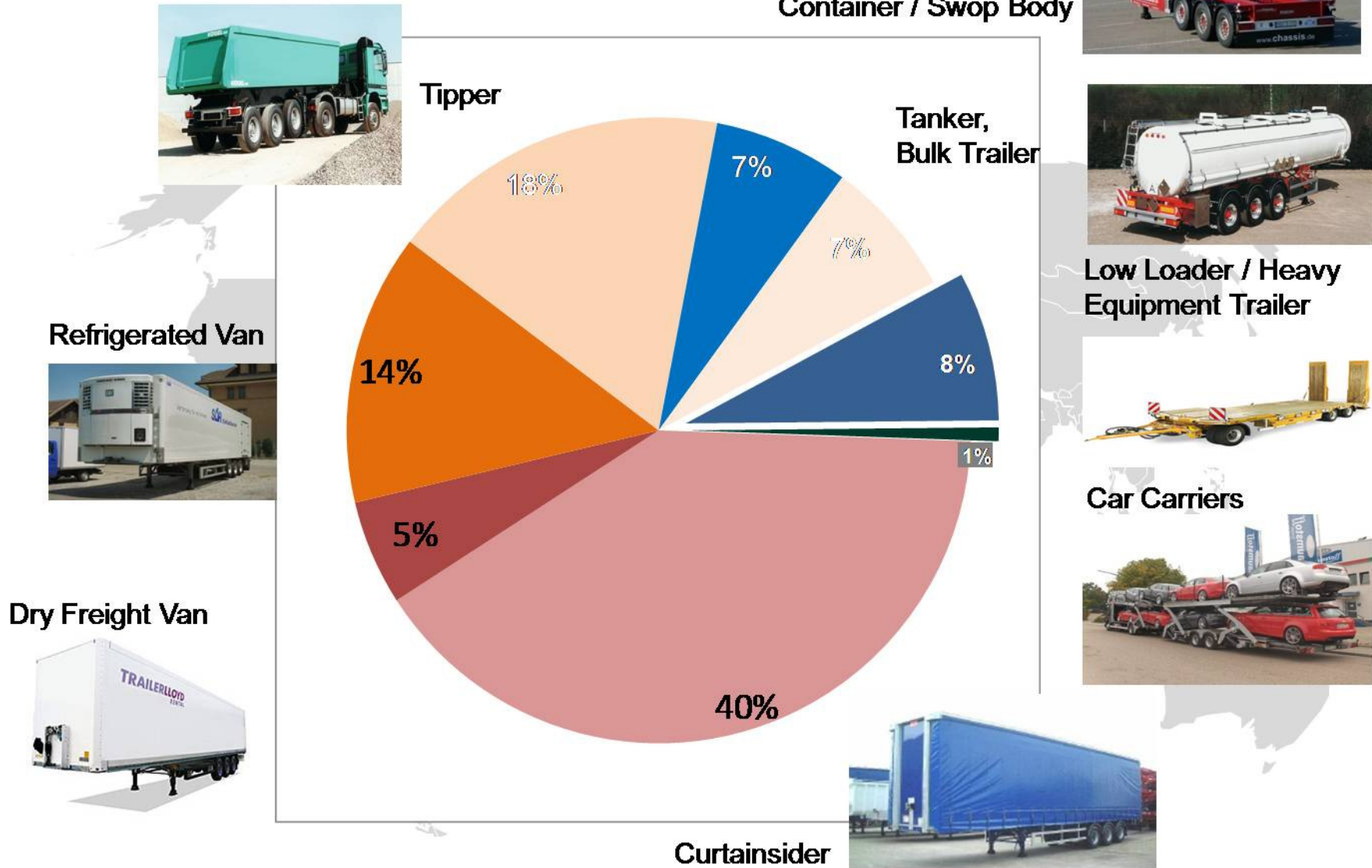
## Special Vehicles



Low Loader / Heavy Equipment Vehicle



# European Market Shares according to Trailer Types



Tipper

Container / Swap Body



Tanker, Bulk Trailer



Low Loader / Heavy Equipment Trailer



Car Carriers



Refrigerated Van



Dry Freight Van



Curtainsider







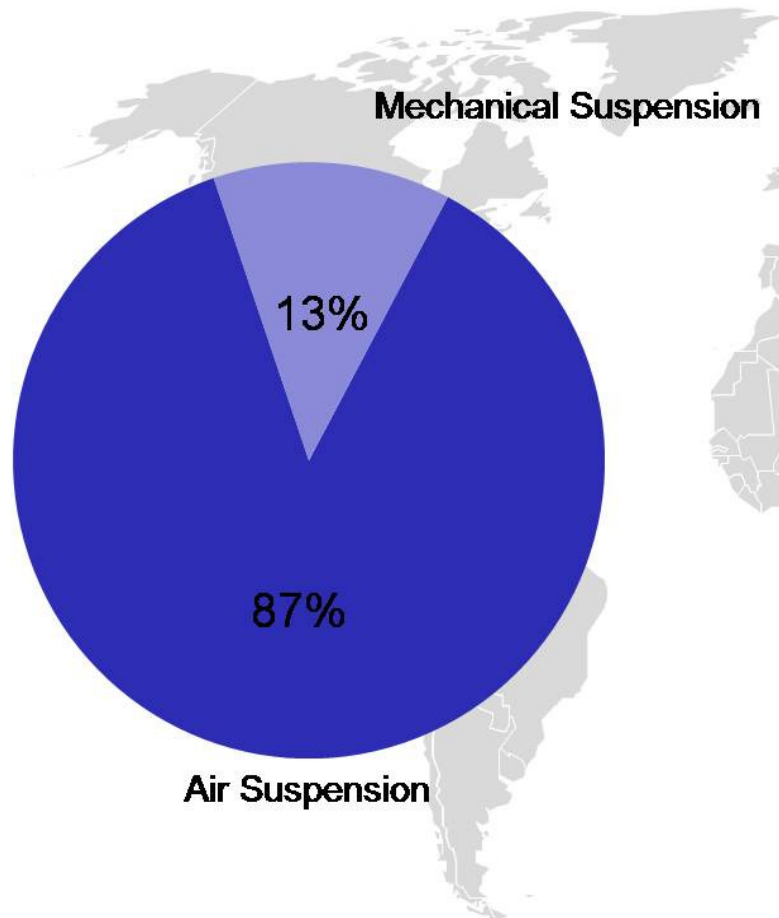
# Agenda:

- Market Details
- Legal Requirements
- Trail@'s
- **Typical European Running Gear**
- Future Prospects
- Technical and Market Trends

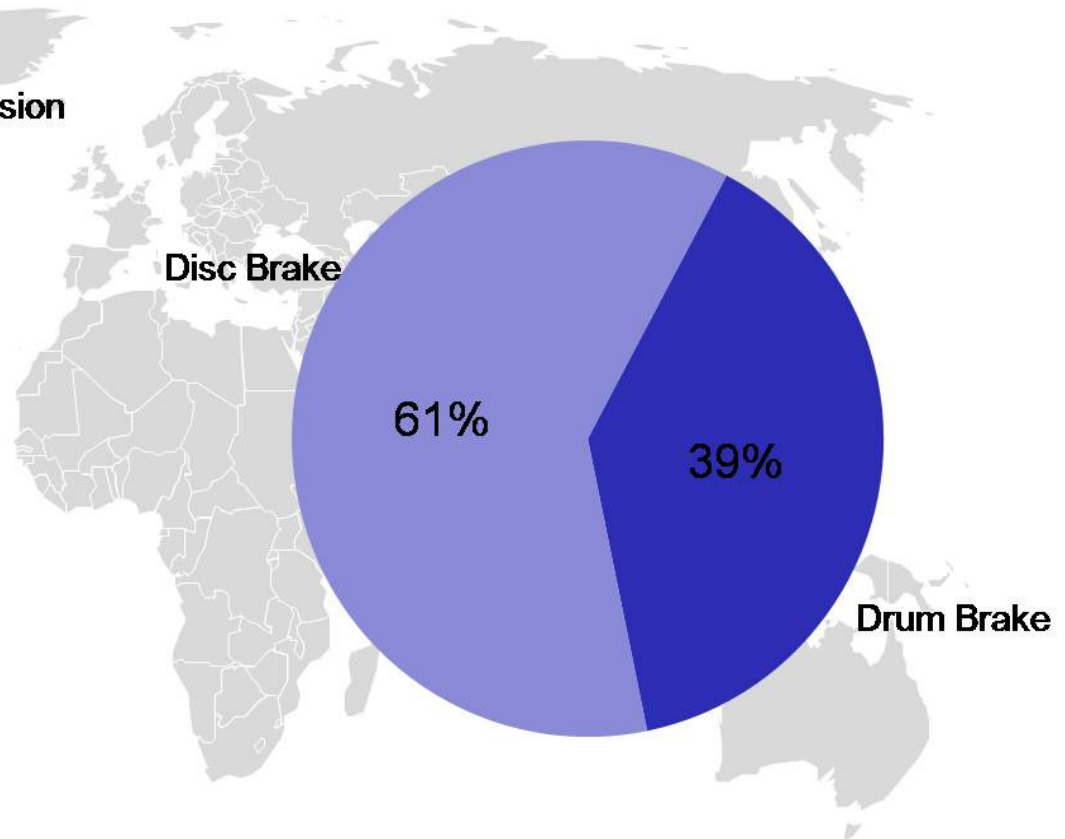


# Typical European Running Gear 2011

Suspension Types



Brake Types



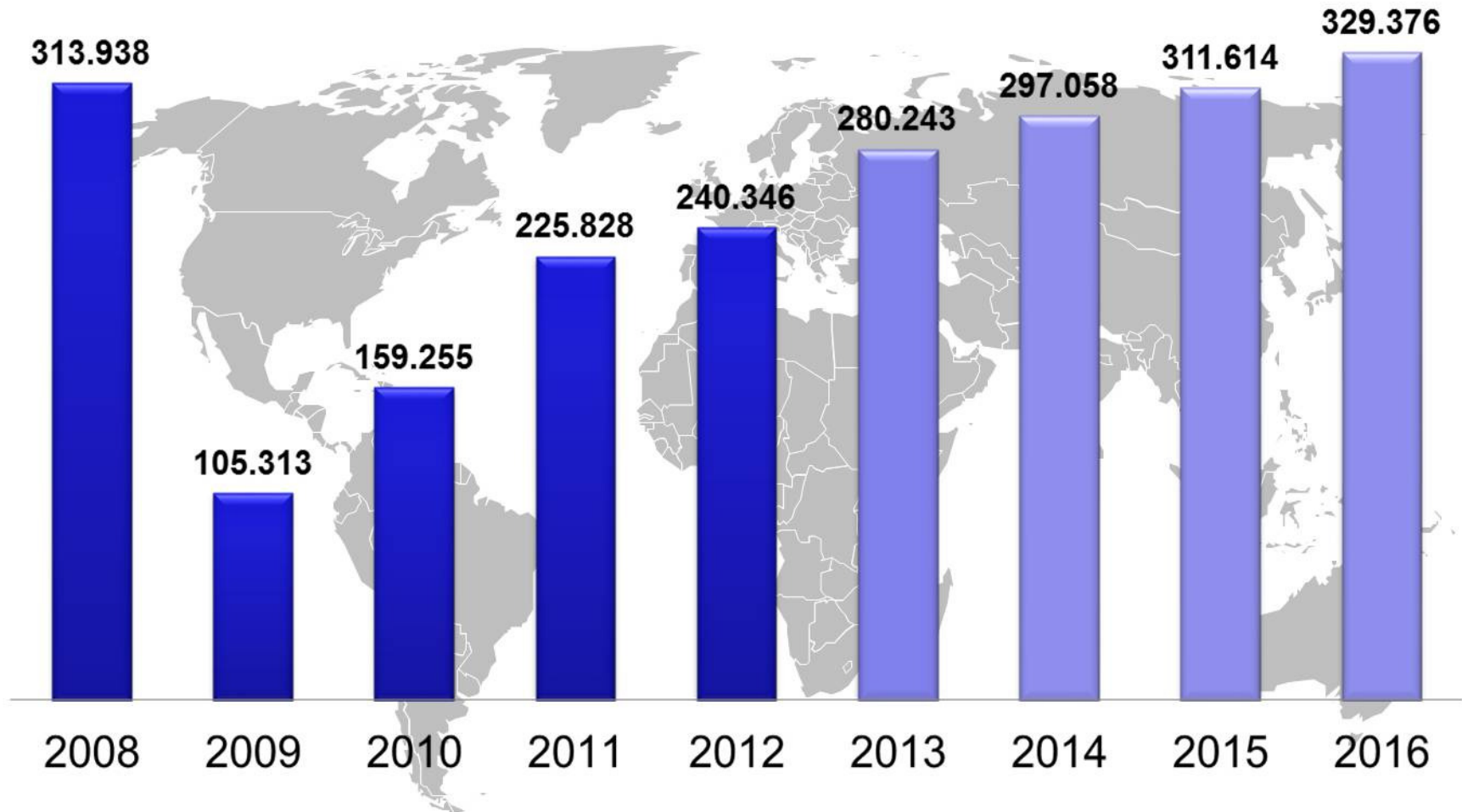


# Agenda:

- Market Details
- Legal Requirements
- Trailer types
- Typical European Recycling Centres
- **Future Prospects**
- Technical and Market Trends



# Trailer Production – Forecast until 2016





# Agenda:

- Market Details
- Legal Requirements
- Trailer types
- Fahrwerksausstattung
- Future Prospects
- **Technical and Market Trends**



## Market Trends: Extra Long Vehicles - Eurocombi



### Main Task for the European Transport Industry:

- Huge growth of the Commercial Transport volume is expected => overstressing the existing infrastructure
- Demographic Development => Lack of Drivers
- Environmental Requirements => CO<sub>2</sub> Reduction

## Current Situation: Long Commercial Vehicles

Within Europe various different concepts exist:

- In Sweden vehicle combinations of 25,25m length and 60t gross weight are permissible (only long distance traffic).
- In Germany an in-field test with 200 vehicles is in progress (max. length 25,25m, gross weight 40t or 44t in combined road- railway traffic). The operation is limited to certain routes and motorways- metropolitan operation is not allowed.
- In the Southern European countries the long commercial vehicles are currently not intended to be implemented



Prime Mover plus centre axle drawbar trailer.  
Max. length 25,25 m



Truck with dolly plus semi trailer.  
Max. length 25,25 m



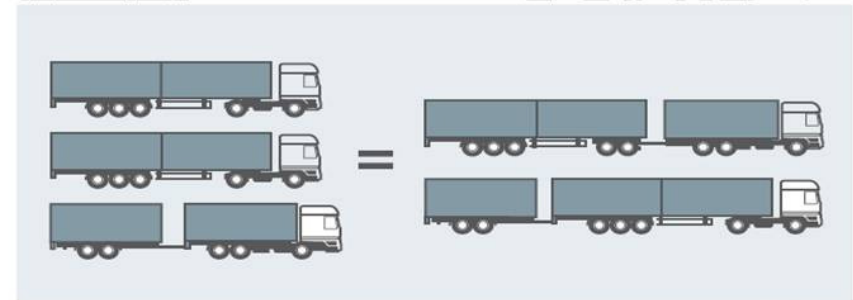
Prime Mover with two semi trailers (B-Double)  
Max. length 25,25 m

## Advantages:

- Greater transport efficiency (a 25.25 m tractor/trailer unit has a loading capacity of 150 m<sup>3</sup> instead of 100 m<sup>3</sup>)
- Takes up far less space on the road (two 25.25 metre tractor/trailer units can replace three of today's standard semi-trailers)
- Reduced fuel consumption 15-30%
- Lower noise emissions
- Lower axle loads (depending on design)



Quelle: VDA



Quelle: VDA



# Disadvantages

## New 25.25 m tractor/trailer combinations



- No suitable infrastructure (e.g. parking spaces at service areas, turning facilities, petrol stations)
- Meets the criteria of the Swept Path with additional steering axle(s) only
- Manoeuvrability of long vehicle combinations is limited
- No concepts for separating and/or breaking up the prime mover and trailer units prior to distribution in urban centres.

# Legal Requirements

## ➤ Swept Path

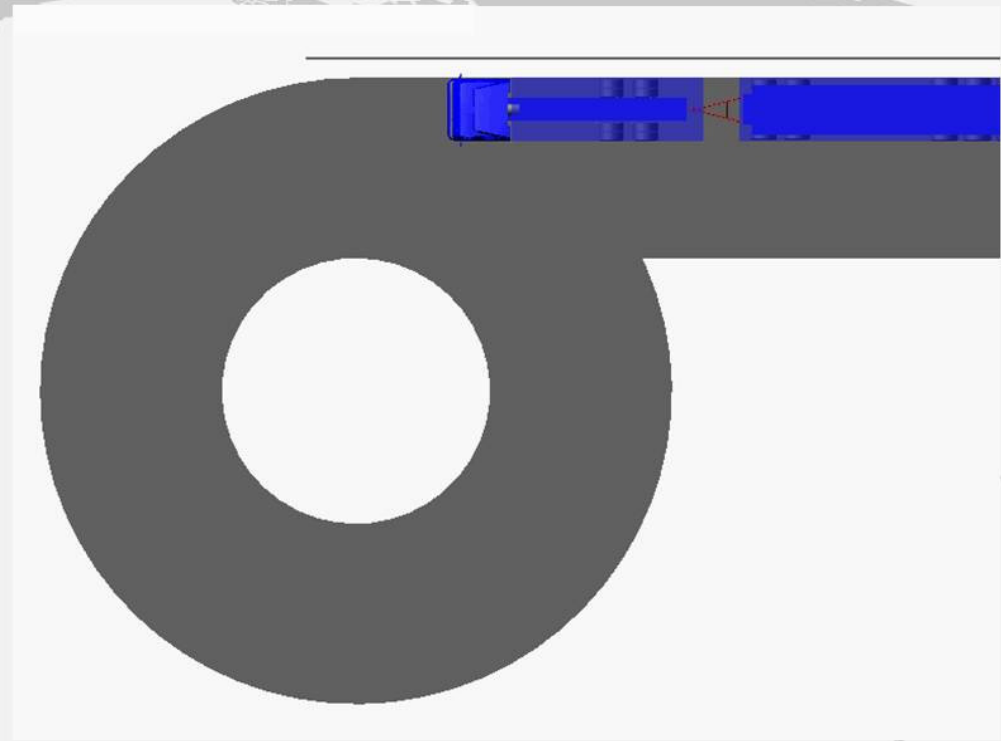
### Special challenge for 25.25 m tractor/trailer combinations

Circular driving simulation:

Dolly with 2 rigid axles, semi-trailer with self-steering axle

**Investigations of the vehicle dynamics were carried out with this concept using computer time frame simulation**

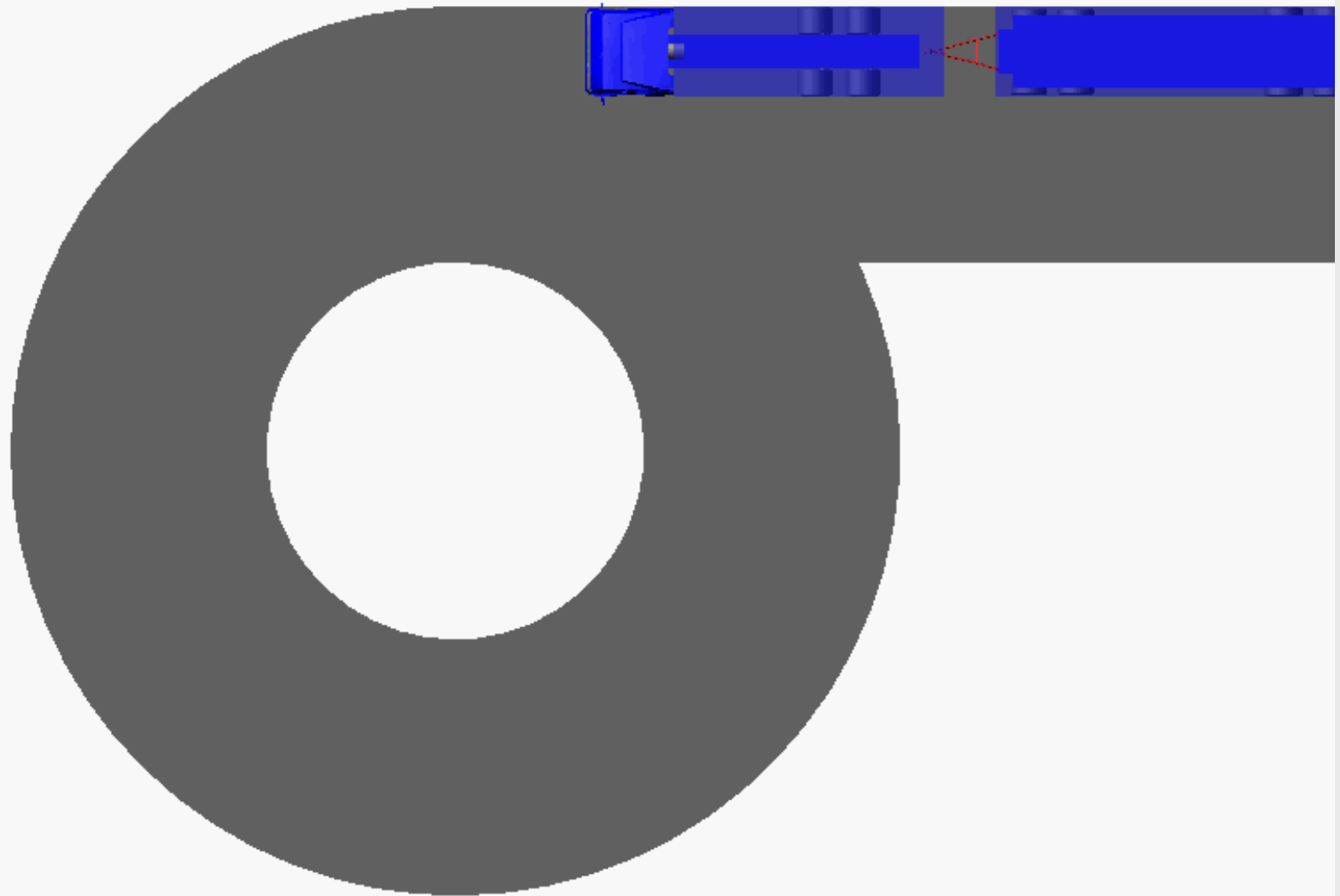
**The turning circle criteria is not met!**







ungelenkt\_step Time= 0.0000 Frame=0001





# Commercial Vehicle Concepts of the Future

## - more goods with less traffic:



BPW has got the solution – with systems which meet all of today's statutory requirements.

# Technology



## The solution: two command-steered BPW axles in the dolly

- **Two SHBFHALMTLL 9010 V30 command-steered self-steering axles with reinforced steering lock for hydraulic twin-steer function - track 2095 mm, centre of hanger bracket 1200 mm/centre of spring 980 mm (3-D trailing arm)**
- **Steering system: hydraulic twin-steer function, Manufacturer: HTS (HYDRO TECH SYSTEMS S.R.L., Sala Bolognese, Italy)**
- **The steering signal is the turning angle between the truck and the drawbar, received via a lever mechanism; transmitted via two Bowden cables to each axle**
- **Hydraulic rotary distributor on axles: nominal value comes from Bowden cable, actual value from track rod**



# Technology



## The solution: two command-steered BPW axles in the dolly

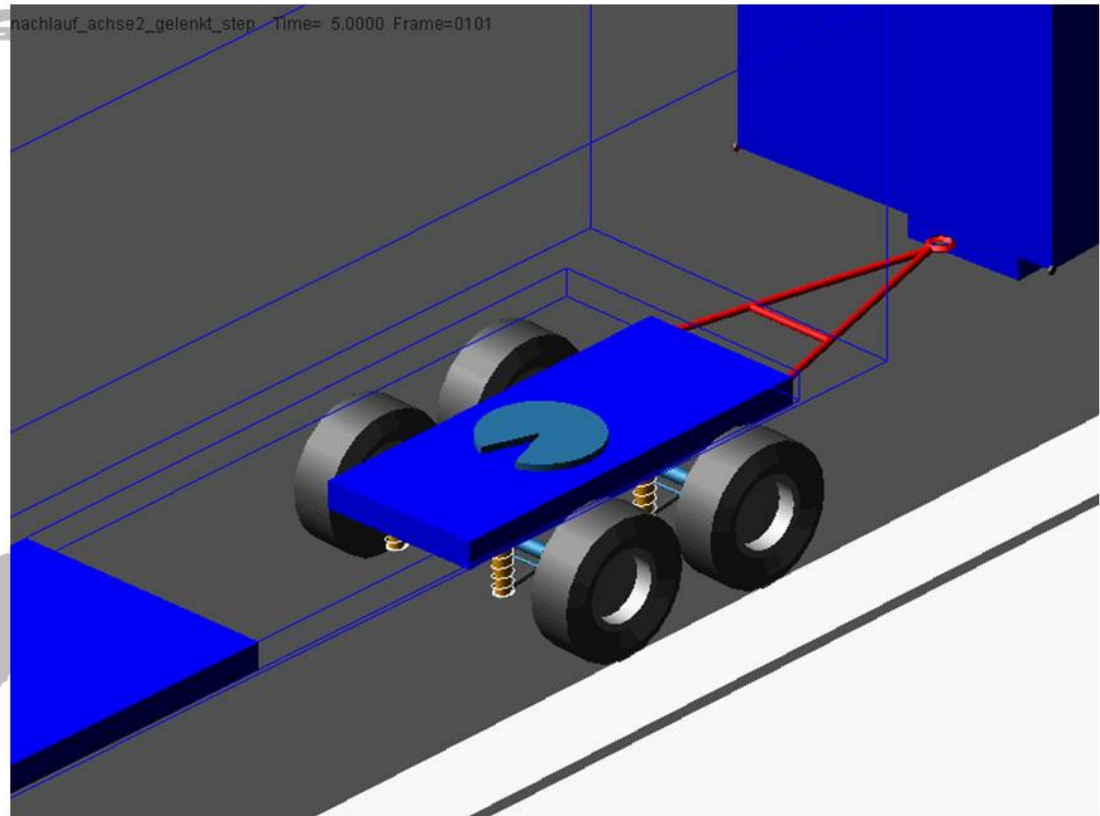
- Both axles perform the same steering angle (theoretically a different steering angle is also possible)
- When the dolly is not steered, the dolly's steering axles are pneumatically operated in the neutral position and mechanically locked by means of a spring.
- The steering is locked at a speed > 25 km/h, released by means of hydraulic pressure.
- The hydraulics are supplied by means of an electric pump in the dolly, the power supply from the two starter batteries and via a charging wire. The pump only operates when the steering is operated.
- The steering is monitored by central control electronics with a diagnostic function. In the event of a malfunction, the system is pneumatically operated in the neutral position and mechanically locked.

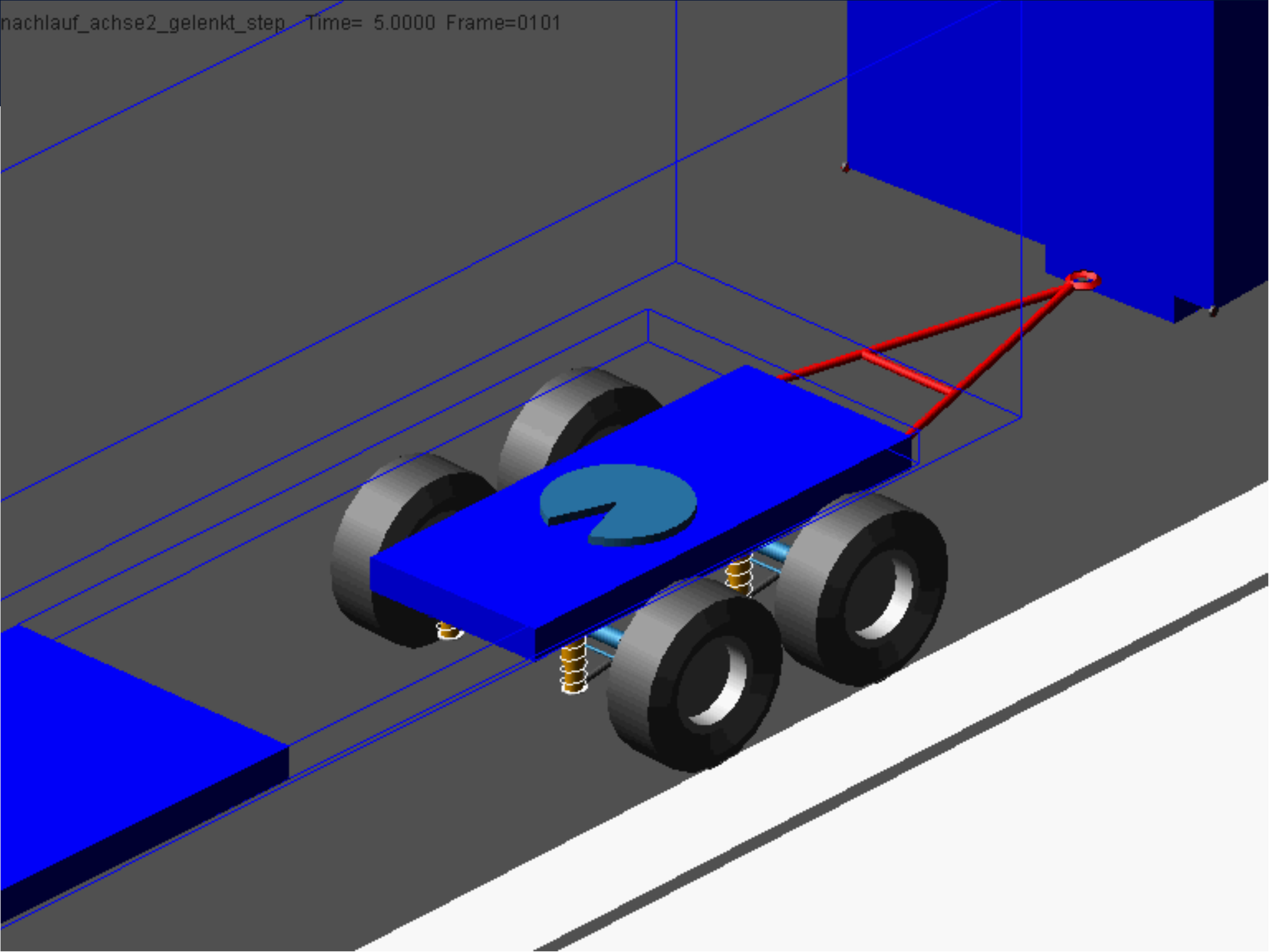


# Legal Requirements

## ➤ Swept Path

Driving simulation:  
two command-steered  
BPW axles in the dolly





# Legal Requirements

## ➤ Swept Path

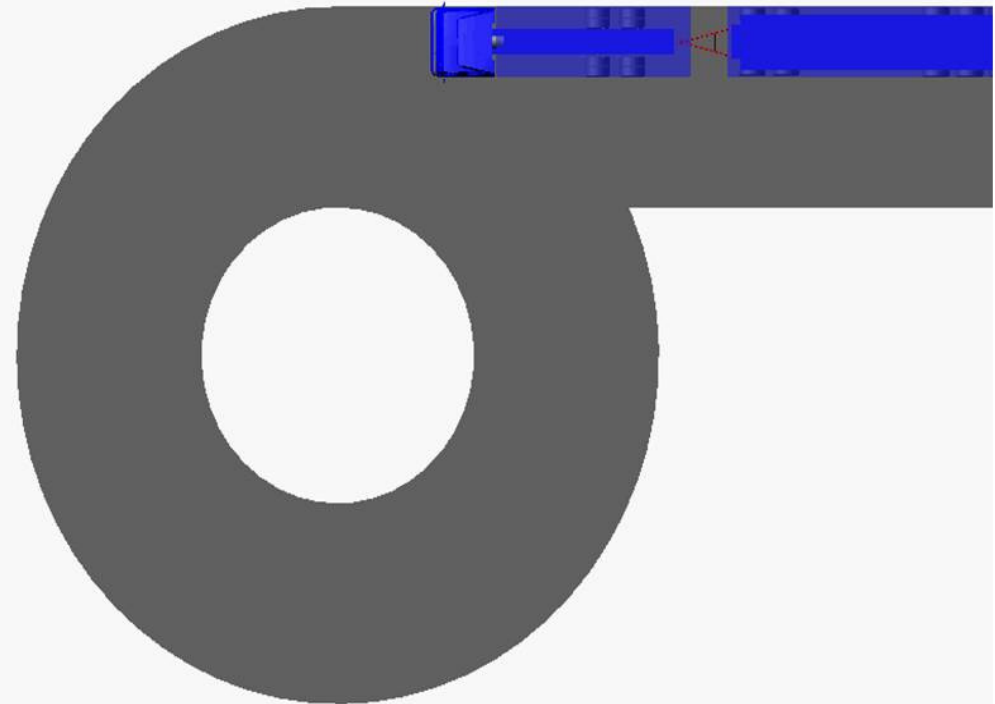
### Simulation of circular driving:

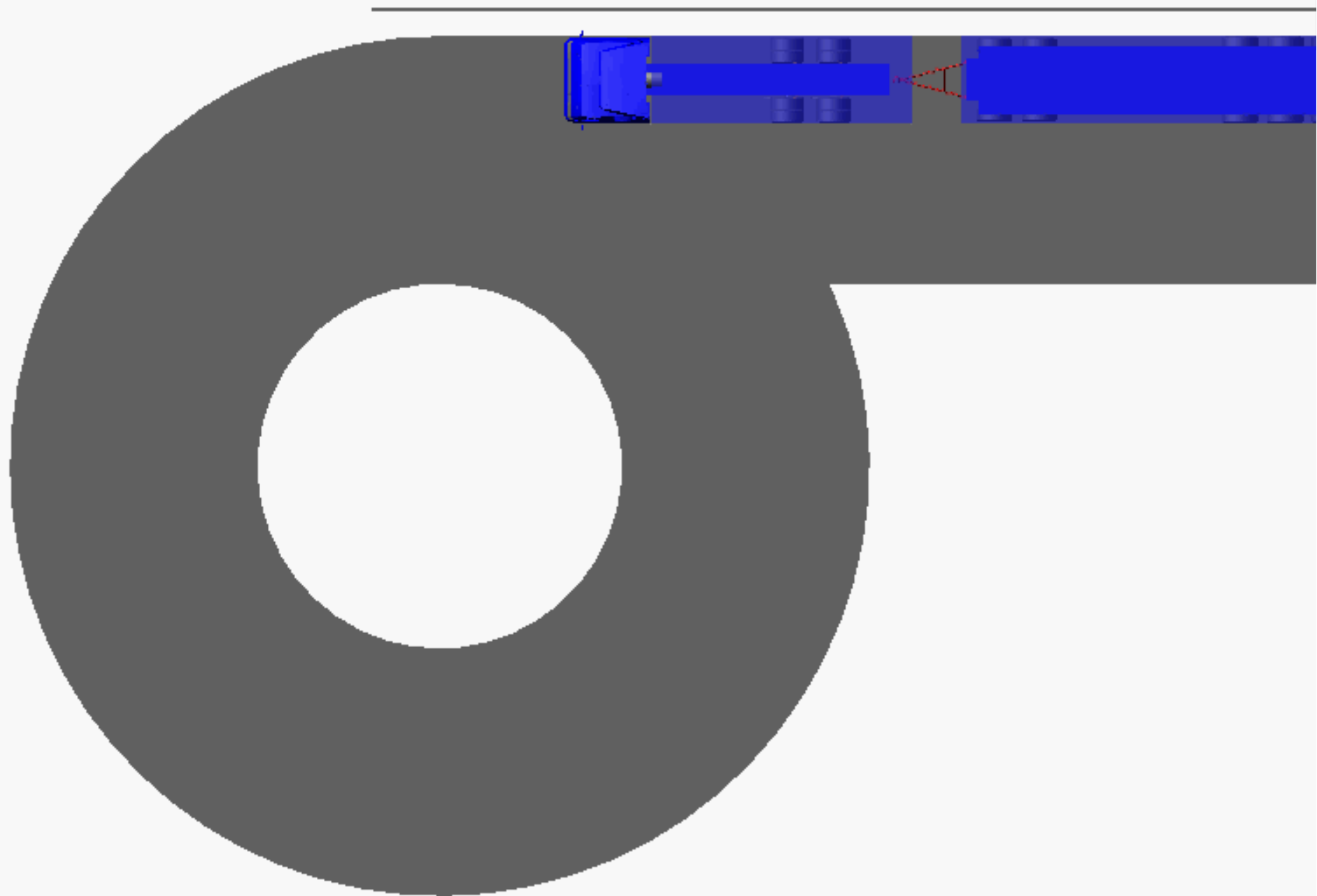
Dolly with 2 command-steered axles,  
semi-trailer with  
self-steering axle

**By using two command-steered axles on the dolly, today's turning circle requirements (statutory conditions on vehicle manoeuvrability) can be met with 25.25 m long dolly combinations.**

**The turning circle criteria is met!**

nachlauf\_achse2\_gelenkt\_step Time= 0.0000 Frame=0001











# The Future

The commercial vehicle concepts of the future today

