Stopping Sight Distance (Reaction and Braking)

Stopping sight distance of a vehicle from speed, perception–reaction time and braking friction (deceleration a = f g), including the effect of a grade.

Method: SSD = v t + v²/(2g(f ± G)) (AASHTO Green Book and IRC basic relation)

Input parameters

Unit system: SI

Parameter	Value	Unit
Speed	80.000	km/h
Perception–reaction time	2.5000	s
Longitudinal friction factor From your road standard for the speed.	0.35000	
Grade (positive uphill)	0	%

Calculated results

Parameter	Value	Unit
Reaction distance v t_r	55.556	m
Braking distance v²/(2g(f + G))	71.938	m
Stopping sight distance	127.49	m

Formula and method

$$SSD = vt_r + \frac{v^2}{2g(f+G)}$$

Variables

v	Speed	m/s
t_r	Perception–reaction time	s
f	Longitudinal friction factor	-
G	Grade (positive uphill)	-
d_r	Reaction distance v t_r	m
d_b	Braking distance v²/(2g(f + G))	m
SSD	Stopping sight distance	m

Method and standards

Uniform deceleration after the reaction time.

Assumptions and limits

- Constant friction. To work from a deceleration a instead, enter f = a/g: the AASHTO 2011 value a = 3.4 m/s² is f = 0.347.

References

- SSD = v t + v²/(2g(f ± G)) (AASHTO Green Book and IRC basic relation)

Report details

Report reference	FCC-WVY5-HRCV (the same inputs always give the same reference)
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Calculator	Stopping Sight Distance (Reaction and Braking)
Method last reviewed	12 November 2026
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Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/civil/roads/stopping-sight-distance

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.