

ISWIM NEWSLETTER

Message from the ISWIM president

Dear ISWIM Members, Colleagues, and Friends,

Welcome to the August edition of our Newsletter. This edition has a wide breath of information covering research initiatives in the USA WIM area and case studies.

I was recently interviewed by Traffic Technology International. The key messages conveyed included the progress over the last few years including the advancements and continuing adoption of direct WIM enforcement by countries, the increasing integration of WIM as part of the broader ITS community and very importantly the significant data produced that can now address key policy questions especially in the on-road and in-vehicle weighing dimensions.

This edition also includes:

- On-Going WIM Research Activities in the USA
- Case studies in Canada and the Czech Republic
- Call for Abstracts and information on the 3rd Regional ISWIM Seminar in South Africa

Keep well, take care of your families and friends and be safe.

Chris Koniditsiotis
President – ISWIM

■ [Chris Koniditsiotis](mailto:ChrisK2.0@bigpond.com) | ChrisK2.0@bigpond.com



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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 2021.

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

IRD Regina Bypass Project – Saskatchewan, Canada

The Regina Bypass is the largest transportation infrastructure project ever undertaken in the province of Saskatchewan, Canada. The goals of the project were to improve transportation of goods **in and out of the province’s capital city** while also improving highway safety. International Road Dynamics (IRD) supplied six Virtual Weigh Station (VWS) systems at four locations on the bypass to provide the Saskatchewan Ministry of Highways and Infrastructure (MHI) with vehicle records for commercial vehicle enforcement, traffic surveillance and data collection applications.



Virtual Weigh Station Site on the Regina Bypass

The VWSs classify vehicles based on weight and axle spacing and determine when vehicles are in violation of regulations. The stations create records of commercial vehicles, and display a sequence of these records through a web

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 presented in the Newsletter.

ISWIM LinkedIn Group

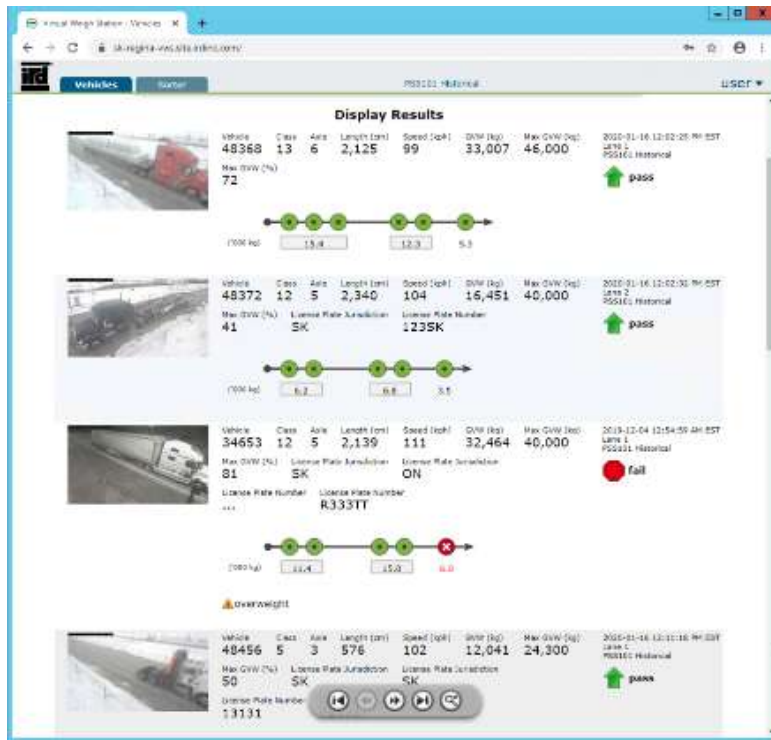
Besides the periodical Newsletter there is another way of keeping up to date with the latest developments in Weigh-In-Motion: the ISWIM LinkedIn Group. In this group; researchers, end-users and vendors can find AND post short articles on new projects, test result, or other developments related to WIM-technology and –applications.

Like with the Newsletter the aim is to find a balance between research and application and between public and commercial items. The ISWIM LinkedIn Group has currently more than 200 members.

If you want to join, please visit:
[linkedin.com/groups/13400438](https://www.linkedin.com/groups/13400438)



application. Components include IRD-PAT Bending Plate® WIM scales, Virtual Weigh Station (VWS) Software, iSINC® roadside electronics, image capture cameras, and License Plate Readers (LPR). While the Bending Plate WIM system easily met the project specification requirements of ASTM E1318-09 Type I, the accuracies actually demonstrated by the system were well within ASTM E1318-09 Type III, i.e. within +/- 6% GVW (Gross Vehicle Weight) error or better (with 95% confidence). The vehicle records can be accessed through the VWS software using standard web browsers. The Saskatchewan Highway Patrol uses the weight data to perform targeted enforcement for overweight vehicles.



Virtual Weigh Station Software – Historical View

Real-time data (speed, vehicle type and frequency) is sent to a Commercial Vehicle Enforcement Data Server which can be accessed in real time by enforcement officers and MHI operations. Historical data is used to confirm that the bypass is facilitating effective traffic flow and that commercial vehicles are taking the bypass route.

■ Peter Fedechko | Peter.Fedechko@irdinc.com

On-Going WIM Research Activities in the U.S.

This article provides a compilation of on-going WIM research activities in the U.S., including the following:

- Development of a Self-Powered WIM System – This study is focused on developing a roadside piezoelectric energy harvesting system.
Expected Completion Date: 02/15/2021.
URL: <https://transet.lsu.edu/research-in-progress/>
- Sensitivity and Accuracy Assessment of WIM Measurement Errors Using In-Pavement Strain-Based Sensors –The objective of this study is to provide the systematic sensitivity analysis on the influences of external contributors on the measurement accuracy of a WIM system based on in-pavement strain

Coming Events (subject to changes)

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

HVTT-16
Qingdao, China
13-16 October 2020
<http://www.rtet.com.cn/en/>

4th ANTT WIM Workshop
Brasilia, Brazil
Early December 2020 (To be confirmed)
www.antt.gov.br

TRB Annual Meeting
Washington DC, USA
24-28 January 2021
www.trb.org

Intertraffic Amsterdam
Amsterdam, the Netherlands
23 - 26 March 2021.
www.intertraffic.com

NaTMEC 2020
Raleigh, North Carolina, USA
June 2021 (To be confirmed)
www.natmec.org

ISWIM 3rd Regional Seminar
Pretoria, South Africa
7-9 November 2021
www.is-wim.org

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

For other WIM-related events contact:
■ Hans van Loo | hans.vanloo.int@gmail.com

sensors. The main external contributors to be investigated in this study include air temperature, vehicle wander behavior, air humidity, and wind speed on the measurement accuracy of a WIM system. Expected Completion Date: 07/31/2022. URL: <https://www.mountain-plains.org/research/details.php?id=498>

- Development of Low-Cost WIM and Response Spectra Techniques, Phase I of “**Development of a Cost-Effective Sensing System for Integrated Traffic and Pavement Response Monitoring in Support of Pavement Management**” – This project will develop a long life WIM system with much lower costs using the piezoelectric sensors. The system will be named as P-WIM. The P-WIM will essentially consist of several piezoelectric disks sealed in a protective package made from engineering plastics. A wireless transmission module will be included in the package of the P-WIM to enable wireless data transmission. The P-WIM will be powered by solar panels and supplemented by the energy harvested from pavement deformations and vibrations. Expected Completion Date: 03/01/2021. URL: <https://r3utc.psu.edu/research/current-research-projects/projects-year-1-2/ciam-utc-reg13/>
- LTPP Data Analysis: Develop Practical Tools and Procedures to Improve WIM Data Quality – The objective of this research is to develop the next generation of tools and procedures to improve accuracy and increase reliability of WIM data through (1) more appropriate site selections; (2) WIM system selection, installation, calibration, and maintenance; (3) data analysis methods; and (4) quality control/quality assurance (QC/QA) procedures. Expected Completion Date: 2021. URL: <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4412>

■ Olga Selezneva | oselezneva@ara.com

Call for Abstracts for the 3rd ISWIM Regional Seminar

ISWIM has published the call for abstracts for the 3rd Regional ISWIM Seminar. The seminar will be held from 7-9 November 2021 in the CSIR Convention Centre in Pretoria, South Africa.



The CSIR Convention Centre in Pretoria, South Africa.

3rd Regional ISWIM Seminar in South Africa

In 2021 ISWIM will be organizing its 3rd Regional WIM-Seminar in Pretoria, South Africa with a specific focus on Sub-Saharan Africa. Several countries in this region have been using WIM systems for many years, while others have only recently started implementation. By bringing all these users together ISWIM wants to support the development of WIM in Southern Africa.

The seminar will be held from 7-9 November 2021 at the CSIR Convention Centre in Pretoria, South Africa. The hosts of the seminar are ISWIM, PIARC Technical Committee TC2.3 ‘Freight’ and Mikros, with the support of the ASANRA, CSIR, HVTT, SARF, SANRAL, and ITS South Africa.

During the seminar there will also be an exhibition where ISWIM Vendors will have the opportunity to present their systems and solutions.

The seminar offers different levels of sponsorship; each level includes a booth at the exhibition, a 15 minute presentation at an end-user session, and a number of free registrations depending on the sponsorship level.

For details on the possibilities and conditions for sponsoring please visit our website: www.is-wim.org or contact:

- Andy Lees | Andrew.Lees@q-free.com
- Andrew Houlston | Andrew@syntell.co.za



The seminar will cover the following topics concerning in-road and on-board WIM:

- **WIM systems, users' perspectives and experiences,**
- WIM sensors, technologies and developments,
- Standards, specifications and testing,
- Data quality, management and use,
- Application of WIM for enforcement and toll-by-weight,
- Applications of WIM in infrastructure and road safety.

The selection of presentations for the seminar will be based on extended abstracts which should be about 4 pages and include sufficient information for a good understanding of the topic to be presented. The **Seminar's Program Committee** will make a selection based on the content and quality of the abstract and the relevance for the specific topics of the symposium and quality of the proposed papers.

Abstracts must be submitted in English and on-line at www.is-wim.com. The authors of abstracts selected for presentation will be notified early 2021. All abstracts presented at the symposium will be made available to the delegates in electronic form and via the ISWIM web-site. The timetable for submission of abstracts and registrations is as follows:

- 1 March 2021: Closure of submission for extended abstracts
- 30 April 2021: Notification of successful authors/presenters
- 1 September 2021: Final date for registration of presenters
- 7-9 November 2021: 3rd Regional ISWIM Seminar.

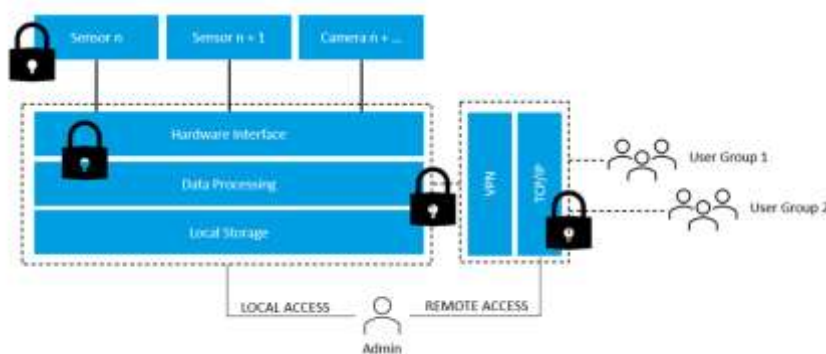
■ [Andrew Houliston](mailto:Andrew@syntell.co.za) | Andrew@syntell.co.za

■ [Chris Koniditsiotis](mailto:ChrisK2.0@bigpond.com) | ChrisK2.0@bigpond.com

NMi for WIM and Cyber Security

After NMi published its Weighing in Motion standard back in 2016, there have been interesting developments in the field of weighing in motion. One is that WIM-systems did not become simpler, on the contrary, they became more advanced and got equipped with more and more features.

Cyber Security on Multiple Levels



Cyber Security on Multiple Levels

ISWIM Vendors

Axtec	www.axtec.co.uk
Betamont	www.betamont.sk
Camea	www.cameatechnology.com
Captels	www.pesage-captels.com
Cestel	www.cestel.eu
Ciemsas	www.ciemsas.com.uy
Corner Stone	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
NMi	www.nmi.nl
Q-free/TDC	www.q-free.com/products
RTS GmbH	doupal@hispeed.ch
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
Wheelright	www.wheelright.co.uk

■ [Andy Lees](mailto:andrew.lees@q-free.com) | andrew.lees@q-free.com

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



In case of WIM these additional features are, often, intended to offer more and more advanced applications to end-users and to make the systems and the measurements more accurate and more reliable. In addition when developing systems, we want to make sure they are always available to the user, no matter what. End-users will want these WIM-systems to operate 24/7, while the data is guaranteed to be correct and the privacy is not compromised. In other words, how to achieve optimal availability, data quality, integrity and confidentiality over the entire data-chain?

All this can be covered when taking cyber security into consideration when developing, or purchasing systems or components in order to compose your state-of-the-art weighing in motion system. More specifically, the IEC-62443 provides great insight on how to analyze and address the aforementioned areas (technology, people, policy and procedures).

■ Mike van de Heijden | mvanderheijden@nmi.nl

Interview with Chris Koniditsiotis in TTI

The July 2020 edition of the Traffic Technology International included an interview with the president of ISWIM. Chris talks Covid-19, in-vehicle scales and why international, high-speed direct enforcement for WIM could be just around the corner. This article is just a summary of the interview, for the full interview please visit: <https://www.traffictechanologytoday.com/online-magazines>.

Covid-19 and WIM: Like everywhere, Australia experienced considerable tailing off in private car movements during Covid-19 restrictions – up to 40% during the lockdown. Freight movements and heavy vehicles, however, have largely stayed the same throughout the pandemic so far. **“It’s still early to look at the findings, but what the WIM data has shown us, in combination with traffic data, is how efficient the road network is when you make a small reduction,”** says Koniditsiotis. **“We’re talking about 20% productivity increase in the freight task, which is phenomenal. The legacy is a dataset of before, during and after the pandemic that we can use. It’s a chance experiment of what it would look like if we had fewer vehicles on the road. We have the data available, because it’s being monitored. I think research institutes should be offering PhD candidates a whole lot of data. The challenge will be posing the right questions, because the data set will be very rich.**

Direct enforcement: High-speed enforcement is the holy grail of WIM. China, the Czech Republic, Hungary and Russian already use high-speed WIM for direct enforcement. Koniditsiotis believes the last five years or so have thrown up three very important developments in the world of WIM.

1. The first is the improvements in computer processing capability and the ability to monitor the location of a vehicle on the WIM site. That in turn **leads to better and more accurate measurements. “Such improvements do not come with a large price tag, because they are software rather than hardware improvements,”** says Koniditsiotis. **The major improvement is not simply with better hardware but being able to develop the algorithms that tell you the movement of the vehicle literally as it’s going over the scale. You’re calibrating not just a static mass but a dynamic mass in real time. This is very powerful.**

New ISWIM Member

In the last months ISWIM has welcomed another **new member** in it’s Vendors & Consultants College:

Ciemsas, a company based in Uruguay specialized in the design, integration, commissioning and maintenance of complex environment systems that require technology, engineering, and permanent innovation in terms of management and infrastructure.

From Uruguay we provide services that add value to Latin American countries, adapting solutions that have been tried and tested successfully in Uruguay to different realities and contexts.





Chris Koniditsiotis at Traffic Technology International.

2. The second development Koniditsiotis is keen to highlight is the full integration of WIM systems over the last few years. **“They used to be standalone solutions,” he says. “But now they’re integrated into the broader ITS community. These days you don’t go out and buy a WIM system. Instead you buy a logger that is used to log all sorts of devices of which some are on-road WIM devices.**
3. The final issue Koniditsiotis cites is the significant take-up of in-vehicle, on-board scales in addition to on-road WIM technologies. The advantage here is **that many trucks come complete with their own scales. “The beauty of this is that all of a sudden it allows policymakers the option to develop regimes that create improved access to the road network specific for that vehicle because you know the mass,” he says. “A good example of this is in Australia. Our bridge design code has been updated to recognize that if you know the mass of that particular truck, you can reduce the load safety factors. These are only there because traditionally you don’t know the mass, so you make an assumption and apply a safety factor on top. What this means on the ground is weighing systems are allowing a complete rethink of how we provide access to our roads for heavy vehicles. It’s a potential game-changer**

■ Chris Koniditsiotis | ChrisK2.0@bigpond.com

Case Study – CAMEA WIM Station Accuracy

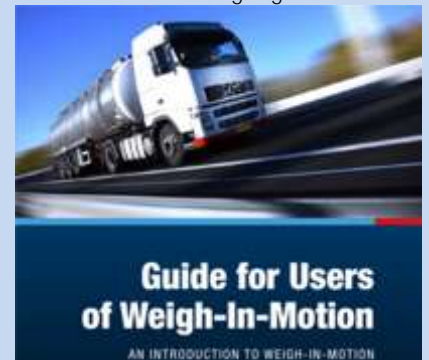
A recent test by the Czech Institute of Metrology on an existing WIM station on a Czech highway proved that high measurement accuracy can be achieved with only 2 rows of time-tested pressure sensors. Necessary preconditions are a very good quality road and software capable of compensating external influences that cause the greatest measurement error independently on the sensing technology. This test consisted in measuring 3 different trucks (2, 4 and 5 axles) passing 60 times in total at 2 different speeds (45 and 85 km/h) in order to reach reasonable data validity.

Evaluation of the measurement results showed a standard deviation of less than 1.5 % and a gross vehicle weight (GVW) error of less than 2 % with an offset included. This is the result of the worst-case scenario; the passing of the 2-axle truck. The outcome is better with more axles and the accuracy could also grow with more sensor rows (more individual measurements – contacts of the vehicle with the pressure sensors).

ISWIM User Guide

The new ISWIM Guide for Users of Weigh-In-Motion was launched last year 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 | hans.vanloo.int@gmail.com



CAMEA WIM station tested by the Czech Institute of Metrology.

However, statistically the above-mentioned accuracy only applies for 68 % of all vehicles (1 standard deviation). That is why presenting this value as the WIM system accuracy should be avoided, although this practice is occasionally seen. Therefore, the GVW error that statistically applies for 95% of vehicles was calculated (2 standard deviations), with the result not exceeding 3%, offset included. This is the confidence level usually used by vendors to show the WIM accuracy.

■ Prokop Kudlik | P.kudlik@camea.cz

LS630-WIM Scale OIML Approval for Intercomp

In further OIML R134 activities for their scales and sensors, Intercomp has received OIML R134 certification for their LS630-WIM™ scales. Achieving accuracy class 10 F, the evaluation was conducted by UK-based testing laboratory NMO, with field testing done at a site near Intercomp's global headquarters in Minnesota, U.S.A. LS630-WIM™ scales operate in pairs, and are currently used in static and low-speed WIM applications throughout the world.



Intercomp WIM sensors

Already NTEP certified for static use for commercial vehicle weight enforcement, a number of local governments, US states, and other Ministries of Transportation deploy LS630-WIM™ scales for screening and ticketing axle and Gross Vehicle Weight (GVW) offenses. As the manufacturer of scales and sensors, Intercomp is demonstrating its dedication to providing the highest quality certified products for weighing vehicles. OIML R134 certified products now include Strip Sensors at low and high speeds, LS-WIM™ Axle Scale at low speeds, and now the LS630-WIM™ scale. The latter two are NTEP certified in static mode within the US, and join the LP788™ portable low-profile scale which is OIML R76 certified for static weighings.

Until we meet again at the next ITS or ISWIM event, please stay safe and our best wishes from our Intercomp family to you and yours.

■ Jon Arnold | jona@intercompcompany.com

Contact ISWIM

Website:
www.is-wim.org



E-mail:
iswim@free.fr

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

Newsletter:
hans.vanloo.int@gmail.com

