

# 7th International Conference on Weigh-In-Motion - ICWIM7 & PIARC Workshop (TC B4) on *Multimodal policies and sustainable, safe and energy efficient road freight transport*

Foz do Iguaçu, Brazil  
7-10 Novembre 2016



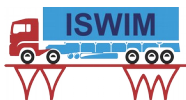
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measure. analyze. innovate.

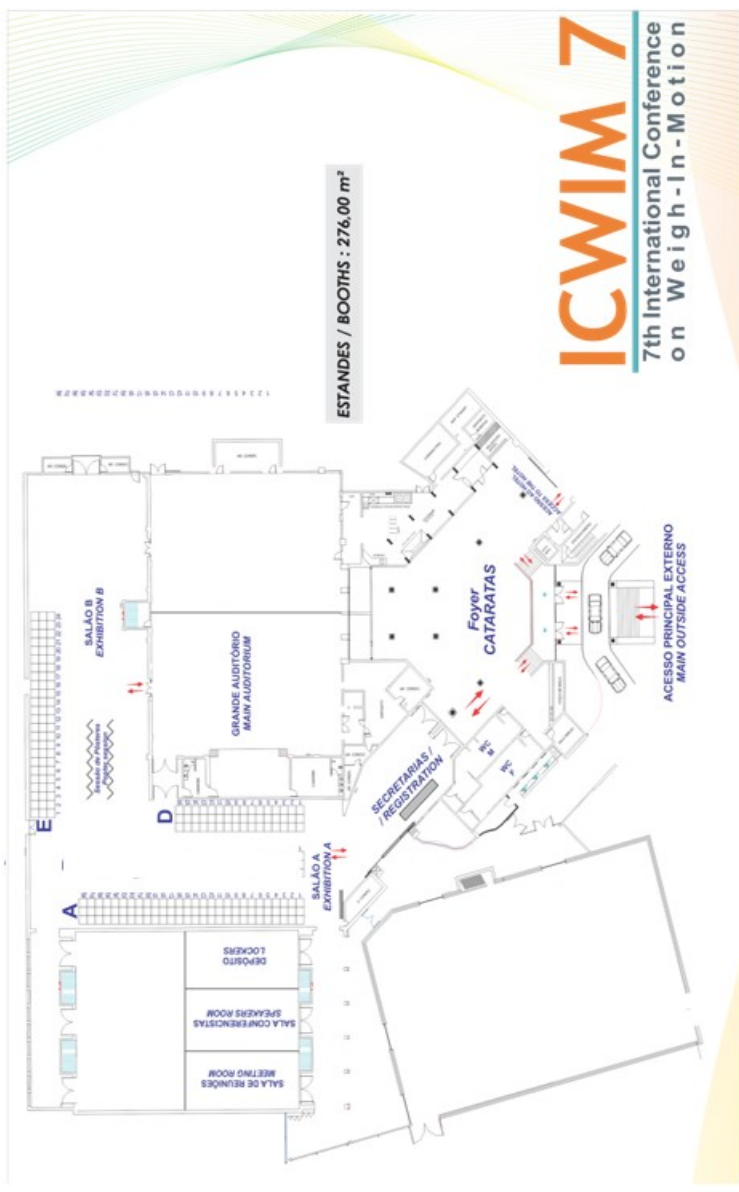


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**DNIT**  
DEPARTAMENTO NACIONAL DE INFRAESTRUTURA DE TRANSPORTES





Bourbon Cataratas Hotel

The 7th International Conference on Weigh-In-Motion (ICWIM7) is the first of the series organized in Latin America. ICWIM7 is hosting an International workshop organized by the PIARC (World Road Association) TC B4 on Freight.

ICWIM has covered WIM technologies, systems and sensors, standards, testing and applications of WIM to traffic monitoring, infrastructure engineering and enforcement. Enforcement of overloads became a major challenge and represents now the main demand for WIM systems. Recent regulations on weights and dimensions are encouraging or requiring more checks and controls of overloads. There are also some promising perspectives of using WIM technology for direct enforcement. WIM is now part of a global ITS and infrastructure monitoring system.

The conference reports the latest research and developments since the last conference in 2012, from all around the World. Approximately 150 delegates from 25 countries and all continents are attending ICWIM7, mixing academics, end users, decision makers and WIM vendors. An industrial exhibition is organized jointly with the conference, with 12 companies involved. Beside the scientific and technical and the poster sessions, two panel discussions are addressing timely and important topics, “Data Quality and Applications to ITS, and Highway traffic Monitoring and Road Freight Transport”, and “WIM for Enforcement and Heavy Vehicle Compliance”.

The objectives of the joint PIARC workshop are to exchange knowledge and experiences, to present and share good practices and to discuss challenges and newest developments regarding freight transport and road network operations. This is a great opportunity to facilitate the exchange and cooperation between members of ISWIM and PIARC.

**Bernard JACOB**

President of ISWIM, ICWIM7 co-chair

**Valter ZANELA TANI**

ICWIM7 chair

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**Valter Tani (chair), Brazil**  
**Bernard Jacob (co-chair), France**  
Mark Aitken, Australia  
Helio Goltsman, Brazil  
Gil Guedes, Brazil  
Leonardo Guerson, Brazil  
Chris Koniditsiotis, Australia  
Joëlle Labarrère, France  
Flavio de Mori, Brazil  
Gustavo Otto, Brazil  
Lily Poulikakos, Switzerland  
Franziska Schmidt, France  
Amir Mattar Valente, Brazil

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**Bernard Jacob (chair), France**  
**Valter Tani (vice-chair), Brazil**

Chia-Pei Chou, Taiwan

Kim Chulwoo, Japan

Wiley Cunagin, United States

Morris De Beer, South Africa

John De Pont, New Zealand

Mark Gardner, United States

Javier Alejandro Jorge, Argentina

Chris Koniditsiotis, Australia

Jesus Leal, Spain

Hans van Loo, The Netherlands

Anne-Marie McDonnell, United States

Eugene O'Brien, Ireland

Lily Poulikakos, Switzerland

Jonathan Regehr, Canada

Franziska Schmidt, France

Amir Mattar Valente, Brazil

Shengchuan Zhao, China

Aleš Znidarič, Slovenia

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1995 - ICWIM1: Zurich, Switzerland  
1998 - ICWIM2: Lisbon, Portugal  
2002 - ICWIM3: Orlando, Florida, USA  
2005 - ICWIM4: Taipei, Taiwan  
2008 - ICWIM5: Paris, France  
2012 - ICWIM6: Dallas, Texas , USA  
2016 - ICWIM7: Foz do Iguaçu, Brazil  
2016 - ICWIM7: Foz do Iguaçu, Brazil

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**Martin Ruesch (chair), Switzerland**

Bernard Jacob (french speaking secretary), France

Carlos Santillan Doherty (spanish speaking secretary), Mexico

Patrick Duprat, France

Patrick Grassl, Austria

Yoshikazu Imanishi, Japan

Tiffany Julien, United States

Else-Marie Marskar, Norway

Zandile Nene, South Africa

Annelie Nylander, Sweden

Silvia Sudol, Argentina

Eiichi Taniguchi, Japan

Hinko Van Geelen, Belgium

## Major s



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Q-Free TDC Systems  
30 Lynx Crescent  
BS249BG Weston-s-Mare, United Kingdom  
Tel :+44(0) 1934 644 299  
E-mail [sales@tdcsystems.co.uk](mailto:sales@tdcsystems.co.uk)

Web: [www.tdcsystems.co.uk](http://www.tdcsystems.co.uk)



Intercomp Company  
3839 County Road 116  
55340 Medina, United States  
Tel :+1 763-476-2531  
E-mail [ericp@intercompcompany.com](mailto:ericp@intercompcompany.com)  
Web: [www.intercompcompany.com](http://www.intercompcompany.com)

## Regular





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Kistler Instrumente AG  
Eulachstrasse 22  
8408 Winterthur, Switzerland  
Tel: +41 52 224 11 11  
E-mail [Info@kistler.com](mailto:Info@kistler.com)  
Web: [www.kistler.com](http://www.kistler.com)



Sterela  
5 Impasse Pedeneau  
31860 Pins Justaret, France  
Tel: +33(0)5 62 11 78 78  
E-mail [its@sterela.fr](mailto:its@sterela.fr)  
Web: [www.sterela.fr](http://www.sterela.fr)

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LabTrans

IFSTTAR

# ISWIM

ISWIM Board Meeting 1  
(members only)

08:00 -

Registr

10:45 -

## Session 1 : WIM Technologies

Chair: Sebastião Roberto Soares (LabTrans, Brazil)

57. Development and Technology Transfer of a Weigh-in-Motion System in Argentina  
*Javier Alejandro JORGE, Ignacio MORETTI, José AMADO, Daniel PUNTILLO, Cristian CANIGLIA*

32. Mobile Scales for Automobile based on Optical Fiber  
*George BELITSKY, Vladimir BELITSKY, Aharon LIBERSON*

55. Strain Gauge based WIM Sensor Performance in Low Speed Applications  
*Karl KROLL, Matt YOUNG, Kai KROLL*

9. Temperature Properties of Weigh-in-Motion Systems  
*Janusz GAJDA, Piotr BURNOS*

11:50 -

Poster and  
12:00 - Exhibition

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# PIARC

## **Session 1: Increasing Eco-efficiency of Freight Transport**

Chair: Annelie Nylander (Trafikverket, Sweden)

Road freight transport management for sustainable and liveable cities

**Eiichi Taniguchi**, *Kyoto University, Japan*

Swiftly Green and GET greener,

**Annelie Nylander**, *Trafikverket, Sweden*

Energy efficient and CO<sub>2</sub>-free Urban Freight Logistics

**Martin Ruesch**, *Rapp Trans Ltd., Switzerland*

Electric Road System Solution for Freight Transport

**Patrik Duprat**, *Alstom, France*

# ISWIM

14:00 -

## Opening Session

Mr. Valter Casimiro Silveira, General Director of National Department of Transportation Infrastructure - DNIT, Brazil

Mr. Jorge Luiz Macedo Bastos, General Director of National Land Transportation Agency - AN  
Eng. Nicolas Beretta, Vice-President Argentinean Road Association - AAC, Argentina

Coffee

16:15 -

## Session 2 : Use of WIM Data for H

Chair: Lily Poulidakos & Martin Ru

### 33. Relating Impact of Heavy Vehicles to the External Costs

***Lily POULIKAKOS**, Kurt HEUTSCHI, Patrik SOLTIC, Andrea DEL DUCE*

### 20. Test Site for Evaluation of High-Speed WIM and ITS Solutions in Brazilian Conditions

***Leonardo GUERSON**, Gustavo OTTO, Bruno DE MELO GEVAERD, Tiago TAMAGUSKO, Amir MATTAR VALENTE*

### 23. Benefits of a Weigh-In-Motion Solution for Toll Collection considering the Brazilian Law 13.103, Article 17

***Stefan DAXBERGER**, Sergio SANTILLÁN*

19:00 - Welc



# PIARC

Innovative Best Practices for Freight Transport in Europe – Results from  
the BESTFACT Project

**Martin Ruesch**, *Rapp Trans Ltd., Switzerland*

ITS Solutions and Platooning for long Distance Road Freight,

**Bernard Jacob**, *IFSTTAR, France*

## Session 3 : Data Quality and Accuracy Assessment by Modeling

Chair: Franziska Schmidt (IFSTTAR, France)

14. Modelling Weigh-in-Motion System based on Load Cells including Vehicle Dynamics and Road Roughness for Vehicle Weighing Enhancement  
**Douglas GASPARETO**, *Herbert GOMES*
19. Development of a WIM Data Quality Management System for the Brazilian Federal Road Network  
**Leonardo GUERSON**, *Hans VAN LOO, Lucas FRANCESCHI, Valter ZANELA TANI, Amir MATTAR VALENTE*
59. Study of WIM Sensor Electro-Mechanical Behavior: a Model in the Frequency Domain  
**Gustavo OTTO**, *Jean-Michel SIMONIN, Jean-Michel PIAU, Leto MOMM*
74. Modeling Tank Vehicle Weigh-in-Motion System  
**Luciano FARUOLO**, *Fernando Augusto DE NORONHA CASTRO PINTO*
72. Accuracy of Mass Sensor Units (MSUs) used for On-Board Mass (OBM) monitoring  
*Andriy DYUKOV, Sean MCQUEEN, **Chris KONIDITSIOTIS***

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# PIARC

## **Session 3: Multimodal Freight Policies for more efficient and sustainable Freight Transport**

Chair: Eiichi Taniguchi (Kyoto University, Japan)

International road transport and infrastructure in South America: The border crossing dilemma

***Silvia Sudol***, *Argentina*

National Logistics Action Plan for Austria

***Patrick Grassl***, *Fed. Ministry for Transport, Innovation and Technology, Austria*

A transport system that is safe, increases profitability and contributes to the transition into a low-emission society – is it possible?

***Else-Marie Marskar***, *Norwegian Public Roads Administration, Norway*

# ISWIM

## Session 4 : Assessment of WIM Systems by Testing

Chair: Javier Jorge (NIIT, Argentina)

13. Standard Quality Checks for Weigh-in-Motion Data  
*Hans VAN LOO, Andrew LEES*
10. Evaluation of Weigh-in-Motion Sensors on the IFSTTAR Accelerated Testing Facility  
*Pierre HORNYCH, **Jean-Michel SIMONIN**, Louis-Marie COTTINEAU, Jean-Michel PIAU, Ivan GUEGUEN*
51. High-Speed Weigh-In-Motion road tests in France  
***Eric KLEIN**, Eric PURSON, Didier SIMON, Gerald GENTIL*
28. Evaluation of a GLOBAL-WIM weighing Station  
*Bruno DE MELO GEVAERD, Alain BANCEL, Wolney FREIRE, **Morgan AUTRET***



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## PIARC

12:30

### **Session 4: Off-Hours Freight Delivery for more efficient and sustainable Urban Freight Transport**

Chair: Tiffany Julien, Federal Highway Administration, United States

The Road to silent Off Peak Hour's Delivery in Belgium

***Hinko van Geelen***, *BRRC, Belgium*

Impact of Off-hour Deliveries: NYC, Sao Paulo and Bogota

***Hugo Yoshizaki***, *Sao Paulo University, Brazil*

Tackling Urban Congestion: Federal Highway Administrations' Off- Hours Delivery Grant Program

***Tiffany Julien***, *Federal Highway Administration, United States*

Smart Urban Logistics Initiative

***Patrick Grassl***, *Fed. Ministry for Transport, Innovation and Technology, Austria*

# ISWIM

14:00 -

## Session 5 : Heavy Vehicle I

Chair: Bernard Jacob

62. Assessment of Effect in Bridge Loading of Changes in Traffic

*Franziska SCHMIDT, Bernard JACOB*

63. Pavement Damage - Brazilian P Deterioration Test using WIM

*Gustavo OTTO, K SHINOHARA, Adosindro JOAQUIM DE ALMEIDA, Leto MOM*

*MATTAR VALENTE*

Coffee

16:15 -

## Panel 1 : Data Quality and Applications to ITS, Highway

Chair: Chris Koniditsiotis & Martin Ruesch (T

Chris Koniditsiotis  
Chris Koniditsiotis  
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17:15 -

Poster and

20:00 - Ga



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# PIARC



Assesment of Pavement Deterioration and Lifetime under heavy  
Traffic Loads using Accelerated Pavement testing Facilities  
*Pierre Hornych, Jean-Michel Simonin, **Louis-Marie Cottineau***

# ISWIM

08:30 -10:15

## Session 6 : Overload Enforcement

Chair: Hans van Loo (Corner Stone International, The Netherlands)

49. French Policy to prevent Overloading  
*Vittorio DOLCEMASCOLO, Julien FERNANDEZ, Bernard JACOB, Eric KLEIN*
  
44. The Control on Overloaded Vehicles and Automatic Axle Weighing System for Rapid Transit installed in the Hanshin Expressway  
*Junichi MORIKAWA, Tsurumaki ATSUSHI, Kato MUNEHICO*
  
17. Implementation and Challenges of a WIM Enforcement System  
*Jose LARRAMENDI, Diego COIRO, Martin ARRIOLA*
  
36. Weigh-in-Motion System to monitoring Overloading in a Brazilian Heavy Traffic Highway  
*Mariana BOSSO, Kamilla VASCONCELOS, Igor Amorim BEJA, Liedi BERNUCCI, Túlio BITTENCOURT*
  
24. Applications of WIM Systems for Enforcement and Toll-by-Weight  
*Benoit GEROUDET, Philippe DELMAS*

# ISWIM

10:45 - 12:30

## Session 7 : Direct Enforcement

Chair: Chris Koniditsiotis (TCA, Australia)

38. WIM Enforcement Systems - in the Field Experience  
*Otto FUCIK, Emil DOUPAL, Miroslav Juhas , **Jan FUCÍK***
6. Start of Direct Enforcement in Czech Republic  
***Emil DOUPAL**, Zuzana ADAMEOVA, Ivan KRIZ*
31. Direct Enforcement of Overload by WIM  
***Louis-Marie COTTINEAU**, Bernard JACOB, Pierre HORNYCH, Franziska SCHMIDT, Eric KLEIN*
8. Weigh-in-Motion Systems for Direct Enforcement in Poland  
*Janusz GAJDA, **Piotr BURNOS**, Ryszard SROKA*
58. Brazilian PIAF Model and the Direct Enforcement Project  
***Keyla JUNKO SHINOHARA**, Gustavo OTTO, Valter ZANELA TANI, Flavio DE MORI, Amir MATTAR VALENTE*

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# ISWIM

14:00 -

## Panel 2 : WIM for Enforcement

Chair: Bernard Jacob & Valter Tani (IT)

Bernard jacob  
Bernard jacob  
Bernard jacob

15:00

Poster and

Coffee

16:15 -

## Session 8 : R

Chair: Louis-M

54. Railroad WIM Facilitates Safe Train Operation in North America  
*William GEMEINER, Thomas BARTLETT, Ken MEEKS*

77. Adapting Bridge WIM Technology to Railway Bridges  
*Ales ZNIDARIC, Jan KALIN, Maja KRESLIN, Matja MAVRIC, Przemyslaw KOLAKOWSKI*

17:15 -

ISWIM

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**ISWIM**

**08:00 -**

ISWIM Board  
(members)

**Session 9 :**  
Chair: Aleš Žnidar

76..Latest Developments in Bridge WIM Technology

Ales ZNIDARIC, Jan KALIN, Maja KRESLIN, Matija MAVRIC

65. Bridge Weigh-in-Motion (B-WIM): An Analyzis of B-WIM Method

Nicole PRETE, Richard CHRISTENSON, Sarira MOTAREF

**Coffee**



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# ISWIM

10:30

12:00



Lunch

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Monday . November 7, 11:50-12:30  
Tuesday, November 8, 17:15-18:30  
Wednesday, November 9, 15:00-15:45

101. IRD VectorSense Technology-Enhancing Traffic Information Systems

*Terry BERGAN, Carlos HAYLER*

102. OIML R-134 Testing and Certification of WIM system

*David CORNU, Hans VAN LOO*

103. WIM enforcement : Belgium's case study

*Benoit GEROUDET, Philippe DELMAS*

104. Self-sufficient WIM station : Congo's case study

*Benoit GEROUDET, Philippe DELMAS*

106. Metrological support of the weighing of the commercial vehicles

*Emil DOUPAL*

109. Automatic overload control - Road tests in France

*Eric KLEIN, Eric PURSON, Didier SIMON*

110. WIM data for investigation of truck weights and dimensions

*Livia TOVAR, Frédéric DOMPROBST, Franziska SCHMIDT, Bernard JACOB*

CAMEA

Data Traffic SA and Cestel d.o.o

Intercomp Company

International Road Dynamics

Kapsch

Kistler Instrumente AG

Mikros Systems

Politrans Tecnologia

Q-FreeTDC

Sterela & EGIS

TE Connectivity

Traffic Data Systems GmbH

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## **Sunday, November 6th**

Tour to the Iguazu falls ,Argentinean side (optional)  
18:30 - Ice-breaking cocktail

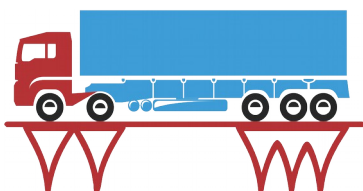
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Tour to the Iguazu falls Argentinean side (optional)  
18h30: Ice-breaking buffet [Bourbon Hotel]

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**ISWIM**

International Society for Weigh in Motion

## International Society for Weigh-in-Motion

<http://www.is-wim.org/>

**ISWIM**  
co/ EMPA,  
Überlandstrasse 129,  
CH-8600 Dübendorf  
SWITZERLAND