Another point which seems to Dr Dickinson to require further careful study is that of objects blending into the back ground It is clear for instance that in any spotty field of illumination there are many positions where this can occur In fact if the object is not large relative to the pattern of illumination the problem becomes very important The relative size of most important objects on the highway is such as to avoid some of the more serious phases of this problem

TRAFFIC CAPACITY

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The investigation of traffic capacity of two-, three- and four-lane highways reported in the Tenth Proceedings of the Highway Research Board was continued during 1931, fifty-six additional stations being occupied As a complete report of this work has been published in the May, 1932 issue of *Public Roads,* Volume 13, No 3, only the results

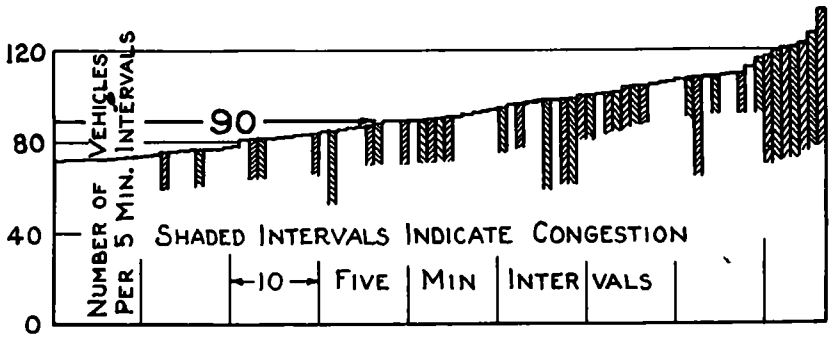

Figure 1 Traffic on a Two-Lane Road with 70 Per Cent of the Traffic in One Direction, Showing That When the Traffic Reached More Than 90 Vehicles Per 5 Minutes, Congestion Became Practically Continuous. The Portion of Each Five-Minute Interval During Which Congestion Prevailed Is Indicated by the Length of the Shaded Area Relative to That of the Whole Interval

additional to those already reported in the Proceedings will be summarized here

In the 1930 observations previously reported no congestion was found on the four-lane roads on which counts were made In 1931 some four lane road congestion was observed The maximum hourly traffic observed on any four-lane road was 3,496 vehicles while the maximum rate per hour for a five minute interval was 3,912, the actual hourly traffic being about 89 per cent of the maximum five minute interval

Figures 1 and 2 illustrate the method used for determining the point of incipient congestion or working capacity under different

traffic conditions When plotted in this way the number of vehicles at which congestion occurs during a considerable portion of nearly all five minute intervals becomes easily apparent

The evidence brought out by the study of the data is summarized in Table I.

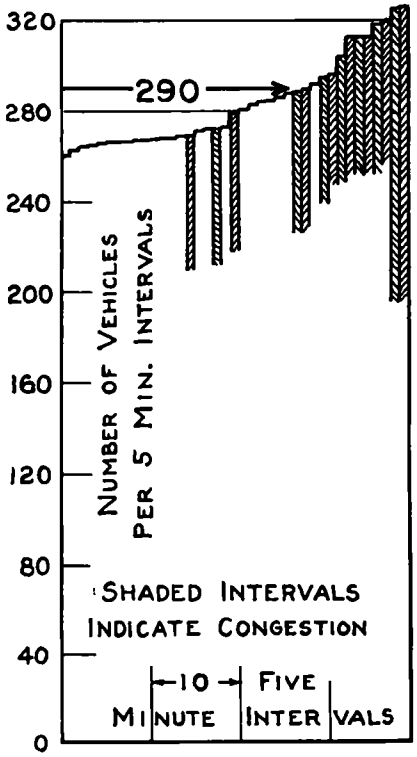

Figure 2 Traffic on a Four-Lane Road with 70 Per Cent of the Traffic in One Direction, Showing That When the Traffic Reached More Than 290 Vehicles Per 5 Minutes, Congestion Became Practically Continuous. The Portion of Each Five-Minute Interval During Which Congestion Prevailed Is Indicated by the Length of the Shaded Area Relative to That of the Whole Interval

From this table it would appear that the effect of unbalanced traffic on the capacity of 2-lane roads is not marked until 80 per cent of the traffic is in one direction, when the capacity rises considerably above the average On a 3-lane road the effect is not so definite, but the maximum capacity is reached when about 70 per cent of the traffic is in one direction

The results for the 4-lane road are even less conclusive, as there was no congestion noted when the traffic was 50 or 60 per cent on one direction, although as many as 273 vehicles were counted during one

5-minute interval The occasions when 4-lane roads were seen working to capacity were rare. With the traffic 70 per cent in one direction congestion was reported when 290 vehicles passed in five minutes, and when the traffic was 80 per cent in one direction congestion occurred with a count of 270 vehicles These figures would indicate that, as the traffic becomes more unbalanced, the 4-lane road becomes less efficient.

TABLE I

WORKING CAPACITY OF 2-LANE, 3-LANE, AND 4-LANE HIGHWAYS

Number of Lanes	Vehicles per 5-Minute Interval					Practical Hourly Capacity (Vehicles)
	Percentage of Traffic in One Direction				Average	
	50	60	70	80		
2	90	97	90	105	97	1,000
3	185	165	195	175	180	2,000
4	*300	*300	290	270	290	3,000

* Estimated

CONCLUSIONS

The influence of the proportionate amount of traffic in one direction is not marked on 2-lane roads until the fraction increases to 80 per cent or more, when a greater volume of traffic is carried without congestion The average working capacity for 2-lane roads is approximately 95 per 5-minute interval, or 1,000 per hour

Three-lane roads appear to operate to slightly better advantage when 70 per cent of the traffic is in one direction The average working capacity is approximately 180 per 5-minute interval or 2,000 per hour

Four-lane roads (estimating the capacity as 300 vehicles in five minutes when traffic is 50 or 60 per cent in one direction) have an average working capacity of 290 vehicles per 5-minute interval

These values give a ratio for 2-lane, 3-lane, and 4-lane roads of approximately 1 : 2 : 3 That is, the traffic capacity of a 3-lane road is twice that of a 2-lane road, and the 4-lane road has a capacity of at least three times that of the 2-lane road and 50 per cent greater than that of the 3-lane road.

The addition of one lane to a 2-lane road increases its width 50 per cent and its capacity 100 per cent Addition of two lanes increases the width by 100 per cent and the capacity by 200 per cent In other words, doubling the width of a 2-lane highway triples its capacity

It should be clearly understood and emphasized that this study relates to traffic capacity only No consideration has here been given to the relative safety of 2-lane, 3-lane, and 4-lane design in highways under varying volumes of traffic There seems to be very general agreement among those who have observed the operation of 3-lane roads that as traffic increases the hazards increase in a greater ratio than is the case of the 2-lane or the 4-lane roads, but this conclusion must rest upon research of an entirely different nature from that here reported

REPORT ON TRAFFIC LAW OBSERVANCE AND ENFORCEMENT METHODS

SECOND REPORT

Traffic Law Enforcement in Municipalities

Burton W Marsh, *Project Chairman,*
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SYNOPSIS

This report is intended to focus attention upon the need for traffic law enforcement in municipalities It is the firm conviction of this committee that the greatest gains in accident reduction can be brought about by businesslike administration of sound traffic laws and regulations Facts concerning the records in a number of cities that are securing good or reasonably good results in traffic control together with the reasons for the improvements shown are presented The findings and conclusions of the committee are summarized

A large proportion of the citizens of the United States does not support businesslike enforcement of traffic regulations Analysis of conditions in many municipalities proves the truth of this statement Yet, probably at least one-third, of traffic fatalities and other accidents could be eliminated by firm and efficient enforcement of sound regulations A proportion of one-third represents 11,000 fatalities and over 300,000 other traffic accidents per year

The losses involved constitute a shocking toll which is being paid for inefficient administration, "fixing" and other defects in enforcement This toll is high, yet it takes no account of the considerable reduction in congestion and improvement in general traffic conditions which would also result from sound enforcement It is not unreasonable to state that the poor enforcement, with its manifold correlated effects, existing in many municipalities results in an invisible but none the less real "tax" of about $25 00 per family per year Yet, the great majority of our citizens either considers traffic violations as