

It's about time (to stop using P3 on tight bends with a restricted view)

Stopping distance comprises two components;

1. Thinking distance (the distance covered in the time it takes you to see, process the information and decide what to do)
2. Braking distance (the distance which it takes to come to a stop from first applying the brakes).

Thinking distance should not be confused with thinking time. The time it takes you to see, process the information and decide what to do will be the same whatever speed you are travelling at. The thinking distance covered in that time will however be greater at a higher speed and less at a slower speed.

Reacting to a hazard such as an oncoming vehicle will take the same thinking time, during which you will cover a distance related to your speed. The distance that then remains can be converted to time for any given speed, to illustrate how long you have to take the action (swerving, braking etc) needed.

All the examples given below assume that you are travelling at a speed at which you can stop safely within the distance you can see to be clear on your side of the road (the safe stopping distance rule), and that the vehicle coming the other way is travelling at the same speed.

Let's assume you are negotiating a fairly tight left hand bend and the distance you can see to be clear on your side of the road is 36 metres. Using the table from the Highway Code you are travelling at 40mph as 36 metres is the stopping distance at that speed. You are in P3. Assume that a car is coming the other way at the same speed, and is right up to the centre line of the road. Unless you take avoiding action you are going to pass dangerously close to each other at a combined speed of 80mph.

The calculation of the time you have to take avoiding action (ie action time as opposed to thinking time) is set out below.

40 mph

The distance you can see to be clear (**DC**) (same as overall stopping distance) 36m

Thinking distance (**TD**) at 40 mph is 12m (see table in HC)

Action distance (**AD**) is the distance from where you first see the car minus twice the thinking distance (assuming he is moving towards you at the same speed)

$$36 - (2 \times 12) = 12\text{m}$$

Closing speed (**CS**) in metres per second is your speed plus the speed of the oncoming vehicle in mph divided by 2.237 (to convert mph to m/s)

$$40 \times 2 \div 2.237 = 36 \text{ m/s}$$

Action Time (**AT**) in seconds is 1 divided by the closing speed multiplied by the action distance

$$1 \div 36 \times 12 = \quad \quad \quad \mathbf{0.3 \text{ sec}}$$

You only have 0.3 sec to take avoiding action.

Using the same calculation for different speeds produces the following table showing your Action Time at 10 mph intervals:

70 mph	0.87 sec
60 mph	0.7 sec
50 mph	0.5 sec
40 mph	0.3 sec
30 mph	0.18 sec
20 mph	Zero sec

The lower the speed (such as when negotiating a tight bend as opposed to a fast flowing bend) the less time you have to take avoiding action. At 20 mph you have no time to act at all, as the time between the two opposing vehicles is entirely taken up by thinking time.

This seems counter – intuitive but is explained by the fact that **thinking distance increases with speed but thinking time remains the same.**

At 20 mph thinking distance is 6m

Convert 20 mph to m/s by dividing by 2.237 which gives 8.94 m/s

Convert to time by the formula; one divided by the speed in metres per second multiplied by the distance ie $1 \div 8.94 \times 6 = \mathbf{0.67 \text{ sec}}$

You can use the same formula for any given speed and the thinking time remains unchanged at 0.67 second.

The reason why you have less time to act at a lower speed is because **the lower the speed the greater your thinking distance as a proportion of your overall stopping/action distance.**

Of course an oncoming car may be exceeding the safe stopping distance speed which would reduce your margin even further. There is also an increased likelihood of an oncoming vehicle on a tight (as opposed to a gradual) bend being over the centre line of the road. Tight, restricted visibility bends are more likely to occur on B roads which are also likely to be narrower, and increase further the risk of an oncoming vehicle being up to, or over, the centre line. The vehicle may be larger or longer than a car and encroach even further onto your side of the road. The road surface may be wet or damp which is likely to affect your ability to take avoiding action. Braking or swerving mid-bend may be hazardous (see tyre grip trade off – Roadcraft page.).

Conclusion: on a tight (therefore low speed) bend with a restricted view you are putting yourself in potential danger by using P3 because you do not have sufficient time to take avoiding action from an offside hazard.

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