

Written by Rod Klashinsky & Rish Malhotra, International Road Dynamics, Canada

## How to make sure the heavyweights pay

Weigh-in-motion methods for dealing with overloaded, dangerous trucks on toll roads

➔ WIM has a long history of application in data collection for use in planning transportation infrastructure. This has expanded to use in enforcement in sorting compliant from violating vehicles to increase the throughput and ease congestion at inspection stations. In various applications – particularly within the tolling area – it has long proved itself to be a valuable option for road managers. Using this concept, both axle and gross vehicle weights are monitored.

Various vehicle-weighing strategies include the use of static scales as well as high-speed and slow-speed WIM sensors. The WIM technology deployed, installed, and



weight. There is a direct relationship between the wear and tear on pavements, bridge structures, and other components of the transportation infrastructure as a relationship to the increase in weight of the vehicle or the vehicle's number of axles.

IRD has installed several WIM@Toll plaza systems in India, China, and Korea, and has several systems at the

“Concessionaires support this concept as charging tolls to overloaded vehicles is beneficial in recovering the infrastructure development and maintenance costs”




maintained by International Road Dynamics Inc (IRD) in various locations worldwide includes single loadcells, bending plates, slow-speed WIM scales, lineas quartz, and piezoelectric sensors. Systems in operation use a range of video-imaging technologies, including color, low-light, and infrared imaging. Some use ALPR and RFID to assist in identification. Most systems installed by IRD also include various vehicle dimensioning sensors, such as height sensors, light curtains, tire width sensors, and axle sensors.

Data collection, weight and dimension enforcement, truck weighstations, and toll collection have in the past been separate operations, but integration of these fields equates to efficiency. WIM at the toll plaza (or WIM@Toll) is the most easily implemented and efficient method of collecting tolls based on

planning stages in Africa, the Middle East, and North America. The concept of tolling based on weight is seen as a fair and equitable way to recoup the cost of consumption of transportation infrastructure by a commercial carrier. IRD's bending plates are widely used in China where the WIM@Toll concept has been implemented. Concessionaires and other commercial vehicle operators are in support of this concept as charging tolls to the overloaded trucks recovers the infrastructure development and maintenance costs in the long run.

IRD's successful implementation of WIM@Toll is based on its years of expertise in WIM, automatic vehicle identification, video imaging, database management, and application service provision. The future trend is toward the use of universal RFID in commercial vehicles, and in doing so leading to further integration of transportation management functions via ETC of overloaded vehicles.



**TS086**  
**Thurs, Sept 24**  
 14:00-15:30  
 IRTD WORLD CONGRESS  
 STOCKHOLM 2009

## Safer driving, whatever the weather

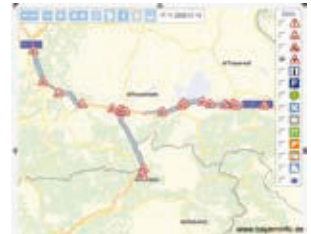
A new atmospheric weather detector can detect rain, wind, temperature and humidity

➔ The fieldbus-based WS600 atmospheric weather detector from Lufft can measure a number of conditions. For instance, an innovative Doppler radar sensor can record the type and intensity of precipitation. The direction and speed of wind can also be measured through the use of a non-mechanical ultrasonic transducer, and air pressure can be measured with a built-in pressure transducer. Air temperature and relative humidity are measured within a protection shield, with active ventilation that helps to speed up the response time and ensure accurate measurement of the surrounding atmosphere.

The device has one serial interface within which all

the temperature. Finally, it can measure road surface conditions based on the dielectric characteristics of the cover.

The ARS31-UMB sensor device measures the freeze point temperature by cooling and heating up a small sensitive area on top of the sensor surface, allowing the measurement the actual freeze temperature of the liquid solution on the pavement.



“For traveler information, a service operation platform processes meteorological and road weather data sources, producing TMC-coded warnings”

measured data is reported. The communication protocol specification is open and can easily be implemented into OEM solutions.


The IRSx-UMB series of road surface sensors from Lufft has proved successful in accurately reporting all parameters appropriate to the evaluation of the condition of the road surface. It measures road surface temperature (in °C), benefits from up to two subsurface temperature probes (for a depth of 30cm), and provides waterfilm depth measurement by means of a microwave radar transducer. Freeze temperatures can also be measured via gold electrodes that assess the chemical concentration and conductivity within the solution, while also considering the waterfilm thickness and

For traveler and traffic information, a road weather service operation platform was developed by mickS MSR in cooperation with BMW. This processes meteorological and road weather data sources, which can also have various time and geographical references, producing TMC-coded warnings and messages referenced to short road sections based on digital map links or TMC locator.

The platform has been run since 2008 by the Bavarian Traffic Information Agency (VIB), established by the Bavarian Interior Ministry and a consortium of private firms.

To meet the requirements of a premium service, BMW has also run several automatic quality measurement and probe-collecting tours by XFCV vehicles from BMW is called upon. The results show a reliability of over 80% for critical weather warnings.





**TS116**  
**Friday, Sept 25**  
 11:00-12:30  
 IRTD WORLD CONGRESS  
 STOCKHOLM 2009

Written by Karl E. Schiedler, mickS, Germany