

THE LOW-SPEED MOPED - SAFE OR NOT?

The likely consequences upon road safety of introducing the low-speed moped.

Summary and conclusions from the Advisory report for the Minister of Transport and Waterways of The Netherlands.

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PREFACE

It is not often that a new vehicle is introduced, and for this reason alone it is an interesting subject of research. Having been asked by the Minister of Transport and Waterways of The Netherlands to give its views in the form of advice, regarding the likely consequences upon road safety of introducing a low-speed moped, the Institute for Road Safety Research SWOV was therefore glad to comply with this request.

But the condition that the report had to be made within three months of the request, was a major limiting factor. In such a short time it is impossible to carry out thorough scientific research, and resort has to be had to data already available or else obtainable at short notice. This limitation was all the more important for this advice because few of the data really required were available in an adequate or reliable form. This applies particularly to statistics of the proportion of cyclists and moped-riders among road users. It therefore proved to be necessary to arrange interviews specially for these investigations which would at the same time provide an opportunity to find out something more about potential low-speed moped users. Since little time was available, these interviews, however, were of limited scope.

Nevertheless, an effort has been made even with this somewhat sketchy information to express an opinion about the likely effect of the low-speed moped on road safety. It must be stressed, however, that this opinion applies only within the peripheral conditions stated in SWOV's terms of reference: that is to say that this vehicle must be regarded as an ordinary moped (conform the Dutch law) but subject to several different rules:

- (a) its top speed is 20 kms/hr;
- (b) the rider and passenger are released from the obligation to wear crash helmets.

Otherwise, the rider is subject to the same rules as the ordinary moped rider in The Netherlands; he will have to be at least 16 years

of age.

In this advisory report some opinions are expressed on a number of these peripheral conditions, especially some of the rules of conduct and the user's release from the obligation to wear a crash helmet.

Should the above peripheral conditions be departed from if and when the low-speed moped is introduced, or thereafter, SWOV's conclusions will no longer (fully) apply. Closer reflection upon the implications of any such changes will then be called for.

This paper gives only the introduction, the summary and the conclusions of the Advisory report for the Minister of Transport and Waterways. The report was written by Mr. A. Blokpoel (Ad-hoc Projects Section) and S. Harris, M.A. (Head of the Basic Data Section), both of the Research Services Department SWOV.

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INTRODUCTION

On September 9th, 1975, the TV feature "Hier en Nu" launched the notion of the "low-speed moped". In this broadcast, representatives of the moped manufacturers and the Dutch Cycle and Automobile Industry Association stressed that in the first half of 1975 only 50.000 mopeds had been sold, or half the number in the same period of 1974. The main reason for this was claimed to be the introduction of compulsory crash-helmet wearing for moped riders. In addition, they said that the total number of mopeds had decreased in less than a year by about 150.000, while another 100,000 users were expected to stop using mopeds. It was claimed that there were indications that two-thirds of these 250,000 were housewives, or at least women aged about twenty-five or older.

On the one hand, therefore, there is an economic problem, and on the other a mobility problem. The solution the moped manufacturers envisaged for these problems was to introduce a light moped with a top speed of 25 kms/hr, like that in the Federal Republic of Germany. The introduction of this light moped in The Netherlands would provide some compensation if users no longer had to wear crash helmets.

Replying to the contents of the feature as communicated to him, the Minister of Transport and Waterways said: "I have indeed had a large number of letters from people saying they would willingly wear a crash helmet but that it is simply impossible. The present rule provides no scope for exemption. We had to do this, because the police would otherwise have had no possibility of enforcement. I am quite willing to consider ways of providing for exemption, but it would in any case have to be as follows:

It would have to be a light moped unable to go faster than say 20 kms/hr and would also have to be very noticeable, for instance because of its colour; and that exemption from wearing a crash helmet would then be allowed for people riding such mopeds (....). This is really a bicycle that doesn't have to be pedalled (....).

In that case I would be prepared - and, of course, with the guarantee that such a moped could not be hotted up by simple tuning - to consider exempting their users from wearing crash helmets".

In order to obtain an idea of the implications upon road safety of introducing low-speed mopeds, the Minister of Transport and Waterways requested the Institute for Road Safety Research SWOV by letter dated October 9th, 1975 to make an advisory report before the end of 1975.

SUMMARY

Up to 1968, the number of mopeds in the Netherlands increased; next, it remained stable until 1970; since then it has been declining (in 1969, there were 1.9 million; on 1st January 1975 1.6 million).

The increase in the number of mopeds up to 1968 was due to a big increase in the number of moped riders aged 16 to 20 years; this increase was bigger than the decrease in the age groups 21 and older.

The changes in the number of mopeds after 1968 have been due to their penetration in the 16 to 20 age group not increasing as much, because the number of people in this group decreased (owing to the ending of the post-war bulge) and because the number of moped riders in the 21 and older age group decreased. In view of the trends in moped ownership among the various age groups, a further decrease in the total number of mopeds is likely in the years ahead.

There are no figures for actual sales of new mopeds to their users. Those that are available relate to sales invoiced by Dutch manufacturers and importers to Dutch dealers (retailers). As from mid-1974 the number of sales invoiced to retail dealers has greatly decreased. Without figures for sales of new mopeds to users, however, it cannot be said whether this decrease gives a realistic picture of moped sales to actual riders. There are, in fact, indications that the boom in sales of new mopeds owing to the energy crisis, which was expected but did not materialise, greatly pushed up retail stocks. The trade will obviously have sold these accumulated stocks before placing new orders. This might explain the big decrease in sales to the retail trade. The fact that retail sales did not rise as anticipated may be blamed on the short duration of the energy crisis, the bad weather and the continuation of the declining trend in the total number of mopeds owing to structural changes.

It seems to be quite out of the question that compulsory wearing of crash helmets has had any great effect on the indicated decrease in sales of new mopeds.

With the aid of interviews covering over 2000 persons aged 15 and older, an effort was made to gain some idea of the number of potential low-speed moped riders, their socio-demographic characteristics and the changes in their movement patterns arising from the introduction of this new means of transport. After introduction of a low-speed moped, the actual situation may differ from that emerging from interviews. This is because the respondents were not yet actually faced, at the time they were interviewed, with the decision whether to buy or not. It has been calculated from the results of the interviews that about two years after the introduction of a low-speed moped, assuming prices, top speed, minimum age and release from compulsory crash-helmet wearing all to be as at present, there will probably be about 100,000 actual low-speed moped riders. This will presumably increase the total number of vehicles by about 75,000. Potential low-speed moped riders do not belong to any specific socio-demographic group or a given road-user category. 39 percent are now cyclists, 15 percent car passengers, 14 percent ordinary moped riders, 14 percent bus or tram passengers, 12 percent car drivers, 5 percent train passengers and 1 percent motor cycle or motor-scooter riders. Potential low-speed moped riders include hardly any former ordinary moped riders who have disposed of their vehicles because they would have had to wear crash helmets.

The potential low-speed moped riders are now about 5 percent less mobile than the people not planning to buy one of these vehicles; after acquiring a low-speed moped they will increase their mobility by about 1 percent. This will increase the overall mobility of the population aged 15 years and older by about 0.01 percent, or about 10 million traveller-kilometres per annum.

Low-speed moped riders will make less use of all other types of transport, but the effect of this on overall vehicle use will only be slight.

In introducing a new or modified vehicle, very many aspects (relating to vehicle and rider characteristics, behaviour rules and traffic facilities) will have to be studied and regulated so as to avoid being faced with unanticipated road safety problems.

Some notes may be added to a number of aspects specific to the low-speed moped as regards its possible effect on road safety: Open frame: Research in other countries has demonstrated that riders of two-wheeled vehicles with open frames run a bigger risk of injury than riders of two-wheeled vehicles with closed frames. The use of an open frame would also seem to do little towards contributing to the specific recognisability of low-speed mopeds.

Top speed 20 kms/hr: In view of its lower top speed and its presumably lower acceleration compared with ordinary mopeds, the low-speed moped will probably stay longer in the instability range. In order to make such low-speed vehicles easier to ride, it is advisable:

- (a) for them to be equipped with flashing indicator lights as an inclusive extra;
- (b) for them not to carry any adult pillion-riders.

It will have to be examined whether the low-speed moped can be allowed on "optional" cycle paths, because its low speed will make it differ very greatly from other motorised traffic (including ordinary mopeds).

Wheel diameter: As regards wheel diameter, it may be commented that the inertia moments around the wheel axle and handlebar shaft influence a two wheeler's stability.

From available data, it can be derived that in the Federal Republic of Germany the Mofa 25 is not as safe as the Moped and the

Mokick. Furthermore, both the Mofa 25 and the Moped and Mokick are not as safe vehicle-wise as the moped in The Netherlands. It is to be noted that the German statistics are not entirely comparable with the Dutch ones owing to the different traffic situation (lower minimum riding age for the Mofa 25, theoretical examination for driving licence for Mokick and Moped riders). In their traffic behaviour, low-speed moped riders are likely to show more resemblance to ordinary moped riders than to cyclists. The death rate (number of deaths per 10^9 traveller kilometres) for moped riders without crash helmets is about twice as high, the injury rate (number of injured persons per 10^9 traveller kilometres) about five times as high, as the respective rates for cyclists.

Besides the low-speed moped's own speed, in accidents with four-wheeled motorised vehicles the speed and mass of the latter will particularly affect the severity of the injuries.

The percentage of head injuries in low-speed moped rider deaths will probably be about the same as for cyclists and ordinary moped riders (without crash helmets), i.e. about 75 percent.

CONCLUSIONS

The unsafety for low-speed moped riders is likely to be greater than for cyclists, but less than for ordinary moped riders not wearing crash-helmets. There will be little difference compared with ordinary moped riders wearing crash-helmets.

The average death rates and injury rates for the present road-user categories who might take up riding low-speed mopeds in the future differ little from those expected for low-speed moped riders. In view of this, and since the traffic output of the total number of low-speed mopeds is expected to be comparatively limited, the effect of these vehicles on overall road safety is not likely to be great. There are indications that this slight effect will tend to be unfavourable rather than favourable.

Despite the low-speed moped's top speed, the wearing of crash helmets by their riders will greatly reduce the death rate and (to a less extent) the injury rate.