



Sight Distances of Highway Formulas

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Examples!

Conversions!

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List of 30 Sight Distances of Highway Formulas

Sight Distances of Highway 🕑

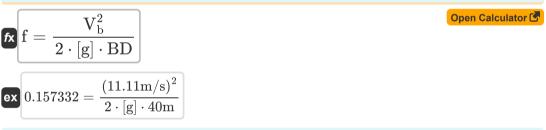
Coefficient of Friction C



fx
$$f = rac{V_b^2}{2 \cdot [g] \cdot (\mathrm{SSD} - (V_b \cdot t))}$$

ex
$$0.047595 = rac{(11.11 \mathrm{m/s})^2}{2 \cdot [\mathrm{g}] \cdot (160 \mathrm{m} - (11.11 \mathrm{m/s} \cdot 2.5 \mathrm{s}))}$$

2) Coefficient of Longitudinal Friction given Breaking Distance 🖒



OSD 🖉

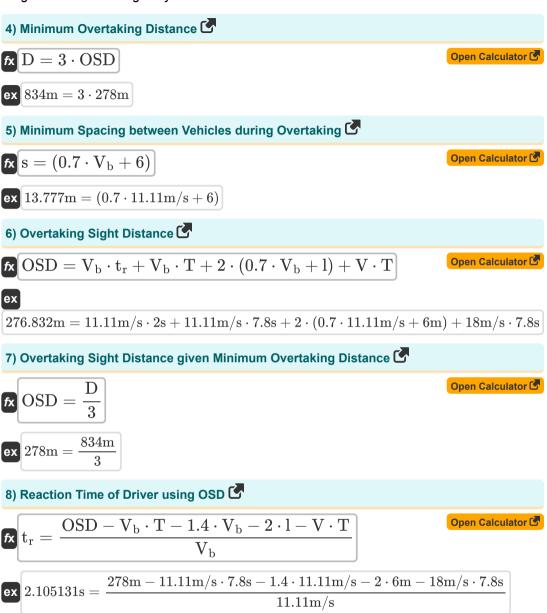
3) Acceleration of Vehicle given Total Time of Travel in Overtaking Sight distance

$$f_{\mathbf{X}} = \frac{4 \cdot s}{T^2}$$

$$(s) 0.900723 \text{m/s}^2 = \frac{4 \cdot 13.7 \text{m}}{(7.8 \text{s})^2}$$



Open Calculator





()

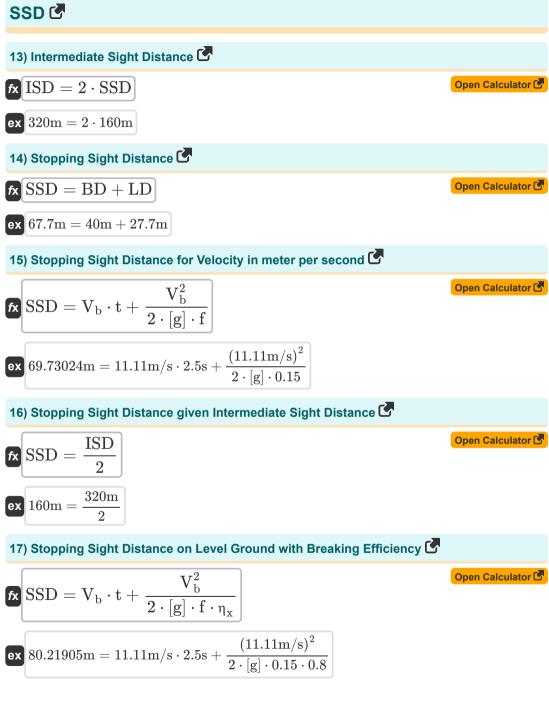
3/11

9) Spacing between Vehicles given Total Time of Travel in Overtaking Sight distance 🗹

$$\begin{array}{l} \textbf{(T^2) \cdot a} \\ \textbf{(T^2) \cdot a}$$









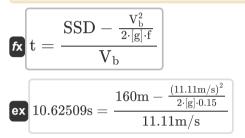


18) Stopping Sight Distance on Upward Inclined Surface 🕑

fx
$$SSD = V_{b} \cdot t + rac{V_{b}^{2}}{2 \cdot [g] \cdot f + \Delta H}$$

$$\begin{array}{l} \overbrace{}{34.65451 \mathrm{m}} = 11.11 \mathrm{m/s} \cdot 2.5 \mathrm{s} + \frac{\left(11.11 \mathrm{m/s}\right)^2}{2 \cdot [\mathrm{g}] \cdot 0.15 + 15 \mathrm{m}} \end{array}$$

19) Total Reaction Time given Stopping Sight Distance 🕑



Braking Distance 🗹

20) Braking Distance on Inclined Surface 子

fx
$$BD = \frac{V_b^2}{2 \cdot [g] \cdot f + 0.01 \cdot \Delta H}$$

ex $39.91989m = \frac{(11.11m/s)^2}{2 \cdot [g] \cdot 0.15 + 0.01 \cdot 15m}$

21) Braking Distance on Inclined Surface with Efficiency 🕑

$$\mathbf{fx} BD = \frac{V_b^2}{2 \cdot [g] \cdot f \cdot \eta_x + 0.01 \cdot \Delta H}$$
(11.11m/c)²

$$49.30192 \mathrm{m} = \frac{(11.11 \mathrm{m/s})^2}{2 \cdot [\mathrm{g}] \cdot 0.15 \cdot 0.8 + 0.01 \cdot 15 \mathrm{m}}$$



Open Calculator 🛃

Open Calculator

Open Calculator 🗗

Open Calculator 🖸

22) Braking Distance on Level Ground with Efficiency



()

Lag Distance
$$\mathbf{C}$$

27) Lag Distance or Reaction Distance for Velocity \mathbf{C}
(\mathbf{L} $\mathbf{D} = \mathbf{V}_{\mathbf{b}} \cdot \mathbf{t}$ (Open Calculator \mathbf{C}
(\mathbf{x} 27.775m = 11.11m/s \cdot 2.5s
28) Lag Distance or Reaction Distance given Stopping Sight Distance \mathbf{C}
(\mathbf{x} \mathbf{L} $\mathbf{D} = SSD - BD$ (Open Calculator \mathbf{C}
(\mathbf{x} $\mathbf{120m} = 160m - 40m$
29) Reaction Time given Lag Distance or Reaction Distance \mathbf{C}
(\mathbf{x} $\mathbf{t} = \frac{\mathbf{L}D}{\mathbf{V}_{\mathbf{b}}}$ (Open Calculator \mathbf{C}
(\mathbf{x} $2.493249s = \frac{27.7m}{11.11m/s}$
30) Velocity of Vehicle given Lag Distance or Reaction Distance \mathbf{C}
($\mathbf{v}_{\mathbf{b}} = \frac{\mathbf{L}D}{\mathbf{t}}$ (Open Calculator \mathbf{C})

ex
$$11.08 {
m m/s} = rac{27.7 {
m m}}{2.5 {
m s}}$$





Variables Used

- a Acceleration (Meter per Square Second)
- BD Breaking Distance (Meter)
- D Minimum Length of OSD (Meter)
- f Design Coefficient of Friction
- ISD Intermediate Sight Distance (Meter)
- I Length of Wheel Base as per IRC (Meter)
- LD Lag Distance (Meter)
- OSD Overtaking Sight Distance on road (Meter)
- S Minimum Spacing between Vehicles during Overtaking (Meter)
- SSD Stopping Sight Distance (Meter)
- t Break Reaction Time (Second)
- T Time taken for Overtaking Operation (Second)
- t_r Reaction Time of Driver (Second)
- V Speed of Fast moving Vehicle (Meter per Second)
- V_b Speed of Slow moving vehicle (Meter per Second)
- **ΔH** Difference in Elevation (*Meter*)
- η_x Overall Efficiency from Shaft A to X



Constants, Functions, Measurements used

- Constant: [g], 9.80665 Meter/Second² Gravitational acceleration on Earth
- Function: **sqrt**, sqrt(Number) *Square root function*
- Measurement: Length in Meter (m) Length Unit Conversion
- Measurement: Time in Second (s) Time Unit Conversion
- Measurement: **Speed** in Meter per Second (m/s) Speed Unit Conversion
- Measurement: Acceleration in Meter per Square Second (m/s²) Acceleration Unit Conversion



Check other formula lists

- Highway and Road Formulas C
- Highway Geometric Design Formulas C

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