



evropský
sociální
fond v ČR



EVROPSKÁ UNIE



MINISTERSTVO ŠKOLSTVÍ,
MLÁDEŽE A TĚLOVÝCHOVY



OP Vzdělávání
pro konkurenceschopnost

INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

KKS/ZDMT Automobiles

Lecture 7

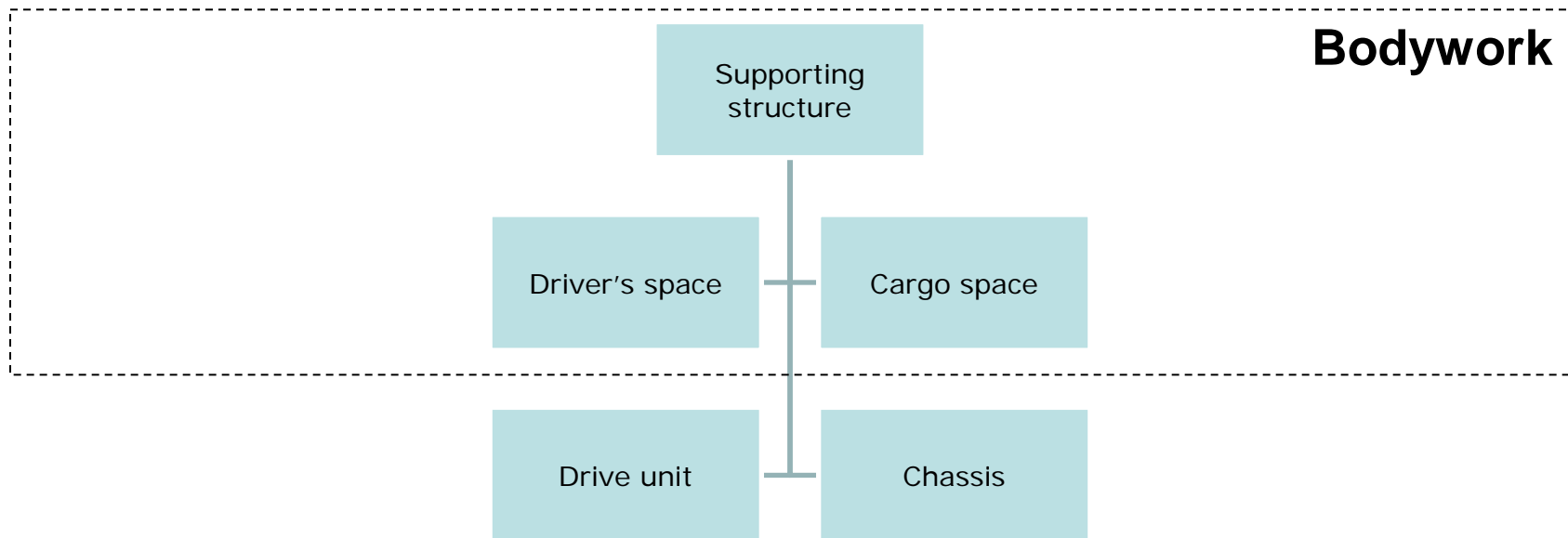
Ing. Vladislav Kemka

2011, UWB Pilsen

**Project CZ.1.07/2.2.00/15.0383
Inovace studijního oboru Dopravní a manipulační technika
s ohledem na potřeby trhu práce**

AUTOMOBILE FUNCTION GROUPS

- Motor vehicles transport people and cargo. The type of vehicle depends on its role.



CLASSIFICATION OF AUTOMOBILES according to task

- personal
- bus
- delivery
- special
- towing
- connecting
- tractor
- other



REQUIREMENTS

- ❑ Requirements on the construction of motor vehicles are set by the directives of the European Economic Commission and EHS/ES directives.
- ❑ Other requirements are given in national and ISO standards.

CLASSIFICATION

- Basic vehicle classification
- Classification **L** – less than 4 wheels
- Classification **M** – min. 4 wheels and used for personal transport
- Classification **N** – min. 4 wheels and used for cargo
- Classification **O** – connecting vehicle
- Classification **T** – agricultural or forestry tractor
- Classification **S** – work machine
- Classification **R** – other vehicles which don't fit into the above classifications

- Class M is divided into
- M1 – a vehicle with a maximum of 8 seats for transporting people apart from the driver, or a multi-purpose vehicle
- M2 - a vehicle with more than 8 seats for transporting people apart from the driver, with a maximum weight of 5,000 kg.
- M3 - a vehicle with more than 8 seats for transporting people apart from the driver, with a maximum weight exceeding 5,000 kg.



- Class N is divided into
- N1 – weight does not exceed 3,500 kg
- N2 – weight over 3,500 kg but does not exceed 12,000 kg
- N3 – weight exceeds 12,000 kg.



VEHICLE DIMENSIONS

- Dimensions of road vehicles
- Greatest permitted width
 - M1 2.5 m
 - M2, M3, N, O, OT, T 2.55 m
- Greatest permitted height
 - Vehicles including trams and trolleybuses including pantograph in lowest operating position 4 m
 - Class L 2.5 m



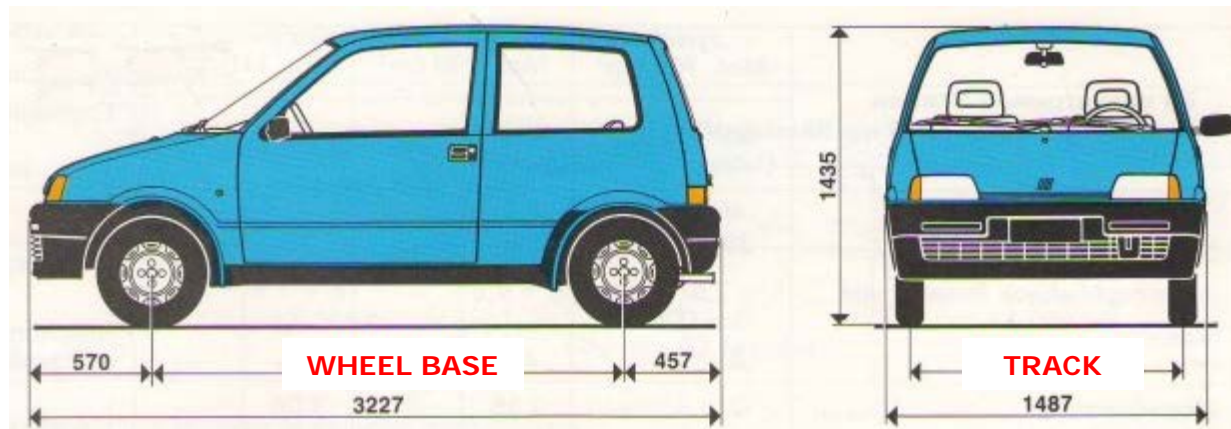
VEHICLE DIMENSIONS

□ Greatest permitted length

- Individual vehicle with exception of bus and semi-trailer 12 m
- Bus with 2 axles 13.5 m
- Bus with 3 or more axles 15 m
- Truck with trailer 16.5 m
- Motor vehicle with 1 trailer 18.75 m
- Vehicle with 2 trailers or trailer and 1 semi-trailer 22 m

□ Other important dimensions:

- track – distance between the tyre centres
- wheel base– distance between axle centres, sum of partial wheel bases



- ❑ **Gross weight** - the maximum allowable total weight of a vehicle in operation on a road
- ❑ **Gross axle weight** - the maximum allowable total weight of a static vertical load acting from the axles on the chassis surface
- ❑ **Technically permissible maximum laden mass** means the maximum mass of the vehicle based on its construction and performance, stated by the manufacturer.
- ❑ **Mass of the vehicle in running order** means the mass of the unladen vehicle with bodywork, and with coupling device in the case of a towing vehicle, in running order, or the mass of the chassis with cab if the manufacturer does not fit the bodywork and/or coupling device (including coolant, oils, 90 % fuel, 100 % other liquids except used waters, tools, spare wheel and driver (75 kg), and, for buses and coaches, the mass of the crew member (75 kg) if there is a crew seat in the vehicle).

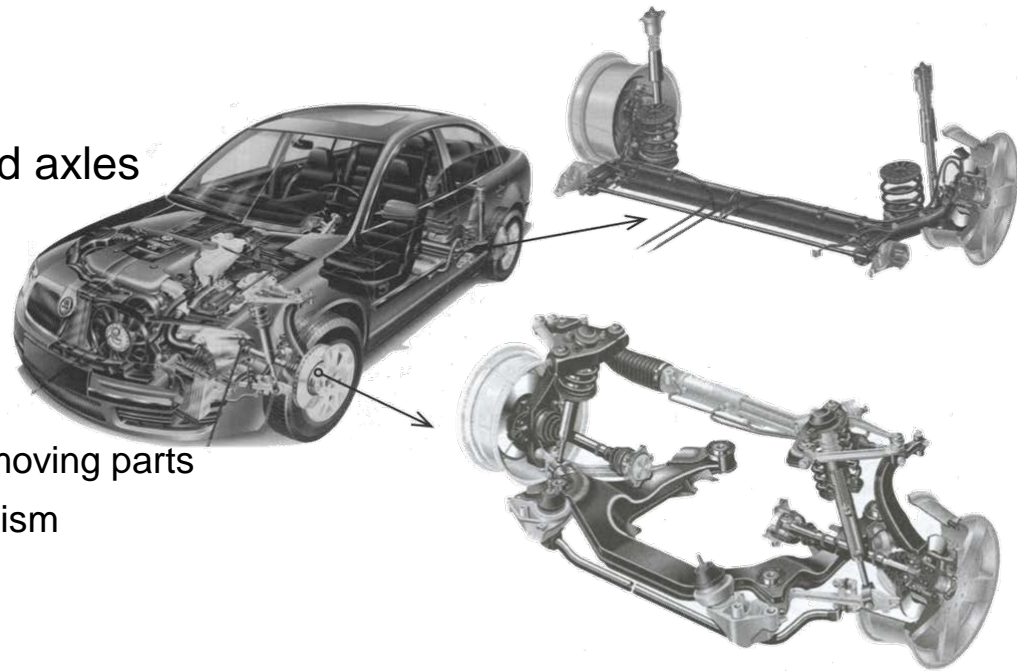
VEHICLE WEIGHT

- Weight of road vehicles (applicable in Czech Republic)
- the maximum allowable total weight on the axles must not exceed
 - on individual axles 10 t
 - on individual drive axles 11.5 t
- the maximum allowable total weight of a road vehicle must not exceed
 - motor vehicles with 2 axles 18 t
 - motor vehicles with 3 axle 25 t
 - for tandem/articulated vehicles 48 t

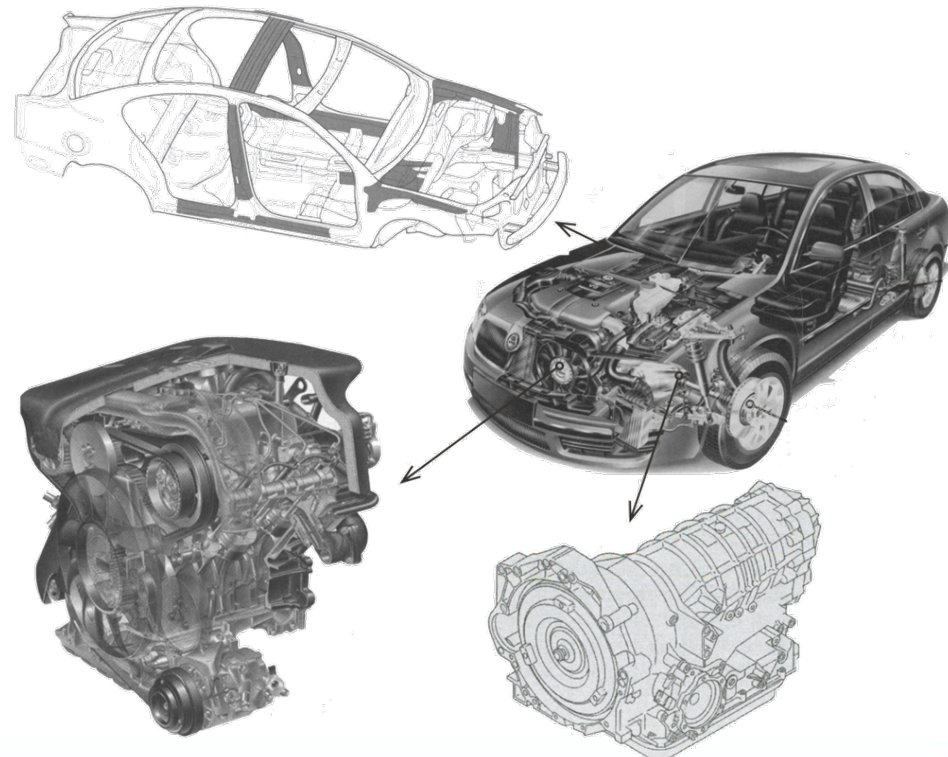


Motor vehicle

- Underbody
 - Chassis
 - Frame
 - Wheel mounts and axles
 - wheel
 - axle
 - suspension
 - brakes
 - supporting and moving parts
 - steering mechanism
 - Wheel control
 - Braking



- Underbody
 - Drive
 - Motor
 - internal combustion
 - electric
 - Gear change
 - clutch
 - transmission
 - Cardan shaft
 - axle drive
 - other
 - Chassis
 - Driver's compartment
 - superstructure

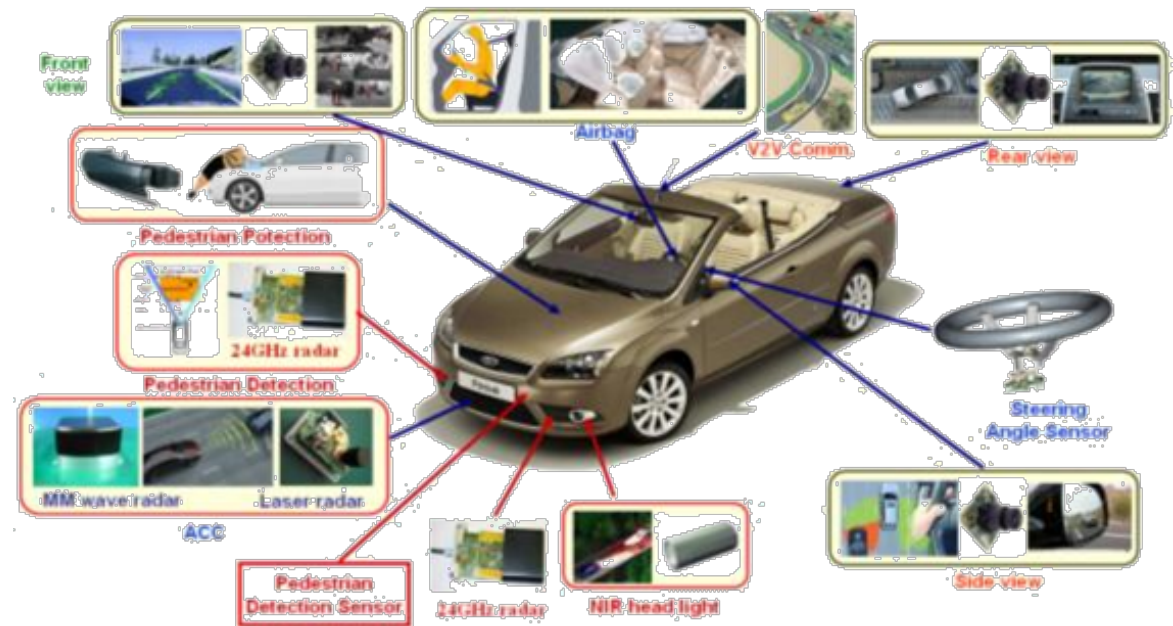


The task of road safety is to reduce the number of traffic accidents on roads.

KILLED per 1 BILLION Veh-Km	Rate (year 2003)
Finland, United Kingdom	7.6
The Netherlands	7.7
Australia	8
Norway, Sweden	8.3
Switzerland	8.8
Canada	8.9
The United States	9.4
Denmark, Germany	9.7
France, Ireland, Italy	10.9
Japan	11.2
Austria	11.7
New Zealand	12.4
Iceland	16
Belgium	16.3
Slovenia	16.7
Korea	26
Greece	26.7
Czech Republic	31.7
Slovak Republic	46.9

- pedestrian
- passenger
 - Active safety
 - Passive safety

- chassis
- First aid



□ Active safety

Safety measures which lower the likelihood of an accident occurring.

- Drive safety- properties reducing drive inadequacies
- Conditional safety – measures ensuring drive comfort
- Visibility – ‘see and be seen’
- Operational safety – reliability and vehicle control

□ Passive safety

Safety measures which lower the results of an accident.

- External safety – vehicle outline is designed to minimize injury
- Internal safety – measures to protect or limit injuries to passengers

PASSENGER CAR

- Passenger cars are for transporting up to 9 passengers and their luggage or cargo and may also tow a trailer.
- Chassis design
 - Sedan
 - Estate
 - Hatchback
 - Coupe
 - Cabriolet
 - MPV
 - Off-road, SUV



- Buses are motor vehicles for transporting a minimum of 9 passengers including the driver and their luggage. Buses can have one or two decks.
- classification
 - Minibus
 - Midibus
 - City
 - Public service
 - Long distance
 - Double-decker
 - Articulated



COMMERCIAL VEHICLES

- Commercial vehicles are designed to carry a cargo. They can also tow a trailer, a truck is designed to tow a connected vehicle.

- Classification by weight:
 - Light (<3.5t)
 - Medium (3.5-12t)
 - Heavy (>12t)

COMMERCIAL VEHICLES

- Classification by role
 - Pick-up
 - Delivery
 - Flat-bed
 - Platform trailer, dumper truck, box truck
 - Truck
 - Special



CONNECTED VEHICLES

- ❑ Connected vehicles do not have their own drive and are designed for towing by various types of motor vehicles.

- ❑ Trailer

- ❑ Semi-trailer





INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

Acknowledgements

**This project is co-financed by
Evropským sociálním fondem a státním rozpočtem České republiky**

**Project CZ.1.07/2.2.00/15.0383
Inovace studijního oboru Dopravní a manipulační technika
s ohledem na potřeby trhu práce**