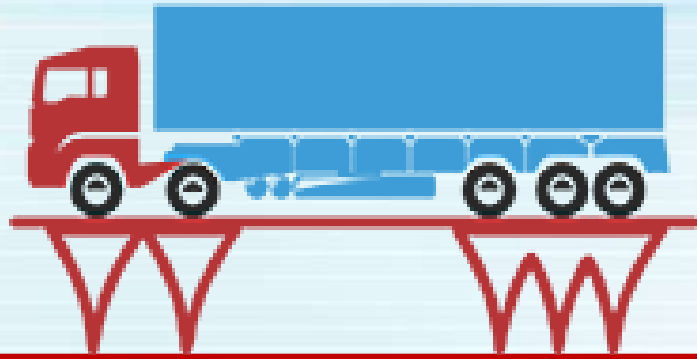




ISWIM
International Society for Weigh in Motion

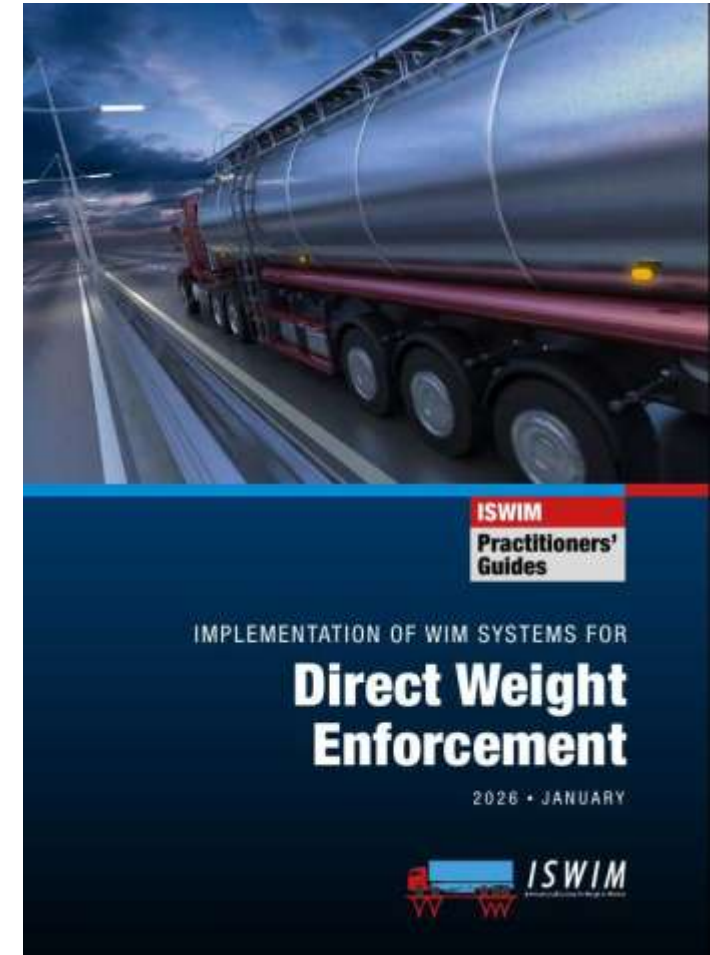


ISWIM Practitioners' Guide on: **Implementation of WIM Systems for Direct Weight Enforcement**

Hans van Loo
Promotion Officer
International Society for Weigh-In-Motion

Introduction

- **Scope**
 - *Direct Weight Enforcement*
 - *Road WIM*
 - *Pavement and Bridge WIM*
 - *High Speed WIM*
- **Objective**
 - *Share experience*
 - *More standardization in Implementation*
 - *Not a new standard!*



Why?

- **Why Weight Enforcement?**

- *Damages to road infra*
 - *Pavements and Bridges*
- *Traffic safety*
- *Unfair competition*

- **Limitations of Traditional Enf.**

- *Expensive in operation and staff*
- *Limited effect in area and time*
- *Limited capacity and efficiency*



Why?

- **Advantages of Direct Enforcement**
 - *24/7 operation*
 - *99% detection*
 - *Lower costs*
 - *No disturbance of traffic flow*
 - *Data also for other applications*
- **But**
 - *Needs careful implementation*



How?

- **Objective**
 - **Guarantee of each individual WIM measurement used for enforcement**
- **3 Key Elements**
 - **Legal Acceptance**
 - **System Certification**
 - **Data Quality Control**

Overall objective: Each WIM measurement used for direct enforcement is legally accepted!

Key elements for successful implementation	Legal Acceptance (Enforcement Authorities)	System Certification (Legal Metrology)	Data Quality Control (Operator)
Project Phase	Preparation	Implementation	Operation
Role in Process	To provide legal basis for application	To provide proof of performance from day 1	To provide proof of every day performance
Key Requirements	- Measurement accuracy and reliability - Operational procedures - Maintenance and calibration of WIM - Determination of sanction	- Standard test procedure with 3 levels of tests - Type approval - Initial verification - In-service verification	- Continuous performance stability tests - Weighing accuracy - Detection of trends - Confidence level of measurements
Guide reference	See chapter 5	See chapter 6	See chapter 7

Legal Acceptance

- **Enforcement Authority**
- **Phase**
 - Preparation
- **Role**
 - Provide *Legal Basis*
- **Requirements for**
 - Accuracy & Reliability
 - Operational Procedures

Overall objective: Each WIM measurement used for direct enforcement is legally accepted!

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Legal Acceptance

- **Metrological Requirements**

- *Traceability of measurements*
- *Immunity to disturbances*
- *Accuracy in MPE*
 - *Right balance*
- *Use of (inter-)national standards*

- **Organization**

- *Authorities involved*
- *Requirements*
- *Procedures*



System Certification

Legal Metrology

- **Phase**
 - Implementation
- **Role**
 - Provide proof of performance on day 1
- **Requirements for**
 - Test Procedure

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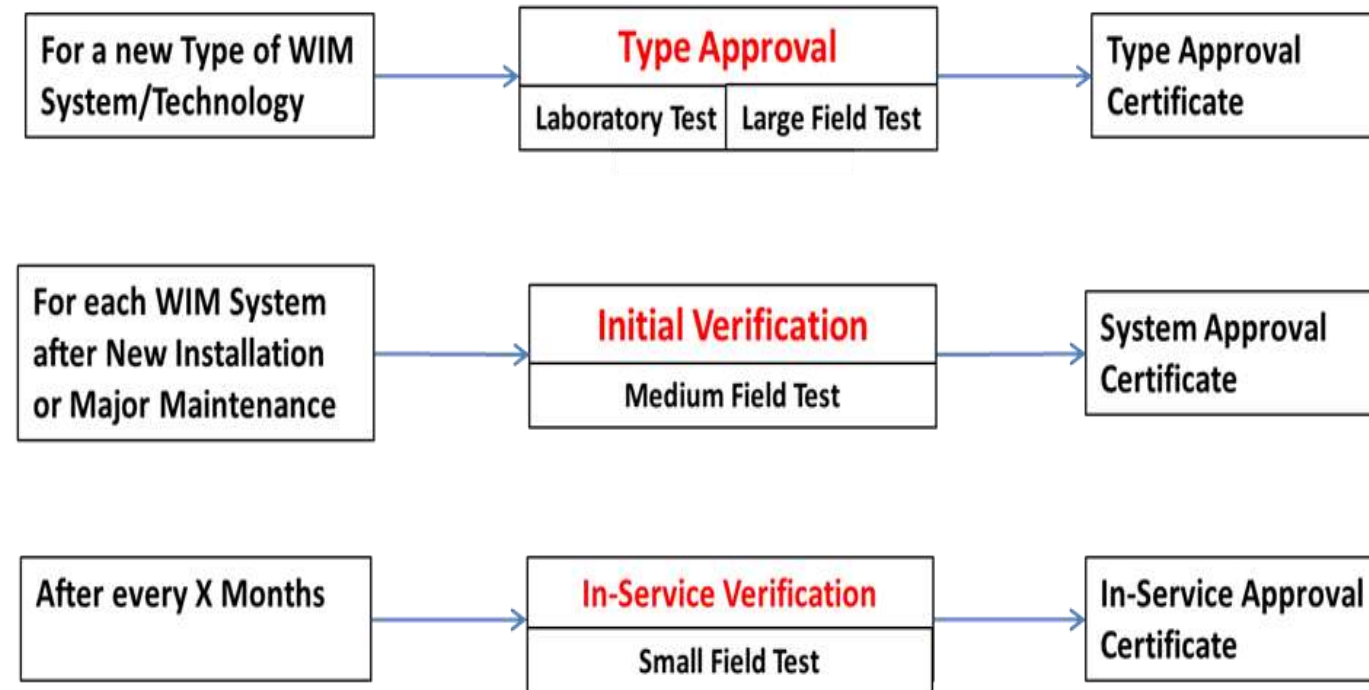
System Certification

- **3 Levels of Testing**

- *Type Approval*
- *Initial Verification*
- *In-Service Verification*

- **Test Procedures**

- *Laboratory Tests*
- *Field Tests*
- *Size & Frequency*



Data Quality Control

Operator

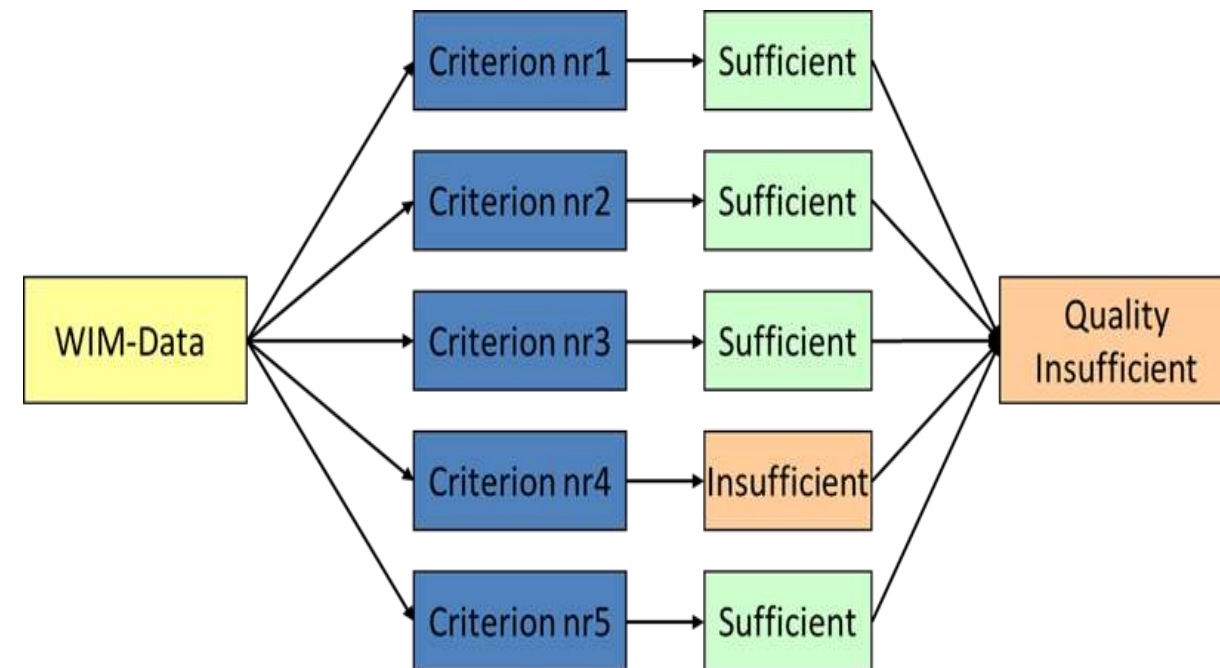
- **Phase**
 - Operation
- **Role**
 - Provide proof of every day performance
- **Requirements for**
 - Test Procedure

Overall objective: Each WIM measurement used for direct enforcement is legally accepted!

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Data Quality Control

- **In-service Accuracy**
 - *Guarantee of each WIM measurement used for enforcement*
- **Performance Stability**
 - Variation over time
- **Measurement Accuracy**
 - Reference vehicles
- **Measurement Confidence Test**
 - By WIM system

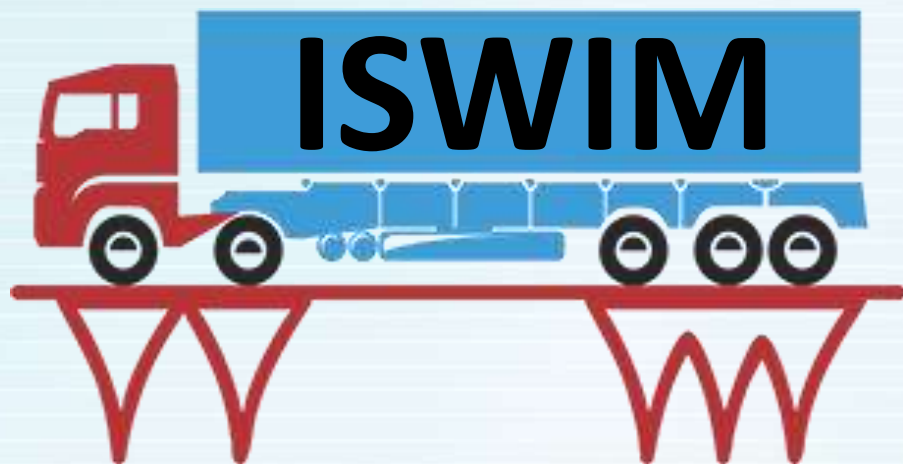


Examples

- Czech Republic, *Since 2011*
- Hungary, *> 120 systems, 2018*
- Brazil, *by Road Concessionaires, 2022*
- USA, *New York City, 2023*
- South Africa, *Technology Trials, 2025*



Questions?



www.is-wim.net

www.linkedin.com/groups/13400438/



ICWIM10
HVTT19

Moving Forward Together
Connecting Heavy Vehicles and Weigh-In-Motion