

ISWIM NEWSLETTER

Message from the ISWIM president

Dear Readers,

As 2019 comes to an end, it is appropriate to reflect on the year.

2019 was a milestone year for ISWIM, in addition to the successful 8th International Conference on Weigh in Motion, we had a significant number of regional events and partner events. We launched the young researchers' award. Furthermore, 2019 saw a year of increased ISWIM membership both of individual members and that of the Vendor College including the Statue amendment **which led to the College's upgrading to include Consultants.**

Why did this occur, why these ISWIM milestones?

I believe there are two broad reasons, firstly because the importance of knowing the mass is critical to the design and operation of infrastructure, that is, what ISWIM does is important to stakeholders globally. The second reason is that we have sufficient people, which is a critical mass of individuals who are capable and just as importantly have the passion to devote their time to the activities of ISWIM. On this matter, 2019 also saw the election of a new Board and executive Board. With this in mind, I reflect on 2019 with a smile and provide you the last newsletter for the year which again is full of all things WIM. I look forward to a healthy program in the forthcoming year.

Wishing you and your family a safe and enjoyable festive season and may all your prayers and wishes come to fruition in 2020.

President – ISWIM

Chris Koniditsiotis

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Young Researcher Award – Deadline Extended!

Every year, ISWIM offers scholarships to bachelor, master and PhD students, or post docs up to five years after graduation working on WIM-related research projects. Participants must demonstrate a passion for WIM through either their **studies or early professional life and show “substantial evidence” of their research. “Substantial evidence” could be an original contribution** in the form of a journal or conference paper; a report; or a series of presentations that clearly defines the scope of the project, technical approach, and anticipated or final conclusion(s).

ISWIM will fully sponsor the travel and registration expenses for recipients to present their work at an ISWIM event worldwide, such as ICWIM, an ISWIM seminar, or a sponsored session by ISWIM at other conferences. Sponsorship from ISWIM will not exceed 2500 Euro. Applicants should send their CV, two reference letters, and an abstract up to 1000 words with supporting “substantial evidence” of their work if it is not fully documented in the abstract. Submissions should be emailed to Lily Poulikakos at lily.poulikakos@empa.ch. This year’s deadline is extended to December 31st and the award winners will be announced early 2020.

■ [Lily Poulikakos](mailto:lily.poulikakos@empa.ch) | [Lily.Poulikakos@empa.ch](mailto:lily.poulikakos@empa.ch)

VanJee new Digital Strain Gauge Sensor

VanJee introduces second generation digital bar sensor which is based on digital strain gauge technology. The new digital bar sensor has two great advantages which are first a strong signal anti-interference ability, and second decreasing computational load and improving big data processing capacity. First of all, in order to overcome signal interference problems, VanJee upgrades bar sensor from analog signal output to digital signal output.

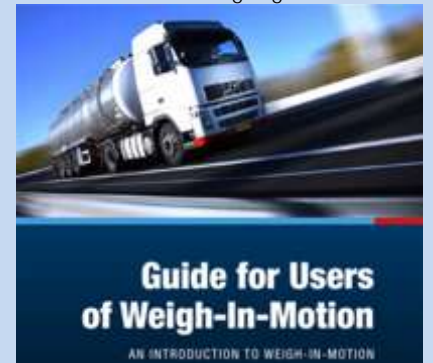


VanJee staff installing digital bar sensors in China.

ISWIM User Guide

The new ISWIM Guide for Users of Weigh-In-Motion was launched last May during the 8th International Conference on WIM in Prague, Czech Republic. All delegates of the conference received a free hard copy of the guide.

It serves as a basic, yet comprehensive introduction to Weigh-In-Motion. The Guide covers different aspects related to the working, specifying, buying, installing, testing, maintaining and using of WIM systems and data. To enhance accessibility for users starting with WIM, these topics are described in easy-to-understand language.



The guide was well received at the conference both by vendors of WIM systems and end users of WIM data. **As one of the vendors said:** “This is exactly what we needed. We are definitely going to use the guide in our contacts with customers especially the ones that are new to WIM”.

For those of you that were not able to participate at the ICWIM8 a .PDF version of the WIM User Guide can be downloaded at the ISWIM website: <https://lnkd.in/euW9KuZ>.

■ [Hans van Loo](mailto:hans.vanloo.int@gmail.com) | hans.vanloo.int@gmail.com

Digital Bar Sensor converts analog signal to digital signal in the inside of bar sensor and data logger would receive digital signal directly. As a result, VanJee can collect more reliable and authentic signal during long-distances transmission. In contrast, in long distance transmission, analog sensors is vulnerable to signal interference and even signal distortion, which ultimately leads to large weight measurement error.

Secondly, data-logger has the larger capacity to process more than 30 digital bar sensors signal output. In the meantime, WIM computational load would decrease significantly. This is because digital bar sensor can perform preliminary processing on data collection because sensor integrates a low-volume data operation processor. As a result, VanJee data-logger have more powerful capabilities to process a large amount of data with reduced computational load. Additionally, digital bar sensor even could measure arbitrary pressure direction in any position of sensor. Digital bar sensor can measure temperature and humidity. In conclusion, VanJee digital bar sensor has the great reliability and capacity on big data processing.

■ Zhao Zhai | Zhaizhao@vanjee.net

Advanced Validation of WIM Measurements

The closer to a standard the driving through a high-speed Weigh-In-Motion station is, the better is the probability of a perfect measurement. Sooner or later, some of the drivers of overloaded vehicles are going to realize this. Consequently, they will try to avoid being measured properly.

The standard is passing through the WIM site at a constant speed of roughly 20–100 km/h, with all wheels crossing the sensors. Sometimes, drivers intentionally make abrupt changes in their vehicles' speed or sudden changes in driving direction. With CAMEA WIM, an advanced validation is performed in order to avoid an incorrect measurement. Such a record is tagged as invalid and the user of the system can act accordingly, e.g. stop and weigh the vehicle if the video documenting the situation implies that the driver's behavior was motivated by avoiding being weighed.



CAMEA WIM system electronics.

Coming Events

3rd ANTT WIM Workshop
Brasilia, Brazil
4-5 December 2019
www.antt.gov.br

TRB Annual Meeting
Washington DC, USA
12-16 January 2020
www.trb.org

Intertraffic Amsterdam
Amsterdam, the Netherlands
21-24 April 2020
www.intertraffic.com

Transport Research Arena
Helsinki, Finland
27-30 April 2020
www.traconference.eu

NaTMEC 2020
Raleigh, North Carolina, USA
1-4 June 2020
www.natmec.org

ITS World Congress
Los Angeles, USA
4-8 October 2020
www.itsworldcongress2020.com

International WIM Symposium
Cape Town, South Africa
2-5 May 2021
www.is-wim.org

ICWIM-9
Melbourne, Australia
2023
www.is-wim.org

If you know other WIM-related events please contact:

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

Avoiding crossing the sensors by leaving the lane is common. Changing the lane **to the opposite direction won't help the driver** if the lane is equipped with CAMEA WIM as well. The system is capable of weighing in both directions within one lane. Those driving on the shoulder may be limited in this behavior by installing the guardrail. However, that is not always possible due to safety reasons. A combination of more pressure sensors and/or 3D scanners can represent a solution to this problem.

Driving slowly causes issues at high-speed weigh stations. These can be tackled by a specific sensor setup. The great advantage of the scalable CAMEA electronics is the sensor independence, allowing to combine high-speed and low-speed weighing.

■ Prokop Kudlik | p.kudlik@camea.cz

Axtec OnBoard WIM assures Chain of Responsibility Compliance

Since their formation in 1991, Axtec, a privately owned and managed, UK based world leader in axle weighing and load monitoring solutions have gone from strength to strength by offering innovative products backed by unrivalled service. Having formed a strategic partnership with Transport & Waste Solutions Pty Ltd, Axtec products are currently helping several Australian state utility companies meet their Chain of Responsibility obligations, by providing accurate and reliable vehicle load information in real-time as vehicles perform their day-to-day operations.



AXTEC On-Board Axle Load Indicator.

Changes to the Chain of Responsibility (CoR) laws, which aligned them more closely with workplace health and safety laws, were introduced in Australia on 1 October 2018. CoR is intended to make sure that everyone in the supply chain shares responsibility for ensuring compliance with the law. As a consequence, everyone named as a party in the chain of responsibility who exercises (or has the capability of exercising) control or influence over any transport task, has an interest in making sure that every vehicle that leaves the depot is compliant with all legislation, including the Heavy Vehicle National Regulations

The Agência Nacional de Transportes Terrestres (ANTT) is Brazil's national regulator for road freight transport. On December 4th and 5th ANTT organizes the third edition of the annual Weigh-In-Motion Workshop titled: **"Novos Paradigmas da Pesagem de Veículos em Movimento"** at their head office in Brasilia.

The workshop brings together all stakeholders from Brazil including regulatory and enforcement agencies, public and private road operators, the transportation industry, research and test institutes and providers of WIM-system solutions.

This year ISWIM is actively supporting the event by sponsoring the participation of two of the four international speakers:

- Chris Koniditsiotis on New perspectives on mass compliance and enforcement;
- Emil Doupal on the Implementation of WIM for direct enforcement;
- Tom Kearney on Experiences with electronic pre-qualification programs and;
- Hans van Loo on Alternative approaches to increase mass compliance.

During the workshop there will also be an exhibition where several ISWIM Vendors will present their systems and solutions.

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III WORKSHOP

Novos Paradigmas da Pesagem de Veículos em Movimento

Axtec's innovative OnBoard Axle Load Indicator is used to provide real-time information to the drivers of thousands of vehicles from 3.5t van-based derivatives through to 26t and 32t rigids.

Axtec OnBoard advises the driver on axle and gross vehicle loads via a very simple, easy to read, colour coded bar graph display. Visual and audible warnings can prompt the driver when overloads are present, whilst load data can be simultaneously written to the built-in logger and transmitted to a tracker system. The colour touch screen can automatically display images from rear-view or side-mounted cameras and can be set to dim when the vehicle is in motion. All of these functions take place with absolutely no input from the driver, so he is not unnecessarily distracted and can focus on his daily tasks.

■ Alasdair Littlejohn | Alasdair.littlejohn@axtec.com

WIM Workshop at TRB 2020

At TRB 2020, on Sunday January 12th from 13:30-16:30 in the Convention Center, there will be a workshop titled 'Employing Weigh-in-Motion Data to Design, Rate, Manage, and Preserve the Nation's Bridge Structures'. This workshop is sponsored by the Standing Committee on Truck Size and Weight; and the Standing Committee on Highway Traffic Monitoring. It is also endorsed by ISWIM and will have several ISWIM members participating.

The nation's transportation system depends upon the load-carrying capacity of its bridges. Weigh-in-motion technology measures and characterizes actual truck traffic loadings in the field. This workshop brings together bridge and traffic data-collection experts and practitioners to discuss how real-world data from existing technologies can be leveraged to reduce risk and more efficiently address bridge needs and utilization of funding."

■ Anne-Marie McDonnell | Annemarie.McDonnell@ct.gov

World's only OIML R134 certified WIM system

Traffic Data Systems from Germany highlights that it is still the only manufacturer in the world capable of supplying low and high-speed Weigh-In-Motion (WIM) systems that are in compliance with the OIML R134 standard for enforcement and tolling applications.



TMCS-IP with integral WIM-DSP32

ISWIM Vendors

- Axtec
www.axtec.co.uk
- Betamont
www.betamont.sk
- Camea
www.cameatechnology.com
- Captels
www.pesage-captels.com
- Cestel
www.cestel.eu
- Corner Stone Int.
www.corner-stone-int.com
- Cross
www.cross.cz
- ECM
www.ecm-france.com
- Haenni
www.haenni-scales.com
- Intercomp
www.intercompcompany.com
- IRD / PAT Traffic
www.irdinc.com
- Kapsch
www.kapsch.net
- Kistler
www.kistler.com
- Mettler Toledo
www.mt.com
- Mikros
www.mikros.co.za
- Osmos Group
www.osmos-group.com
- Q-free / TDC
www.tdcsystems.co.uk
- Sterela
www.sterela.fr
- TE Connectivity
www.te.com
- Traffic Data Systems
www.traffic-data-systems.net
- Tramanco
www.tramanco.com.au
- VanJee Technology
www.wanji.net.cn
- Wheelright
www.wheelright.co.uk

■ Andy Lees | andy.lees@tdcsystems.co.uk
 ■ Hans van Loo | hans.vanloo.int@gmail.com

The latest design of the WIM-DSP 32/TMCS-IP WIM enforcement/tolling system was introduced to the public and press by Traffic Data Systems during the ITS World Congress 2019 in Singapore. The TMCS-IP is supplied in a solid all-aluminium enclosure with the same degree of protection against dust and water as the well-known WIM-DSP 32. New with the TMCS-IP are professional M12 connectors and cables for an extended temperature range and harsh environments. A 4.3" touch display with a resolution of 800 × 480 pixels is available for easy configuration and function checks and a PROFIBUS® interface as an option.



TMCS-IP without integral WIM-DSP32

The City Currently Traffic Data Systems is capable of providing OIML R134-certified low-speed and high-speed WIM systems for a speed range of 5 km/h to 120 km/h for HGVs (Heavy Goods Vehicles) and for 5 km/h to 140 km/h for LGVs (Light Goods Vehicles). Accuracies of $\pm 5\%$ (initial verification) and $\pm 10\%$ (in-service inspection) according to OIML R134 have been achieved (temperature range $-30^{\circ}\text{C}/+75^{\circ}\text{C}$ with a relative humidity of up to 85%).

Traffic Data Systems latest research and development aims to improve accuracies to $\pm 2.5\%$ (initial verification) and $\pm 5\%$ (in-service inspection) according to OIML R134 by the time of the ITS World Congress 2021 to be hosted by the City of Hamburg. TDS can of course also supply very precise weight information for road and bridge.

■ Florian Weiss | F.Weiss@traffic-data-systems.com

Intercomp Strip Sensors in the Middle East

A recent WIM pilot site evaluation with Intercomp Strip Sensors resulted in a local integrator winning a contract for additional WIM lanes in the Middle East. Integrating WIM Strip Sensors in the mainline for data collection, an assessment of the strip sensors was conducted by Ministry of Transportation officials after witnessing the installation with subsequent performance field testing to meet COST 323 requirements.

New ISWIM Members

In the last months ISWIM has welcomed four new members in it's Vendors & Consultants College:

Osmos Group, a company specialized in structural behaviour analysis. Providing structural asset managers, engineering and construction companies the ability to continuously track the health of their structures in real time.

Osmos' fiber optic solutions called Optical Strands™ enable our clients to reduce their costs through a predictive maintenance approach.

- Comprehensive overview of structures tracked by OSMOS
- Customized reports and event alerts
- Guidance and support throughout the structure's life cycle

www.osmos-group.com

Tramanco, a leading supplier to heavy transport industries in Australia, New Zealand and South East Asia. Supplying on-board truck scales, weighbridge's and truck mounted crane scales.

Tramanco have been specialists with supply and installation of on-board weighing systems for heavy vehicles since 1975. The CHEK-WAY® Eliminator series of electronic on-board scales has recently been type approved by Transport Certification Australia.

www.tramanco.com.au



Intercomp strip sensors installed in the Middle East.

The OIML R134 certified strip sensors are installed in channels cut into the pavement and operate in pairs, with a typical data collection configuration consisting of a single pair of sensors. These sites will be operated in conjunction with ANPR cameras and other equipment provided by the integrator, with Intercomp providing an API and engineering support for in-road sensor and weight data integration into the system.

First phase of installations included 50 WIM lanes, with another approximately 50 lanes to be added in early 2020, replicating the configuration and system of the first phase. Intercomp scales and sensors have been installed in various countries in the Middle East for many years, and we look forward to installing the next chapter of WIM along with our partners for our customers.

■ [Jon Arnold](mailto:jona@intercompcompany.com) | jona@intercompcompany.com

2019 CVSA WIM Enforcement Symposium

This year's annual Commercial Vehicle Safety Alliance (CVSA) conference and exhibition was held in Biloxi, Mississippi, USA from 23-25 September. CVSA is the association of North American state and federal officials responsible for the administration and enforcement of motor carrier safety laws including size and weight regulations. Members of CVSA are a major group of end users of WIM equipment and data especially aimed at weight enforcement. For this reason CVSA and ISWIM organized the WIM for Enforcement Symposium on September 24th as part of the annual conference. The symposium follows up on the results of the CVSA-ISWIM WIM workshop held in Jacksonville, Florida in 2015.

The one day event saw an audience of over 80 participants from the USA, Canada and Mexico. The program had a mix of presentations on the state of weight enforcement on a federal level and experiences from several states (Mississippi, Texas, Maryland, North Carolina, Florida and Oregon). Combined with international experiences and perspectives on the use of WIM were provided by ISWIM members; Leonardo Guerson, Chris Koniditsiotis (President) and Hans van Loo (ISWIM Consultant). The symposium was concluded with two discussion sessions with a panel of WIM vendors (Kistler, Intercomp, Mettler Toledo, Drivewyze, IRD and Kapsch

New ISWIM Members

In the last months ISWIM has welcomed four new members in its Vendors & Consultants College:

Mettler Toledo, a world leading manufacturer of weighing systems, has offered solutions for commercial vehicle weight enforcement and screening, data collection for transportation planning, industrial applications, and more.

It's fixed facility weigh station and virtual weigh station solutions continue to prove their operational reliability and accuracy in high-volume applications. Mettler Toledo also provides WIM solutions for other vehicle weighing applications such as border crossings, toll roads and bridges, seaports, and trucking. www.mt.com

Corner Stone International is an independent consultant specialised in Weigh-In-Motion with more than 20 years international experience in WIM. This includes working with different end-users, vendors, technologies and applications of WIM systems.

Corner Stone can assist through: specifying and selecting the right WIM system for specific applications and operational conditions; e.g. in the preparation of tender documents and evaluation of offers;

www.corner-stone-int.com



ISWIM presence at CVSA WIM Symposium.

Topics covered ranged from practical hands-on experience with using WIM systems for pre-selection or as virtual weigh stations; to recent covered in the symposium ranged from practical hands-on experience with using WIM systems for pre-selection or as virtual weigh stations; to recent developments in WIM sensor technology and the additional benefits they offer for traffic safety; and new perspectives on mass compliance policies and enforcement using in-car technology. Additionally, the importance of knowing vehicular mass information and how with this information one may adopt a more efficient and productive operational use of the network. Judging by the many positive reactions we have received on the WIM-symposium we are confident to say: **“We will be back at CVSA!”**

■ [Hans van Loo](mailto:Hans.vanloo.int@gmail.com) | Hans.vanloo.int@gmail.com

IRD WIM Sorter System – Cordelia, California

Cordelia is a complex commercial vehicle screening system that uses WIM, tire safety screening, and vehicle identification data to sort trucks into multiple lanes at the weigh station based on the degree to which the vehicles meet inspection criteria. The Cordelia system specifies higher WIM accuracies than ASTM Type III.



Tire Anomaly Screening using IRD TACS™ – Cordelia, CA

WIM Workshop at XXVI World Road Congress

In From 6-10 October 2019, the World Road Association (PIARC) held the XXVI World Road Congress in Abu Dhabi. During the congress a workshop was organized on: **“Weigh-in-motion for Road Infrastructure and Freight Transport”**. This workshop was sponsored by TC/B4 (Freight Transport), TC C3 (Bridges) and ISWIM.

Central topics of the workshop were; the use of WIM data to ensure durable, safe and resilient infrastructure and fair/compliant road freight transport. And the required data quality and their application for bridge and pavement assessment and monitoring, for intelligent access strategies and for a full compliance of heavy vehicles.

Part 1 of the workshop focussed on the use of **“WIM data for infrastructure assessment and management”**. While part 2 covered the use of **“WIM for optimizing a freight transport system”**

Both sessions started with a number of presentations covering different aspects of the topic and were concluded by a discussion with a panel of international experts.

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 ■ [Aleš Žnidarič](mailto:Ales.znidaric@zag.si) | Ales.znidaric@zag.si



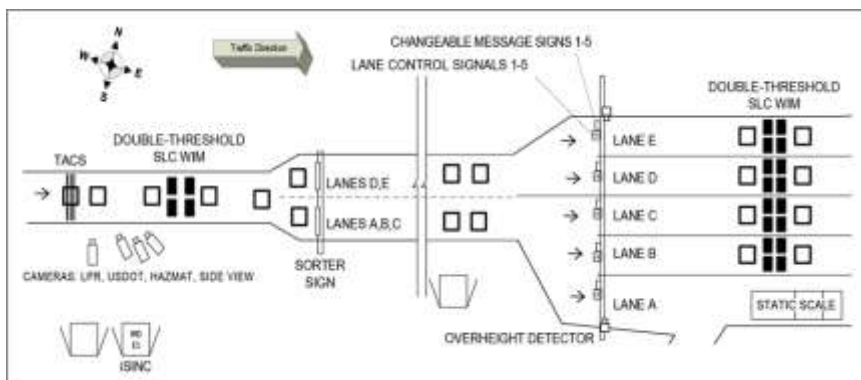
The IRD WIM Sorter System monitors, weighs and measures commercial vehicle traffic travelling along the ramp at speeds below 40 mph (65 kph). The double-threshold SLC WIM scales on the ramp achieve accuracies of $\pm 4\%$ GVW for 95% of vehicles.



Ramp Screening Technology – Cordelia, CA

The site incorporates an IRD iSINC® to provide WIM screening and control other devices at site. Vehicles are identified on the ramp using ANPR technology, and sensor measurements are used to determine whether a vehicle is compliant with regulations.

Based on vehicle compliance, all commercial vehicles are directed into either the left or right lane. From these two lanes, they are sorted into one of the four low-speed WIM lanes downstream. Vehicles suspected of being noncompliant are directed to the two lanes closest to the station, whereas vehicles more likely to be compliant are directed to the two lanes to the left. All commercial vehicles are weighed again in the low-speed WIM lanes.



Lane Configuration – Cordelia, CA

In the low-speed lanes vehicles travel at 2-15 mph (3-24 kph) with double-threshold SLC WIM scales achieving accuracies of $\pm 2\%$. Weight compliance is determined and signaled to a Programmable Logic Controller (PLC) to direct the flow of vehicles through the station using signs and signals. When it is determined that a vehicle is compliant, the system sets traffic signals directing the vehicle to leave the station. Non-compliant vehicles are held and directed by a station operator to an inspection bay or static scale for inspection.

■ Rish Malhotra | Rish.malhotra@irdinc.com

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