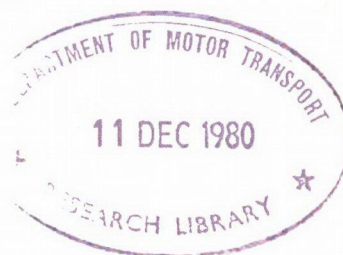


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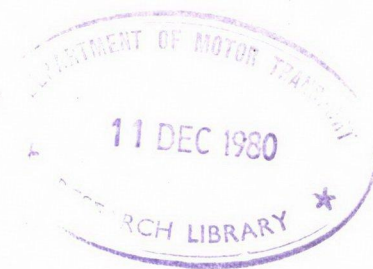
DAYTIME HEADLAMPS FOR MOTORCYCLISTS

SUMMARY REPORT

by

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DAYTIME HEADLAMPS FOR MOTORCYCLISTS

SUMMARY REPORT


BACKGROUND

Following special studies by the Traffic Accident Research Unit, as documented in Research Reports 5/70, 4/72 and 2/77, it was concluded that the daytime use of motorcycle headlamps would render motorcycles more conspicuous to other road users and that the number of crashes involving motorcycles would be reduced if such daytime use of headlamps were universal. It was estimated that an overall reduction in motorcycle crashes of about 10 per cent could be expected, and that such crash savings would outweigh the additional costs arising from increased headlamp use.

It was predicted that universal headlamp use was unlikely to be achieved by persuasion and, accordingly, a recommendation was made in late 1977 that the Motor Traffic Regulations be amended to require headlamps on motorcycles to be lighted during daytime.

Strong opposition to the proposed legislation was voiced by representatives of the motorcycling public. Claims were made that the legislation would be unduly harsh on motorcyclists, that the effectiveness of daytime headlamps in improving conspicuity was questionable, that there was already a high level of voluntary use of headlamps in daytime, that the additional load on motorcycle electrical systems would impose undue costs on motorcyclists, and that there would exist additional problems concerning legal responsibility in the event of a crash.

In deference to such arguments, introduction of the legislation was suspended and it was proposed that a publicity campaign be mounted with a view to increasing voluntary daytime headlamp use, and that further investigation of the effects of extended headlamp use on motorcycle electrical systems be undertaken.



SCOPE OF INVESTIGATION

The Traffic Accident Research Unit was charged with commissioning, monitoring and assessing the effects of the publicity campaign, and with conducting the investigation of motorcycle electrical systems. In addition, the opportunity was taken during the period of the campaign to undertake a questionnaire survey of motorcyclists, seeking attitudes towards daytime headlamp use. There were thus three major components of the investigation:

- (1) an assessment, by means of roadside observational surveys, of the extent to which the publicity campaign influenced the daytime use of motorcycle headlamps;
- (2) an appreciation, by means of a questionnaire survey, of motorcyclist attitudes and opinions concerning the daytime use of motorcycle headlamps;
- (3) an examination, by means of laboratory and field tests, of the ability of motorcycle electrical systems to withstand daytime headlamp use.

PUBLICITY CAMPAIGN AND HEADLAMP USE

Campaign

A publicity campaign urging motorcyclists to use their headlamps during daytime was conducted in mid-1978. The campaign comprised advertising on radio and in motorcycle magazines, and the distribution of leaflets and posters. In addition, press and radio interviews with the Superintendent, TARU, lent further support to the campaign.

Roadside Surveys

Roadside observational surveys were conducted at 49 different locations in the Sydney Metropolitan Area. Observers recorded details such as headlamp use, motorcycle engine capacity, helmet use and type, and rider apparel. Surveys were undertaken in both fine and overcast weather conditions.

Such surveys are conducted regularly in September of each year, but in 1978 further surveys were conducted in March and June in an attempt to detect any effect the publicity campaign might have had.

Headlamp Use

An increasing trend in daytime headlamp use in fine weather conditions had been observed in surveys prior to the publicity campaign. The proportions of motorcycles with headlamps alight were as follows:

September 1976	34%
September 1977	37%
March 1978	37%

An earlier survey in September 1975 had indicated a proportion of about 31%, but the results are not strictly comparable in every detail with those from later surveys.

Surveys conducted during and after the publicity campaign yielded proportions as follows:

June 1978	53%
September 1978	51%
September 1979	52%

Motorcycle headlamp use thus appears to have undergone a noticeable increase at about the time the campaign was conducted, and that increase appears to have been sustained. Statistical testing indicates that the increase observed between the March 1978 and June 1978 surveys is greater than could have been expected from the natural increase suggested by previous surveys.

The analysis also indicated that for motorcycles with engine capacity greater than 100 ml, the proportion with headlamps alight was between 40 and 45 per cent, whereas for smaller motorcycles the proportion was only 30 per cent, and that difference was significant.

The above results refer to fine weather conditions only, and should not be extended to overcast weather. Because of difficulties in accurately defining overcast weather, no firm conclusions can be drawn about changes in daytime headlamp use under those conditions. The surveys have indicated, however, that headlamp use under such conditions is considerably greater than in fine weather.

Conclusion

A significant increase was observed in the extent to which motorcycle headlamps were used in daytime under fine weather conditions. This increase occurred at the time when the publicity campaign was in force and has been sustained since.

It is not possible to estimate accurately the use of daytime headlamps that would have been observed had the campaign not been conducted, but the analysis does suggest that the campaign might well have been one of the factors responsible for the increase that was observed.

Overall, about 50 per cent of motorcyclists are using headlamps in daytime.

ATTITUDES TO HEADLAMP USE

Questionnaire Survey

The opportunity was taken at the Sydney Motor Show, held in August 1978, to conduct a questionnaire survey of motorcyclists visiting the Department's display stand (at which information concerning daytime motorcycle headlamps as a safety measure was available).

The questionnaire was designed to examine the extent to which motorcyclists agreed with daytime headlamp use, and sought attitudes and opinions as to various ways by which universal headlamp use might be achieved. Questions were also asked about the age, educational level, and riding experience of the respondents, and about the motorcycles they usually rode.

Stated Headlamp Use

It was clear from the analysis of questionnaire results that a large proportion (more than 70%) of the respondents stated that they always used their headlamps in daytime in poor visibility conditions.

The stated use of headlamps in fine weather was taken as a measure of the extent of agreement with the principle of improving conspicuity. Just over half the respondents stated that they always turned on their headlamps in fine weather.

The above results agree well with the use of daytime headlamps as observed in roadside surveys.

Respondents who rode motorcycles of less than 250 ml capacity, and those who rode less than 100 km per week, stated more often than others that they never used their headlamps in daylight. Those who did not belong to a motorcycle club stated more often than others that they always used daytime headlamps.

It was also revealed that a higher level of education was associated with more frequent daytime headlamp use, for at least part of the time.

Attitudes and Preferences

About 60 per cent of the respondents agreed that motorcyclists should be asked to use headlamps in daytime, with the vast majority of these giving safety or conspicuity as the reason for their agreement.

Those who disagreed were more likely to ride large touring motorcycles, travel long distances and belong to motorcycle clubs. The main reasons given for disagreeing were that the riders themselves should make the choice, that there was no need for it, and that motorcycle batteries and headlamp globes would suffer.

The method most frequently suggested for achieving universal daytime headlamp use was the imposition of a law requiring compulsory use, followed by education and advertising. An Australian Design Rule (ADR) for a headlamp-ignition interlock also received considerable support.

Of these suggested methods, education was by far the most acceptable, and there was high approval for an ADR. However, the imposition of a law to compel motorcyclists to light their headlamps was not so popular—less than half of those who suggested a law were in favour of its introduction.

Conclusion

The results of the questionnaire survey are limited by the fact that the respondents could not be held up as a representative sample of all New South Wales motorcyclists. Whether those attending the Motor Show held

substantially different views from others is a matter for conjecture.

It is clear that about half the respondents already used their headlamps in daytime, and that more than half the respondents agreed that this should be done universally. It appears that opposition to this is seated in the belief that motorcyclists should make their own choice in this matter, that there is no need for it anyway, and that motorcycle headlamps and batteries would need more frequent replacement,

While education and advertising, or an ADR, were highly favoured methods of achieving universal daytime headlamp use, introduction of the most frequent suggestion - a law compelling motorcyclists to use their headlamps - was favoured by less than half those who suggested it.

In other words, while a law is acknowledged as an effective method of achieving universal daytime headlamp use, there is considerable resistance to its introduction, and other methods are preferred.

MOTORCYCLE ELECTRICAL SYSTEMS

Investigation

Registration records were examined and those motorcycle models constituting the vast majority of motorcycles on register were identified. Specifications for the electrical performance of a representative range of motorcycles were collected and these were related to the actual performance of motorcycles in use by means of laboratory tests. Typical travel cycles of running and idling times for motorcycles in commuter traffic (the worst operating conditions) were devised and validated by field tests on a range of motorcycles.

Electrical System Capacity

The range of motorcycles studied in detail represented more than half the registered motorcycle population. It was found that the capacity of motorcycle electrical systems to withstand the additional load imposed by daytime headlamp use in commuter traffic varied between models.

Generally, the smaller motorcycles experienced greater net discharges than did larger motorcycles, but more than half of all models suffered either negligible or no discharge.

Additional Costs

For those models suffering a significant net discharge, additional costs that would arise from more frequent battery replacement were calculated, but possible savings and costs associated with special recharging of batteries were not considered. Globe and sealed beam replacement costs were considered for all models. Total additional costs for the entire motorcycle population were determined.

It was estimated that on average motorcyclists would incur an additional cost of somewhere between \$4 and \$9 per year through the daylight use of headlamps. It is not smaller motorcycles that are likely to incur the greater costs. In fact, the larger motorcycles, with their more expensive batteries, and especially their sealed beam headlamps, would incur the greater costs.

Conclusion

There would certainly be an additional cost incurred by the motorcycling public through the universal use of daytime headlamps. The estimated average cost of between \$4 and \$9 per year for each motorcycle is based not only on a more frequent battery replacement but also on a more frequent headlamp or globe replacement, and it is the latter which contributes the major component cost for the larger motorcycle. Previous estimates have considered battery replacement costs only.

Nevertheless, the savings which would accrue from the expected reduction in motorcyclist casualties and crashes would certainly outweigh the estimated costs to the motorcycling population.

SUMMARY

About half the motorcyclists in the Sydney Metropolitan Area use their headlamps in daytime.

The extent of this headlamp use could be increased to virtually universal use by introducing legislation making it compulsory for motor-

cyclists to light their headlamps at all times.

While the motorcyclists themselves acknowledge that this would be effective in achieving widespread daytime headlamp use, they do not favour such a law. Instead, they prefer encouragement by means of education and advertising, and would be prepared to accept a headlamp-ignition interlock.

Universal daytime headlamp use would impose additional costs upon the motorcycling population, but such costs would be outweighed by the estimated savings from reductions in motorcyclist casualties and crashes.