National AustStab Guidelines
TRAFFIC ESTIMATE
[Version A - 23 September 1996]

AustStab

Estimating the Design Traffic on Stabilised Pavements

The following AustStab Guideline has been produced based on industry practice and reference to AUSTROADS Guidelines. Please contact your regional AustStab contractor for further information.

1 Introduction

To estimate the design traffic on a pavement requires several inputs from the traffic engineering department and to assign a desired pavement life.

There are several ways to determine the design traffic and these methods are well documented in Chapter 7 of the AUSTROADS Pavement Design Guide [Ref.1].

The terms and abbreviations commonly used to estimate traffic are as follows:

AADT	AADT (Annual Average Daily Traffic - This represents traffic in both directions over a 24 hour period and is the total yearly traffic volume divided by 365)
DIR	Percentage of traffic volume in one direction (assume 0.5 if not available)
ESA	Equivalent Standard Axles
HV	Percentage of heavy/commercial vehicle traffic.
F	Factor F from Table E5 of the AUSTROADS Pavement Design Guide [Ref. 1] or refer to Table 1.
GTH%	Percentage annual traffic growth rate (generally between 2 and 6%). This is used to determine the cumulative growth factor (GF) and may be derived from first principles (ie GF = $1 + \sum_{i=1}^{n-1}(1 + \mathrm{GTH\%}/100)^{i}$) or from Table 7.2 of the AUSTROADS Pavement Design Guide.

2 Calculations

It is suggested that the designer adopts the following steps to calculate the design traffic in ESAs:

A. Initial daily ESAs
N_E = AADT x F x DIR x HV% ÷ 100

B. Growth factor (GF) for design period
- select time period
- select traffic growth rate
- determine growth factor from equation in Section 1 or refer to Table 7.2 of Ref.1.

C. Design ESAs
$ESA_D = N_E$ x GF x 365

3 Heavily Trafficked Roads

The estimate of ESA_D from Section 2 does not take into account multi-lane systems and the designer may assume a lower value for multi-lane roads where it is known that a small percentage of commercial vehicles travel in the fast lane. The designer should also consult the regional road authority for their published guidelines.

4 Lightly Trafficked Roads

In the case of lightly traffic roads these pavements are generally designed and maintained by local government departments, and some road managers have special requirements.

Some general traffic data is now available in the proposed Chapter 13 *Design of New Pavements for Light Traffic*, AUSTROADS Pavement Design Guide [Ref.2], and Table 2 summarises some indicative data.

Table 1 Number of ESAs per commercial vehicle according to state and road functional class, Factor F [Ref.1].

Road Functional Class[1]	State/Territory							
	NSW	VIC	QLD	WA	SA	TAS	ACT	NT
1	1.8	1.9	1.5	1.5	2.0	1.1	-	1.9
2	2.1	1.2	1.1	2.2	1.6	1.4	-	-
3	1.9	1.2	1.2	1.6	1.5	1.6	-	2.5
6	1.9	1.0	1.1	1.5	1.5	0.9	-	-
7	2.7	0.9	0.9	1.2	0.5[2]	0.7[2]	-	-
NOTES:	1. Road Functional Classes are defined in Appendix A of Ref.1. 2. Extrapolated from 1973 survey data							

Table 2 Indicative commercial vehicle traffic volumes for urban streets [Ref.2]

Street Type	AADT in both directions	Percent HVs	Cumulative CVs over Design Period	Average ESAs/CV	Cumulative ESAs over Design Period	Design Traffic (ESAs)
Minor with single lane traffic	30	3	6,570	0.2	1,314	1.3×10^3
Minor with two lane traffic	90	3	9,855	0.2	1,971	2.0×10^3
Local Access with no buses	400	4	64,298	0.3	19,289	1.9×10^4
Local Access with buses	500	6	120,560	0.4	48,224	4.8×10^4
Local Access in industrial area	400	8	128,597	0.6	77,158	7.7×10^4
Collector with no buses	1,200	6	303,797	0.5	151,899	1.5×10^5
Collector with buses	2,000	7	590,716	0.6	354,430	3.5×10^5
NOTES:	1. The design period is 20 years 2. The annual growth rate varies but is less than 1.5% 3. HVs are vehicles with a gross vehicle mass greater than 3 tonnes 4. For new residential developments some consideration should be given to construction traffic (see Ref.2).					

5 Example

For an existing heavily traffic 2-lane road to be recycled and stabilised for a design period of 20 years, the following traffic data is available:

AADT = 12,000
DIR = 0.65
HV = 7%
Road Functional Class = 2 (SA), F = 1.6 (Table 1)
Growth rate = 2%

Estimated design traffic is:

A. N_E = 12,000 x 1.6 x 0.65 x 7 ÷ 100
= 874

B. GF = 24.3 (Table 7.3 of Ref.1)

C. ESA_D = 874 x 24.3 x 365
= 7.75×10^6

6 References

1. AUSTROADS *Pavement Design - A Guide to the Structural Design of Road Pavements* October, 1992

2. AUSTROADS *Design of New Pavements for Light Traffic* APRG Document 95/04 June 1996

For further information, please contact the Secretary, AustStab, PO Box 1889, North Sydney 2059 or Email: vorobief@auststab.com.au