average conditions it would be economic to light a highway when the daily traffic volume reaches 2,500 vehicles. This figure is based upon rather scanty data regarding the economic loss due to accidents and also the relation between the number of accidents and the traffic density. The conclusion derived from this data suggests that the cost to the community represented by the loss of earning-power, medical expenses, and the property damage incurred by accidents, amounts to a figure in the vicinity of ¼d. per vehicle-mile. This is based largely on American statistics, which may not be strictly applicable in New Zealand. However, the figures supply a means of indicating to a very approximate degree when it is economic to incur certain expenditure upon the elimination of accident hazards.

It may be mentioned that among other factors the volume of motor traffic which may influence the question of the desirability for night illumination are the volume of cyclist and pedestrian traffic. Apart from the strictly economic viewpoint there is the human side of the problem represented by the suffering and sorrow which inevitably accompanies accidents, and the strain upon drivers and consequent bodily and mental fatigue caused through night driving under inadequate conditions for seeing. The Committee therefore feels that it is desirable to light as many of the denser traffic routes as possible for the purpose of preventing accidents caused through lack of seeing ability, and for the general benefit of the road-user.

From the most recent traffic records it is found that the only highways outside of the cities and larger boroughs where the traffic exceeds 2,500 motor-vehicles daily are—

(i) The Hutt Road from Thorndon to Petone (5,800 vehicles daily).
(ii) The Great South Road from Auckland to Otahuhu (2,700 vehicles).

This represents a total length of about sixteen miles, which would be lighted if the Committee's recommendations are adopted. The only other highways where this volume is at present approached are the Great South Road from Otahuhu to Papakura, and the Christchurch–Dunedin Main Highway from Christchurch to Sockburn.

The Type of Lighting.

The various available types of light sources are :—

(i) Electric filament lamps ;
(ii) Electric gaseous-discharge lamps—
  (*a*) Mercury-vapour type.
  (*b*) Sodium-vapour type.

The electric filament lamp is the common type of household and street lamp emitting a white light. The mercury-vapour lamp emits a bluish-coloured light and is the type to be seen in use at night in Lambton Quay, Wellington. The sodium-vapour lamp gives a soft yellow light, and the first major installation of this type in New Zealand was recently inaugurated on a length of highway in Devonport, Auckland.

The gaseous-discharge type of installation, either mercury or sodium, gives a much greater degree of illumination for the same expenditure of current than does the filament type. The cost of the lamps in New Zealand is, however, much greater in the case of the gaseous-discharge type.

After carefully considering the information available it appeared to the Committee that the most suitable form of illumination in the case of highways outside of shopping areas is provided by the sodium type of electric-discharge lamp. This light produces no glare and lights up the road surface in such a manner that all objects ahead may be clearly discerned in silhouette against a lighted background. Owing to the monochromatic nature of the light, there are no colour contrasts, and on this account, unless modified by the presence of other lights, which neutralize the yellow effect, sodium lighting is not suitable in shopping areas.

The Standard of Lighting.

Expressed in non-technical terms, the minimum standard of lighting which in the opinion of the Committee should be provided on the highways should be such that drivers may proceed with safety at a reasonable speed without the use of headlights.

With a sodium installation such a standard of illumination may be attained with lamps of not less than 100 watts, the spacing between lamps to be from 2 chains to 150 ft.—*i.e.*, thirty-five to forty lamps to the mile.

The Cost of Lighting.

The initial cost of installation may be assumed to vary from £600 to £800 per mile according to local conditions.

The annual charges for operating the system from dusk to half an hour after midnight, including interest on the first cost and the provision of a sinking fund, should in no case exceed £300 per mile, and will generally be little over £200.

It is considered uneconomic, in view of the very small amount of traffic normally using the roads after midnight, to continue to operate the lights later than 12.30 a.m.

Duty on Highway Lamps and Fittings.

At the present time there is a very heavy duty payable upon the gaseous-discharge lamps and fittings used in this country. In view of the national importance of the benefits to be derived from a system of adequate lighting the Committee recommends that the Customs duty on lamps of the gaseous-discharge type, together with the fittings and equipment used in connection therewith, be removed or reduced to a nominal amount.