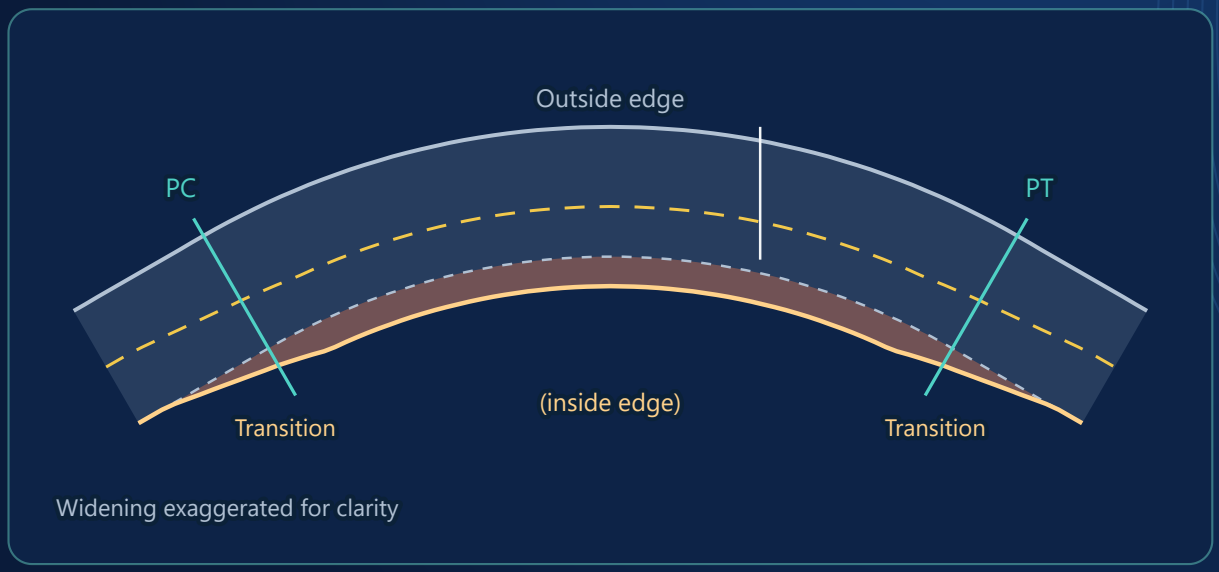
# Curve Widening Design Report

Extra travelled-way width for the design vehicle on horizontal curves (AASHTO Green Book).




## Sample Project

Client: Urban City

PREPARED & SUBMITTED BY

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ISSUE

November 2026

# Horizontal Curve Widening Calculator

Design report · Reference: AASHTO Green Book, 7th Ed. (2018) §3.3.10 Basis: Design vehicle off-tracking · front overhang · Z = 0.1V/√R · Generated 11/5/2026 3:16:00 PM

## 1. Project

| | |
|---|---|
| **Project / road** | Sample Project |
| **Prepared by** | SP Consultant |
| **Date** | 11/5/2026 |

## 2. Travelled Way Widening on Horizontal Curves

### ROAD & CURVE

| | |
|---|---|
| **Design Speed V (kph)** | 60 |
| **Curve radius R (m)** | 150 |
| **Carriageway** | Single, 2 lanes (N = 2) |
| **Lane width on tangent (m)** | 3.65 |

### DESIGN VEHICLE

| | |
|---|---|
| **Design vehicle** | WB-20 semitrailer |
| **Track width on tangent u (m)** | 2.59 |
| **Front overhang A (m)** | 0.91 |
| **Wheelbase of truck or tractor $L_1$ (m)** | 5.94 |
| **Kingpin to rear axle(s) $L_2$ (m)** | 13.87 |

### CALCULATION

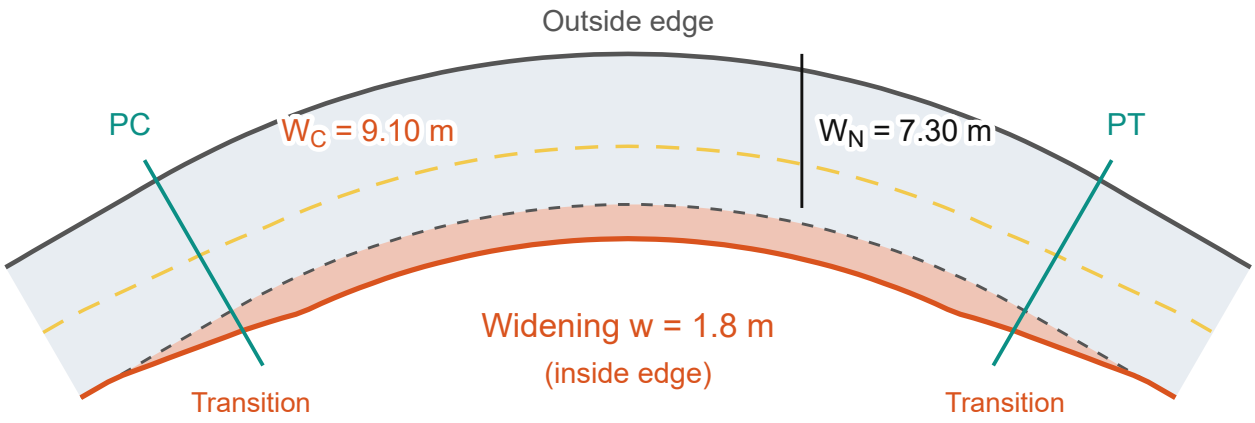
| | |
|---|---|
| **$\Sigma Li^2 = L_1^2 + L_2^2$ (m²)** | 227.7 |
| **Track width on curve U (m)** | 3.35 |
| **Lateral clearance per vehicle C (m)** | 0.90 |
| **Front overhang width FA (m)** | 0.04 |
| **Extra width for steering Z (m)** | 0.49 |
| **Width needed on the curve WC (m)** | 9.03 |
| **Width on the tangent WN (m)** | 7.30 |

### RESULTS

| Widening w = WC − WN (m) | **1.73 m** |
|---|---|
| Design widening, rounded up to 0.1 m | **1.8 m** |
| Travelled way width on the curve (m) | **9.10 m** |
| Recommendation | **Provide 1.8 m on the inside of the curve, run in over the superelevation runoff.** |

Sample report: illustrative data, not for design use

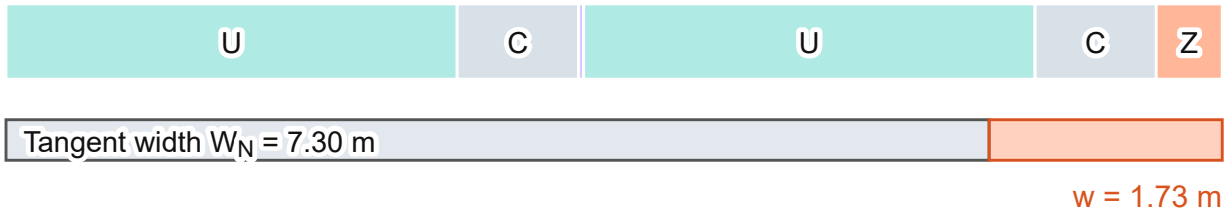
## SKETCH — PLAN OF WIDENED CURVE & WIDTH BUILD-UP (NOT TO SCALE)




Widening exaggerated for clarity

R = 150 m to curve centre ↓

Width needed on the curve $W_C$ = 9.03 m




U = track width on curve · C = clearance · F = front overhang $F_A$ · Z = steering allowance

### COMPUTED VALUES

| | |
|---|---|
| **Design Vehicle** | WB-20 |
| **Off-tracking U − u** | 0.76 m |
| **Width on Curve WC** | 9.03 m |
| **Widening w** | 1.73 m |
| **Widening per Lane** | 0.87 m |
| **Suggested Transition** | over the SE runoff |

**$w = W_C - W_N$**, **$W_C = N(U + C) + (N - 1)F_A + Z$**
**$U = u + R - \sqrt{(R^2 - \Sigma L_i^2)}$** — track width of the design vehicle on the curve (off-tracking of the rear wheels).
**$F_A = \sqrt{(R^2 + A(2L + A))} - R$** — width taken by the front overhang of the inner-lane vehicle, L = $L_1$.
**$Z = 0.1 \cdot V / \sqrt{R}$** — extra width for the difficulty of driving on a curve (V in kph, R in m).
C = lateral clearance per vehicle; $W_N$ = N × lane width. All in metres.

### WIDENING W (M) — RADIUS VS DESIGN SPEED, THIS VEHICLE & ROAD

For a two-lane road with the vehicle and lane width entered on the left, rounded up to 0.1 m. `highlighted` = current speed column. Greyed values are below 0.6 m and may be disregarded.

| Radius R (m) ↓ V (kph) → | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | 8.6 | 8.8 | 9.0 | **9.2** | 9.3 | 9.5 | 9.7 | 9.9 | 10.1 | 10.3 | 10.4 |
| 50 | 4.9 | 5.1 | 5.2 | **5.4** | 5.5 | 5.6 | 5.8 | 5.9 | 6.1 | 6.2 | 6.3 |
| 70 | 3.5 | 3.6 | 3.7 | **3.8** | 3.9 | 4.1 | 4.2 | 4.3 | 4.4 | 4.5 | 4.7 |
| 100 | 2.4 | 2.5 | 2.6 | **2.7** | 2.8 | 2.9 | 3.0 | 3.1 | 3.2 | 3.3 | 3.4 |

Sample report: illustrative data, not for design use

| Radius R (m) ↓ V (kph) → | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 150 | 1.5 | 1.6 | 1.7 | **1.8** | 1.9 | 1.9 | 2.0 | 2.1 | 2.2 | 2.3 | 2.4 |
| 200 | 1.1 | 1.2 | 1.3 | **1.3** | 1.4 | 1.5 | 1.5 | 1.6 | 1.7 | 1.7 | 1.8 |
| 250 | 0.9 | 0.9 | 1.0 | **1.0** | 1.1 | 1.2 | 1.2 | 1.3 | 1.4 | 1.4 | 1.5 |
| 300 | 0.7 | 0.7 | 0.8 | **0.9** | 0.9 | 1.0 | 1.0 | 1.1 | 1.1 | 1.2 | 1.3 |
| 400 | 0.5 | 0.5 | 0.6 | **0.6** | 0.7 | 0.7 | 0.8 | 0.8 | 0.9 | 0.9 | 1.0 |
| 500 | 0.3 | 0.4 | 0.4 | **0.5** | 0.5 | 0.6 | 0.6 | 0.6 | 0.7 | 0.7 | 0.8 |
| 600 | 0.2 | 0.3 | 0.3 | **0.4** | 0.4 | 0.4 | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 |
| 800 | 0.1 | 0.2 | 0.2 | **0.2** | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.5 |
| 1000 | 0.1 | 0.1 | 0.1 | **0.2** | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.4 |
| 1500 | 0.0 | 0.0 | 0.0 | **0.0** | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 |

Generated with the Horizontal Curve Widening Calculator — https://shahidpervaiz.net/EngineeringDesignTools/curve_widening_calculator.
Results should be checked by a qualified engineer before use.

Sample report: illustrative data, not for design use