Agricultural Vehicles & Minor Roads: an Uneasy Embrace?
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Introduction

Differences in speed and mass on roads with mixed traffic modes are an important road safety issue [Wegman 1997]. On minor rural roads the mix of modes includes small and slow pedestrians and bicycles as well as much larger and faster cars and even some heavy vehicles such as trucks. Minor rural roads also are the domain of agricultural vehicles (AVs). In a modern mechanized agriculture AVs are heavy and slow compared to cars, but fast and very heavy compared to pedestrians and bicycles. On average, 12 people are killed yearly and another 225 seriously injured in traffic accidents with AVs involved on minor roads in The Netherlands [Jaarsma et al. 2003].

The objective of this paper is to explore general solutions to reduce the risks of the inevitable encounters between AVs and other road users on minor roads, because for practical reasons in general the alternative of separating them is not realistic [Jaarsma et al. 2003].

Method and results

Several measures can be taken to deal with a mix of slow and fast moving vehicles. Starting point for minor rural roads is the view that their primary function is to provide local access, not to serve through traffic. Therefore minor rural roads should preferably not allow speeds above, say, 60 km/h [Jaarsma 2000], where present West-European legal limits commonly vary between 80 and 100 km/h.

Focussing on AVs, Table 1 shows an overview of measures, categorised by their location: in the region, in the neighbourhood of the minor rural road or on that road itself.

Measures in the region are based on a shortening of agricultural trip lengths and/or on a reduction of the necessity to use public roads for agricultural purposes. Land reallocation projects could provide a useful tool for this purpose. Also traffic safety issues in a wider context can be addressed during such projects.

Measures in the direct vicinity offer the AVs an alternative route, better suited for this purpose, for example because of a wider pavement and/or the presence of a separated bicycle path. This approach is not applicable when the majority of trips is short. It may work for longer trips, for example during the harvest between field parcels and a regional storage centre. To realize this solution it is advised to look for suitable routes in close cooperation with both local road management and the farmers who are intended to use them.
Table 1. Several solutions to mitigate the problem of AVs on minor rural roads by location

<table>
<thead>
<tr>
<th>Location of the measure</th>
<th>(A) in the region</th>
<th>(B) in the direct vicinity of the MRR (*)</th>
<th>(C) on the MRR itself</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) land reallocation</td>
<td>(2) reallocation of flows</td>
<td>(3) speed reducing measures (vertical), such as speed humps and rumble strip</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>(4) speed reducing measures (horizontal), such as extra bends and narrowed passages</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>(5) paved or sealed shoulder</td>
<td></td>
</tr>
</tbody>
</table>

(*) MRR = minor rural road

Given the differences in mass on minor roads, from a road safety viewpoint differences in speed should be low to allow for a safe mix. Therefore the highest speed levels, those of cars, should decrease. This can be realized with speed regulation, either with traffic signs or with physical measures, such as speed humps or narrow bends. Most physical speed reducing measures will also affect AVs and are therefore very unpopular among farmers.

With respect to the road, a protection of the road shoulders may avoid damage to the verges by heavy vehicles, including AVs. This solution is applied in Australia, mainly for safety reasons along rural highways [Ogden 1997]. On minor roads it may even increase speed levels, because a sealed shoulder better facilitates a vehicle than a verge.

Looking at the AV itself instead of the minor road, another possible measure to reduce safety risks is to provide good visibility of the AV and make it more conspicuous, both during daylight and night-time hours [Jaarsma et al. 2003].

**Conclusions**

AVs need minor rural roads because these roads give a direct access to both farm buildings and parcels, the usual origin and destination of AVs. However, large differences in speed and mass appear between road users on minor roads, which is an important safety issue. To increase traffic safety several measures—as summarized in Table 1—can be taken. The full paper will give a further elaboration and more into detail an overview of the pros and cons.

**References**


