



# **Sight Distances of Highway Formulas**

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## List of 30 Sight Distances of Highway Formulas

## Sight Distances of Highway 🕑

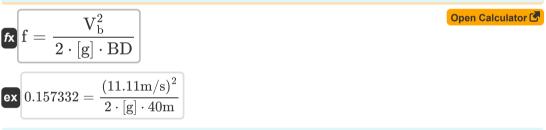
## Coefficient of Friction C



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 🖉

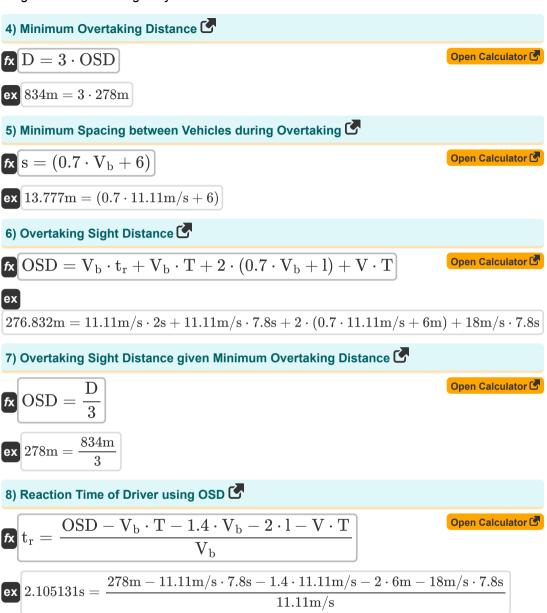
#### 3) Acceleration of Vehicle given Total Time of Travel in Overtaking Sight distance

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

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



Open Calculator





()

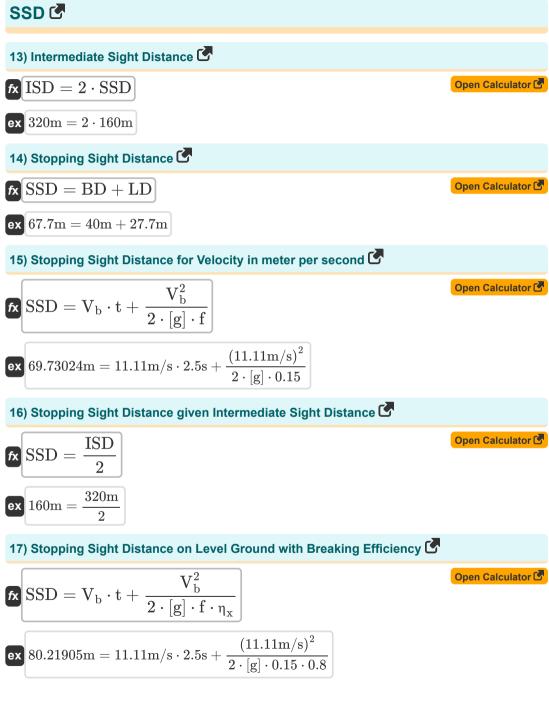
3/11

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

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









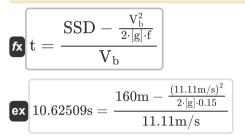


#### 18) Stopping Sight Distance on Upward Inclined Surface 🕑

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)<sup>2</sup>

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



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<sub>r</sub> Reaction Time of Driver (Second)
- V Speed of Fast moving Vehicle (Meter per Second)
- V<sub>b</sub> Speed of Slow moving vehicle (Meter per Second)
- **ΔH** Difference in Elevation (*Meter*)
- $\eta_x$  Overall Efficiency from Shaft A to X



## **Constants, Functions, Measurements used**

- Constant: [g], 9.80665 Meter/Second<sup>2</sup> 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/s<sup>2</sup>) Acceleration Unit Conversion



# Check other formula lists

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

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