

Authors (from body, name, chairman and secretary of the body) Räsänen J., Pursula P., Scholliers J., Jaakkola K., Varpula T.		Type of publication	
		Assigned by Ministry of Transport and Communications	
		Date when body appointed	
Name of the publication RF-TIE. Suitability of passive RF-ID technology to road and transport environment			
Abstract <p>Decreasing prices and low environmental burden compared to active systems with power source increase the use of passive RFID tags in the near future. In transport applications tags and readers may be located in vehicles, on the roadside, in road infrastructure, in freight units or in mobile phones. Communication can be arranged from the vehicle to the roadside or the other way round. In the future each vehicle may be equipped with a passive identification tag and each mobile phone may include a reader, and there may be both readers and tags on the roadside.</p> <p>The objective of this project was to test how read operation succeeds in real highway environment. Typical problems that arise in transport applications are caused by different vehicle speeds, varying reading distances, weather conditions and location of tags and readers. The aim was to test both 1) identification of by-passing vehicle from the roadside and 2) identification of a tag installed inside road structure. Technical goal was to see how standard equipment (not specifically designed for high speed applications or long distances) performs in a field experiment.</p> <p>Firstly the location of the tag in vehicle was chosen. The reader was able to read a tag installed in vehicle's plastic bumper from a distance over 2 meters using 0.5 W power. This location suits well for reading from the roadside. For portal applications it is better to install the tag behind windscreen.</p> <p>Secondly the tests were done using a moving car. The tags could be read up to speeds of 100 km/h, though only with distances of less than 1 meter.</p> <p>Finally tags installed under 15 cm of asphalt concrete and gravel were tested. They could be read, but even 1 cm of water on asphalt blocked the communication.</p> <p>Some tests were repeated using reading power of 2 watts, but there were still some problems with interoperability of new equipment and tags, as well as some quality deficiencies with the tags.</p> <p>Passive RFID technology was found to be suitable for transport conditions, and therefore pilot applications could be developed. Promising monitoring and information provision applications include vehicle identification tags, public transport monitoring, information for pedestrians and cyclists, parking place reservation, paying and information as well as vehicle flow monitoring.</p>			
Keywords RFID, field test, identification			
Miscellaneous			
Serial name and number FITS publications 45/2004		ISSN	ISBN ISBN 952-201-106-1
Pages, total 59	Language Finnish	Price	Confidence status Public
Distributed by VTT Building and Transport		Published by Ministry of Transport and Communications	