



CE 442

CONSTRUCTION AND MAINTENANCE OF HIGHWAYS AND AIRPORTS

HW No. 1

1. Traffic Count was conducted on Dammam-Dhahran (Jubail) Expressway for one week using automated traffic counters. The count for each lane is shown in tables 1 to 3. Determine the design lane traffic (design traffic) in terms of Equivalent 18-kip Single Axle Loads (EAL) using Ministry of Transport (MOT) method if:

- The expressway is designed for 20 years
- The annual traffic growth is expected to be 3 %
- The truck factors as per MOT method is 0.10 for mini bus, 3.5 for small trucks, 2.5 for long trucks, and 3.0 for trailers.
- Total $EAL_n = (EAL_0 (365))((1+i)^n - 1) / \log_e (1+i)$

Where;

i = growth factor

n = Design period



Table 1. Right lane traffic, Dhahran-Jubail expressway.

Day	Passenger Car	Minibus	Small Truck	Truck + Bus	Trailer
	L<6.25 m	6.25<L<8.25	8.25<L<11.75	11.75<L<14.75	L>14.75
Saturday	5,877	715	528	353	170
Sunday	5,731	702	499	341	183
Monday	5,689	664	411	332	176
Tuesday	5,683	649	473	314	207
Wednesday	5,783	691	484	351	186
Thursday	5,162	651	493	365	185
Friday	5,654	679	481	342	185

Table 2. Middle lane traffic, Dhahran-Jubail expressway.

Day	Passenger Car	Minibus	Small Truck	Truck + Bus	Trailer
	L<6.25 m	6.25<L<8.25	8.25<L<11.75	11.75<L<14.75	L>14.75
Saturday	15,613	405	186	152	120
Sunday	14,487	657	564	291	231
Monday	14,299	620	514	293	242
Tuesday	14,309	623	552	279	253
Wednesday	14,974	672	591	312	260
Thursday	13,108	565	487	295	195
Friday	14,465	590	483	270	217

Table 3. Left lane traffic, Dhahran-Jubail expressway.

Day	Passenger Car	Minibus	Small Truck	Truck + Bus	Trailer
	L<6.25 m	6.25<L<8.25	8.25<L<11.75	11.75<L<14.75	L>14.75
Saturday	16,839	339	393	125	221
Sunday	16,744	317	377	111	175
Monday	16,494	298	386	123	199
Tuesday	16,516	317	384	119	186
Wednesday	17,449	352	433	133	218
Thursday	15,173	226	263	93	117
Friday	16,536	308	373	117	186