Another method of potential interest is that used by the Ministry of Communications of the Kingdom of Saudi Arabia (MOC). This is a relatively simple method to apply, in which the soil is characterized by the CBR, and the traffic by a 16-kip equivalent single axle loading. Design charts are then entered to perform the actual design. roads are placed into two categories ("Expressways" and "Roads Other Than Expressways"), allowing some treatment of the desired level of reliability.

Each of these methods incorporates all of the variables described in the beginning of this section, with the primary difference being the degree to which these variables are explicitly incorporated in the analytical portion of the analysis. In general, one can characterize the AASHTO method as closest to the analytical end of the spectrum, and the MOC method as closest to the phenomenological end of the spectrum. There are methods which are even more heavily weighted towards analysis, but these are most commonly used for research rather than practice. The methods described herein are considered representative of many methods in common use today, and are illustrative of the important factors in pavement design.

604.01.02 Comparison of Design Results

Calculations were performed using the newest AASHTO method, the ADOT method, and the MOC method and compared with the TRIP method. In order to simplify direct comparison of results, the comparison was based on Structural Numbers (SN) which result from each analysis, rather than on a comparison of the pavement sections themselves. This approach was used because the SN is the most useful design descriptor which results from the procedures, and because it is independent of the individual pavement layer components chosen by a given agency.

High traffic, weak soil, or high degrees of conservatism will all yield higher SN values, and this number thereby allows direct comparison of the results of an analysis for similar input variables. For example, if two methods are used that generate vastly different SN values for the same input variables, then one method can be said to yield a substantially more conservative design than the other. In the current case, we will compare the SN value for the original TRIP method with the newer design methods using a consistent set of material coefficients.

A SN was developed for each roadway classification pavement section described in the DCIL TRIP report. The TRIP SN are compared to the SN resulting from each pavement design method used in this study in Table 600.02.

Table 600.02
Comparison of Structural Numbers for Multiple Design Methods

Design Method	*Truck Route*	*Freeway Expressway*	*Main Road*	*Sector Road*
TRIP	8.40	7.28	5.69	3.31
AASHTO	7.9-9.5	7.3-8.9	5.6-6.8	2.8-3.7
ADOT	7.27	6.90	4.91	2.50
MOC	*	*	*	4.69

*Traffic values too far beyond the range of design charts to allow extrapolation.

The AASHTO results show a range because of the correlation from CBR to resilient modulus required for the AASHTO method. A design CBR of 10 was used for the TRIP design. In order to correlate CBR to resilient modulus, AASHTO recommends the equation:

$$Mr = 1500(CBR) \qquad \text{(Eqn. 1)}$$

where-
Mr = Resilient Modulus (psi)

CBR = California Bearing Ratio

Equation 1 was used to develop the lower SN's shown in Table 600.02. However, there was considerable scatter in the correlation between the CBR and the resilient modulus, with the conversion factor ranging to as low a value as 750. In the absence of actual measured resilient moduli with which to evaluate the applicability of the AASHTO conversion, a conservative approach was adopted in which the design would be checked with a lower resilient modulus