23/02|

July 2023

ISWIM NEWSLETTER

Message from the ISWIM president

ISWIM Members and Friends,

Welcome to another edition of the ISWIM newsletter advising the latest weighing issues.

Articles from a number of installations and operations are included in this edition. It is particularly pleasing to see in this edition articles concerning the installation and operation of weighing systems in countries that traditionally have not had a long-standing association with WIM, namely Senegal and Greece.

The FHWA has also released a series of practical tools and procedures to improve WIM data quality.

I would like to thank all the members from JSWIM and HVTT Forum for contributing and volunteering their time to support our joint forthcoming conference - Technology Convergence 2023, Setting the wheels in motion – Reimagining the future of heavy vehicles, roads and freight. The scientific and organisational committees meet regularly to progress the conference.

The ISWIM Newsletter is your newsletter, and your articles, research initiatives, programs, and learnings are welcomed.

Chris Koniditsiotis, President of ISWIM

■ Chris Koniditsiotis | ChrisK2.0@bigpond.com

In this issue

Young Researcher Award

Two young scientists (Amin Moghadam and Lucas Franceschi) have received the ISWIM Young Researcher Award. They have been selected based on their contribution to the Weigh-In-Motion (WIM) field and passion through their studies or early professional life. ISWIM will fully sponsor them to attend the Technology Convergence 2023 conference in Brisbane, Australia to present their work, visit the exhibition, and further develop their industry knowledge and global network.

Lily Poulikakos, Chair ISWIM Young Researcher Award Committee.

■ Lily Poulikakos | Lily.poulikakos@empa.ch

TECHNOLOGY CONVERGENCE 2023

Setting the wheels in motion

Reimagining the future of heavy vehicles, roads and freight.

The joint conference 'Technology Convergence 2023' in Brisbane, Australia being hosted by the ISWIM with HVTT Forum and is approaching. With over 100 abstracts from authors across the globe and strong interest locally and internationally, the joint conference is shaping up to be a major event. Here's some important information to help delegates prepare for the joint conference.

1. **When will it be held?**
   The conference will run from 6 to 10 November 2023. Key dates/times are:
   - A welcome reception will be held on the evening of Monday, 6 November (commencing at 6 pm Brisbane time).
   - The official opening plenary session will occur on the morning of Tuesday, 7 November (between 9 am and 10:30 am).
   - The conference will close on the afternoon of Friday 10 November (5 pm).

2. **Where will it be held?**
   - The conference is being held at the Brisbane Convention & Exhibition Centre (BCEC). Further information about the BCEC is available here: Brisbane Convention & Exhibition Centre (*www.bcec.com.au*).
   - The BCEC is located on the southern side of the Brisbane River in the area known as 'South Bank'. Further information about South Bank is available here: *www.visitbrisbane.com.au*.

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 300 articles, papers and reports related to Weigh-In-Motion.

ISWIM LinkedIn Group

Besides the new ISWIM website and the periodical Newsletter there is another way of keeping up to date with the latest developments in Weigh-In-Motion; the ISWIM LinkedIn Group.

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

The ISWIM LinkedIn Group has currently more than **450** members. If you want to join, please visit:
linkedin.com/groups/13400438

3. **What is the conference pricing?**
   - Early bird delegate price will be AU$1,650 plus GST (VAT), and will be available until the end of September 2023. Post this date the delegate price will be AU$1,950 plus GST.
   - Day tickets will also be available prior to and during the conference.
   - Online registration and ticket purchases are available at: *www.icwim.is-wim.net* and *www.techconverge23.org*

View of Brisbane, Australia.

4. **What accommodation options are available?**
   - There are numerous accommodation options available within walking distance to the Brisbane Convention and Exhibition Centre. Suggested hotels are presented below (in alphabetical order):
   - Emporium, Novotel, Mantra, Menso, Riverside, Rydges.

5. **Sponsorship and exhibition opportunities**
   - A showcase exhibition for manufacturers, users, government agencies and related industries will be held in conjunction with the joint conference.
   - A limited number of spaces are available, so get in touch by contacting Andy Lees at: andrew.lees@q-free.com.

6. **Is the program available?**
   - The draft program is available at: www.is-wim.net/events/coming-events/icwim9/topics-program/.

7. **What if I need a formal letter of invitation to attend the conference?**
   - A formal letter of invitation can be arranged by contacting Gavin Hill on gavinh@tca.gov.au.

The latest information on the conference, papers, program, registration for delegates, and possible sponsoring and participating in the exhibition will be made available on: www.techconverge23.org, www.is-wim.net, www.hvtt.org and www.linkedin.com/groups/13400438/ or contact the Chairs of the Organising Committee:

- **Chris Koniditsiotis, President of ISWIM** | ChrisK2.0@bigpond.com
- **Gavin Hill, Vice-President HVTT Forum** | GavinH@tca.gov.au

Sponsors of Technology Convergence 2023

Platinum Sponsors:

DG Compatibility
www.DGCompatibility.com

Q-Free www.q-free.com/solution/weigh-in-motion

V-DAQ www.v-daq.com.au

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VanJee Technology
www.wanji.net.cn

Silver Sponsors:

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TrafficSensors www.trafficsensors.com

Tramanco www.tramanco.com.au

Also interested to be a sponsor, just contact:

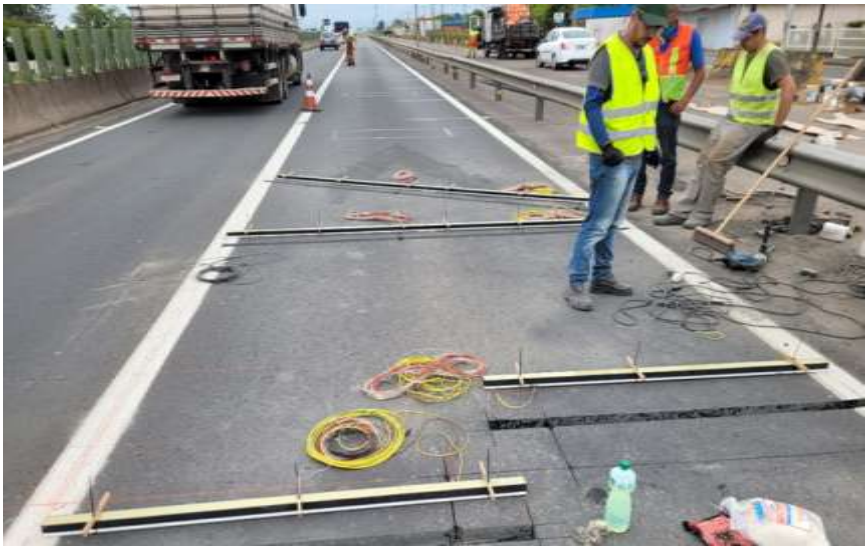
- **Andy Lees** | andrew.lees@q-free.com

CAMEA HS-WIM at Labtrans testsite, Brazil

At the beginning of 2023, CAMEA made their first set up a WIM system together with LabTrans at the Federal University of Santa Catarina at the research site on the BR-101 highway near the city of Araranguá in Santa Catarina, Brazil.

This research site is a reference in studies with WIM systems for Brazil and Latin America; it was conducted by the concessionaire CCR-Via Costeria, with the objectives of: (1) subsidising the National Agency of Land Transportation (ANTT) with information to promote changes in public policies to combat transport with excess cargo on Brazilian highways. (2) to open the challenges for implementing HS-WIM systems for direct enforcement and other applications.

The research project aims to propose the creation of standards (or the review of existing standards) through studies on sensor technologies, systems, and aspects of road operation related to automated monitoring and also to promote the development and modernisation of the levels of intelligence of the processes currently in place. The CAMEA HS-WIM site uses 6 total sensors (4 sensors + 2 tilted for vehicle position) per lane. The same setup with which CAMEA received the OIML 10F certification in 2023.



Installation of the CAMEA HS-WIM on the BR-101 highway.

Great results have been immediately achieved in terms of weighing accuracy, which falls in the INMETRO 3C class (equivalent to COST 323 A(5) or OIML 10F), i.e., the requirements for type approval test for direct enforcement, at speeds up to 90 km/h. The in-service category falls within the Class 1A. Moreover, the testing procedure surpassed the prescribed standards set by INMETRO, employing a more rigorous protocol. The assessment encompassed three vehicles, spanning various speed levels and multiple lateral positions. The vehicle classification also has excellent results and will serve as a comparison for the upcoming project for non-intrusive free-flow classification, axle counting, and lifted axle detection.

■ Jan Fučík | j.fucik@camea.cz

ISWIM Consultants

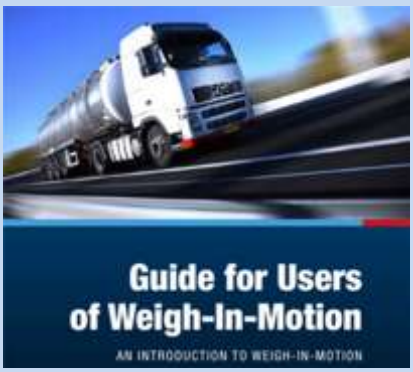
Corner Stone	www.corner-stone-int.com
FIMAU	www.FIMAU.com
NMi	www.nmi.nl
RTS GmbH	doupal@hispeed.ch
Static Motion	www. staticmotion.co.za

Interested to join the ISWIM Consultants, just contact:

■ Andy Lees | andrew.lees@q-free.com
■ 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.



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

Intercomp Strain Gauge Strip Sensors for Vehicle Overload Control in Italy

The Autostrade per l'Italia, a company responsible for building and managing toll motorways in Italy, has installed multiple HS-WIM sites using Intercomp's strain gauge strip sensor technology. The sites are placed at locations in central and southern Italy, specifically at toll road entrances, to detect overloaded vehicles as they enter the toll roads. These HS-WIM systems are composed by two strip sensors staggered and provide accurate information about where, when, and how vehicle overloading happens most frequently and severely.

While Autostrade operates its own HS-WIM sites, the data is accessible to enforcement authorities. They can log into the system to understand the overloading situation and take appropriate action. By focusing on transport operators with a history of frequent and severe overloading violations, Autostrade and enforcement officials can be more effective in their control strategies.

HS-WIM with two strain gauge strip sensors in staggered layout

Autostrade uses the HS-WIM sites to monitor vehicle traffic, identify overload conditions, and analyze traffic trends. This helps them understand which regions and times experience more significant overloading. By gathering this information, they can address the problem with specific transport companies and types of overloads.

Vehicle overloading is seen as a serious issue that affects public safety, and it requires high-quality information for effective solutions. Understanding the traffic and loads carried on the roads becomes essential. Autostrade per l'Italia, as a road owner, is using strain gauge strip sensor technology to improve their control actions and develop strategies based on reliable data.

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

Coming Events
(subject to change)

IWSHM-14
Stanford, California, USA
12-14 September 2023
https://iwshm2023.stanford.edu/

CVSA Annual Conference
Grapevine, Texas, USA
17-21 September 2023
www.cvsa.org/events

PIARC World Road Congress
Prague, Czech Republic
2-6 October 2023
www.piarc.org

Technology Convergence 2023
(ICWIM9 + HVTT17)
Brisbane, Australia
6-10 November 2023
www.is-wim.net

Gulf Traffic
Dubai, UAE
21 – 23 November 2023
www.gulftraffic.com

Transport Research Board (TRB)
Washington, USA
7-11 January 2024
www.trb.com

Transport Research Arena (TRA)
Dublin, Ireland
15-18 April 2024
www.traconference.eu

Intertraffic
Amsterdam, The Netherlands
16-19 April 2024
www.intertraffic.com

NaTMEC
Boise, Idaho, USA
2-5 June 2024
www.natmec.org

Southern African Transport Conf.
Pretoria, South Africa
8 -11 July, 2024
www.satc.org.za

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

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

Practical Tools and Procedures to Improve WIM Data Quality

This past spring, the US Department of Transportation, Federal Highway Administration's *Long-Term Pavement Performance* (LTPP) program, in collaboration with the Transportation Research Board's National Cooperative Highway Research Program (NCHRP), hosted a webinar series to introduce new Weigh-In-Motion (WIM) tools. The objective of NCHRP Project 20-50(20), *"LTPP Data Analysis: Develop Practical Tools and Procedures to Improve WIM Data Quality,"* was to develop practical tools and guidance to collect high-quality WIM data. This data is used for transportation and freight planning, pavement and bridge design, and highway safety investigations. The LTPP program has collected truck weight and axle loading data using WIM systems installed at LTPP Specific Pavement Study (SPS) test sites across North America for almost two decades. The LTPP program has also collected WIM performance validation and calibration data at these sites, which includes test truck data for quantifying WIM measurement precision and bias. The dataset from the SPS sites and the LTPP program's WIM data collection practices—along with State, national, and international WIM specifications and FHWA best practices—were used to develop practical tools and procedures to assure high-quality WIM data collection.

Applied Research Associates, Inc. was procured to review scholarly literature and the state of practice and analyze WIM data to develop the next generation of tools and procedures to improve the accuracy and increase the reliability of WIM data through more appropriate site selection; WIM system selection, installation, calibration, and maintenance; updated data analysis methods; and advanced quality control/quality assurance (QC/QA) procedures. The results for this project will be published this fall and will include the following:

- NCHRP Research Report 1070: Tools for Assuring WIM Data Quality: Practical Guide, which will contain instructions on how to use the six WIM spreadsheet tools (site assessment, sensor selection, installation QA, maintenance, calibration, and data QA analysis tools); and
- NCHRP Web-Only Document 370: LTPP Data Analysis: Practical Tools and Procedures to Improve WIM Data Quality, which will document the entire research effort.

These materials will be available on the National Academies Press website (nap.nationalacademies.org), and the release of the recordings of the webinar series, with training sessions demonstrating use cases for the six WIM tools, will be available at that time through the LTPP Customer Service Support Center (ltppinfo@dot.gov). Further development of web-based tools is planned in the future. NCHRP is administered by the Transportation Research Board (TRB), part of the National Academies of Sciences, Engineering, and Medicine, under a Cooperative Agreement with the Federal Highway Administration (FHWA) website (www.nap.nationalacademies.org).

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■ **Olga Selezneva** | OSelezneva@ara.com
■ **Camille Crichton-Sumners** | CCrichton-Sumners@nas.edu

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
ECM	www.ecm-france.com
Excel Technology	www.exceltech.com.au
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
TE Connectivity	www.te.com
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

IRD Low-Speed WIM for Compliance in Senegal

Sotracom is a construction company based in Senegal that requires a weight compliance solution to meet regulatory requirements and ensure their vehicles operate within legal weight limits. A single platform static scale was unsuitable for this application as axle weights are required by the regulations.


Unpacking the WIM Scale and Installing it at the Facility Entrance

For this reason, they selected IRD's low-speed WIM system to measure vehicle weights before they depart Sotracom's aggregate facility, ensuring conformity with regulatory requirements and avoiding costly fines. Objectives of enforcement regulations in Senegal are to reduce the risk of accidents and prevent premature degradation of roads that costs billions in CFA francs each year to remediate. The onus is put on private companies to monitor their vehicle weights and ensure they are within the permitted maximum weights.

An 4020 low-speed WIM Scale installed at the Sotracom Aggregate Facility

The IRD 4020 low-speed WIM scale measures vehicle weight within +/- 2% at 95% confidence for speeds up to 5 km/h. Typical uses for the 4020 scale include weighing vehicles at toll systems, border systems, and port-of-entry screening locations. A system using the 4020 scale was selected by Sotracom as the performance is well suited for the application, delivering high accuracy and easy maintenance. The 4020 scale can also be used for monitoring the amount of material brought in or taken out of the facility. The WIM scale is controlled using IRD's iSINC® WIM system electronics. The operators use the W4 web GUI to view live vehicles and export vehicle records to provide drivers with printed weight certificates.

■ Brendan Ezeanowi | brendan.ezeanowi@irdinc.com

WIM Data for Bridge Engineering

In May 2022, ISWIM published its second Practitioners' Guide, 'WIM Data for Bridge Engineering'. Its main goal is to present the possibilities of using WIM data for various bridge applications in an easy-to-understand way.

All WIM data has applications in bridge engineering, whatever the technology used to secure it. Perhaps the most critical application is in traffic loads. With some statistical calculations, WIM data can be used to determine the characteristic maximum load effects on bridges and hence their design values. This has applications in developing traffic load models for countries and finding site-specific design loading for a particular bridge.

The WIM data can also be used to protect bridges with lower load-carrying capacity. It can support posting policy or issuing a warning to heavy vehicles using a variable message sign. WIM, particularly Bridge WIM, can also be used for bridge health monitoring. Having load and bridge performance under this load significantly improves the quality of the information on the overall safety of a bridge structure.

For more information on this ISWIM Practitioners' Guide contact:

■ Gustavo Otto | otto.gus@gmail.com
■ Aleš Žnidarič | ales.znidaric@zag.si

CROSS Weigh in Motion system in Greece

From the end of the year 2019 until January 2023, CROSS Zlín, a.s. has installed twenty WIM stations in the regions of Greece. The final users are several Greek municipalities like Nea Odos, Egnatia Odos, Olympia Odos and Aegean Motorways. Thanks to CROSS´s very appreciated local partner and system integrator NewAlert and their highly experienced employees, they have, under CROSS´ supervision, installed and calibrated all of the High-Speed Weigh in Motion systems. The systems meet strict local demanding criteria and ensure accurate measurement results for pre-selection purposes.

One of the 20 WIM systems installed by CROSS in Greece

Every single installation was finalised with extensive training for final operators to be able to operate and maintain the system properly. The installations were realised on state roads with respect to the surrounding nature, citizens, and highway users. The solution has been proposed to measure all vehicles and especially to inform the operator about every dangerous overloaded vehicle.

Sensor installation in Greece

The delivery also contained cameras for license plate recognition as well as overview cameras to take a picture of each drive-thru. A part of some deliveries was also our smart city platform “Invipo” which connects several technologies under one umbrella software. The platform can supply cooperative functionalities with many other technologies and make them cooperative thanks to the customisable rule engine.

■ Miroslav Kušnír | kusnir@cross.cz

Calibration of WIM Systems

This guide is being developed by ISWIM volunteers 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 describe 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.

ISWIM
Practitioners' Guides

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 will be made available via the ISWIM website: www.is-wim.net

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

African Transport Research Conference 2024

Africa is urbanising rapidly, raising enormous infrastructural and transport challenges that jeopardise the social and economic potential of the continent. Already, its countries contend with the immense challenge of providing sustainable and affordable connectivity and accessibility within and between cities, between countries and with the rest of the world. Both in terms of passenger transport as well as in terms of freight transport and logistics.

These challenging conditions, however, also provide transport professionals with a wealth of interesting and relevant opportunities to advance transport research and solutions for Africa and beyond.

The first-ever African Transport Research Conference (ATR-2024) will bring together a wealth of interesting and relevant opportunities to advance transport research and solutions in Africa and for Africa – in a beautiful world-class conference setting in Cape Town, South Africa. The organisers are Centre for Transport Studies of the University of Cape Town, in partnership with the Volvo Research and Educational Foundations (VREF).

The conference will be held at the Graduate School of Business Conference Centre, University of Cape Town, South Africa. The conference welcomes contributions to transport studies in Africa (and related fields), encompassing work on all land-based transport modes (including passenger and freight) in both urban and rural contexts and across six thematic areas:

1. User needs and practices, equity issues
2. Governance, politics, institutions and finances
3. Emerging business models and service options
4. Safety, health and the environment
5. System design and modal integration
6. Analytical tools and emerging technologies

The deadline for extended abstracts is 1 August 2023. Submission link: https://easychair.org/conferences/?conf=1statr. Extended abstracts should be at least three pages but not more than five pages in length; the word limit is 1500 - 2,000 words. After the deadline, good quality abstracts may still be accepted by the organisational committee; for more information:

■ Contact | ATR2024@uct.ac.za

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