

19/02

MAY 2019



ISWIM
International Society for Weigh in Motion



**ICWIM8
SPECIAL
EDITION**

ISWIM NEWSLETTER

Message from the ISWIM president

Welcome to ICWIM8!

ICWIM8 brings to Prague the broad international weigh-in-motion (WIM) community comprising three distinct stakeholder groups:

- Users of WIM and the information it collects
- Academics and researchers in WIM technology and its associated data
- Vendors that provide WIM products and/or services

ICWIM8 promises to be a significant milestone in the development, better use and understanding of WIM. I invite you to participate and take full advantage of the scientific sessions, panel discussions and end-user workshops and the networking opportunities provided.

As President of ISWIM, I would like to acknowledge and warmly thank our local host, namely CDV. Additionally, I would like to thank the ICWIM8 organizing committee inclusive of the ISWIM Executive Board for its significant and voluntary contribution to ensuring the conference is a success.

I look forward to engaging with all of you at the conference.

President – ISWIM

Chris Koniditsiotis

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

Young Researcher Award

Four young scientists have received for 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 8th International Conference on WIM (ICWIM8) in Prague to present their work, visit the exhibition, and further develop their industry knowledge and global network.

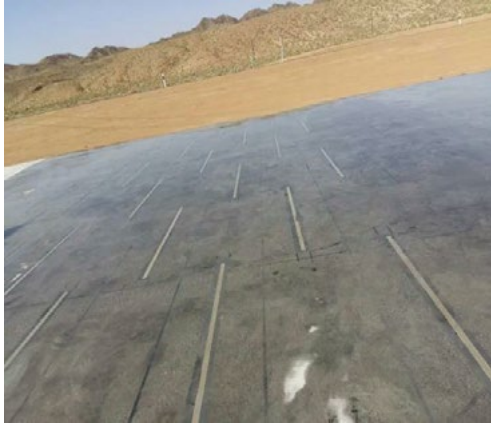
In this issue

Message from the ISWIM president	2
Young Researcher Award	2
Sensor layout for direct enforcement	3
ICWIM8 Technical Tour	3
IRD honored with Kistler WIM Award	4
ICWIM8 End-User Sessions	4
WIM User Guide launched at ICWIM8	5
Coming events	5
Recent WIM developments by Cross	6
ISWIM Vendors	6
Highlights of Prague	7
UK approval Achieved For Axtex	7
Highlights of Prague, continued	8
Increasing Interest in Bridge WIM for Damage Detection	8
ICWIM Committees	9
Countrywide Direct Enforcement WIM Application in Russia	9
ICWIM Committees	9
ICWIM Committees	10
Contact ISWIM	12



Sensor layout for direct enforcement

Transportation authorities would like to collect accurate weight data to perform effective and legitimate weight direct enforcement. For WIM enforcement under free flow conditions, VanJee has developed an interleave bar sensor layout to deal with truck vibration and abnormal driving behaviour.



Interleave sensor layout in Qinghai, China.

1. First, truck vibration is a major factor contributing to the weighing error. Therefore, designing systematic layout of bar sensor is an important method to reduce weighing error. VanJee has designed an interleave layout with specific distance between left and right sensor. This allows the system to extrapolate the entire vibration period and compensate the effects on weighing result.
2. Secondly, many truck drivers use abnormal driving behaviour to cheat on WIM system in order to decrease the weighing outcome, including S shape driving, suddenly braking and 'jump-driving'.

The interleave layout uses a multi-point weighing algorithm to track the vehicle driving route based on the wheel time across sensor, weight and angle. As a result, the WIM system can determine and adapt most abnormal driving behaviour and guarantee measurement accuracy. As a result, the interleave layout contributes to more accurate and effective weight data for direct enforcement.

■ Zhao Zhai | zhaizhao@wanji.net.cn

ICWIM8 Technical Tour

The technical tour of the conference on Thursday May 23rd will go to a WIM station and to the main traffic management centre of the city of Prague (TPMC).

The WIM station is located between the busy D1 motorway and the industrial part of eastern Prague. It is two-lane installation consists of two inductive loops and two lines of WIM sensors per lane, and ALPR cameras to recognize the front and rear license plates of the vehicles.. The system is in operation as pre-selection for road side controls and for direct weight enforcement.



The TPMC provides central coordinated traffic management and control in the city of Prague, and it also provides verified real time traffic information. All information is processed, to react automatically to the traffic situation by invoking the so called traffic management scenarios the individual steps of a scenario change the status of telematics devices (traffic lights, VMS) to ensure the free flow of traffic.



Regulating Overloading Trucks Efficiently to Protect Road Quality.

VanJee WIM Direct Enforcement System

VanJee launches the all-inclusive WIM Direct enforcement solution which includes strain gauge sensor, LiDAR, ANPR, loop detector and WIM data management platform. The system can regulate overloading trucks in free flow situation with the speed 0-130 km/h. VanJee system collects not only accurate Gross Vehicle Weight also the complete chain of legal evidence including weight, time, location, plate number, speed, vehicle driving direction to enforce traffic rule.

Become Partner with us:

VanJee is happy to provide any WIM consulting service and promote WIM system to protect worldwide road.

IRD honored with Kistler WIM Award

The Kistler Group announced that it has presented its first WIM Award to International Road Dynamics Inc. (IRD), Saskatoon Canada, in appreciation of IRD's dedication to excellence in the transportation industry. In the last 20-years, IRD has installed over 4,000 Lineas quartz WIM sensors which have made vital contributions to infrastructure planning and road safety, and are currently deployed in 48 states in the U.S.

The Connecticut and Maine Departments of Transportation were early adopters of the Kistler technology, where Lineas was installed and supported by IRD, to capture WIM data for road planning purposes. Most recently IRD installed Kistler Lineas WIM sensors in Colorado at Loma and Trinidad and will soon install at the Fort Collins Ports of Entry. At these sites, the Lineas sensors are used to detect overloaded commercial vehicles and sort them to static scales for enforcement before allowing these vehicles to travel through the state, thus protecting road infrastructure and improving traffic safety.



IRD's CEO Randy Hanson receiving the Kistler WIM Award.

Looking back on the company's 20-year partnership with Kistler, Randy Hanson, President and CEO, commented: "IRD is proud of our long-term relationship with Kistler and is pleased to have reached this milestone which demonstrates the suitability of Kistler Lineas quartz sensors for most WIM applications."

■ **Tomas Pospisek** | tomas.pospisek@kistler.com

A promotional graphic for IRD at the ICWIM8 booth. The background shows a city skyline at night with a complex highway interchange. The IRD logo is in the top right. The main text reads 'ADVANCING TRANSPORTATION INTELLIGENCE'. Below this is a list of bullet points: 'World Leader in WIM', 'WIM Systems Integrator', 'WIM Technology & Solutions Developer', 'Providing Best in Class WIM Accuracy', and 'Single Source Provider for all Your WIM Needs'. At the bottom left is the website 'www.IRDINC.com' and at the bottom right is 'www.VI2M.com'. A white circle in the bottom right contains the text 'ICWIM BOOTH # B2'.

ICWIM8 End-User Sessions

For the first time at an ICWIM, we are holding sessions specifically aimed at the end-users of WIM.

It has been felt, that in the past there hasn't been enough emphasis towards the practical application of WIM. So, this time we are holding three 90 minute sessions, each afternoon of the conference, where ISWIM vendors, will be giving short 10-15 minute presentations on various practical applications and experiences.

We hope these sessions will interest the delegates and possibly stimulate a healthy debate on these experiences. The three sessions are:

1. Transport Efficiency & Safety on Monday May 20th, 13:00-14:30. The session will be chaired by Chris Koniditsiotis (President ISWIM, Australia) and will have presentations by Heanni, IRD, Camea, Intercomp and Mikros.
2. Advanced Weight Enforcement on Tuesday May 21st, 13:30-14:45. This session chair will be Bernard Jacob (IFSTAR, France) with presentations by VanJee, Cross, Kapsch, Sterela and TDS.
3. Infrastructure Design & Maintenance on Wednesday May 22nd 13:30-14:45. Session chair is Aleš Žnidarič (ZAG, Slovenia) and has presentations by Q-free, Cestel, Kistler and TE Connectivity.

More detailed information on the End User Sessions can be found at:

■ www.is-wim.org



**LEADING THE WAY IN
COMPLETE
ITS SOLUTIONS**

TOLLING
PARKING
INFOMOBILITY
URBAN
INTER-URBAN

High and Low Speed Weigh-in-Motion | Bluetooth Journey Time Systems
Traffic Count and Classification | Cycle and Pedestrian Monitoring | Air Quality Monitoring
Data Hosting and Reporting | Central Parking Management Solution | Parking Guidance Solution

Q-Free offers a complete range of ITS products, solutions and professional services based on the most advanced and cost-effective technologies with an established UK Office and Production Facility based in Weston-super-Mare in the South West of the UK.

Tel +44 01944 644 299 | Email: sales.uk@q-free.com
www.q-free.com | Twitter@QFreeASA



LEADING THE WAY

CANADA | AUSTRALIA | BRAZIL | CHILE | FRANCE | MALAYSIA | NORWAY | PORTUGAL | RUSSIA SERBIA | SLOVENIA
| SOUTH AFRICA | SPAIN | SWEDEN | THE NETHERLANDS | THAILAND | UNITED KINGDOM | USA

WIM User Guide launched at ICWIM8

Over the past decades, a vast amount of scientific and practical experience has been gathered on the development, installation and operation of WIM systems. However, these experiences often come in the form of technical scientific reports, which are typically not accessible or understandable to a novice user of WIM systems or data. They often lack the answers that a WIM user is looking for. Consequently, the International Society for Weigh-In-Motion has decided to develop a document providing basic, yet a comprehensive introduction to WIM.

This document covers different aspects related to the working, specification, purchase, installation, testing, operation and maintenance of WIM systems, and the application of the data they produce. To enhance accessibility for users starting with WIM, these topics are described in an easy-to-understand language. This means that sometimes a simplified description is given that may not be completely in line with the latest scientific results. For those interested in more detailed and scientific explanations, references to these detailed reports are included. The WIM User Guide will be officially launched during the ICWIM8 and will be made available on the ISWIM website free of charge.

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



Night view of the old city of Prague

Coming events

8th International Conference on WIM

Prague, Czech Republic
May 19-23, 2019
www.is-wim.org

Southern African Transport Conference

Pretoria, South-Africa
Jul. 8-11 2019
www.satc.org.za

CVSA Annual Conference + Exhibition

Biloxi, Mississippi, USA
Sept. 22-26, 2019
www.cvsa.org

PIARC, 26th World Road Congress

Abu Dhabi, UAE
Oct. 6-10, 2019
www.piarc.org

26th ITS World Congress

Singapore, Singapore
Oct. 21-25, 2019
www.itworldcongress2019.com

3rd ANTT WIM Workshop

Brasilia, Brazil
Dec. 4-5, 2019
To be confirmed

TRB Annual Meeting

Washington DC, USA
Jan. 12-16, 2020
www.trb.org

Intertraffic Amsterdam

Amsterdam, the Netherlands
Mar. 21-24, 2020
www.intertraffic.com

Transport Research Arena

Helsinki, Finland
Apr. 27-30, 2020
www.traconference.eu

NaTMEC 2020

Raleigh, North Carolina, USA
JUN. 1-4, 2020
www.natmec.org

If you know other WIM-related event please contact:

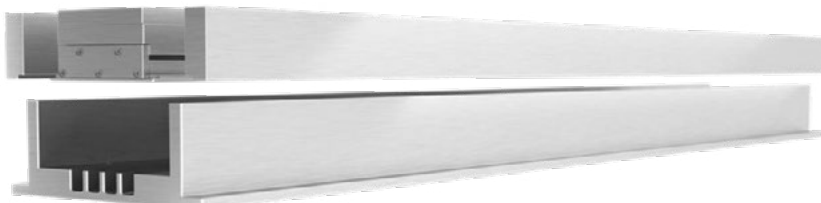
■ **Hans van Loo** | hans.vanloo.int@gmail.com



Recent WIM developments by Cross

CrossWIM is a high-speed weigh-in-motion system, which covers all current requirements for traffic detection and weighing. CrossWIM is an open system designed to support available types of weighing sensors and other detectors and is used for traffic statistics, pre-selection and direct enforcement.

OptiWIM® is a completely new WIM system, which uses the unique fiber-optic technology. The sensor itself operates solely on optical principles, without electronic components as the electronics are located in the control unit only. This innovative solution allows to get a disproportionately large amount of data from the sensor during each measurement in comparison to conventional technologies. It is totally passive with maximum radio frequency immunity.



Cross OptiWIM sensor

The OptiWIM® sensor is unique in its design and functionality, which allows to reach the highest possible accuracy class A3 ($\pm 3\%$) and fully supports free-flow ability to measure vehicles at any trajectory they can have passing the WIM station. These new features make the OptiWIM® the real toll-per-tone ready WIM system. Thanks to the original U-bad solution together with 10 year lifespan the new system also significantly decreases maintenance and service costs.

ISWIM Vendors

Axtec

www.axtec.co.uk

Betamont

www.betamont.sk

Camea

www.cameatechnology.com

Captels

www.pesage-captels.com

Cestel

www.cestel.eu

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

Mikros

www.mikros.co.za

Sterela

www.sterela.fr

TDC / Q-free

www.tdcsystems.co.uk

TE Connectivity

www.te.com

Traffic Data Systems

www.traffic-data-systems.net

WanJi Technology

www.wanji.net.cn

Wheelright

www.wheelright.co.uk

■ **Andy Lees** | andy.lees@tdcsystems.co.uk

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

■ **Libor Susil** | susil@cross.cz

UK approval Achieved For Axtec

Axtec have been granted a world-first UK National approval to Class 0.2 for an Axtec 5000 Dynamic Axle Weighbridge installed at their facility in Runcorn.

As part of the approval, the weighbridge was tested statically to full capacity using calibrated dead weights. It was then tested dynamically using three different vehicles at speeds below 4km/h. During the test runs over the centre, nearside and offside of the weighbridge, accuracy was always within the prescribed 0.1% limits. The measured tests were then followed by an over-speed test to ensure that vehicles which did not complete the weighing process properly were detected.



Axtec Dynamic Axle Weighbridge installed in Runcorn, UK

The Axtec 5000 Dynamic is highly automated and requires no special skills to operate. Its colour touchscreen display gives simple instructions or requests information which can then be entered via the numeric keypad. The vehicle is weighed and a ticket showing individual axle and gross weights can be produced automatically, all within 40 seconds. Axtec products are used by state utility providers, transport operators and waste management companies who are looking to maximise their loads whilst operating within the law, and by the governmental agencies responsible for enforcing those laws.

■ Asdair Littlejohn | alasdair.littlejohn@axtec.com

Why wait for your weight?

The latest generation Series 5000 Dynamic Axle Weighbridge from Axtec delivers incredibly fast weighing – just 40 seconds for a six-axle artic. Simply drive over and it's done. It's accurate, too. In fact, with Class 0.2 Approval from UK NMO, it's the most accurate commercial vehicle weighbridge in the world.

ONBOARD LOAD INDICATORS – DYNAMIC & STATIC WEIGHBRIDGES – PORTABLE WEIGHPADS

T: +44 (0)1928 581575 W: axtec.co.uk

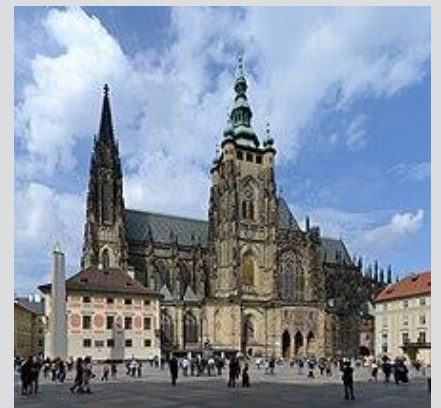


Highlights of Prague

Among the many top sights in the historic city of Prague, three of the highlights are:



Charles Bridge 14th century structure over the river Vltava (Moldau).



Prague Castle seat of power for kings of Bohemia, Holy Roman emperors, and presidents of Czechoslovakia.

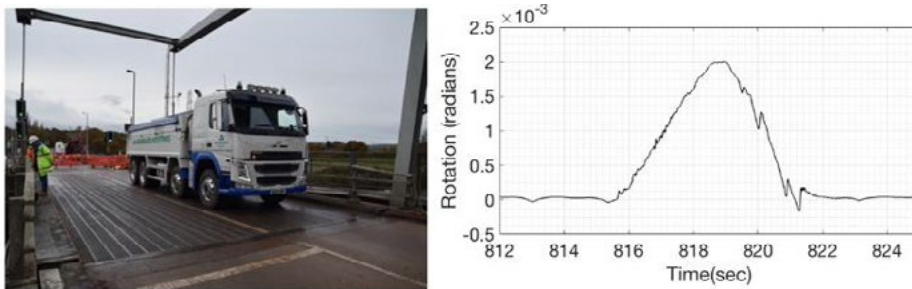


Astronomical Clock, 600-year-old mechanical clock on the facade of the city hall.

Increasing Interest in Bridge WIM for Damage Detection

There is increasing interest in using Bridge WIM concepts to monitor the condition of a bridge. The primary purpose of Bridge WIM is to weigh trucks but any reduction in the bridge's condition will invalidate the calibration and will cause the reported weights to increase. The probability of this is small but researchers have found that it is very effective as a means of getting an early warning if something happens to the bridge. In effect, this is a two-for-one deal – if nothing happens to the bridge, valuable truck weight data is collected. On the other hand, if there is a strange trend in the WIM data, it can provide an early warning that something may have happened to the bridge. When this happens, the bridge should be checked and the WIM system recalibrated.

If using WIM concepts for bridge health monitoring, the first requirement is to use a health-sensitive sensor. Conventional Bridge WIM systems use strain transducers and this works very well as their calibration is generally not affected by bridge damage (unless there is damage at the sensor itself). For damage detection, a damage-sensitive sensor is needed. The figure shows results from a rotation sensor installed on a bridge in the United Kingdom.



Example of rotation measurements recorded in the field, UK

The first figure shows a four axle 32 tonne truck used during load testing and the second figure the rotation time history recorded using an inclinometer placed near the right support (pictures courtesy of Full Scale Dynamics)

■ Eugene O'Brien | eugene.obrien@ucd.ie

Pure Precision.
HAENNI
 A Baumer Company

www.haenni-scales.com

Wheel Load Scale WL 400

- Flexible application
- Dynamic with an unlimited weight range
- Light and thin for an unbeatable mobility
- Absolutely Swiss innovation

Highlights of Prague, continued

Another three of the highlights of Prague city are:



Wenceslas Square, home to the National Museum and numerous other architectural treasures.



The National Gallery in Prague is home to some of Europe's most important art collections.



Situated within the grounds of Prague Castle, the Roman Catholic St. Vitus Cathedral is the Czech Republic's most important Christian church.

One overloaded truck causes the same road damage as 30,000 cars.



CAMEA WIM Exceptionality

First WIM certified for direct enforcement worldwide

- Speed and dimension enforcement
- Sensor independence
- Measuring between lanes
- Measuring in both directions
- Dual tire detection
- Wide range of recognized classes
- Multiple classification schemes
- Advanced validation process
- Centralized remote diagnostics
- Central data server support

Reduce the damage with the leader in WIM DIRECT ENFORCEMENT.

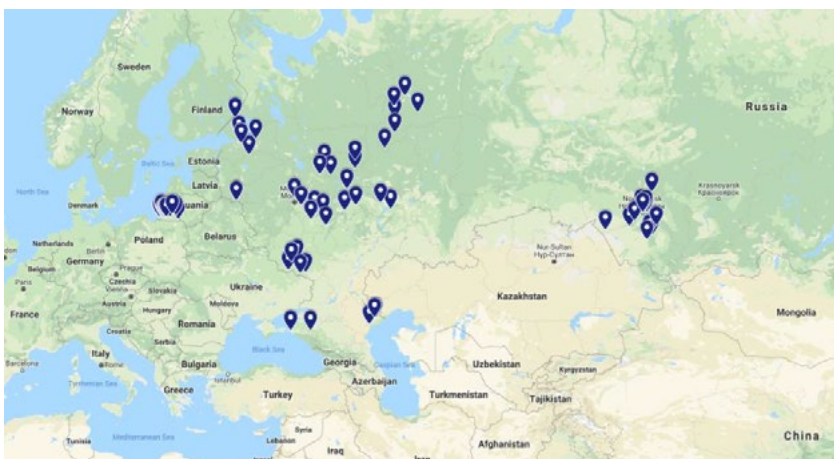
CAMEA Unique Customer Solutions for ITS www.cameatechnology.com



Countrywide Direct Enforcement WIM Application in Russia

The Weigh-In-Motion for direct enforcement stands at the top of all intelligent transportation systems as the most sophisticated application of the most complex solution for traffic data management around. As such, it is a solution challenging in terms of development, implementation and maintenance. Also, deploying it means going through a complicated process including the legal authorization, public education and in-the-field operations.

A network of WIM stations is being built on a regional and national level. These major infrastructure projects are unique both in its extent and the combination of technologies. The enforcement is performed not only in vehicle weighing. The solution for enforcement in Russia enables fining speed and vehicle dimension violations as well.



Overview of WIM installations in Russia

CAMEA WIM solution was the first in the world to be certified for the direct enforcement. Now type-approved both in the Czech Republic and Russian Federation, the CAMEA WIM continues being successful on the Russian market with more than 60 stations used for direct enforcement out of almost 100 stations in operation today.

■ Prokop Kudlik | p.kudlik@camea.cz

ICWIM Committees

ORGANIZING COMMITTEE

- Chris Koniditsiotis (chair), Australia
- Hana Bojanovská, CDV, Czech Rep.
- Emil Doupal, CDV, Czech Republic
- Bernard Jacob, IFSTTAR, France
- Andy Lees, Q-Free, United Kingdom
- Lily Poulikakos, EMPA, Switzerland
- Denisa Veselá, CDV, Czech Republic
- Deborah Walker, FHWA, USA
- Aleš Žnidarič, ZAG, Slovenia

EXHIBITION AND DEMOS COMMITTEE

- Andy Lees (chair), Q-Free, UK
- Aleš Žnidarič (Co-chair), ZAG, Slovenia
- Hana Bojanovská, CDV, Czech Rep.
- Emil Doupal, CDV, Czech Republic
- Bernard Jacob, IFSTTAR, France
- Denisa Veselá, CDV, Czech Republic

SUNDAY	8:30-12:30		14:00-16:15		16:15-18:00	Evening	
	Exhibition mounting (booths)		Exhibitor installation		ICWIM8 registration	Ice-breaking (exhibition open)	
MONDAY	8:00-9:30	10:00-12:00	13:00-14:30	14:30-16:00	16:30-18:00	Evening	
	ISWIM Board Meeting 1	Coffee Opening Session + Exhibition opening	Lunch	Poster/Expo	Coffee	Session 2	Welcome buffet
	Registration			Workshop 1			
TUESDAY	9:00-10:30	11:00-12:30	13:30-14:45	14:45-16:00	16:30-18:00		
	Session 3	Coffee	Lunch	Poster/Expo	Coffee	Panel Discussion 1	Gala dinner
	Session 4			Workshop 2			
WEDNESDAY	9:00-10:30	11:00-12:30	13:30-14:45	14:45-16:30	17:00-18:00		
	Session 6	Coffee	Lunch	Poster/Expo	Coffee	General Assembly ISWIM	Free
	Panel Discussion 2			Workshop 3			
THURSDAY	9:00-10:30	11:00-12:30	13:30-18:00				
	Session 8	Coffee	ISWIM BM 2	Technical Tour			
	Closure Session						

 Plenary session	 Poster session	 General Assembly ISWIM	 Tour
 Technical and scientific session	 Panel Discussion	 End-user Workshop	 Reception/Meals Coffee Break

ICWIM8 Program at a glance



VISIT US AT ICWIM8

STERELA
WIM
GLOBAL WIM SOLUTIONS

 **DIRECT ENFORCEMENT READY**

 **OIML R134 COMPLIANT**

 **MULTIPLE MEASUREMENTS**

www.sterela.com



ICWIM Committees

SCIENTIFIC COMMITTEE

- Bernard Jacob (chair), IFSTTAR, France
- Franziska Schmidt (secretary), IFSTTAR, France
- Piotr Burnos, AGH, Poland
- Chia-Pei Chou, NTU, Taiwan
- Kim Chulwoo, Kyoto University, Japan
- Wiley Cunagin, PBS&J, United States
- Morris De Beer, CSIR, South Africa
- John De Pont, TERNZ, New Zealand
- Javier Alejandro Jorge, INTI, Argentina
- Chris Koniditsiotis, TCA, Australia
- Jesus Leal, CEDEX, Spain
- Hui Li, Tongji University, China
- Anne-Marie McDonnell, Conn DOT, United States
- Ralph Meschede, BAST, Germany
- Eugene O'Brien, UCD, Ireland
- Lily Poulikakos, EMPA, Switzerland
- Jonathan Regehr, University of Manitoba, Canada
- Valter Tani, UFSC/LabTrans, Brazil
- Shengchuan Zhao, Dalian University of Technology, China
- Aleš Žnidarič, ZAG, Slovenia



CROSS
NEW GENERATION WIM
WEIGH-IN-FREE-FLOW

#OPTIWIM®

- Fiber-optic technology
- High precision Weigh-in-Free-Flow
- Width measurement, multi-tyre and underinflated tyres detection
- Easy installation and maintenance via U-Bed
- Toll-per-Tonne ready

www.optiwim.com



Another way to weigh

- ±10% on gross weight
- Sensors : 2P/1L, 2P only, 1P/2L ...
- From 20 to 200 km/h
- HERA station reliable technology
- User-friendly software
- Overweight enforcement

ELECTRONIQUE CONTROLE MESURE

Designer and Manufacturer of High Speed Weigh-In-Motion
Your partner since 1979

HERA and HESTIA traffic stations / PE10 WIM Sensor / Management software suite

www.ecm-france.com
info@ecm-france.com



WEIGH IN MOTION
ROADTRAX BL: OVER 20 YEARS

20 YEARS

Excellence in Axle Sensors
Since 1999

TE
connectivity

EVERY CONNECTION COUNTS

© 2019 TE Connectivity Ltd. All Rights Reserved. TE Connectivity, TE, EVERY CONNECTION COUNTS and TE connectivity (logo) are trademarks

**ICWIM8
SPECIAL
EDITION**

ISWIM NEWSLETTER

19/02 | MAY 2019



Contact ISWIM

Website:

www.is-wim.org

E-mail:

iswim@free.fr

LinkedIn:

linkedin.com/groups/13400438

Newsletter:

hans.vanloo.int@gmail.com

ISWIM Newsletter editor:

Hans van Loo

Design concept:

Sonja Eržen

May 2019

