

THE IMPORTANCE OF UNDERSTANDING BRAKING DISTANCES

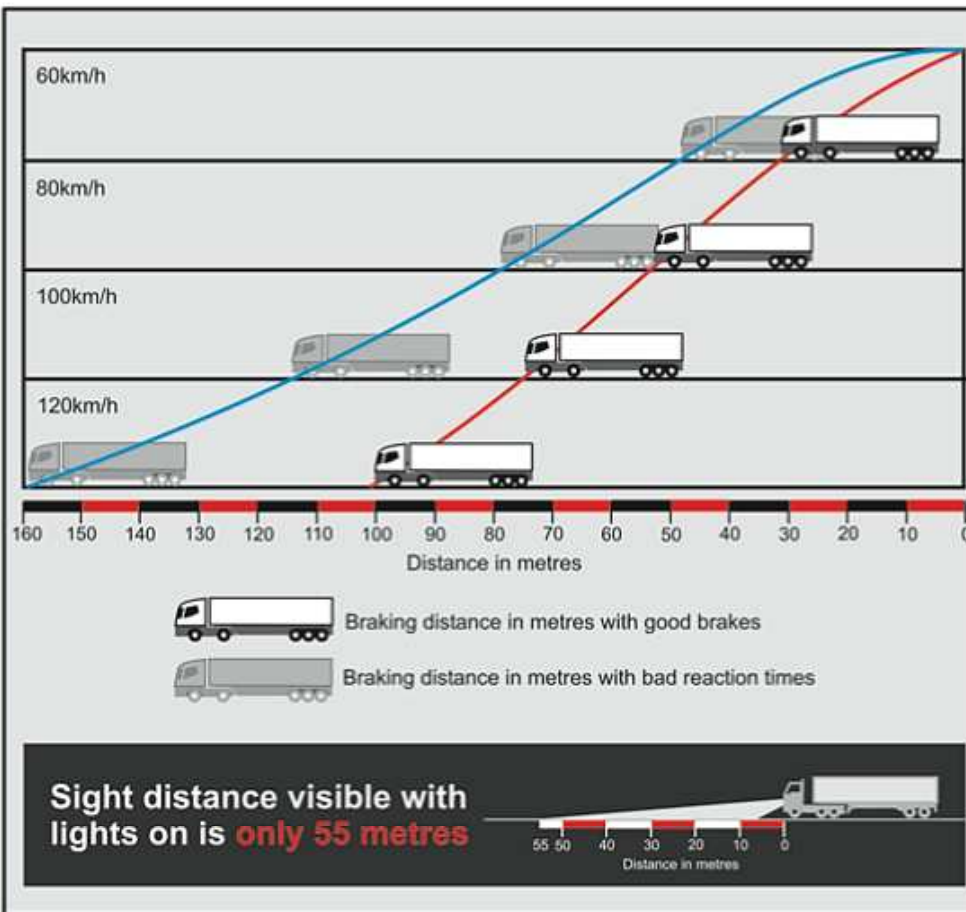
Understanding braking and reaction times when stopping a vehicle.

A vehicle can be equipped with ABS, RBD, ASR and ESP and still not stop in time because of too many seconds absorbed in recognizing a hazard and only then entering the time span allocated to 'pre-braking'.

The total stopping distance of a vehicle is made up of 4 components:

- Human Perception Time
- Human Reaction Time
- Vehicle Reaction Time
- Vehicle Braking Capability

- 1) The **human perception time** is how long the driver takes to see the hazard, and for the brain to realize it is a hazard requiring an immediate reaction. This perception time can be as long as **¼ to ½ a second**.
- 2) Once the brain realizes danger, the **human reaction time** is how long the body takes to move the foot from accelerator to brake pedal. Again this reaction time can vary from **¼ - ½ of a second**. The above are human factors and as such can be affected by tiredness, alcohol, fatigue and concentration levels.
- 3) Once the brake pedal is applied there is the **vehicle reaction time** which depends on the brake pedal free-play, hydraulic properties of the brake fluid and working order of the braking system.
- 4) The last factor that determines the total stopping distance is the **vehicle braking capability** which depends on factors such as:
 - the type of braking system,
 - brake pad material,
 - brake alignment,
 - tyre pressures,
 - tyre tread and grip,
 - vehicle weight,
 - suspension system,
 - the co-efficient of friction of the road
 - surface, wind speed,
 - slope of road,
 - surface smoothness
 - the braking technique applied by the driver.



Thinking time and distance

The time it takes from the moment you see the need to apply brakes until you actually start to brake depends on how quickly you react.

Reaction time can vary from person to person and can be anything between two thirds of a second to two seconds. It may also be drastically impaired by fatigue, illness, excessive use of alcohol or drugs, bad eyesight, inattentiveness, poor visibility or the use of certain types of medication.

An average driver reacts within 3/4 second. At 80 km/h, this adds 16.7 metres to the stopping distance. Distances travelled, before the brakes are even applied.

0.4 seconds is equal to 13 metres of road at 120km/h.

Double your following distance in adverse conditions

Adjust your following distance to appropriately match weather conditions, road conditions, visibility, and traffic. In emergency conditions, maintaining a safe distance from the vehicle in front of you will allow you to stop safely and/or to take necessary evasive action.

How far you go before braking

Speed	Reaction time	Distance travelled
60 km/h	0.66 sec	11.1 metres
	0.75 sec	12.5 metres
	1.00 sec	16.7 metres
80 km/h	0.66 sec	14.8 metres
	0.75 sec	16.7 metres
	1.00 sec	22.2 metres
100 km/h	0.66 sec	18.5 metres
	0.75 sec	20.8 metres
	1.00 sec	27.8 metres
120 km/h	0.66 sec	22.2 metres
	0.75 sec	25.0 metres
	1.00 sec	33.3 metres

Did you know?

The average stopping distance for a loaded tractor-trailer at 80 km/h is 155 metres, compared with 60 metres for a passenger vehicle.

A driver needs 0.2 seconds for a 'spontaneous' reaction.

If you have to decide what action to take, a driver will need at least 0.3 seconds.

If you turn your eyes to look at a hazard, danger reaction time will be around 0.4 seconds.

Loaded trailers require 20 to 40 percent more braking distance than passenger vehicles to come to a complete stop.

The posted speed limit on an exit/entrance ramp generally shows the safe speed for a passenger vehicle - the safe speed for a large truck is significantly lower than the posted speed.

Even though ramps and interchanges make up less than 5 percent of all highway miles, 20 to 30 percent of all large truck crashes occur on or near ramps



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