

4. DISCUSSION AND CONCLUSIONS

The study results indicated that the roundabout supported driving without rapid head movement, unlike other intersection types. The questionnaire results also showed that the roundabout was rated highly for ease of safety checking. In addition, vehicle speed at the roundabout was lower and variations in vehicle speed among subjects were smaller than for other intersection types. It is therefore considered that serious accidents are less likely to occur on roundabouts, and accordingly that roundabouts are safer than other intersection types also in winter.

In the area of safety measures, comparison of winter and summer driving behavior on the roundabout revealed more rapid head movement as well as more frequent steering wheel operation and acceleration/braking in winter. This was presumably because roads were more slippery and there were fewer visual cues to support driver orientation in winter (the snowy season) than in summer (the non-snowy season). Accordingly, it is considered effective to take safety measures by installing snow poles and delineators on central islands and both sides of entrances to roundabouts to support driver orientation, and to implement winter maintenance in order to facilitate safety checking.

Based on this study, roundabouts were identified as an intersection type that facilitates safety checking for drivers, and can therefore be considered safer than four-way right-angled ground intersections.

In future work, the authors plan to quantitatively evaluate the effects of the safety measures introduced here. To support discussion of roundabout installation in cold snowy regions, further studies will be conducted based on driving experiments with conditions highly similar to those of actual roads in terms of traffic volume, pedestrian presence and other factors with focus on a variety of winter road surface conditions.

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