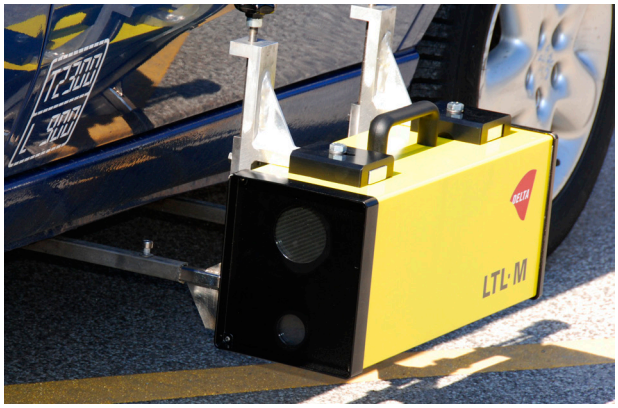
Mobile measurement of pavement markings

Safe driving is very much related to proper guidance of the traffic. High quality pavement markings are the key to reduce the risk of road accidents. Using a mobile retroreflectometer, road markings can be measured in full length and width to ensure compliance with standards.

Driving at nighttime and under difficult weather conditions, drivers rely on pavement markings and road signs to guide them safely to their destination. International standards exist (e.g. the European CEN and the US ASTM standards) explaining how to measure and what minimum retroreflection levels to meet. Outside EU and USA the CEN and ASTM standards are increasingly being implemented as one way to improve safe driving.

Hand-held retroreflectometers are today the only instruments being accurate enough and accepted for contractual valid measurements of road markings. DELTA's LTL2000, LTL-X and LTL-XL instruments are very much the standard used by the market but hand-held instruments have limitations. Hand-held instruments provide sample measurements which are not representative for retroreflection measurements of the full length and width of pavement markings. Use of hand-held instruments typically needs costly closure of roads.

Hand-held LTL-XL retroreflectometer



More recently mobile retroreflectometers have been introduced on the market. A mobile retroreflectometer allows measuring the full length and width of pavement markings. A mobile retroreflectometer is mounted on the side of a car and measurements are taken at normal driving speed without disturbing the traffic flow. Data on measurement results and location are automatically stored for later review. An overhead camera may film the road and allow for later visual check of stretches of pavement markings not meeting the standard.

Existing instruments on the market have, due to the technology used, difficulty in providing precise measurement results. The so called "fixed geometry" technology is not compensating for car movements or bumpy roads. Tests show that these instruments -run by a professional team- typically show a systematic and random error of at least 10% and the errors have been documented to be as high as 50% in other tests.

A new patented mobile retroreflectometer technology developed by DELTA offers increased measurement accuracy in line with hand-held instruments under all driving conditions including bumpy roads and curves. This technology is able to compensate for car movements by digital processing with no moving parts. Field tests carried out in Denmark and Sweden in October 2009 confirmed that DELTA's LTL-M mobile retroreflectometer measured as accurate as the hand-held reference with systematic and random errors in the range of 3.5 – 5.3%. The report of the study can be located on www.roadsensors.com. Besides measuring the full length and width of pavement markings LTL-M also records RRPMs (Raised Reflective Pavement Markings) and line geometry.

LTL-M can be integrated with existing mobile road measurement systems as well as used as a stand-alone unit easily mounted on any type of vehicle. LTL-M is designed for easy on the spot calibration and maintenance with no or minimal downtime. Mounted on existing road measurement vehicles as an add-on instrument LTL-M can be used in parallel to other measurements already being undertaken, i.e. no extra kilometres to drive to add pavement marking information.

DELTA is convinced that offering an accurate and easy to use mobile retroreflectometer will increase mobile retroreflection measurements in the future – to the benefit of safe driving. The mobile system will allow road authorities to check the condition of the pavement markings more frequently and in full length. The data generated will be used by road authorities to identify where maintenance is really needed and thus to spend the often limited maintenance budget more effectively – and at the same time increase safe driving.

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