



COUNTY OF LOS ANGELES DEPARTMENT  
OF PUBLIC WORKS

**TRAFFIC INDEX** GUIDELINES

TRAFFIC AND LIGHTING DIVISION  
JUNE 2002

## **TRAFFIC INDEX**

The calculation of the traffic index (TI) provides information necessary to design a structural section for a roadway. Basically, the TI is a measure of the deteriorating effects that truck traffic has on asphalt concrete pavement. The following procedures should be used to conduct 10- and 20-year TI calculations for County roadways.

The California method of calculating equivalent 5,000 pound wheel loads and the TI should be used.<sup>1</sup>

## **PROCEDURE**

### **A. SITE INSPECTION AND TRAFFIC COUNTS**

- x Conduct field inspection of the project area and locate appropriate location(s) for 24-hour average daily traffic and truck counts.

The 24-hour truck axle breakdown (TAB) counts should be conducted with the counting machine approved by the Department *for two lane roadway (one lane each direction) only*. If 24-hour TAB counts cannot be obtained, then six-hour (7 a.m. to 1 p.m.) manual counts should be conducted. The six-hour counts can then be converted to 24-hour counts by using the following expansion factors:

Vehicles Per Day	Expansion Factor
$\leq 6,000$	2.95
$> 6,000 \text{ \& } \leq 10,000$	3.03
$> 10,000$	3.01

### **B. CALCULATION**

Two methods acceptable are as follows:

1. Using the County Software.

Obtain a copy of the County developed excel software (TI.xls) at a cost of \$100.

2. Manual Calculation.

Use the attached TI calculation worksheet (Exhibit A).

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<sup>1</sup>. Principles of Pavement Design, Second Ed., Chapter 20

## EXHIBIT A

**A. Calculate the 10-year traffic index.**

- 1. Convert the truck axel breakdown (TAB) counts to annual 5,000 pound equivalent wheel load (EWL) using the following table:**

Axle						
	Existing			10-Year		
	(A) 24-Hour TAB Volumes	(B) EWL Constants <sup>2</sup>	(C) Existing EWL (A) x (B)	(D) Ambient Growth *	(E) 24-Hour TAB Volumes (A) x (1 + D/100) <sup>10</sup>	(F) 10 Year EWL (E) x (B)
2		300				
3		920				
4		1320				
5		4080				
<b>TOTAL</b>						

\* The ambient growth rate is a general traffic growth of the study area. The rates range from 0.5 percent for areas that are built out such as East Los Angeles to 3.0 percent for areas that have high potential for new developments as in the North County area.

$10\text{-YEAR EWL} = \frac{(C) \text{ TOTAL} + (F) \text{ TOTAL}}{2} \times 10 =$
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- 2. Find TI** using the attached Conversion of EWL to TI table (Table A).

$10\text{-YEAR TI} =$
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<sup>2</sup>. Principles of Pavement Design, Second Ed., Chapter 20, Table 20.6, State Highways

**B. Calculate the 20-year traffic index.**

- Convert the truck axel breakdown (TAB) counts to annual 5,000 pound equivalent wheel load (EWL) using the following table.**

Axle						
	Existing			20-Year		
	(A) 24-Hour TAB Volumes	(B) EWL Constants <sup>3</sup>	(C) Existing EWL (A) x (B)	(D) Ambient Growth *	(E) 24-Hour TAB Volumes (A) x (1 + D/100) <sup>20</sup>	(F) 20 Year EWL (E) x (B)
2		300				
3		920				
4		1320				
5		4080				
<b>TOTAL</b>						

\* The ambient growth rate is a general traffic growth of the study area. The rates range from 0.5 percent for areas that are built out such as East Los Angeles to 3.0 percent for areas that have high potential for new developments as in the North County area.

$20\text{-YEAR EWL} = \frac{(C) \text{ TOTAL} + (F) \text{ TOTAL}}{2} \times 20 =$
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- Find TI using the attached Conversion EWL to TI table (Table A).**

<b>20-YEAR TI =</b>
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<sup>3</sup>. Principles of Pavement Design, Second Ed., Chapter 20, Table 20.6, State Highways.


















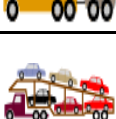
**TABLE A: COVERSION OF EWL TO TRAFFIC INDEX<sup>4</sup>**






EWL	*TI	EWL	TI
1,320,000,000		9,420,000	
	15.5		8.5
1,000,000,000		5,750,000	
	15.0		8.0
759,000,000		3,400,000	
	14.5		7.5
568,000,000		1,940,000	
	14.0		7.0
420,000,000		1,060,000	
	13.5		6.5
308,000,000		558,000	
	13.0		6.0
223,000,000		277,000	
	12.5		5.5
159,000,000		129,000	
	12.0		5.0
112,000,000		55,600	
	11.5		4.5
77,900,000		21,800	
	11.0		4.0
53,100,000		7,620	
	10.5		3.5
35,600,000		2,290	
	10.0		3.0
23,400,000		562	
	9.5		2.5
15,000,000		104	
	9.0		
9,420,000			

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<sup>4</sup> Principles of Pavement Design, Second Ed., Chapter 20, Table 20.6  
\* For local streets, use minimum TI of 5.0.

### Vehicle Classifications and Lengths

Class 1: Motorcycle	5.6 feet	
Class 2: Passenger car	17.4 feet	
Class 3: 2-axle, 4-tire single units	19.1 feet	
Class 4: Buses	41.7 feet	
Class 5: 2-axle, 6-tire single units	29.0 feet	
Class 6: 3-axle single units	34.0 feet	
Class 7: 4+ axle single units	51.2 feet	
Class 8: 4 or less axle single trailers	48.0 feet	
Class 9: 5-axle single trailer trucks	62.4 feet	
Class 10: 6 or more axle single trailer trucks	71.2 feet	
Class 11: 5 or less axle multi trailer trucks	70.0 feet	
Class 12: 6-axle multi-trailer trucks	77.5 feet	
Class 13: 7 or more axle multi-trailer trucks	No Data	
Class 14: Class 2 + trailer	27.4 feet	
Class 15: Class 3 + trailer	39.1 feet	
Class 16: Class 5 + trailer	44.0 feet	
Class 17: Class 6 + trailer	63.0 feet	
Class 18: Loaded auto carrier	83.1 feet	

Class 19: Empty auto carrier	80.0 feet	
Class 20: Bobtail tractor	24.0 feet	
Class 21: Combination tractor-trailer	64.4 feet	
Class 22: 30-foot bus	32.4 feet	
Class 23: 20-foot bus	24.0 feet	

These individual vehicle classifications are grouped into Caltrans-specified categories based on the number of axles, as shown below. These categories are used for the display on the GUI.

Passenger vehicles	Class : 2, 3, 14, 15
2-axle	Class : 4, 5, 16, 20, 22, 23
3-axle	Class : 6 , 8
4-axle	Class : 7
5 or more axle	Class : 9, 10, 11, 12, 13, 17, 18, 19, 21
Others	Class : 1
Unknown/unclassifiable	Class : 24