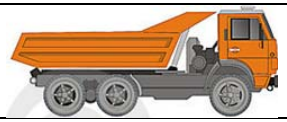
Example of ESAL Calculation Table

Vehicle Type	Gross Weight (ton)	Axle Conf.	Axle Load Distr.	Vehicle Count	Axle Count	LEF of Axles	Track factor of vehicles (ESAL)	Total ESAL of each axle (ESAL)	Total ESAL of vehicles (ESAL)
	40	Tridem Tandem Single	20 16 4	120	120 120 120	0.730 1.269 0.052	2.051	87.60 152.28 6.24	246.12
	3.0	Single Single	1.5 1.5	250	250 250	0.001 0.001	0.002	0.25 0.25	0.50
	25	Tandem Single	22 3	90	90 90	4.339 0.016	4.355	390.51 1.44	391.95
	3.5	Single Single	1.75 1.75	250	250 250	0.002 0.002	0.004	0.50 0.50	1.00
	5.5	Single Single	2.75 2.75	300	300 300	0.011 0.011	0.022	3.30 3.30	6.60
	18	Tandem Single	14 4	150	150 150	0.740 0.052	0.792	111.00 7.80	118.80
	15	Single Single	7.5 7.5	60	60 60	0.713 0.713	1.426	42.78 42.78	85.56
TOTAL =				1220				850.53	850.53

$$ESAL = ADT \times TKS \times DD \times LD \times TF \times 365 \times G \quad \text{OR}$$

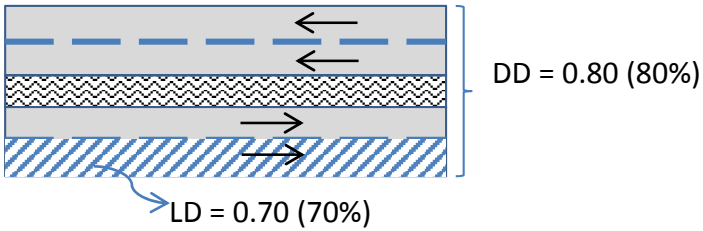
$$ESAL = W_{80\,kN} \times DD \times LD \times 365 \times G$$

where

ADT = Average daily traffic; TKS = Percentage of truck traffic; DD = Directional distribution of truck traffic; LD = Lane distribution of truck traffic;

TF = Average truck factor; G = Annual traffic growth factor; $W_{80\,kN}$ = Total ESAL of traffic

In the above example, assume that the traffic count was made for a two-way, two lane highway section, and DD = 0.80, LD = 0.70



TF = 850.53/(120+90) = 4.05, $G = \frac{(1+g)^n - 1}{g}$ where g = Annual traffic growth rate (%),

For the above example if 15 years after traffic (n = 15) is estimated with an annual traffic growth rate of 4%;

$G = \frac{(1+0.04)^{15} - 1}{0.04}$ = 20.02, Note that If n = 1 is used, then G = 1, so that the current year traffic will be estimated.

ESAL = 1220 x (120+90)/1220 x 0.80 x 0.70 x 850.53/(120+90) x 365 x 20.02 = 3,480,443.6 OR

ESAL = 850.53 x 0.80 x 0.70 x 365 x 20.02 = 3,480,443.6