Road Traffic Noise Level (CRTN Method)

Hourly L10 road traffic noise at a receiver from traffic flow, speed, heavy vehicle share, distance and height, by the Calculation of Road Traffic Noise method.

Input parameters

Unit system: SI

Parameter	Value	Unit
Traffic flow (vehicles per hour)	1,500.0	
Mean traffic speed	60.000	km/h
Heavy vehicles	10.000	%
Road gradient	0	%
Horizontal distance from the nearside kerb	30.000	m
Receiver height above the road	1.2000	m

Calculated results

Parameter	Value	Unit
Basic hourly level at 10 m (dB(A))	73.961	
Speed and heavy vehicle correction (dB)	0.97956	
Gradient correction (dB)	0	
Distance correction (dB)	-3.9499	
Hourly L10 at the receiver (dB(A))	70.991	

Notes for this case

• The method starts from a basic hourly L10 of 42.2 + 10 $\log_{10}$ q dB(A) at 10 m from the kerb, then corrects for mean speed and the share of heavy vehicles, 33 $\log_{10}$(V + 40 + 500/V) + 10 $\log_{10}$(1 + 5p/V) − 68.8, for gradient (+0.3 dB per per cent) and for distance, −10 $\log_{10}$(d′/13.5) with the slant distance d′ from the source line 3.5 m inside the kerb. Ground absorption over soft ground, screening by barriers and façade reflection (+2.5 dB) are further corrections not included here.

Formula and method

$$L_{10} = 42.2 + 10\log_{10} q + 33\log_{10}\left(V + 40 + \frac{500}{V}\right) + 10\log_{10}\left(1 + \frac{5p}{V}\right) - 68.8 + 0.3G - 10\log_{10}\frac{d'}{13.5}$$

Variables

q	Traffic flow (vehicles per hour)	-
V	Mean traffic speed	m/s
p	Heavy vehicles	-
G	Road gradient	-
d	Horizontal distance from the nearside kerb	m
h	Receiver height above the road	m
$L_{10,basic}$	Basic hourly level at 10 m (dB(A))	-
Δ_v	Speed and heavy vehicle correction (dB)	-
Δ_G	Gradient correction (dB)	-
Δ_d	Distance correction (dB)	-
$L_{10,1h}$	Hourly L10 at the receiver (dB(A))	-

Method and standards

CRTN.

Assumptions and limits

- Hard ground; no screening; free field; flow above about 200 vehicles per hour.

Report details

Report reference	FCC-N54P-E651 (the same inputs always give the same reference)
Generated	23 November 2026, 18:09 UTC
Calculator	Road Traffic Noise Level (CRTN Method)
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/instrumentation/vibration-noise/road-traffic-noise-crtn

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Reopens the calculator with the inputs of this report.