

This spreadsheet provides solutions to Equation 1 (Max allowable speed, Vm) for various different values of Thinking Distance + Braking Distance, due a limited Sightline
 To use the spreadsheet, enter the total thinking + braking distance in Cell D6 in feet. The result in Cell C25 is the max speed (Vm) allowable to be able to stop in this distance.
 The spreadsheet calculations may be validated by entering the standard distances from the UK Highway Code and noting it correctly predicts the resulting speeds (Table 1)

f = 21.46 ft/sec² deceleration under emergency braking (Highway code figure)
 t_r = 0.67 secs Reaction Time (Highway Code figure)
 S_L = 52.82 feet Sightline (react dist + braking dist)
 Vm = ft/sec Max speed where car just reaches pedestrian

Vm² + 2*f*t_r*Vm - 2*f*S_L = 0 This is the quadratic eqt to predict Vm for a sightline S_L
 a b c

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

This is the standard formula for solving a quadratic equation
 Formula is solved below by calculating individual parts.

a = 1
 b = 28.7564
 c = -2267.0344 4*a*c = -9068.14
 b² = 826.9305

b²-(4*a*c) = 9895.06814 Sq Root = 99.4739571

1st Solution :

Vm = 35.35878 ft/sec 88 ft/sec = 60 mph

So Vm = 24.10826 mph

NB : 2nd Solution to Quadratic is a negative number with no real-world meaning.

Validation Table		Table 1		
	Highway Code / RAC figs:			
	Total Thinking + Braking distance ft	Highway Code /RAC example speeds (mph)		Formula* (mph)
	40	20		20.1
Sightline	52.82	N/A		24.11
	75	30		30.1
	118	40		39.7
	175	50		50.1
	240	60		60.09
	315	70		70.08

* The speeds shown in this column were obtained from this spreadsheet by entering UK Highway Code distances into Cell D7 and reading the resulting speed from Cell C26. These speeds match the Highway Code speeds which validates the equations and calculations used in the spreadsheet.

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