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ISWIM
International Society for Weigh in Motion

ISWIM NEWSLETTER

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Message from the ISWIM president

Welcome to the August edition of the ISWIM Newsletter for 2024.

As stated in my first welcome earlier this year, ISWIM is committed to being of service to you in advancing and increasing WIM technology and data usage for multiple applications and helping decision makers in transportation organizations understand how traffic loading information can be used to extend the life of their infrastructure assets.

The articles in the following pages summarize an initiative underway for evaluating the accuracy of WIM data based on various sensor arrays, practical examples of WIM use in the field, and new WIM devel-opments by manufacturers.

In addition, the founding president for ISWIM, Prof. Eugene O'Brien has been inducted as an honorary member of the society and his numerous contributions to the WIM community are highlighted. Thank you, Eugene, for your vision. ISWIM has members from over 80 counties around the world because of the diligence and commitment by you and those who worked alongside during the early years.

You will also find several opportunities to participate in WIM conferences and webinars in the coming months and year. Some events are sponsored by ISWIM and are free to participate.

Remember, the ISWIM Newsletter is your newsletter. So, keep the articles coming about your research initiatives, programs, and ideas for advancing WIM technology.

Deborah Walker, President of ISWIM

■ Deborah Walker | deborah.walker@dot.gov

Young Researcher Award

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 conference paper; a report; or a series of presentations that clearly defines the scope of the project, technical approach, and (anticipated) conclusion(s).

The selection committee of the ISWIM Young Researcher Award 2024 is pleased to announce that Navoda Rillagodage was selected for the 2024 award. The work she has done since her internship and research assistantship experience days shows her depth of understanding and interest in WIM. Dr. Rillagodage's work has implementable results that law enforcement and engineers can use to understand the behavior of drivers and to design pavements better. Her current role as the manager for the Manitoba Highway Traffic Information System shows her desire and commitment to the WIM field.

ISWIM will fully sponsor the travel and registration expenses for recipients to present her work at the WIM Subcommittee meeting during the Transport Research Board (TRB) Annual Meeting 5-9 January 2025 in Washington DC, USA. Sponsorship from ISWIM will not exceed 2500 Euro. Next year's deadline is May 31st and the award winners will be announced mid 2025.

■ Lily Poulikakos | l.poulikakos@outlook.com

Optimizing Highway Investments: LTPP Compares WIM Sensor Array Design Accuracies

For over two decades, the Long-Term Pavement Performance (LTPP) program has collected truck weight and axle loading data using weigh-in-motion (WIM) systems installed at LTPP Specific Pavement Studies (SPS) test sites across North America. The Federal Highway Administration oversees the management and data collection of the LTPP test sites which have been used in many national pavement performance and traffic loading research studies.

Nevada LTPP SPS-10 WIM Site – Sensor Array

Disclaimer

The projects described, ideas shared, and claims made in this Newsletter do not necessary represent the official view or position of ISWIM.

While care has been taken in the preparation of the content of this Newsletter, ISWIM accepts no responsibility in its use, for any omission, or damage that may be caused and does not endorse any specific product or result presented in the Newsletter.

ISWIM Website

Please visit the official ISWIM website: www.is-wim.**net**. Here you will find information on our society, all Newsletters, past ISWIM Events, the Guide for Users of WIM and links to our all Vendors & Consultants.

New is our online, searchable library with over 450 articles, papers and reports related to Weigh-In-Motion.

ISWIM LinkedIn Group

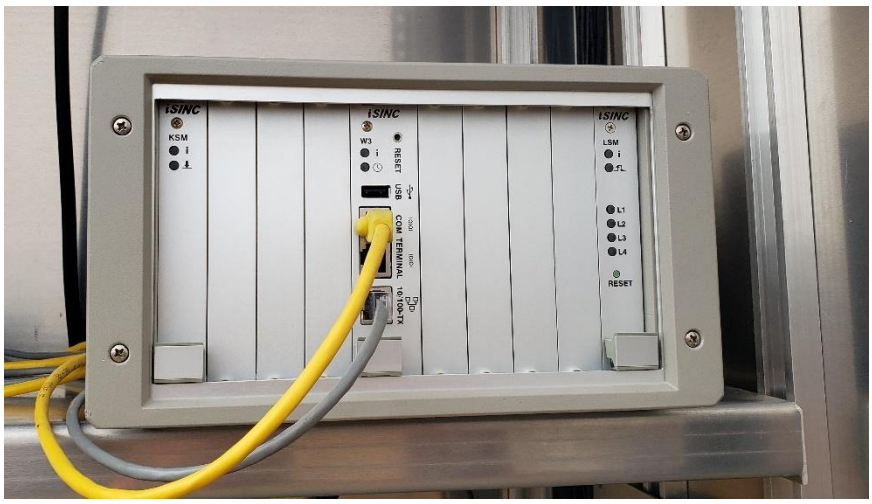
The ISWIM LinkedIn Group is another way of staying connected with the latest developments in WIM .

In this group, researchers, end-users and vendors can find and post short articles on initiatives, new projects, test results, or other developments related to WIM-technology, applications and data.

The ISWIM LinkedIn Group has currently more than **515** members. If you want to join, please visit:
linkedin.com/groups/13400438

In an era where data-driven decisions are paramount, the LTPP program has recently started investigating the critical aspect of highway investment in WIM technology. While it is understood that installing arrays of strategically spaced strip WIM sensors can reduce errors caused by dynamic loads, this investigation is focused on analyzing the WIM Sensor Array Design and its effect on WIM data accuracy and on quantifying the benefits of multi-sensor arrays. The results will offer highway agencies the necessary data to guide their investments effectively.

The investigation will analyze data from four LTPP SPS-10 (Warm-Mix Asphalt Overlay of Asphalt Pavements) WIM sites; two located in the state of Arizona, one in Nevada, and another in Oregon. All sites are equipped with advanced iSINC WIM controllers and staggered arrays of four piezoelectric quartz WIM sensors. Quarterhill (formerly IRD) installed the WIM system, maintains the sites, and provides data downloading and quality checks. The iSINC's ability to report data from individual sensors or pre-defined groups with varying numbers of sensors enables the LTPP program to study the effect of WIM sensor arrays (consisting of 1 to 4 sensors), including arrays with different spacing between sensors, on WIM data accuracy. Creating virtual lanes at the same site allows comparisons under consistent local and environmental conditions.



Arizona LTPP SPS-10 WIM Site – iSINC Lite WIM Controller

Applied Research Associates (ARA) will be responsible for the data analysis, which will compare the performance of different piezo quartz sensor arrays (in terms of percentage error from the reference static weight of test trucks) using gross weight and axle weight measurements of the test trucks.

Through this investigation, the LTPP program will contribute to expanding the knowledge required to make more informed and efficient infrastructure investment decisions. As we move towards a future where every dollar counts, investigations like this one are instrumental in ensuring our roadways are built and maintained on the backbone of reliable, accurate data.

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■ Olga Selezneva | oselezneva@ara.com
■ Deborah Walker | deborah.walker@dot.gov

ISWIM Board (elected nov. 2023)

Executive Board:

- Deborah WALKER, United States **President ISWIM**
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- Matija MAVRIČ, Slovenia **Vice-President Vendors**
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- Andrew Lees, Great Britain **Information Officer**

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- Steven JESSBERGER, United States
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- Eugene O'BRIEN, Ireland
- Jonathan REGEHR, Canada
- Victor Joaquin VARGAS ARCE, Bolivia

Vendors & Consultants College:

- Matija MAVRIČ, Slovenia
- Christoph KLAUSER, Switzerland

Promotion Officer:

- Hans VAN LOO, Switzerland

Honorary ISWIM Membership for Prof. Eugene O'Brien

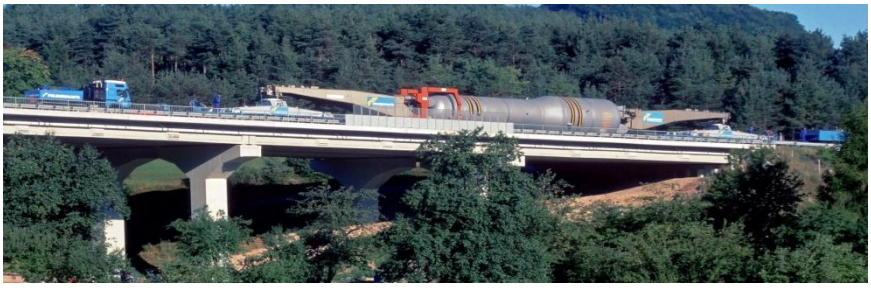
The Board of ISWIM awarded Honorary Membership to Mr. Eugene O'Brien in recognition of his outstanding life-time contribution. His Honorary Membership was awarded at the ISWIM Board meeting on 9 January 2024.

Prof. O'Brien involvment in Weigh-in-Motion (WIM) research was when he joined the European Commission's COST 323 action in 1994. This led to the European 4th Framework WAVE project which was the beginning of a research career that has bridged the gap between university and industry. COST 323 organised the first two conferences on WIM. Prof. O'Brien joined the International Scientific Committee in 1995 for the first, in Zürich, and chaired the committee for the second conference in 1998 in Lisbon. Recognising the need for an organisation to disseminate knowledge and understanding of WIM and its applications, he worked to draft the statutes for ISWIM and was the founding president in 2008.

Prof. O'Brien's contributions to knowledge and understanding of WIM include:

- Extending Bridge WIM to a much wider range of bridge types;
- Developing algorithms to improve the accuracy of Bridge WIM systems;
- Showing that the accuracy of Bridge WIM is similar to other technologies;
- Leading the project which resulted in an increase in the allowable gross weight of 6-axle trucks in Ireland from 44 to 46 tons;
- Developing the concept of a probabilistic Bridge WIM algorithm;
- Developing the first non-contact Bridge WIM system, based only on camera measurements;
- Showing that Bridge WIM data can be used to monitor the condition of bridges;
- Writing a book on Bridge Traffic Loading, published by CRC Press, which addresses all the major issues on the subject, including dynamic amplification for short-span bridges, multi-lane loading and patterns of traffic loading in long-span bridges.

■ Aleš Žnidarič | ales.znidaric@zag.si



Guide on Calibration of WIM Systems

The latest addition to the series of ISWIM Practitioners' Guides is the guide on "**Calibration of WIM Systems**". This guide has been developed by a group of ISWIM volunteers and is aimed to assist WIM contractors and transportation agency personnel involved in field WIM equipment calibration. In addition, road owners responsible for developing WIM programs may find this document useful in establishing their specific requirements for a successful WIM operation.

This document will offer recommendations based on proven best practices and published documentation for conducting a successful WIM calibration for in-road and bridge WIM technologies. The purpose of this document is to provide step-by-step procedures to perform an initial or routine calibration of WIM equipment installed for high-speed WIM data collection to support highway monitoring and transportation statistics.

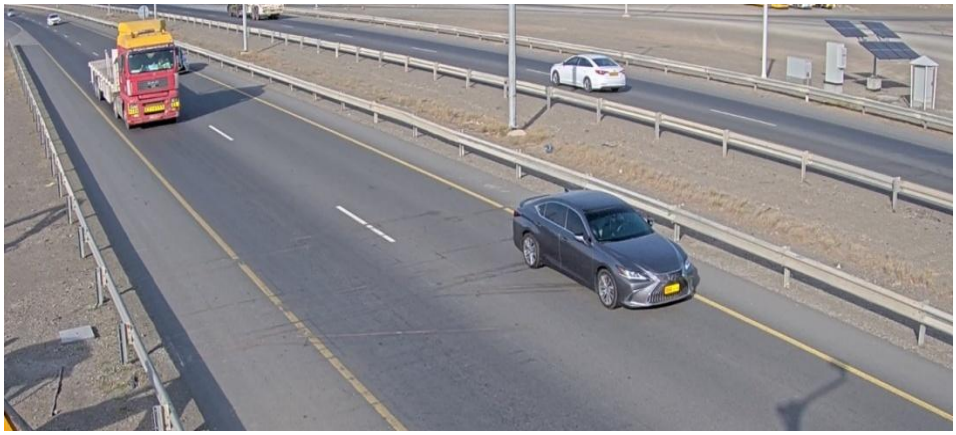
This guide should be used only for systems that are for general traffic monitoring, statistical applications and WIM pre-selection. This guide is not aimed at systems used for legal metrology applications such as direct enforcement and does not circumvent any available standard WIM specifications.

The ISWIM Practitioners' Guide has recently been published and is available via the ISWIM website: www.is-wim.net

■ Andy Lees | andrew.lees@q-free.com
■ Deborah Walker | deborah.walker@dot.gov

Why CAMEA combines WIM with other technologies for Direct Enforcement

For As part of a Proof-of-Concept project, CAMEA has successfully installed, tested, certified and handed over a CAMEA ITS system in Oman that weighs vehicles in motion (WIM) and also measures their speed. By combining the two functions into one system, the system's utility value is significantly increased as individual components are shared for multiple functions. With respect to saving both investment and operating costs, it is very efficient to use sensors, cameras, computing units, power and communication infrastructure for two enforcement systems certified for fully automated direct enforcement at the same time. In practice, trucks, which by definition drive relatively slowly, are often overloaded, and passenger cars, which are typically not overloaded, often exceed the speed limit.



The site of the PoC project used both for WIM and speed enforcement

The effectiveness of such a solution was demonstrated by analyzing the measured data, where some vehicles were found to weigh around 120 t, many of them repeatedly. These were mostly tank trucks going to a nearby refinery and vehicles carrying earth, which are frequently transported commodities in Oman. In addition, several vehicles per day were found to pass through the WIM station at speeds of over 200 km/h. It is now up to the user to decide how to deal with the offenders, but it is already evident that CAMEA ITS technology can make a significant contribution to road protection and road safety in Oman, without the need to install two enforcement systems. CAMEA is deploying a similar concept in other countries around the world.

■ **Jan Fučík** | international@camea.cz

OSMOS WIM+D Bridge-WIM solution successfully applied to large historical iron-truss bridges

The Large historical iron-truss bridges are not common for the application of Bridge-WIM systems. Beam girder concrete, composite bridges, or concrete slabs are indeed the usual types of application widely documented in the literature. In April 2022, the weigh-in-motion & deformation or WIM+D solution by OSMOS was tested according to COST 323 on two viaducts over the river

Coming Events
(subject to change)

ITS World Congress
Dubai, UAE
16-20 September 2024
www.itsworldcongress.com

ANTT-Labtrans-ISWIM Webinar
WIM for Enforcement (Brazil)
30 October 2024
www.is-wim.net

Intermobility Expo
Jeddah, Saudi Arabia
11-13 November 2024
www.intermobilitysaudi.com

CVSA-FHWA-ISWIM Webinar
WIM for Enforcement (USA)
14 November 2024
www.cvsa.org

Transport Research Board (TRB)
Washington, DC, USA
5-9 January 2025
www.trb-annual-meeting.nationalacademies.org

Intertraffic China
Shanghai, China
28-30 April 2025
www.intertraffic.com/china/

International Association for Bridge and Structural Engineering (IABSE) Symposium
Tokio, Japan
18-21 May 2025
www.iabse.org/Tokyo2025

HVTT18 Symposium
Québec City, Canada
26-29 May 2025
www.hvttforum.org

Southern African Transport Conference (SATC)
Pretoria, South Africa
7-10 July 2025
www.satc.org.za

Commercial Vehicle Safety Alliance (CVSA)
Annual Conference and Exhibition
21-25 September 2025
Denver, Colorado, USA
www.cvsa.org

Transport Research Arena (TRA)
Budapest, Hungary
18-21 May 2026
www.ectri.org/project/tra-2026/

Do you know other WIM-related events? Please contact:
■ **Hans van Loo** | hans.vanloo.int@gmail.com

Loire in France: The Mauves and the Haut-Village bridges. Both dating back to 1881 and made of long continuous iron truss boxes with up to 11 spans of 45 m each, they are a challenging case for a B-WIM. A set of 6 strain sensors for each bridge was enough to achieve good results: Class B(10) for the gross vehicle weight and B+(7) for the axle load on the Mauves bridge. The system remained fully operational for a total duration of 18 months. This case study was presented in detail at the IABMAS conference in Copenhagen in June 2024 and is available in open access [1].

Truck passing iron truss box bridge

This study is a part of the applied research project GeRICO. It received a grant from the call for projects Ponts Connectés funded by the French State and led by Cerema which aims to improve bridge management by using the most recent techniques in terms of monitoring, data transfer and data processing.

[1] Jensen, J.S., Frangopol, D.M., & Schmidt, J.W. (Eds.). (2024). Bridge Maintenance, Safety, Management, Digitalization and Sustainability (1st ed.). CRC Press.

■ François-Baptiste Cartiaux | cartiaux@osmos-group.com

Intercomp's Strain Gauge HS-WIM: Facilitating the shift from pre-selection to direct enforcement

Intercomp's strain gauge strip sensors have become a dependable and robust choice for High-Speed Weigh-In-Motion (HS-WIM) systems, especially in controlling vehicle overloads. Beyond their OIML-certified accuracy, these sensors are designed for long-lasting durability and a high ability to maintain calibration over time, reducing operating costs and ensuring consistent performance between calibrations.

The transition from pre-selection to direct enforcement of vehicle weight is an emerging trend. In countries like China and the Czech Republic, HS-WIM systems using strain gauge strip sensors have been successfully implemented in direct enforcement frameworks. Other countries, including Poland and Brazil, are progressively adopting this model by first effectively employing HS-WIM systems for pre-selection.

ISWIM Vendors

APM	www.apm.pl
Axtec	www.axtec.co.uk
Betamont	www.betamont.sk
CAMEA	www.cameatechnology.com
Captels	www.pesage-captels.com
Cestel	www.cestel.eu
Ciemsa	www.ciemsa.com.uy
Cross	www.cross.cz
Dynaweigh	www.dynaweigh.com
Excel Technology	www.exceltech.com.au
FardEU	www.fardeu.com
GEC Scales	www.gecscales.com
Girwim	www.girwim.com
Intercomp	www.intercompcompany.com
IRD / PAT Traffic	www.irdinc.com
iWIM	www.iwim.it
Kistler	www.kistler.com
Mikros	www.mikros.co.za
Osmos Group	www.osmos-group.com
Q-free	www.q-free.com/products
Sterela	www.sterela.fr
TDS	www.traffic-data-systems.net
Tramanco	www.tramanco.com.au
VanJee Technology	www.wanji.net.cn

Interested to join the ISWIM Vendors, just contact:

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

Intercomp's HS-WIM for mainline pre-selection in Poland

Poland's Overload Control program highlights the effectiveness of strain gauge HS-WIM technology. APM PRO has implemented 44 lanes equipped with HS-WIM systems utilizing Intercomp's sensors. These systems, enhanced by ANPR, CCTV, and 3D scanning technologies, efficiently monitor and preselect overloaded vehicles. The strain gauge strip sensors have demonstrated high stability, maintaining calibration over time and performing reliably under various temperature conditions. Currently, a project with AGH University and the local National Metrology Institute is further exploring the potential for direct enforcement.

In Brazil, 41 lanes of HS-WIM equipment have been installed for mainline pre-selection and traffic data collection, representing a critical step towards direct weight enforcement. In 2022, Intercomp's sensors became the first HS-WIM system to receive Type-approval from Brazil's National Metrology Institute (INMETRO) for direct enforcement, meeting stringent accuracy standards.

Intercomp's strain gauge strip sensors are proving to be pivotal in the evolution of vehicle weight monitoring and enforcement. Their reliable performance is paving the way for more efficient, accurate, and effective vehicle control systems in the future.

■ **Leonardo Guerson** | leonardog@intercompcompany.com

Special session at IABSE Symposium 2025: Bridge-WIM for sustainable bridge management

You are invited to participate at the special session planned during the International Association for Bridge and Structural Engineering (IABSE) Symposium May 2025 (Tokyo, Japan) covering topics regarding Bridge Weigh-in-Motion. This special session is titled, "Bridge Weigh-in-Motion for sustainable bridge management ". The symposium will be held at Waseda University and Rihga Royal Hotel in Tokyo. This special session is aimed at studies reporting new developments in B-WIM technology, experiences in operational installations, and their application towards bridge management and structural health monitoring.

ISWIM Consultants

Corner Stone	www.corner-stone-int.com
FIMAU	www.FIMAU.com
NMi	www.nmi.nl
RTS GmbH	doupal@hispeed.ch
Static Motion	www. staticmotion.co.za

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

ISWIM Guide for Users of WIM

The ISWIM Guide for Users of Weigh-In-Motion 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.

This document covers different aspects related to the working, specification, purchase, installation, testing, operation and maintenance of WIM systems, and the application of the data they produce. A PDF version of the WIM User Guide can be downloaded at the ISWIM website: www.is-wim.net.

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

Topics may include, use of alternative sensing technologies (e.g. fibre Bragg, accelerometers), measurement of alternative load effects (e.g. rotations, support reactions), improved algorithms and novel approaches (e.g. machine learning) for B-WIM technology. In addition, it welcomes investigations on novel applications of B-WIM installations and the use traffic information towards bridge maintenance and structural health monitoring.

This link https://www.iabse.org/Tokyo2025 provides direct access to the dedicated webpage for the symposium. For any queries, you can contact.

■ **Daniel Cantero** | daniel.cantero@ntnu.no

Kistler's webinar on fully digitized WIM platform, KiTraffic Digital

Kistler, a leading provider of Weigh-In-Motion (WIM) technology, proudly introduces its latest innovation: the fully digitalized WIM platform, KiTraffic Digital. As one of the most advanced WIM systems available today, this state-of-the-art solution identifies overloaded vehicles with unparalleled accuracy and is OIML R134 certified for accuracy class 5, a crucial standard for direct weight enforcement.

Kistler's KiTraffic Digital Platform

In early July, Ingrid Sagorz, Product Manager, and Christoph Klauser, Business Development Manager at Kistler, hosted a webinar on KiTraffic Digital and its key features. We invite you to watch the recording to learn how Kistler's Digital WIM Technology can revolutionize road safety!

https://www.kistler.com/INT/en/webinar-kitraffic-digital-revolutionizing-weigh-in-motion-technology/C00000741

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