

ISWIM NEWSLETTER

Message from the ISWIM president

ISWIM Members and Friends,

Welcome to the final edition of our Newsletter for 2021.

The Directors of ISWIM are your elected representatives with a key accountability to ensure that the collective membership's needs are addressed.

From time to time, Directors engage the membership for views to deal with specific issues. Other times, the Board has been approached with issues from members. At our last formal Board meeting, I proposed, and the Board accepted the need for a more formal engagement, though the creation and issuance of a questionnaire to the entire membership base. The purpose of the questionnaire being to ascertain member's views concerning existing ISWIM products and their views about initiatives and future programs we should be considering.

The collected questionnaire information is important because the Board wants to know what is working well and what needs to improve. The results of this questionnaire will permit the Board to better identify and scope products and services that meet future member needs.

I invite you to invest five to ten minutes of your time to make ISWIM a more informed member-based association. The questionnaire is accessible directly via the link below and will remain open till the end of November 2021.

<https://freeonlinesurveys.com/s/FQtzfnTN>

A special congratulations to our ISWIM Young Researcher Award recipients for 2021, namely Mr. Lucas Franceschi and Mr Amin Moghadam. Well done!

Thank you all for your contribution.

Chris Koniditsiotis
President – ISWIM

■ Chris Koniditsiotis | ChrisK2.0@bigpond.com

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Young Researcher Award 2021

Two young scientists 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 (ICWIM-9) in 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

The recipients of the ISWIM Young Researcher Award are:

Amin Moghadam is a Ph.D. candidate in civil and structural engineering at Virginia Tech with successful investigations on various topics, including smart infrastructures, novel intelligent transportation systems (ITS), structural health monitoring, drive-by monitoring, etc. He specializes in structural instrumentation to design integrated systems for remote monitoring of structural integrity and traffic.



In his Ph.D., Amin has been working on a novel ITS platform called "Multiple-Presence Nothing-on-Road Bridge-Weigh-in-Motion (MP-NOR-BWIM)." MP-NOR-BWIM still has all the advantages of current NOR-BWIM (e.g., more cost-effective than pavement WIM, portable, no lane closure, easy installation, etc.) and solves its multiple presence limitation.

■ Amin Moghadam | moghadam@vt.edu



Lucas Franceschi is an engineer and researcher at LabTrans and is currently pursuing a master's degree in transportation engineering at the Federal University of Santa Catarina, Brazil. Lucas' studies focus on maximizing the efficiency of weight enforcement systems by appropriately selecting the locations for equipment placement on the network to capture the most vehicle flows. With LabTrans, Lucas has led studies on the impact of the evasive behavior of carriers on WIM placement and developed a methodology and software to assist the Brazilian government in this decision.

■ Lucas Franceschi | franceschi.lucas@gmail.com

!!! NEW DATES !!!

Regional ISWIM Seminar in South Africa

The 3rd Regional ISWIM Seminar will be held from the 6th to the 8th of July 2022 at the CSIR Convention Centre in Pretoria, South Africa. The theme of the seminar is 'Optimizing Road Freight Transport using WIM Data'. For the seminar ISWIM has joined forces with the Southern African Transport Conference (SATC).

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 the 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 **330** members. If you want to join, please visit:

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

The 40th edition of the SATC will be held from 4-7 July 2022 in the same venue, hence right before and in parallel with the ISWIM Seminar.

Further information on the SATC can be found on: www.satc.org.za.



The 3rd Regional ISWIM Seminar has 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 hosts of the seminar are ISWIM, PIARC Technical Committee TC2.3 'Freight' and Mikros Systems, with the support of the ITS South Africa, South African Road Federation, SANRAL, World Bank, ASANRA, CSIR, FEHRL, IRFTT/HVTT, Namibian Road Agency, Bakwena, N3TC, Trac-N4 and the Cross Border Agency.

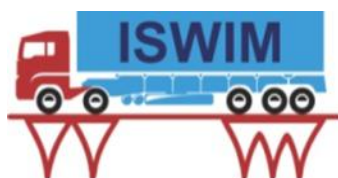


Famous Jacaranda trees in Pretoria, South Africa.

The seminar will cover the following topics concerning in-road and on-board Weigh-In-Motion:

- Recent advances in WIM systems, sensors, applications, implementation, operation and testing;
- Practical experiences with the implementation and operation of WIM systems and use of vehicle mass data in Sub-Saharan Africa for different applications;
- Use of WIM data for pavement and bridge engineering, pre-selection for weight enforcement, direct enforcement and tolling by weight;
- Use of mass information in innovations in road transport logistics, Performance Based Standard (PBS), Road Transport Management System (RTMS) and on-board vehicle approaches.

For more information on the submission of abstracts, registration for delegates, the possibilities for sponsoring and participating in the exhibition, please visit: www.is-wim.net or contact:



■ **Andy Lees** | Andrew.Lees@q-free.com

■ **Andrew Houliston** | Andrew@syntell.co.za

■ **Chris Koniditsiotis** | ChrisK2.0@bigpond.com

**ABSTRACT SUBMISSION
UNTIL JANUARY 31ST**

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
Cross	www.cross.cz
Dynaweigh	www.dynaweigh.com
ECM	www.ecm-france.com
Excel Technology	www.exceltech.com.au
GEC Scales	www.gecscales.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:

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

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

Colorado LTPP WIM Site Reinstallation

The Federal Highway Administration (FHWA) recently commissioned a reinstallation of a WIM system for one of the Long-Term Pavement Performance (LTPP) test sites in the State of Colorado. The WIM system was originally installed on Highway I-76 northeast of Denver, Colorado on April 27, 2006 as part of the LTPP program to collect research quality pavement performance data from active traffic test sites in the United States and Canada. WIM data collection started immediately after site deployment and calibration.



Original installation of WIM Scales and Loops.

The original single-lane WIM site was instrumented with IRD’s iSINC (Intelligent Sensor Interface Network Controller) WIM electronics and two IRD-PAT 1.75 Meter Bending Plate WIM scales. The equipment has provided accurate, uninterrupted WIM data for 15 years.



Site upgrade work at the WIM site and new Bending Plate

The site was recently updated on September 5, 2021 with new in-road equipment. After calibration, the WIM site is measuring within ASTM Type III standards ($\pm 6\%$ gross vehicle weight at 95% confidence), surpassing the ASTM Type I accuracy specified as the minimum requirement for the site. The following figures show the calibration results for the new WIM system

Average:	70208	10497	29263	30448	57	229	52	297	50
% Error:	0.3%	-1.4%	-0.1%	1.2%	0.1			1.0	
Stddev:	2.3%	3.8%	3.0%	3.7%	0.2			1.0	
Confidence:	95%	5.0%	9.2%	7.4%	0.5			3.0	
Allowed:		6%	15%	10%	n/a			6.0	
ASTM Compl:		100.0%	100.0%	100.0%				100.0%	

Calibration Results Summary.

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

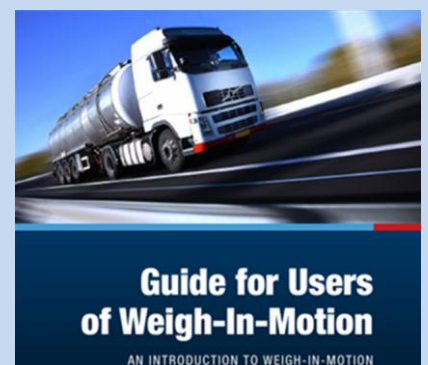
Interested to join the ISWIM Consultants, just contact:

■ **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

WIM data from the Colorado LTPP test site consists of vehicle weights, speeds, and uses the LTPP classification table to classify vehicles. This data has been used for research data analysis and is a valuable source of information that has been used by highway transportation agencies and universities within and outside of the United States. We look forward to continuing long-term operation of this site for many more years to come.

■ [Debora Walker](mailto:debora.walker@dot.gov) | debora.walker@dot.gov

■ [Roy Czinku](mailto:roy.czinku@irdinc.com) | roy.czinku@irdinc.com

Road damage compensation using Bridge WIM

Overweight heavy goods vehicles cause the majority of damage to the road surface. Based on data gathered by the portable SiWIM bridge weigh-in-motion (B-WIM) system, these vehicles can be identified and compensation proportional to the damage they cause calculated. The most severe infractions of gross weight and axle load restrictions are usually found near certain sources of heavy goods vehicles (HGV), such as quarries, sawmills and construction sites. Portability of the SiWIM B-WIM system enables its users to install and move the system between locations, accurately measure gross vehicle weight and axle loads of heavy vehicles and, with the help of an advanced vehicle classification system, determine the origin of overweight HGVs.

In Slovenia, the Ministry of Transportation devised methodology for determining division of costs of excessive traffic burden of cargo vehicles. In line with this methodology, Cestel's traffic experts have been using data gathered by SiWIM to convert axle loads into a monetary assessment of damage. They use ESAL values to calculate the impact of overweight axles on the pavement and determine the proportional cost of damage caused by overweight vehicles from a particular quarry, construction site or other similar locations. Since 2012, between 35 and 85 such measurements have been performed each year in Slovenia. **Impact of overloading**



This system is similar to weight-based tolling and is especially important for small municipalities with smaller budgets, as they can use it to claim damages and thus finance reconstruction of infrastructure. Road damage is thus paid for by legal entities which own the overweight vehicles and, at the same time, monitoring potentially problematic sources of overweight traffic also encourages adherence to weight and axle load regulations.

■ [Matija Mavrič](mailto:matija.mavric@cestel.si) | matija.mavric@cestel.si

Coming Events (subject to change)

Gulf Traffic

Dubai, UAE

6 - 8 December 2021

www.gulftraffic.com

Intertraffic Amsterdam

Amsterdam, the Netherlands

29 March – 1 April 2022

www.intertraffic.com

NaTMEC 2022

Idaho, USA

13-16 June 2022

www.natmec.org

ISWIM 3rd Regional Seminar

Pretoria, South Africa

6-8 July 2022

www.is-wim.net

ITS World Congress

Los Angeles, CA, USA

18-22 September 2022

www.itsamericaevents.com

ITS Central Eastern Europe

Kazan, Russia

19-21 September 2022

www.itsinceurope.com

CVSA Annual Conference

Rapid City, SD, USA

18-22 September 2022

www.cvsa.org/events

Transport Research Arena

Lisbon, Portugal

14-17 November 2022

www.traconference.eu

ICWIM-9

Australia

2023 (to be confirmed)

www.is-wim.net

For other WIM-related events contact:

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

WIMTRONIC – New Generation of WIM Sensors

WIM users need systems to weigh accurately, with minimum impact of sensors onto the pavement, and with costs not being excessive. In order to fulfill these needs and push the evolution of high-speed weighing further, CAMEA cooperated with university researchers and developed digital WIM sensors named WIMTRONIC which meet and exceeded the strictest requirements of today's market and in addition offer many innovative functions.

The technology comes with a unique construction. Wider build improves weighing accuracy, a constant object of pursuit for WIM manufacturers. The developers reached a small sensor profile to limit road wear, while making the upper abrasive layer of the sensor higher. Therefore, this design extends both the sensor's and the road's lifespan.

Installation of WIM systems can be a time consuming and costly task. WIMTRONIC sensors feature a daisy-chain interconnection instead of the usual wiring to each sensor. This significantly reduces the amount of used cables, as well as cutting in the road surface, with a very positive impact on the user's budget.



Installation of WIMTRONIC sensors.

The digital WIMTRONIC sensors feature individual measurement of signals generated by piezo sensing elements and embedded digital signal pre-processing. This, together with artificial-intelligence post-processing algorithms, brings simpler WIM system integration, high accuracy, advanced diagnostics, longitudinal calibration limiting the influence of a road-pavement unevenness and more unique user benefits. WIMTRONIC will be available in different lengths as a part of WIM solutions by CAMEA from 2022.

■ Prokop Kudlik | p.kudlik@camea.cz



Call for Papers for NaTMEC 2022

Practitioners, researchers, and students are invited to submit presentation abstracts for consideration for NaTMEC 2022. Submissions are due October 22, 2021 and the theme will be "Advancing Travel Monitoring in a Data Driven World." You can submit your abstract at www.natmec.org.



Beyond the traditional presentation formats of lectern, poster, and lightning talk, we are excited to introduce a new presentation format of Demonstration. You can find more information on the presentation types at www.natmec.org. Key topic areas:

- Data Applications; Safety; Cyber Security; Third Party Data, Applications, and Utilizations;
- Transportation Data Collection, Processing, and Tools
- Program Development, Performance Measures, Communicating Reports, and Ensuring Data Requirements and Quality Standards Meet Program Needs;
- Emerging Equipment, Technologies and Capabilities to Address Travel Monitoring Basics and Beyond

NaTMEC will be presented by the Idaho Transportation Department in conjunction with the Pacific North-west Transportation Consortium with support from the Federal Highway Administration. Early registration will be opening in December 2021. Preliminary information for exhibitors and sponsors will be available on the website mid-October 2021.

■ Margaret Pridmore | margaret.pridmore@itd.idaho.gov

Structural Road Analysis service from Kistler

The Czech road authority and system integrator SPEL are now deploying the new Structural Road Analysis (SRA) service from Kistler to determine the best road locations and sensor layouts for optimal WIM performance.

WIM systems must ensure a reliable basis for legal prosecutions, and their performance must meet all applicable standards, in Czech Republic an accuracy of 95 percent GVW is required for direct enforcement. Evaluation and analysis of the site before installation are key factors in optimizing the performance and lifetime of WIM systems. As Miroslav Kolda of SPEL points out: "Information from the SRA tests is very valuable for us: knowing the right number of sensors, best location and ideal layout saves us time and money later on."

Kistler conducted a full SRA on a planned extension to the existing WIM site at kilometer 8.3 of the Břeclav-Brno highway. Based on a simulation model with eight empty and fully-loaded vehicles, Kistler's final report to SPEL identified a location between meters 68 and 84 of the highway section as ideal.



Measurements for Structural Road Analysis.

The report also included detailed alternative layouts, intermediate lane distances, pavement structure modeling and calculation of each layer's elastic modulus. Kolda sums up: "We're highly impressed by the results of Kistler's work: as well as managing the entire project, they gave us specific recommendations on improving the WIM site." Depending on discussions currently in progress, SRA from Kistler could soon be specified for all future WIM installations in the Czech Republic. Read the full version [here](#).

■ [Tomas Pospisek](#) | tomas.pospisek@kistler.com

Delaware County, Oklahoma Virtual Weigh Station

IRD recently installed Oklahoma's first Virtual Weigh Station (VWS) for weighing and e-screening commercial vehicles. The new VWS is located on the westbound lanes of U.S. Route 412 to screen vehicles entering the state from Arkansas. Oklahoma Highway Patrol will use the site for monitoring and mobile weight enforcement.

WIM Best Practitioners Series

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.

Each of the publications will be prepared separate working group. After evaluation by an Editorial Board and approval by the ISWIM Board; the publications will be published via the ISWIM website www.is-wim.net.



Currently 'WIM Best' publications are being prepared on the following topics:

- Glossary of Terms, with definitions of terms used in WIM
- Guidance on WIM sensor selection
- Design of WIM sensor arrays for different applications
- Best practices in WIM site selection
- Calibration for monitoring, statistics and pre-selection applications
- Calibration for legal applications
- WIM data for bridge engineering.

For more information on the ISWIM Practitioners Series contact:

■ [Olga Selezneva](#) | oselezneva@ara.com

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

IRD's WIM systems are capable of incorporating a multitude of WIM sensor types depending on the user's speed and accuracy requirements – up to, and including, high-speed direct enforcement. At this site, double-threshold IRD-PAT Bending Plate WIM scales were determined to be most suitable. Initial calibration indicated that the scales meet the ASTM Type III standard for WIM accuracy. Lane 1 was measuring gross vehicle weight (GVW) with a maximum error of -2.4% in the test runs, while Lane 2 had only 0.9% maximum error in GVW during the test runs.



A test truck crosses the WIM scales at the U.S. 412 VWS site

The site is equipped with Automated License Plate Readers (ALPR) and USDOT cameras for vehicle identification. Using IRD's iROC system, LPR/USDOT numbers are screened against federal and state databases to identify the truck and carrier – and to screen against related safety information.



iSINC WIM Controller and IRD-PAT Bending Plate WIM Scales

All commercial vehicles traveling through the VWS are assigned a pass or fail status depending on e-screening settings. Through the VWS interface, highway patrol can select vehicles for weight enforcement using SAW III portable scales. Weights from the portable scales can be entered into the VWS software to automatically calibrate the WIM. The new Delaware VWS advances the State's commercial vehicle enforcement program and will help OHP and ODOT improve road safety and infrastructure protection.

■ **Peter Fedechko** | peter.fedechko@irdinc.com

FEHRL, FERSI and ECTRI Young Researcher Seminar 2021

The Young Researchers Seminar is a bi-annual event organised by FEHRL, FERSI and ECTRI. This seminar offers the opportunity to a network of young transport researchers to gather and interact during a three-day seminar, where young researchers can improve their presentation skills in written and oral scientific communication. The 10th Young Researchers Seminar took place on September 15-17, 2021, in Portorož, Slovenia and was hosted by the Faculty of Maritime Studies and Transport of the University of Ljubljana.

Overall, 38 papers and presentations, guided by 19 tutors, were presented. Three young researchers were awarded for their outstanding papers and presentations.

One of them was Doron Hekič from ZAG Ljubljana, who presented his paper "A review of B-WIM as a SHM application on bridges".



The paper was, co-authored by Andrej Anžlin and Aleš Žnidarič and described the use of B-WIM systems for SHM and updating numerical models of bridges, Doron's work during the 1st year of his PhD studies at the University of Ljubljana.

■ **Doron Hekič** | doron.hekic@zag.si

■ **Aleš Žnidarič** | ales.znidaric@zag.si

Advancement in Bridge WIM research in Brazil

As a way of evaluating the behavior of a Special Engineering Structure (SES) and the transit of heavy vehicles, a Brazilian methodology is being developed for presentation by the Laboratory of Transport and Logistics (LabTrans) of the Federal University of Santa Catarina. In a first stage of testing, one bridge was selected and is located at km 212, BR-101, Santa Catarina state in south of Brazil. In this context, the methodology uses a Bridge Weigh-In-Motion (B-WIM) system to obtain real structural data from the SES through strain gauges sensors.



Strain gauge sensors installed under a bridge in Brazil

The purpose of the data is to evaluate the fatigue cracking life through the influence line, cross load distribution and impact coefficient, as well as traffic information. Thirty-three sensors will be instrumented in the lower part of the SES bridge platform, with monitoring for 1 year. The installation is as shown in the figure, with the indicated sensors being responsible for weighing due to shear stress (WC), weighing due to the bending moment (WM) and Free-of-Axle Detectors (FAD). In the end, the data interpretation system developed by LabTrans aims to validate the Brazilian methodology for safety inspection and evaluation based on data from the B-WIM system.

■ [Keyla Junko Chaves Shinohara](#) | KeylaJunko@gmail.com

■ [Roberto Caldas de A. Pinto](#) | r.pinto@ufsc.br

Bison: durable materials and lasting installation

Each Weigh in Motion System has its own peculiarities: for BISON we focus on durability, for materials and installation techniques. WIM systems play an important role in the monitoring of traffic loading of roads and infrastructures, or when installed at toll-gates for the collection of payments. The systems must be able to withstand the passage of many heavy vehicles, unfortunately often also including overloaded trucks.

ISWIM members Questionnaire

The ISWIM members questionnaire's purpose is to ascertain member's views concerning existing ISWIM products and their views about initiatives and future programs ISWIM should be considering.

The collected questionnaire information is important because the Board wants to know what is working well and what needs to improve. The results of this questionnaire will permit the Board to better identify and scope products and services that meet future member needs.

I invite you to invest five to ten minutes of your time to make ISWIM a more informed member-based association. The questionnaire is accessible directly via the link below and will remain open till the end of November 2021.

Chris Koniditsiotis

President – ISWIM

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





Bison stainless steel scales

For this reason iWIM has chosen AISI 316L stainless steel, a material highly resistant to corrosion that has also a high resistance to fatigue breaking, in fact the system will last for tens of years. This life time expectancy is based on structural strength tests with cyclical loads on the structure to verify the effects of fatigue.



Installation directly in a reinforced prefabricated concrete.

An other crucial element are the installation methods; based on years of experience we have seen that installing the system directly in reinforced concrete (using the structure as shown in the picture above, or directly in a concrete foundation at a toll gate) makes the system extremely stable and resistant over the years. Furthermore, the absence of electric cables under the plates allows them to be moved easily when working on the road surface with the possibility then to reposition them when the work is completed. Durable materials and lasting installations are iWIM's choice for BISON, a system created to last for years.

■ **Luca Trainotti** | Luca.trainotti@iwim.it

WIM Sites in the Ohio Turnpike

Installation has begun on Weigh-In-Motion (WIM) sites on the Ohio turnpike, in a multi-year project which will upgrade the systems on the 241 mile (288 km) toll highway. The project includes installation of multiple sites along the toll system which will utilize WIM for both commercial vehicle weight enforcement and data collection.

Contact ISWIM

Website:

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Newsletter:

hans.vanloo.int@gmail.com



Intercomp (USA) was selected as the WIM sensor provider for their strain gauge WIM strip sensors, which are to be installed in dual threshold configurations in over 55 lanes in the toll road. Saskatoon-based International Road Dynamics (IRD) will contribute their extensive WIM experience to install, integrate, and maintain the WIM sites for Conduent, which was selected as the overall toll system integrator with additional upgrades to the entire tolling system.



WIM systems at Ohio Turnpike toll station.

Sensor performance and system uptime were among the factors used to determine suppliers, with ASTM E1318 Type III accuracy (6% GVW) used as a performance metric for the WIM systems. The sites will be tied into the Ohio Turnpike and Infrastructure Commission (OTIC) systems, and will enable monitoring and protection from overweight vehicles with options into 2035.

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