

ISWIM NEWSLETTER

Message from the ISWIM president

ISWIM Members and Friends,

Welcome to the third edition of our Newsletter for 2022. ISWIM produces this Newsletter to inform its membership and the broader community about the developments within the association and to provide a snapshot of the world of Weigh-In-Motion (WIM).

ISWIM aims to represent the interest of its members and service their evolving needs. The Board of ISWIM engages with colleges and individual members to receive feedback. It is also important that ISWIM reaches out and provides the opportunity for engagement to all members.

As ISWIM President, I believe a wide-reaching questionnaire was important to ascertain members' views concerning existing ISWIM products and services and their views about initiatives and future programs ISWIM should be considering. The Board of ISWIM agreed with this position and a questionnaire was widely communicated through the ISWIM newsletter, ISWIM website and LinkedIn. The questionnaire had forty-three responders and the results of the questionnaire were presented to the Board meeting earlier this calendar year and are now formally presented as part of this newsletter.

This is the first ever formal questionnaire of members and represents an import vehicle for members to advise collectively on their needs. The e results of this questionnaire will permit the Board to better identify and scope products and services that meet future member needs, within its scope and resources.

Finally, I invite you all to contribute to the Newsletter. The ISWIM Newsletter is your newsletter and your articles, research initiatives, programs and learning's are very welcomed. As such, please do not hesitate to submit an article!

Thank you all for your contribution.

Chris Koniditsiotis

President – ISWIM

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Young Researcher Award

Two young scientists (Amin Moghadam and Lucas Franceschi) have received the ISWIM Young Researcher Award for 2021. 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 9th International Conference on WIM (ICWIM9) in Brisbane, Australia in May 2023 to present their work, visit the exhibition, and further develop their industry knowledge and global network.

Lily Poulidakos, Chair ISWIM Young Researcher Award Committee.

■ Lily Poulidakos | Lily.poulidakos@empa.ch

9th International Conference on Weigh-In-Motion

ISWIM is happy to announce that the 9th International Conference on Weigh-In-Motion (ICWIM9) will be held from 4-9 November 2023 in the Brisbane Convention & Exhibition Centre in Australia. After Asia, Europe and the Americas the ICWIM conference will now come to Australia for the first time.



Furthermore, ICWIM9 will be held jointly with the 17th International Symposium on Heavy Vehicle Transport and Technology (HVTT17). After Paris, France in 2008 this will be the second time that an ICWIM conference will be held jointly with a HVTT symposium). The joint conference theme Technology Convergence 2023 - *Setting the wheels in motion - Reimagining the future of heavy vehicles, roads and freight* is relevant and timely. This relevance and timeliness acknowledge the impact of the convergence in technology within the sector in delivering concurrently improved productivity, safety and environmental outcomes.

Furthermore, these outcomes are being achieved by bringing the world of heavy vehicles and Weigh-In-Motion together. This joint conference along with the supporting exhibition promises to be a great event, providing a richer collaborative stage for both associations and all stakeholders.



View of Brisbane.

Brisbane, the capital of Queensland - known as the "Sunshine State" - is a dynamic, cosmopolitan, safe and friendly city. It is surrounded by some of the most popular sightseeing destinations in Australia: the Gold & Sunshine Coasts, beautiful sand islands, zoos and theme parks. The amazing weather, excellent quality of life and friendly, relaxed people make Brisbane the excellent quality of life and friendly, relaxed, perfect Australian city to visit.

Disclaimer

The projects described, ideas shared, and claims made in this Newsletter do not necessarily 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 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 **400** members. If you want to join, please visit:

[linkedin.com/groups/13400438](https://www.linkedin.com/groups/13400438)



We welcome abstracts on a broad range of topics which relate to the conference theme: 'The future imagining the future of heavy vehicles, roads and freight', including (in alphabetical order):

1. Application of WIM for heavy vehicle operations and access
2. Data management, governance, stewardship
3. Digital technology and data
4. Greening road freight transport, carbon reduction, electrification, alternative fuels
5. Heavy vehicle design and technology
6. Heavy vehicle safety, driver safety, heavy vehicles as a workplace
7. Intelligent Transport Systems (ITS) and traffic management integration
8. Managing the growing freight task, changes in the freight task, micro freight
9. Measuring mass: in-road and on-vehicle
10. Regulations, standards and specifications
11. Supply chain resilience and security
12. Users' experience with WIM
13. WIM data for road asset management, bridge engineering, tolling
14. WIM for compliance and enforcement
15. WIM standards and specifications.

Authors are invited to submit abstracts in English (600 to 1000 words) covering one or more of the conference topics. Abstracts must be submitted through Easy Chair: https://easychair.org/conferences/?conf=joint_hvtt17_icwim9 Abstracts and full papers can be either end-user or academically oriented, but noting it is a scientific conference, free of commercial content. The abstract should include sufficient information for a good understanding of the topics to be presented. Authors will be notified of abstract acceptance by end-December 2022. Full papers will then need to be submitted by 31 March 2023. Accepted papers will be scheduled for presentation in one of the sessions of the joint conference, or as a poster presentation. Accepted papers will be made available to registered delegates who attend the conference. Accepted papers will also (post conference) be published on the ISWIM and HVTT Forum websites, and may be selected for inclusion in ISWIM or HVTT Forum publications.

For more detailed information on the program, registration and exhibition please visit: www.is-wim.net

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■ **Gavin Hill** | GavinH@tca.gov.au

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
Ciemsá	www.ciemsá.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

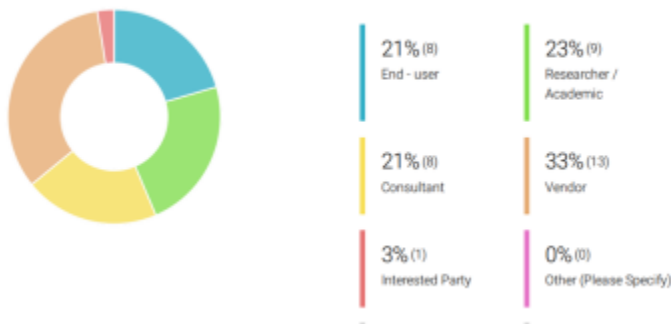
Questionnaire of ISWIM Members

The questionnaire of ISWIM members comprised a series of questions. The results of the questionnaire are presented below across five broad sections, namely interest in ISWIM, reasons for joining and residence, satisfaction with existing ISWIM services & products and new potential ISWIM services or products.

Interest in Weigh-In-Motion and ISWIM

To the question of what the interest in Weigh-In-Motion is, as the results show below, ISWIM members fall into four groups, namely Vendors, Researchers/Academics, Consultants and End-users. This is recognized by ISWIM in the way it is both structured and its content delivered. Furthermore, from the responses received, there would appear to be a relatively even spread.

What is your interest in Weigh-In-Motion?

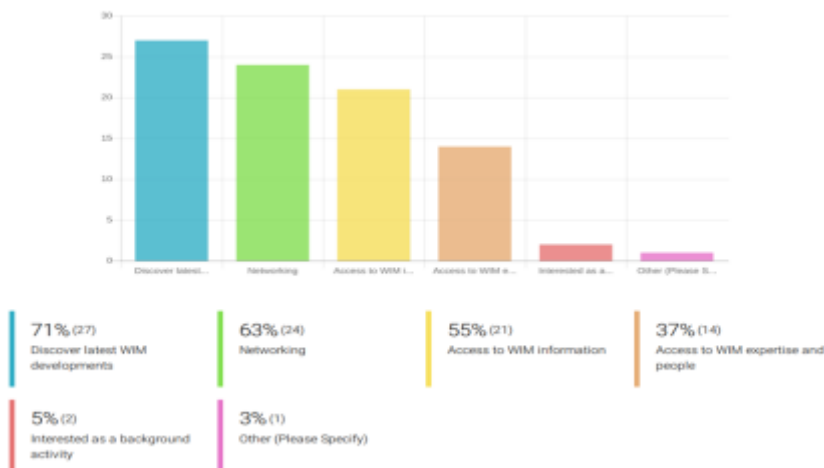


Reasons for joining ISWIM

The follow-up question, namely what are the reasons for joining ISWIM? The responses as detailed below indicate four pillars of interest including (noting responders nominated more than one reason):

- To discover the latest WIM initiatives
- Networking
- Access to WIM information
- Access to WIM expertise and people.

2 What are your reasons for joining ISWIM?



ISWIM Consultants

Corner Stone www.corner-stone-int.com

FIMAU www.FIMAU.com

NMi www.nmi.nl

RTS GmbH douपाल@hispeed.ch

Static Motion www.staticmotion.co.za

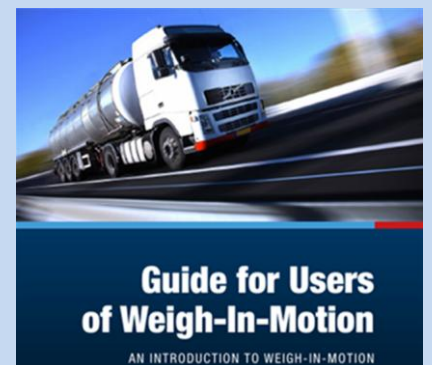
Interested to join the ISWIM Consultants, just contact:

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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.



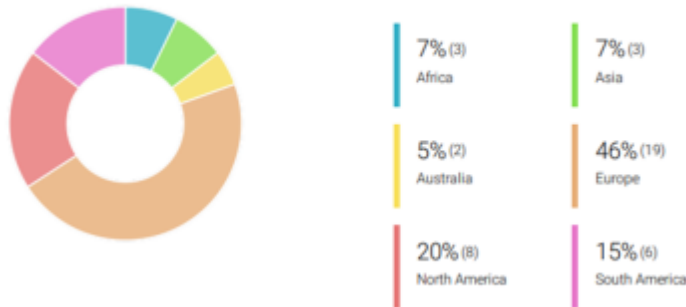
A PDF version of the WIM User Guide can be downloaded at the ISWIM website: www.is-wim.net.

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

Residence of ISWIM members

ISWIM is an internationally based association and the responses to the qQuestionnaire demonstrated this by representing all six populated continents as presented below.

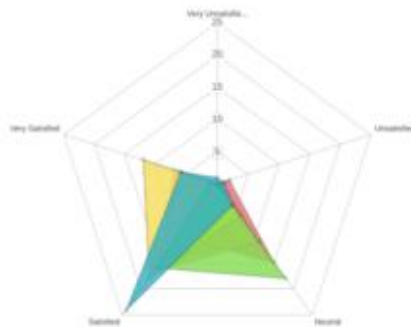
What continent do you reside in?



Satisfaction with existing ISWIM Services and Products

A key question was the level of satisfaction with existing ISWIM services and products. The responses presented below for the services and products have a mean rating of 3.81 from five, ranging from the LinkedIn Group with a rating of 3.51 from five and the ISWIM newsletter with a rating of 4.17 from five.

4 How satisfied are you with the following ISWIM services and products?



Service/Product	Very Unsatisfied	Unsatisfied	Neutral	Satisfied	Very Satisfied	Standard Deviation	Responses	Weighted Average
ISWIM website (www.IS-WIM.net)	1 (3%)	1 (3%)	4 (11%)	24 (67%)	5 (17%)	0.61	36	3.92 / 5
LinkedIn group	0 (0%)	0 (0%)	18 (51%)	16 (46%)	1 (3%)	0.2	35	3.51 / 5
ISWIM newsletter	0 (0%)	0 (0%)	6 (17%)	18 (50%)	12 (33%)	0.7	36	4.17 / 5
ISWIM - i.e. the main 3 to 4 year international conference	0 (0%)	0 (0%)	11 (32%)	17 (50%)	6 (18%)	0.55	34	3.85 / 5
ISWIM regional seminars	0 (0%)	2 (6%)	15 (40%)	10 (28%)	4 (13%)	0.53	31	3.52 / 5
Webinars / Virtual workshops	0 (0%)	1 (3%)	11 (32%)	15 (44%)	7 (21%)	0.74	34	3.82 / 5
Total								3.81 / 5

New ISWIM services or products

The questionnaire asked what the views were concerning possible new services and products that ISWIM could consider. Several responders were comfortable with the existing services and products and in particular their expectation of ISWIM, noting it is a volunteer-based association. There were responses though presented as follows:

- Short videos explaining the technology and its applications
- Information on new sensor technologies

Coming Events
(subject to change)

Transport Research Arena (TRA)

Lisbon, Portugal
14-17 November 2022
www.traconference.eu

Gulf Traffic

Dubai, UAE
6-8 December 2022
www.gulftraffic.com

Transport Research Board (TRB)

Washington, USA
8-12 January 2023
The WIM subcommittee meeting will be virtual and held after TRB. Date to be announced.
www.trb.com

CVSA Workshop

Memphis, Tennessee, USA
23-27 April 2023
www.cvsa.org/events

Southern African Transport Conf.

Pretoria, South Africa
10-13 July, 2023
www.satc.org.za

IWSHM-14

Stanford, California, USA
12-14 September 2023
<https://iwshtm2023.stanford.edu/>

PIARC World Road Congress

Prague, Czech Republic
2-6 October 2023
www.piarc.org

ICWIM9 + HVTT17

Brisbane, Australia
6-10 November 2023
www.is-wim.net

Intertraffic

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

NatMEC

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

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

- Information on the most challenging part of WIM - getting WIM Systems to perform as expected and to deliver accurate and reliable WIM data
- Training webinars for new WIM staff
- Expand on user/practitioner guides per application and subject
- Communication to be more varied, from all ISWIM groups including vendors
- Promote ISWIM more within the industry media
- Establishing a WIM end-users directory on the website so that road authorities and other WIM system owners and data users can talk to each other about the challenges and discuss the current best practice
- In addition to the newsletter, a research paper/periodical publication between the international conferences with identification of the latest research and findings
- An improved LinkedIn engagement process
- More involvement of the vendors' college
- ISWIM could organize more events to raise awareness of the applications and advantages of using WIM and mass data, especially for end users
- Continued sharing of WIM information, examples of installations and applications
- All things WIM related for a State DOT
- To be leading in the development of an international standard.

President – ISWIM

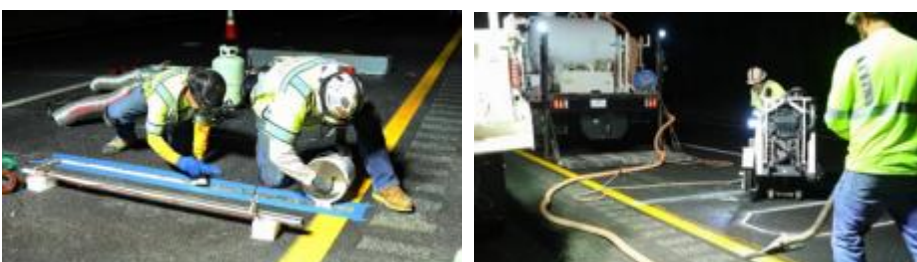
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Smooth ride on the data highway

Caltrans optimizes traffic monitoring with KiTraffic Statistics

Caltrans is tasked with keeping over 50,000 miles of road network safe in California. But in Caltrans District 3 (around Sacramento), the vehicle counting and classifying system was lagging behind the required standards of robustness, longevity and technological performance. This gave Kistler a golden opportunity to implement its KiTraffic Statistics (KTS) solution in the Golden State.

Kistler responded to Caltrans' challenging requirements by proposing KiTraffic Statistics (KTS), its groundbreaking Weigh-In-Motion system. Caltrans Senior Transportation Manager Dean Campbell was impressed: "The Kistler solution's technological superiority soon became clear to me ... and it comes at a really affordable price." This huge project went live in 2019: sensor equipment for 294 lanes at 64 sites was installed with an aggressive time schedule and minimal lane closures. First, Kistler's experts inspected all sites to ensure adequate road quality for the unique Lineas Compact quartz sensors. Combined with the Kistler Data Logger, KTS offers a user-friendly interface for comprehensive data evaluation that can register traffic volume, classification, and weight.



Installation of Kistler's Lineas Compact sensors as part of the KTS system

Glossary of Terms

After the 8th International Conference on Weigh-In-Motion (ICWIM8) in 2019 ISWIM has started the development of the 'Practitioners Series'. The aim of these best practices publication series is to provide WIM practitioners, technicians, and end-users with a series of practical guides illustrating "best practices" about the various aspects involving WIM technology, systems and their applications. All publications will be published via the ISWIM website: www.is-wim.net.



Earlier this year the first guide in the series was published. The 'Glossary of Terms', has an overview of definitions of terms frequently used in WIM. ISWIM guide contributors have discussed practices used around the world, some differences in definitions and terms are included, representing the rich spectrum of global WIM practitioners. It does not circumvent any available standard WIM specifications or calibration procedures.

The following Practitioner Guide are expected later this year:

- Calibration of in-road WIM systems
- Selection of in-road WIM Sites

For more information on the ISWIM Practitioners' Guides contact:

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But just as the project was gearing up in spring 2020, COVID-19 threatened massive disruption. Prime contractor Pacific Excavation (PacEx) responded flexibly by doubling up their on-site teams and pre-assembling the Automated Vehicle Classification (AVC) cabinets in their warehouses, instead of on site. Thanks to close cooperation among all partners, the project was eventually completed on schedule.

Around two years into operation, Campbell is highly satisfied with the outcome: “The system is robust and provides valuable data, including vehicle weights. It delivers a better understanding of traffic flows and better management of the infrastructure.” So it’s no surprise that this success has now inspired more Caltrans districts to consider optimizing their traffic monitoring with KiTraffic Statistics.

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WIM Bypass Site with Tire Width Based Screening

The Weigh2GoBC program in British Columbia, Canada, was developed to improve safety by ensuring vehicles are properly licensed and insured and that drivers comply with weight restrictions. The program also helps to reduce greenhouse gas emissions and congestion. IRD's recently completed Weigh2GoBC site at Terrace, British Columbia, utilizes Weigh-In-Motion (WIM) technology to determine whether vehicles comply with the defined class/compliance scheme and vehicle dimension regulations.

Vehicles are checked for height, weight, and safety credentials at the Terrace Virtual Weigh Station site. Vehicles enrolled in the Weigh2GoBC program are equipped with an AVI transponder, which an AVI reader can read to identify vehicles. Using WIM and other sensor technology, commercial vehicle measurements are used to determine compliance, which may result in a warning or fine for a non-compliant vehicle, but allows compliant vehicles to bypass subsequent inspections for a window of time.



Terrace, BC Virtual Weigh Station – SLC WIM and TACS

IRD's Tire Anomaly and Classification System (TACS™) also provides tire anomaly detection and advanced vehicle classification with tire width. Front axle classification is a new and major development for this project. The new functionality is

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:

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

made possible by the VectorSense® tire footprint sensor technology that can detect tire width with a high degree of accuracy. Vehicles with detected wide front axle tires will be given a higher weight allowance on that axle. Vehicles that would previously be flagged on the weight of the front axle alone may, in fact, be compliant with regulations. This will enable more efficient screening at this site and benefit bypass decision accuracy in the province.

The ability to screen based on a combination of tire types along with weights further improves safety and reduces congestion, thereby meeting the objectives of the Weigh2GoBC program.

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■ **Rish Malhotra** | rish.malhotra@irdinc.com

Durability of the BISON WIM solution

BISON Weigh-In-Motion system demonstrates once again its versatility and it proves one of its fundamental characteristics: the perfect compatibility with the operations of renovating the road surface. In other words, when resurfacing is necessary due to the wear of the asphalt, this operation may concern the road operators since it could affect or even break a wim sensor. But BISON WIM system lays firm in the position and it does not move, neither for an inch, under any circumstances... And no sooner said than done!



iWIM – BISON-WIM system on the Pontebbana in Italy

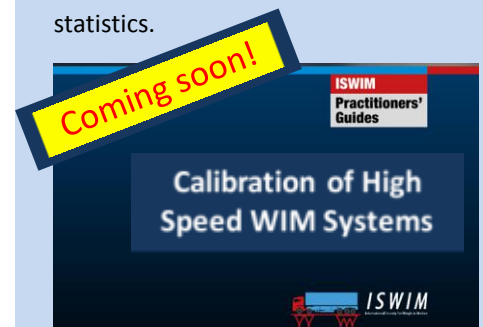
It was in September that Bison gave proof of this beneficial feature at the installation on the State Road 13 "Pontebbana" in Italy, close to the austrian and slovenian borders. The new asphalt mantle was laid for a stretch of 50 m: in the middle of this range, there are 4 BISON bending plates covering two lanes.

The operations of scarification and resurfacing were completed without any particular technical intervention nor the removal of the bending plates, and it did not require the total closing of the road, but only the establishment of one way alternating.

Calibration of High Speed 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.



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

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



Resurfacing without removing the BISON bending plates.

BISON Weigh-In-Motion solution also has remained active and working even during all the asphaltting operations, weighing the vehicles passing on the alternating one way in both directions, as soon as the road was reopened. The work was supervised by some of the iWIM engineers sent to the site, who made sure that everything was done to perfection. **No additional costs, but only many advantages!**

■ Luca Trainotti | luca.trainotti@iwim.it

■ Elisa Corradi | elisa.corradi@iwim.it

VanJee WIM+LiDAR Practice in Indonesia

In 2019, Indonesian Ministry of Transportation (MOT) stated that Over-Dimension and OverLoad (ODOL) trucks caused Indonesia to lose 2,8 Billion USD from road damage and bridge collapse. Also, in 2021 ODOL trucks, caused 26 victims to die. That's why the MOT declare Zero ODOL Policy to regulate all ODOL trucks on Indonesian roads. But until now, the policy hasn't been implemented yet and those accident victims feel like just a statistical number.



VanJee's ODOL Detection System on Palimanan Toll Gate, Indonesia

History of International Conferences on Weigh-In-Motion

So far 8 International Conferences on Weigh-In-Motion have been held and the 9th edition is scheduled for November next year in Brisbane, Australia. The conferences are:

ICWIM-1

Zurich, Switzerland
8-10 March 1995

ICWIM-2

Lisbon, Portugal
14-16 September 1998

ICWIM-3

Orlando, Florida, USA
13-15 May 2002

ICWIM-4

Taipei, Taiwan, ROC
20-23 February 2005

ICWIM-5

Paris, France
19-22 May 2008

ICWIM-7

Foz do Iguaçu, Brazil
7-10 November 2016

ICWIM-8

Prague, Czech Republic
19-23 May 2019

ICWIM-9

Brisbane, Australia
6-10 November 2023

www.is-wim.net/events/coming-events/icwim9/

All papers of the past ICWIM's can be found at:

www.is-wim.net/library/

For questions, please contact:

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



VanJee contributed in Indonesia with the Low-Speed WIM (LSWIM) + LiDAR installation for ODOL Detection System on Palimanan Toll Gate. The purpose of this project was to prevent the ODOL trucks to enter the toll road. It is important for every toll road in Indonesia to install LSWIM + LiDAR on their toll gate, because according to Jasa Marga, a toll road concessionaire in Indonesia, in Q4 of 2020, 40% of trucks that passed their toll road are ODOL trucks. So, to reduce the amount of ODOL trucks entering toll roads and damaging the roads, installing LSWIM + LiDAR on toll gates is a reasonable investment for the toll road concessionaires.



VanJee receives positive testimonials from Mr. Budi Setiyadi.

VanJee's project on Palimanan Toll Gate was the first complete ODOL Detection system in Indonesia. VanJee received praise from the Directorate General of Land Transportation of Indonesia, Mr. Budi Setiyadi during the inauguration of the ODOL Detection System site. He said that the system is very effective and efficient to detect ODOL trucks, lastly, he hopes there will be more of this kind of system in Indonesia.

■ Zhao Zhai | zhaizhao@vanjee.net

Solar and wind powered portable WIM systems

With energy prices skyrocketing across the world, electrical consumption has become a hot topic amongst infrastructure owners. Recently, Cestel included a solar power option for charging its portable SiWIM Bridge Weigh-In-Motion system (B-WIM). This solution is especially useful for remote measuring locations where there is no option to connect the B-WIM system to the electrical grid.

Cestel uses a combination of solar panels and methanol fuel cells to power its SiWIM system. Solar panels are used to charge the batteries during the day and the stored solar energy is used during the night. Methanol fuel cells serve as a backup energy source, which kicks in if the battery output is too low or in case of prolonged unfavorable weather conditions.

The use of alternative energy sources in powering modern electrical devices is closely related to their power consumption. The power consumption of the most basic SiWIM system, which covers two lanes, is 32W. The consumption increases to 47W in the case of a four-lane system with a camera. All of the components of such a setup are fully portable, so the whole Weigh-In-Motion system can be moved to another measuring site in a day.

ISWIM Board

Executive Board:

- Chris KONIDITSIOTIS, Australia
President ISWIM
- Bernard JACOB, France
Vice-President Science
- Andrew Lees, Great Britain
Vice-President Vendors
- Jonathan REGEHR, Canada
Treasurer
- Deborah WALKER, United States
General Secretary
- Aleš ZNIDARIČ, Slovenia
Information Officer

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Promotional Activities:

- Hans van Loo, Switzerland





A solar panel powering a remote Cestel B-WIM system.

The company is also researching the use of roadside helical wind turbines, which harness the airflow of passing vehicles. Such a setup would be particularly advantageous when doing WIM measurements on highways with heavy traffic. ■ [Matija Mavrič](mailto:matija.mavric@cestel.si) | matija.mavric@cestel.si

Weigh-In-Motion is an important topic anywhere

CROSS Zlín have recently supplied several pieces of WIM equipment for the Ukrainian customer Ukravtodor, which is authority for the highway and road network management in Ukraine. Although, the war conflict has been going on in Ukraine for some time, so at the first sight it might seem that the subject of Weigh-In-Motion in this country is absolutely unimportant.



Detailed vehicle data

Pictures of heavy trucks of the world

The world of Weigh-In-Motion is often connected with the world of heavy trucks. When travelling around the world you see these trucks in all size, shapes and colours. In the preparation of the ISWIM Newsletter we are always looking for nice pictures of heavy trucks to lighten up things.

We are looking for anything like: trucks in spectacular scenery, exceptional transport, road trains, cases of severe overloading or trucks passing a WIM system.



If you have any nice pictures of heavy and colourful trucks from anywhere around the world that you would like to share please send them to me at:

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

The opposite is apparently true, the Weigh-In-Motion is important even on the battlefield. The installation is carried out by a Ukrainian partner trained by CROSS Zlin company. A special feature of these installations is the connection to data centers in Ukraine, where the recorded data are automatically sent. These data are of two types. A record of every vehicle passed for statistical purposes and a record of a vehicle with a violation, which can be, in addition to overloading the vehicle, also exceeding the permitted dimensional limits. Since in both cases they are very confidential data, it has to be secured their completeness, immutability and smooth receiving by the remote server.

UAD Data Exchange Overview

Vehicle ID	Vehicle GUID	Vehicle Timestamp	Sent Trials	Sent	Debug Package
1624428	0132e404-4984-11ed-84c4-00306437151d	10/12/2022 9:13:17 AM	0	True	Download
1624427	03cd91c2-4984-11ed-84c4-00306437151d	10/12/2022 9:13:08 AM	0	True	Download
1624426	028940c-4984-11ed-84c4-00306437151d	10/12/2022 9:13:06 AM	0	True	Download
1624425	edf5dc08-4984-11ed-84c4-00306437151d	10/12/2022 9:12:57 AM	0	True	Download
1624424	af09b7e-4984-11ed-84c4-00306437151d	10/12/2022 9:12:54 AM	0	True	Download
1624423	e1ad1a7e-4984-11ed-84c4-00306437151d	10/12/2022 9:12:44 AM	0	True	Download
1624422	d77079d0-4984-11ed-84c4-00306437151d	10/12/2022 9:12:20 AM	0	True	Download
1624421	d3ed11a9-4984-11ed-84c4-00306437151d	10/12/2022 9:12:18 AM	0	True	Download
1624420	49607352-4984-11ed-84c4-00306437151d	10/12/2022 9:12:15 AM	0	True	Download
1624419	d23e9d5e-4984-11ed-84c4-00306437151d	10/12/2022 9:12:12 AM	0	True	Download

UAD Data Exchange Overview

Each individual data package is therefore encrypted and digitally signed by hardware key installed on the WIM station. Then the data package is recorded in the vehicle database at the WIM station and it is verified whether it has been delivered to the data center. This is the essence of the transmitted encrypted data, so that they can believe to the data and continue to work with them, issue violations and fines.

■ Václav Blahník | blahnik@cross.cz

CAMEA Digital WIM Sensor with Novel Features

The WIMTRONIC digital sensor has embedded electronics, multiple rows of sensing elements and additional on-board sensing technologies will not only save costs on components and cabling but also provide new functions which can significantly improve the overall performance of WIM applications. It uses individually pre-loaded piezoelectric elements, so the sensitivity is not affected by manufacturing tolerances of the sensor's components and the body. The longitudinal sensitivity and calibration constants can be calculated for each sensing element individually to ensure its uniform longitudinal sensitivity.



Footprint of under- (left), correctly (center), and over-inflated (right) tires

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Using two or more rows of load cells enables monitoring of dynamic forces caused by the tires. Based on the response of each row, vehicle acceleration and braking can be determined as well as the position, travel direction, wheel track, dual tires, speed of each wheel, and others. This information can be further used to determine which measurements should be considered valid. Thanks to individual measurement of the responses of each load cell, the digital sensor enables to measure the road deflection, the tire pressure and the shape and surface of its footprint. The figure shows the measured pressure distribution in the tire footprint in the cases of underinflated, correctly inflated, and overinflated tires.

■ Jan Fučík |j.fucik@camea.cz

7 years of operation with Intercomp sensors

Oregon Department of Transportation (ODOT) has a program called “Green Light”, where WIM systems are used for vehicle pre-selection before enforcement stations. In 2022, ODOT completed 7 years of operation with Intercomp strip sensors, and the state decided to expand the number of sites as part of a long-term directive.

ODOT installed their first set of Intercomp strip sensors near the city of La Grande, in 2015. Two years after initial calibration, ODOT compared the data from 68 vehicles that crossed the strip sensors at the La Grande WIM site with the measurements made at a static scale located downstream in the same road. The results showed a mean error of -1.81% and standard deviation of 2.37% - even two years without a subsequent calibration.



Intercomp strip sensors installed in Oregon, USA

The numbers at La Grande established the reliability of the WIM system and set the example for other WIM installations in the state. The proven longevity and consistent accuracy of the first Intercomp installations in Oregon were key factors that led the state to expand its WIM network using the same sensors.

Between 2015 and 2022, 13 high-performance WIM sites with Intercomp strip sensors were installed, and Oregon has plans to install an additional 6 sites by 2027. The application of Intercomp strip sensors became a long-term project when the state found a WIM technology that met their expectations in terms of accuracy and ability to sustain calibration over time.

■ Leonardo Guerson |leonardog@intercompcompany.com

