

6

DRIVING AT A SUITABLE SPEED

Stopping distance →

Rain →

Snow and ice →

Fog →

Wind →



Stopping distance

Excessive or unsuitable speed is a factor in one in two fatal accidents. To stay in control of your vehicle, adapt your speed to suit traffic conditions, the weather, the load you are carrying, the state of your tyres, etc.

Keeping your distance from the vehicle in front of you is the best way to avoid a collision. If you saw a danger, would you be able to brake straight away?

No - it's **impossible!**
Why is that?

Stopping distance

The stopping distance of a vehicle is the distance the vehicle travels during the driver's reaction time plus the braking distance.

There is always a slight delay before the driver reacts.

- The eye receives information
- The information is transmitted to the brain
- The brain analyses the information and gives instructions to take action
- These instructions are transmitted to the muscles



The amount of time that passes between perceiving the information and applying the brakes is called **reaction time**. It is estimated to last for one second.

If the driver is tired, has been drinking, or is distracted, etc., reaction time is more than one second.

During reaction time, the vehicle continues at the same speed and travels a distance called the **reaction distance**.

The **reaction distance** depends on:

- speed, and
- the state the driver is in.

The reaction distance can be reduced if the driver is ready to brake as soon as there is any doubt about the situation.

To calculate the approximate value of reaction distance, with a reaction time of one second, the following approximate formula may be applied:

$$\left[\frac{\text{speed}}{10} \right] \times 3$$

Example: speed = 50 km/h

$$\left[\frac{50 \text{ km/h}}{10} \right] \times 3 = 15 \text{ metres}$$

→ The reaction distance is 15 metres.

Braking distance

On top of the reaction distance, there is also the **braking distance**, i.e. the distance travelled between the moment braking starts and the moment the car comes to a standstill.

The braking distance increases in proportion to the square of speed.



If speed is doubled, the braking distance is multiplied by four.

To calculate approximate braking distance on a dry road, with good tyres and a vehicle in perfect condition, apply the following simplified formula:

$$\left(\frac{v}{10} \right)^2$$

Examples:

Speed	Braking distance (m)
30 km/h	4.5 metres
50 km/h	12.5 metres
70 km/h	24.5 metres
90 km/h	40.5 metres
100 km/h	50 metres
130 km/h	84.5 metres

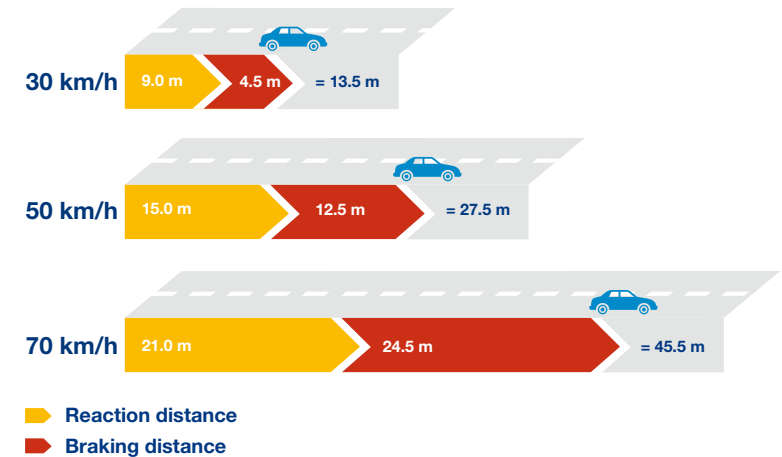


Warning - don't let yourself be taken in by the short braking distances given in specialist publications. These "record" distances can only be achieved by professional drivers in braking conditions that are very rarely found in real life.

The braking distance depends on:

- speed
- weather conditions (rain, snow, ice)
- the state of the road (quality of the road surface, etc.)
- the configuration of the place (uphill, downhill, etc.)
- the state of the tyres
- the state of the brakes
- to a lesser extent, the weight of the vehicle
- the load

Stopping distance
= reaction distance
+ braking distance



Did you know?

The faster you drive,

- **the narrower the driver's field of vision**
At 130 km/h, the driver's field of vision is as little as 30°; this is called "tunnel" vision
- **the longer the stopping distance**
The driver's reaction time is incompressible (1 to 2 seconds on average) and the braking distance increases
- **the more tired you get**
Processing a large quantity of information in a very short space of time and constantly adapting your vision constitutes a substantial stress, resulting in fatigue and loss of vigilance

- **the more serious the accident**

At 100 km/h against a fixed obstacle, the force of the crash is the equivalent of falling 40 metres. At this speed, and with a seat belt, the internal organs (brain, heart, etc.) continue to move forward under the effect of inertia and crash into the internal walls of the body. This is called a “clean” death, because there is no injury visible on the outside of the body

- **the more fuel you use**

Driving on the motorway at 120 km/h rather than at 110 km/h increases your fuel consumption by 1 litre per 100 kms

Some advice

- Adapt your speed to your surroundings at all times (the road, weather conditions, etc.)
- On a motorway, drive at as constant a speed as possible
- Speed limits indicate a maximum not to be exceeded, not an average speed for traffic
- In an emergency, and if your vehicle is fitted with ABS, press the brake pedal down hard and maintain pressure when the pedal vibrates. ABS prevents the wheels blocking in case of heavy braking, so that the driver can maintain control of the vehicle’s trajectory and avoid possible obstacles. The Highway Code lays down a safety distance, outside built-up areas, corresponding to

a time-gap of two seconds between two vehicles travelling in the same direction. This distance is therefore greater the higher the speed

- Make sure you always leave enough of a safety distance between you and the vehicle in front
- Use the new technologies. Some devices enable you to avoid unwittingly breaking the speed limit; these include the speed limiter, which stops you exceeding a pre-set speed (not more than 120 km/h, for example). Using such devices enables drivers to adapt to the multiple limits that may vary in the course of a single journey
- Keep your vehicle in good condition - tyres and brake pads should be checked regularly

Rain

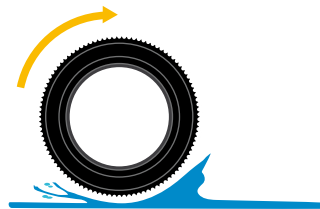
Rain reduces the grip of your tyres with the road

- Braking distances are longer
- Your vehicle doesn't hold the road as well on bends
- The wheels may skid if you start up too sharply

The road is particularly slippery when it rains after a long dry spell, because the water mixes with the dust on the surface and forms a type of white foam (sometimes called "summer ice").

Aquaplaning is the total loss of roadholding that happens when a layer of water has formed on the road and speed is too high.

The risk of aquaplaning increases as tyres wear.



Slowing down is the only way a driver can do anything to avoid the risk of aquaplaning.

When it is raining, the speed limit on the motorway in Luxembourg is 110 km/h.

Rain reduces visibility

Drops of rain are deposited on all the windows and outside mirrors; it is darker and contrasts are reduced.

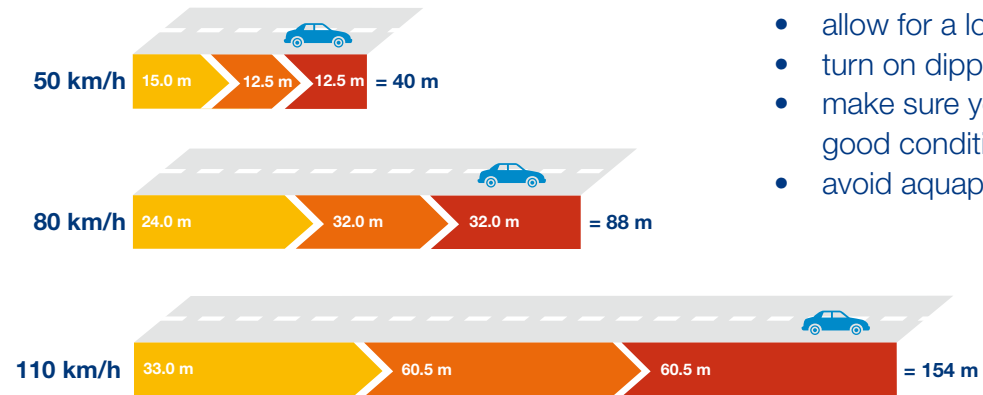
So it's a good idea to turn on dipped headlights so that you can see and be seen better.

If you drive close to pedestrians, take care not to splash them.

Driving in the rain is more tiring because you need to pay more attention.

Arrange to make more frequent stops during long journeys in the rain.

On a wet road, your braking distance may be twice as long.



- ▶ Reaction distance
- ▶ Braking distance on a dry road
- ▶ Additional braking distance on a wet road

Some advice

When it's raining or the road is wet:

- slow down
- increase the safety distance between your vehicle and the vehicle in front of you
- allow for a longer braking distance
- turn on dipped headlights
- make sure your windscreen wipers are always in good condition
- avoid aquaplaning by slowing down

Snow and ice

Snow, even when it starts to melt, makes the road surface slippery. Black ice forms in the presence of humidity when the temperature of the road surface is below freezing point (0°C). This can happen even if your dashboard temperature indicator shows an air temperature above 0°C.

Some advice

- Remove all snow and ice from the vehicle's windows, outside mirrors, headlights and number plates
- Remove snow from the roof and bonnet as well
- Turn on dipped headlights
- Avoid sudden acceleration and braking
- Use your engine for braking, and change gear gently and in good time.
- Have winter tyres fitted on your car
- If chains are compulsory:
 - don't wait until your vehicle is unable to move any further in the snow to fit the chains
 - stop at a layby for fitting chains, a car park, or a safety area, away from the road so that you don't get in the way of the traffic, and so that you stay safe
 - fit the chains onto the driving wheels - onto all four wheels is even better
 - don't forget to tighten them up after a few kilometres
 - drive very slowly - chains are only meant to be used in exceptional circumstances



Be aware that black ice is more likely to form in certain places - near woodland, on bridges, and in places exposed to the wind. You should slow down, adapting your speed to the grip, and increase safety distances.

Fog

Fog reduces visibility, sometimes very considerably. Slow down, and turn your dipped headlights on.

The risk factors

Fog produces three optical effects:

- extinction, i.e. the visual disappearance of obstacles
- a halo effect, apparent more particularly around lights
- a veiled effect, rendering obstacles less clear by blurring them

Depending on the effect, obstacles will not be perceived in the same way. Some will still be visible; others will not.

Fog alters the appreciation of distances and disturbs orientation.

- Drivers tend to speed up so as to not lose sight of the rear lights of the vehicle in front
- At the same time, a driver who sees a vehicle coming up behind him/her will tend to accelerate for fear of being hit. Instead of slowing down, the vehicles actually speed up
- All this, combined with failure to observe adequate safety distances, can cause very serious accidents

Some advice

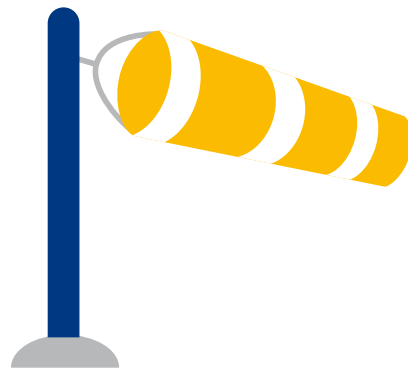
- You must be able to stop your vehicle within the limits of the existing area of visibility - this means you need to adapt your speed to the reduced visibility
- If the vehicle is fitted with fog lights at the front, this is the time to use them
- If visibility is less than 50 metres, you can turn on your rear fog lights, so that you can be seen from a greater distance; these lights are dazzling, so don't forget to turn them off as soon as the fog lifts, or as soon as you are closely followed by another vehicle
- If you are following a car, observe a much longer safety distance than usual, particularly if you can't see beyond it
- In thick fog, driving demands much more attention. Visual and nervous fatigue set in quickly. It's a good idea to stop for a break more often than usual
- Don't overtake in foggy conditions - the fog masks obstacles and makes it very hard to judge distances

Wind

A gust of wind can blow you off course - slow down, and keep a firm hold on the steering wheel.

Did you know?

- A gust of wind can blow you off course, particularly when you go from a sheltered area to into an exposed area, or when you overtake another vehicle. The danger is particularly noticeable on bridges, or when you emerge from a tunnel or woodland etc.
- Strong winds can break branches off trees or blow objects onto the roadway
- In places that are particularly exposed to side winds, a windsock indicates the strength and direction of the wind. The stronger the wind, the closer the windsock gets to being horizontal



Some advice

- To limit the effects of wind, slow down and keep a firm hold on the steering wheel
- If you overtake a two-wheeled vehicle, leave more room than usual in case it gets blown off course by a squall of wind

Sources: [La Sécurité Routière \(Luxembourg\)](#) (Association for road safety), [Code de la Route Populaire 2011 \(Luxembourg Highway Code 2011\)](#), [Ministry of Sustainable Development and Infrastructures, La Prévention Routière \(France\)](#) (Association for the prevention of road accidents), [French national institute for road safety and research](#) (Institut National de Sécurité Routière et de Recherches - INSERR, France)