Problem 1

A driver is travelling at 50 k/h while following another vehicle at a distance of 3 car lengths (15 metres) on a level dry asphalt surface.

Will the average driver avoid a collision with the car ahead?

50 k/h x 0.278 = 13.9 m/s
1.5 seconds x 13.9 m/s = 20.85 metres
= distance travelled prior to braking

15 m = 1.079 seconds
13.9 m/s

The average driver will not avoid collision at this distance.
Increase following distance to 3 seconds = 13.9 m x 3 = 41.7 metres = over 8 car lengths

Problem 2

An severely impaired driver, with a 10 second perception and response time, is travelling at 100 k/h in an urban area on a level dry asphalt surface. The driver sees a red light half a block ahead (50 metres). The cross street consists of 4 lanes and one left turn lane (25 metres wide).

How far will the driver travel prior to stopping?

100 k/h x 0.278 = 27.8 m/s
10 seconds perception and response x 27.8 m/s = 278 metres
d = 100² = 10,000 = 49.212 metres
254 (0.80) 203.2

278 metres + 49.212 metres = 327.212 metres = over three blocks.

Have you ever seen an impaired driver slam on the brakes and stop in the middle of nowhere?

Problem 3

A driver is travelling at 80 k/h on an icy snow covered road. The driver is the last of 4 cars following each other at a distance of 5 metres (one car length) between each vehicle. The driver is responding to a text message on a cell phone, increasing perception and response time to 3.5 seconds.

Will the driver avoid collision with the vehicle at the front of the line brakes abruptly?

80 k/h x 0.278 = 22.24 m/s
5 m = 0.21 seconds
22.84 m/s
3.5 perception and response x 22.24 m/s = 77.84 metres

The driver would hit the vehicle ahead within .021 seconds. Following at short distances inhibits the view of vehicles ahead. The minimum following distance with increased perception and response time is 77.84 metres.

Park safely and use the cell phone. Drive after distractions have been eliminated.

Problem 4

The driver of a 15 passenger van drifts off of a level straight asphalt surface. The right wheels are on grass and gravel and a 6% grade into a ditch.

What is the best course of action?

Try to maintain a straight heading in the direction of the road by applying slight corrective steering. Slow the vehicle gradually. Move back onto the roadway only after the vehicle speed has reduced to permit access onto the roadway without interfering with other traffic.

Avoid abrupt corrective steering to the left. Doing so will direct the vehicle into oncoming traffic or other vehicles travelling in the nearest lane. Abrupt steering manoeuvres may cause vehicle rotation with could lead to roll-over.

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\text{v = velocity = } \frac{1000 \text{ metres}}{3600 \text{ seconds}} = 0.278 \times 1 \text{ km/h}
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d = \text{minimum distance to skid to stop} = \frac{S^2}{254 f}
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Accepted average perception and response time for physically fit 20-25 year old drivers = 1.5 seconds. Increase the duration for age, impairment of any kind, or any distraction.

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f = \text{traction = friction}
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f = 0.80 \text{ level dry asphalt surfaces}
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f = 0.30 \text{ ice and snow}
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