

DESIGN VEHICLE DIMENSIONS

DESIGN VEHICLE TYPE	u WIDTH	A FRONT OVERHANG	L	
			WB *1	WB *2
P	7	3	11	0
SU-30	8	4	20	0
SU-40	8	4	25	0
S-BUS-36	8	2.5	21.3	0
WB-40	8	3	12.5	27.5
WB-62	8.5	4	19.5	4.3

NOTE: THE "L" VALUE USED IN CALCULATING "U" WILL BE THE GREATER OF THE VALUES LISTED UNDER WB*1 OR WB*2 IN THE TABLE. THE "L" VALUE USED IN CALCULATING F_A WILL ALWAYS BE THE VALUE FROM THE WB*1 COLUMN UNDER "L".

LATERAL CLEARANCE

LANE WIDTH	CLEARANCE (C)
9 ft	1.5 ft
10 ft	2 ft
11 ft	2.5 ft
12 ft	3 ft
16 ft	5 ft

FORMULAS USED TO CALCULATE WIDENING (w)

$$U = u + R - \sqrt{R^2 - L^2}$$

$$F_A = \sqrt{R^2 + A(2L + A)} - R$$

$$Z = (V_D / \sqrt{R})$$

$$W_C = N(U + C) + F_A + Z$$

$$w = W_C - 2W_n$$

FOR OTHER DESIGN VEHICLE DIMENSIONS REFER TO THE AASHTO GREEN BOOK.

DESIGN VEHICLE SU-40
24 FT PAVEMENT WIDTH

$V_D = 20$ MPH $R = 200$ FT
 $W_n = 12$ FT $rg = 0.74$
 $E = 6.1$ (6.1% PER 803.32)

$$U = u + R - \sqrt{R^2 - L^2}$$

$$U = 8.0 + 200 - \sqrt{(200)^2 - (25)^2}$$

$$U = 9.56865$$

$$F_A = \sqrt{R^2 + A(2L + A)} - R$$

$$F_A = \sqrt{(200)^2 + 4[2(25) + 4]} - 200$$

$$F_A = .53927$$

$$Z = (V_D / \sqrt{R})$$

$$Z = (20 / \sqrt{200})$$

$$Z = 1.41$$

$$W_C = N(U + C) + F_A + Z$$

$$W_C = 2(9.56865 + 3) + 0.53927 + 1.41$$

$$W_C = 27.08657$$

$$w = W_C - 2W_n = 27.08657 - 2(12) = 3.0865 \text{ or } 3.1$$

DESIGN VEHICLE SU-40
20 FT PAVEMENT WIDTH

$V_D = 35$ MPH $R = 500$ FT
 $W_n = 10$ FT $rg = 0.62$
 $E = 3.1$ (3.1% PER 803.38)

$$U = u + R - \sqrt{R^2 - L^2}$$

$$U = 8.0 + 500 - \sqrt{(500)^2 - (25)^2}$$

$$U = 8.62539$$

$$F_A = \sqrt{R^2 + A(2L + A)} - R$$

$$F_A = \sqrt{(500)^2 + 4[2(25) + 4]} - 500$$

$$F_A = .21595$$

$$Z = (V_D / \sqrt{R})$$

$$Z = (35 / \sqrt{500})$$

$$Z = 1.57$$

$$W_C = N(U + C) + F_A + Z$$

$$W_C = 2(8.62539 + 2) + 0.21595 + 1.57$$

$$W_C = 23.0367$$

$$w = W_C - 2W_n = 23.0367 - 2(10) = 3.0367 \text{ or } 3.0$$

DESIGN VEHICLE WB-62
20 FT PAVEMENT WIDTH

$V_D = 50$ MPH $R = 1000$ FT
 $W_n = 10$ FT $rg = 0.50$
 $E = 7.6$ (7.6% PER 803.38)

$$U = u + R - \sqrt{R^2 - L^2}$$

$$U = 8.5 + 1000 - \sqrt{(1000)^2 - (43)^2}$$

$$U = 9.42492$$

$$F_A = \sqrt{R^2 + A(2L + A)} - R$$

$$F_A = \sqrt{(1000)^2 + 4[2(19.5) + 4]} - 1000$$

$$F_A = .085996$$

$$Z = (V_D / \sqrt{R})$$

$$Z = (50 / \sqrt{1000})$$

$$Z = 1.58$$

$$W_C = N(U + C) + F_A + Z$$

$$W_C = 2(9.42492 + 2) + 0.085996 + 1.58$$

$$W_C = 24.5158$$

$$w = W_C - 2W_n = 24.5158 - 2(10) = 4.5158 \text{ or } 4.5$$

SPECIFICATION REFERENCE

METHODOLOGIES FOR CALCULATING TC-5.11 VALUES



ROAD AND BRIDGE STANDARDS

REVISION DATE

SHEET 1 OF 1

803.21