

ing axle weight limits. The equivalence relationship for a range of single and tandem axles on rigid and flexible pavements, based on the road test data, has been established.

There are many formulas that would approximate the maximum desirable loads. One is the present simplified bridge formula which may be used to determine permissible gross weights and axle weights.

This formula in its present form as stated in "Policy on Maximum Dimensions and Weights of Motor Vehicles to be Operated Over the Highways of the United States" conforms with the results of the AASHO road test mentioned earlier.

I wish to emphasize the present formula was not devised by the AASHO Bridge Committee, was developed in its general form prior to the AASHO road tests, and was never approved by a $\frac{2}{3}$ vote of the AASHO Bridge Committee. It was the opinion of those voting against, that the formula allowed gross loads that were too high.

The basic axle loads used for development of this formula are 18,000# for a single axle and 32,000# for a tandem axle. The present AASHO Policy is modified to allow 20,000# on a single axle when spaced 8 feet or more apart.

The change in the proposed formula from the present formula is a change from 32,000# to 36,000# for a tandem axle. This changes the permissible gross load of the vehicles, even though it may not be a vehicle with tandem axles.

Chart No. 1 shows graphically the comparison of the proposed loading S.B. 2658 and the three (3) common types of AASHO Standard Loadings (H15, H20 and HS20).

Chart No. 2 shows the percentage of the moments produced by the proposed loading as a percent of the standard loadings.

The maximum percentage for the H15 loading is 176% which is for the 83' span.

You will note that the effect of the new load on bridges with HS20 design loading is minor. Bridges designed for H20 loading have an overload of approximately 32% which will result in a maximum overstress of probably 15%.

The effects on H15 bridges is much more critical. With 76% overload for the live load moment an overstress of approximately 40% can be anticipated. While no definite statement can be made as to this overstress we feel that this is in excess of what can be tolerated without exceeding the proper limits of safety and structural life.

Until recently, the AASHO Specifications considered that only loadings which produce a change in sign of the stress were critical in fatigue. The specifications also assumed that the loads would be repeated at least 2 million times, and therefore, allowable stresses were kept below the fatigue limit. Recent research and study indicated that these limits were not adequate. Therefore, in the 1965 Specifications a new set of criteria was published.

Table 2 shows the cycles of loadings for the different types of roads.

TABLE 2

Case	Type of road	Number of cycles of maximum stress to be used when the length ¹ of load producing maximum stress is		
		0 to 14 feet inclusive (H loading)	Over 14 feet to 44 feet inclusive (HS loading)	Over 44 feet (lane loading)
I	1. Freeways; 2. Exressways; 3. Major highway and streets.....	2,000,000	500,000	100,000
II	Other highways and streets not included in Case I.....	500,000	100,000	100,000

¹ Defined as: (1) the distance from first to last axle on the bridge; (2) the length of uniform live load.