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ISWIM
International Society for Weigh in Motion

ISWIM NEWSLETTER

Message from the ISWIM president

Dear Readers,

Welcome to the first edition of our Newsletter for 2018. This is a bumper issue, covering a broad area of Weigh-In-Motion (WIM) including:

- Using bridge WIM systems to monitor the health of bridges,
- New monitoring practices in Canada and the USA,
- The introduction of a subsurface based quartz sensor and OIML certifications.

Included in this edition is an article on the new FHWA's three-part WIM Pocket Guide that provides expert WIM traffic monitoring guidance to practitioners. Like always, the Newsletter showcases the forward program of local and international events including the activities of the International Society for Weigh-In-Motion (ISWIM).

I am particularly pleased with the number and depth of articles from researchers, practitioners and vendors being submitted to the ISWIM Newsletter. This level of content makes the Newsletter even more important to all three stakeholder groups.

Finally, I am proud to announce that the Board of ISWIM has approved an award that pertains to young researchers. This award recognises young research students around the world who are contributing to the WIM field and are demonstrating a passion through their studies and possibly early professional life.

The ISWIM Board has approved to award at least three recipients to attend it's forthcoming 8th International Conference on WIM in Prague in May of 2019. The sponsorship will cover all travel, accommodation and registration fees and will aim to allow the recipients to present their work, visit the exhibition and importantly further develop their industry knowledge and global network. Details

In this issue

are available in the Newsletter, and it is a credit to ISWIM that it can now support researchers and students in the field of Weigh-In-Motion.

Happy reading, and as always, available for a chat or a discussion through our LinkedIn connection.

President – ISWIM
Chris Koniditsiotis

Chris Koniditsiotis | ChrisK@tca.gov.au

New Young Researcher Award

This award recognises young tertiary level students from around the world who are making a contribution to the Weigh-in-Motion (WIM) field and are demonstrating a passion through their studies and possibly early professional life.

ISWIM will fully sponsor at least three recipients to attend the 8th International Conference on WIM (ICWIM-8) in Prague next year to present their work (poster paper or oral presentation), visit the exhibition, and further develop their industry knowledge and global network.

The applicants should email an abstract of their work together with their CV and two references to Lily Poulikakos at lily.poulikakos@empa.ch before October 30th 2018. The ISWIM Board will evaluate the work submitted and notify the winners in January 2019.

Lily Poulikakos@empa.ch | Lily.Poulikakos@empa.ch

Use of Bridge WIM to monitor the health of a bridge.

In Bridge WIM, the bridge is used solely as a tool – a weigh scale to weigh passing vehicles. However the collected data not only contains information about passing traffic but, if we use the right kind of sensor, also on the health condition of the bridge. Bridge WIM systems almost always use strain transducers but can be easily adapted to use other types of sensor, such as displacement transducers or inclinometers, which are sensitive to the bridge condition. Thus, for a moderate increase in the number of sensors, the Bridge WIM system can give information on the bridge's health without compromising the quality of the vehicle weight data.

The studied bridge in Ljubljana, Slovenia

ISWIM Workshop at SATC, Pretoria

The 37th annual **Southern African Transport Conference** (SATC 2018) will take place from Monday 9 July to Thursday 12 July 2018 at the CSIR International Convention Centre in Pretoria, South Africa.

The conference offers a forum for discussion and information exchange on the implementation of transport policy, strategy and technology applications.

On Thursday July 12th ISWIM organises a one day Weigh-In-Motion workshop offering an overview of the latest developments in the applications of WIM technology. The programme consists of a mix of presentations on general developments in the use of weigh in motion system and concrete examples of successful implementations of WIM systems in South Africa and around the world.

Participation in the workshop will be free of charge for all delegates of the South African Transport Conference. More information on the conference can be found at: www.satc.org.za

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Hans van Loo | hans.vanloo.int@gmail.com

Monitoring a bridge using WIM data becomes possible because of the statistical repeatability of the truck weight data. Individual truck weights vary greatly but histograms of truck and axle weights tend to be reasonably consistent from one month to the next. But that can change if a bridge is damaged due to, for example, a bridge 'strike' from a vehicle passing underneath. If this happens, the WIM data derived from damage-sensitive sensors will diverge from that derived from conventional strain transducers.

The concept has been tested using two years of Bridge WIM data taken from a reinforced concrete culvert in Ljubljana, Slovenia. Different damage indicators have been developed from the statistics of the WIM data. As the bridge remains in a healthy condition, changes in bridge stiffness due to temperature have been used as an alternative to damage – our thinking is that if we can detect a change in temperature, then we will be able to detect a change due to damage. Preliminary results are encouraging – the system does seem to be able to detect changes in the bridge's condition due to changes in temperature, giving good confidence that any change due to damage would be detected.

Eugene O'Brien | eugene.obrien@ucd.ie
Barbara Heitner | heitner@phimeca.com,

New Traffic Monitoring Practices Guide for Canada

The Transportation Association of Canada recently published the Traffic Monitoring Practices Guide for Canadian Provinces and Municipalities which provides the first Canadian resource for the planning, design, and implementation of traffic monitoring programs. The Guide represents a synthesis of knowledge stemming from three major efforts, including a comprehensive literature review, a survey of Canadian practitioners, and a detailed inventory of conventional and emerging traffic monitoring technologies. The Guide encompasses all functional components of a typical traffic monitoring program, from program planning and design to data collection, validation, summarization, and dissemination.

Portable Weigh Scale in Manitob, Canada

NATMEC 2018

The bi-annual National Travel Monitoring Exposition and Conference (NaTMEC) will be held from June 10 to 13, 2018 in Irvine, California, USA,

NaTMEC provides travel monitoring professionals and transportation data users from around the world opportunities to share knowledge and good practices, exchange ideas, and see the latest advancements in policy, technology, and equipment.

The goal of the conference is to increase the efficiency and effectiveness of multimodal traffic monitoring programs to enhance data driven decisions in areas of performance management, planning and design, asset management, safety, and program administration.

This year's conference has planned 4 WIM related sessions including 12 presentations along with a few posters. There will be 8 exhibitors who are involved with WIM data in the exhibiting area.

On Sunday, June 12th there will be a special 2 hour FHWA WIM Pocket Guide Workshop.

More information on NATMEC 2018 can be found at: www.natmec.org.

NaTMEC
NATIONAL TRAVEL MONITORING
EXPOSITION AND CONFERENCE

The Guide addresses the unique challenges associated with vehicle weight data. Specifically, the Guide:

- discusses the selection of WIM technologies based on their relative strengths and limitations and their suitability to provide data for a range of transportation applications;
- describes options for leveraging private sector resources for weight data acquisition, equipment installation, calibration, and verification;
- provides examples of how to calculate standard vehicle weight statistics;
- recommends sampling techniques that can be applied to help jurisdictions achieve system-wide coverage from their weight data.

Overall, the Guide contributes new, practical knowledge concerning the use of WIM technologies within vehicle weight monitoring programs.

Jonathan Regehr | Jonathan.Regehr@umanitoba.ca

Kistler introduces first subsurface Quartz Sensors

In February 2018 Kistler installed its new KiTraffic Statistics system in Florida on the interstate I-10 at a FDOT traffic data collection site. The goal is to validate that this system can provide accurate, vehicle count and classification data.

Installation of subsurface Quartz Sensors in Florida, USA

KiTraffic Statistics is a compact, cost-efficient WIM solution, which incorporates newly developed sensors and pre-wired components for a quick and easy installation. Its new Lineas Compact quartz sensors are integrated into the road itself, 25 mm below the surface, and are covered with a grouting compound, which ensures an extended sensor lifetime while providing accurate data for Traffic Data Collection. It is ideal for customers who simply want an overview of road usage. The system offers reliable Weigh In Motion features at a great value and will be first shown to the public at Intertraffic Amsterdam 2018.

Tomas Pospisek | Tomas.Pospisek@kistler.com

ISWIM Workshop at Intertraffic, Amsterdam

From March 20th to 23rd the bi-annual Intertraffic exhibition will be held in Amsterdam, The Netherlands. During the exhibition ISWIM will organise a workshop on 'WIM for Enforcement'. The workshop is scheduled for Thursday, March 22nd, 2017, from 13:30 to 17:30, in Room D407. Participation in the workshop will be free of charge, for more information on the exhibition go to: www.intertraffic.com/amsterdam.

This workshop will present different aspects of the application of WIM for weight enforcement. What are the experiences of different end-users and policy makers with the European control of the loading regulations and what are their expectations for the future?

The workshop will have presentations from the EU-Commission DG Move on the new loading regulations, Euro Controle Route with a vision on future European control of international road transport, Implementations of WIM for enforcement from Hungary and France, NMi on the new international WIM standard, TCA on the experiences with the use of On-Board weighing and CEDR with the EU road owners perspective on overloading.

Hans van Loo | hans.vanloo.int@gmail.com

FHWA WIM Pocket Guide

The FHWA's Office of Highway Policy Information has developed a comprehensive three part Weigh in Motion (WIM) Pocket Guide that provides expert WIM traffic monitoring guidance to all traffic monitoring practitioners. This includes techniques, procedures, policies and technical details on truck weight data collection and processing. These guides are for the field technician and field engineer level, where areas ranging from sensor selection, sensor installation, sensor calibration, sensor maintenance, to data processing and reporting hardware and software are covered in plain and easy to understand language.

The WIM Pocket Guide consists of three parts:

Part 1: WIM Technology Selection, Data Acquisition Requirements, and Procurement Guide;

Part 2: WIM Site Selection, Design, and Installation Guide;

Part 3: WIM Maintenance and Calibration

In addition, a mechanism to enhance communication among practitioners, share ideas, and keep up with technology and equipment will ensure that WIM data are collected and processed in the most efficient and effective manner. Four accompanying videos on different WIM sensor installation practices are also being professionally produced.

FHWA also has developed a management/leadership briefing presentation on WIM Utilization. This briefing is meant to provide senior leaders a perspective of what WIM is, how the data is used and advantages of quality WIM data for informed decisions.

Steven Jessberger | Steven.Jessberger@dot.gov

Intercomp Submits Products for OIML Certifications

Having successfully conducted laboratory and field verification testing, Intercomp has final R 134 certification pending processing by OIML for Weigh-In-Motion scales and sensors. Two different products have passed testing, for use in various applications and industries.

Strain Gauge Strip Sensors are used for both low-speed (LS-WIM) and high-speed (HS-WIM) applications. Installed in channels cut into the pavement, the sensors' current uses range from data collection, tolling, mainline screening, direct enforcement, and check weighing. OIML R 134 Class 5 accuracy was verified.

The LS-WIM Axle Scale for LS-WIM also has passed verification testing. The scale is used in several industries that Intercomp supports ranging from enforcement, agriculture, and the military. With OIML R 134 Class 2 accuracy, excellent performance at low speeds was verified.

Celebrating their 40th year of business, Intercomp has developed and incorporated strain gauge technology for weighing in many different industries around the world. The company anticipates announcements of additional US

Coming Events

Intertraffic Amsterdam
Amsterdam, the Netherlands
Mar. 20-23, 2018
www.intertraffic.com

7th Transport Research Arena
Vienna, Austria
Apr. 16-19, 2018
www.traconference.eu

International Transport Forum (ITF)
Leipzig, Germany
May 23-25, 2018
https://2018.itf-oecd.org/

National Travel Monitoring Exposition and Conference
Irvine, CA, USA
Jun. 10-13, 2018
www.natmec.org

Southern African Transport Conference
Pretoria, South-Africa
Jul. 9-12 2018
www.satc.org.za

ITS World Congress
Copenhagen, Denmark
Sep. 17-21, 2018
www.itsworldcongress.com

15th International Symposium on Heavy Vehicle Transport Technology
Rotterdam, the Netherlands
Oct. 2-5, 2018
www.road-transport-technology.org

Gulf Traffic
Dubai, UAE
Dec. 3-5, 2018
www.gulftraffic.com

8th International Conference on WIM
Prague, Czech Republic
May 2019
www.is-wim.org

PIARC, 26th World Road Congress
Abu Dhabi, UAE
Oct. 6-10, 2019
www.piarc.org

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and International certifications for portable and in-ground products throughout 2018.

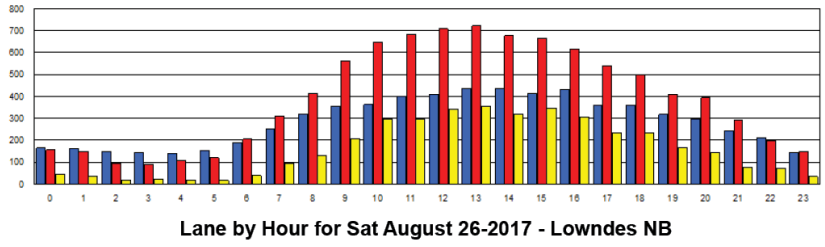
If readers are attending Intertraffic Amsterdam, Intercomp invites ISWIM members to visit booth 12.617 to discuss these certifications and celebrate the history and anniversary of the company.

Jon Arnold |jona@intercompcompany.com

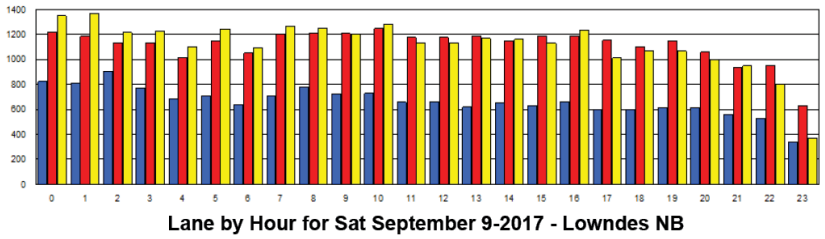
Traffic Monitoring During an Emergency Evacuation

Georgia Motor Carrier Compliance Division (MCCD), the agency responsible for weight and safety enforcement in Georgia, contacted IRD in advance of Hurricane Irma's landfall in order to see what features of their Virtual Weigh Station (VWS) weigh-in-motion sites they could use to monitor traffic.

MCCD could see vehicle images and speeds on the VWS webpage. However, they were looking for more information on the number of vehicles travelling by the stations. Utilizing VI2M™, IRD's cloud-based central data reporting software, IRD provided real-time traffic volume, occupancy and speeds. Reports were produced comparing the traffic during the evacuation with the previous three weekends.



Graph for Aug. 26 - Usual Saturday Traffic



Graph for Sept. 9 - During the Evacuation

The reporting told MCCD how many vehicles were travelling which direction during the crisis period, including both evacuations and return trips. This was important, as contra-flow traffic was one of MCCD's strategies for dealing with the crisis. VI2M reports indicated when it was safe to resume normal traffic flow.

During a period of great concern for traffic safety, IRD's VI2M software offered MCCD the data needed to reassure the public. This response to an extreme weather event also introduced MCCD to the advanced real-time data capabilities of their commercial vehicle screening systems that could assist them when other events, such as holidays or construction, affect traffic.

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ISWIM Vendors

Betamont
www.betamont.sk

Camea
www.camea.cz

Captels
www.pesage-captels.com

Cestel
www.cestel.eu

Cross
www.cross.cz

ECM
www.ecm-france.com

Haenni
www.haenni-scales.com

Intercomp
www.intercomp.com

IRD / PAT Traffic
www.irdinc.com

Kapsch
www.kapsch.net

Kistler
www.kistler.com

Mikros
www.mikros.co.za

Sterela
www.sterela.fr

TDC / Q-free
www.tdcsystems.co.uk

TE Connectivity
www.te.com

Traffic Data Systems
www.traffic-data-systems.net

Wheelright
www.wheelright.co.uk

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OIML R-134 WIM Certification

In order to use WIM for enforcement and tolling the systems hard- and software needs to be legally certified according to international standards like OIML R-134. Yet with the exception of Traffic Data Systems WIM-DSP 32 (5km/h to 120km/h), no other WIM system worldwide is certified for speeds >65km/h based on a legal national/international standard.

Competitors WIM systems tend to be either based on COST 323 or on ASTM E1318. However, customers have to be aware that both documents are not legal standards that are accepted by national metrological institutes like PTB or METAS.

According to OIML R-134 we currently achieve the accuracy classes F (single-axle load/axle-group load) and 10 (vehicle mass). This means a maximum error of ±5% (initial verification) and ±10% (in-service inspection). We currently aim for the higher classes E and 5. This means a maximum error of ±2.5% and ±5%. This may not sound like a big step, but it is a quantum leap in the field of OIML R-134-certified WIM systems. Customers also have to be aware that the certifying bodies require that at least 99.9% of all valid measure-ments have to be within the certified measuring range.

Low speed weighing during tests in Germany

TDS has proved that current hardware and software fulfill the requirements to pass the OIML R-134 requirements for low and high speeds. As a result of this, WIM systems can be used for automatic enforcement and tolling, as long as they are certified according to OIML R-134.

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