# Crest Vertical Curve Length for Haul Truck Sight Distance

Minimum crest vertical curve length so a haul truck driver at a given eye height can see a 0.15 m object at the stopping distance.

## Input parameters

Unit system: SI

| Parameter | Value | Unit |
|---|---|---|
| Algebraic difference in grades (percent) | 10.000 | |
| Stopping (sight) distance required | 89.000 | m |
| Driver eye height | 14.500 | ft |
| Object height | 0.50000 | ft |

## Calculated results

| Parameter | Value | Unit |
|---|---|---|
| Minimum curve length | 53.732 | m |
| Governing case (1: S < L, 2: S > L) | 2.0000 | |
| Curve length per percent of grade change | 5.3732 | m |

**Notes for this case**

- Haul-truck drivers sit high (about 4.4 m for 300,000-600,000 lb trucks, 6 m above 1,000,000 lb), which shortens the curve needed compared with cars. The object height of 0.15 m (0.5 ft) represents a person lying on the road.

## Formula and method

$$L_s = \frac{AS^2}{100\left(\sqrt{2H_1}+\sqrt{2H_2}\right)^2}\ (S<L),\quad L_s = 2S - \frac{100\left(\sqrt{2H_1}+\sqrt{2H_2}\right)^2}{A}\ (S>L)$$

### Variables

| | | |
|---|---|---|
| $A$ | Algebraic difference in grades (percent) | - |
| $S$ | Stopping (sight) distance required | m |
| $H_1$ | Driver eye height | m |
| $H_2$ | Object height | m |
| $L_s$ | Minimum curve length | m |
| $\mathrm{case}$ | Governing case (1: S < L, 2: S > L) | - |
| $K$ | Curve length per percent of grade change | m |

### Method and standards

Parabolic crest curve sight distance.

### Assumptions and limits

- Parabolic vertical curve; no horizontal obstruction.

## Report details

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|---|---|
| Report reference | FCC-CVD9-P578 (the same inputs always give the same reference) |
| Generated | 23 November 2026, 17:26 UTC |
| Calculator | Crest Vertical Curve Length for Haul Truck Sight Distance |
| Method last reviewed | 17 November 2026 |
| Software release | FireCAD Calc, release of 22 November 2026 |
| 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/mine-design/haul-road-crest-curve-length

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.