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	43

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

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

FORMULAS USED TO CALCULATE WIDENING (w)

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

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

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

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

$$w = W_C - 2W_n$$

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)

$U = u + R - \sqrt{R^2 - L^2}$
$U = 8.0 + 200 - \sqrt{(200)^2 - (25)^2}$
$U = 9.56865$

$F_A = \sqrt{R^2 + A(2L + A)} - R$
$F_A = \sqrt{(200)^2 + 4[2(25) + 4]} - 200$
$F_A = .53927$

$Z = (V_D / \sqrt{R})$
$Z = (20 / \sqrt{200})$
$Z = 1.41$

$W_C = N(U + C) + F_A + Z$
$W_C = 2(9.56865 + 3) + 0.53927 + 1.41$
$W_C = 27.08657$

$w = W_C - 2W_n = 27.08657 - 2(12) = 3.0865$ 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)

$U = u + R - \sqrt{R^2 - L^2}$
$U = 8.0 + 500 - \sqrt{(500)^2 - (25)^2}$
$U = 8.62539$

$F_A = \sqrt{R^2 + A(2L + A)} - R$
$F_A = \sqrt{(500)^2 + 4[2(25) + 4]} - 500$
$F_A = .21595$

$Z = (V_D / \sqrt{R})$
$Z = (35 / \sqrt{500})$
$Z = 1.57$

$W_C = N(U + C) + F_A + Z$
$W_C = 2(8.62539 + 2) + 0.21595 + 1.57$
$W_C = 23.0367$

$w = W_C - 2W_n = 23.0367 - 2(10) = 3.0367$ 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)

$U = u + R - \sqrt{R^2 - L^2}$
$U = 8.5 + 1000 - \sqrt{(1000)^2 - (43)^2}$
$U = 9.42492$

$F_A = \sqrt{R^2 + A(2L + A)} - R$
$F_A = \sqrt{(1000)^2 + 4[2(19.5) + 4]} - 1000$
$F_A = .085996$

$Z = (V_D / \sqrt{R})$
$Z = (50 / \sqrt{1000})$
$Z = 1.58$

$W_C = N(U + C) + F_A + Z$
$W_C = 2(9.42492 + 2) + 0.085996 + 1.58$
$W_C = 24.5158$

$w = W_C - 2W_n = 24.5158 - 2(10) = 4.5158$ or 4.5

SPECIFICATION REFERENCE

METHODOLOGIES FOR CALCULATING TC-5.11 VALUES

VIRGINIA DEPARTMENT OF TRANSPORTATION

VDOT
ROAD AND BRIDGE STANDARDS

REVISION DATE

SHEET 1 OF 1

803.21