French National Project: WIM for Direct Enforcement of Overloading

French General Directorate for Infrastructure, Transport and the Maritime Affairs

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Presentation Plan

- Context
- Static weighing enforcement
- The National WIM network (preselection)
- Direct enforcement WIM project
- Blank test, call for participation of manufacturers
8-12% of the trucks are overloaded, mostly by max. 10%, but up to 20%

Since several years, focus on light commercial vehicle overloading

Political support for direct enforcement tool to prevent truck overloading

Context
Yearly static controls: French case

Static weighing number

Years

Number

Years

Number

0
20000
40000
60000
80000
100000
120000
140000
160000
180000
200000
Overloading enforcement using static scale: drawbacks and advantages

- Need human resources (weighing officers, policemen...)
- Need a static weighing area
- Need static scales (risk of vandalism...)
- Capacity to control only a small percentage of the truck traffic flow
- Increase of the truck traffic flow and the average level of truck overloading
- → not efficient
- → but in France, static weighing or low speed WIM are the ONLY devices legally approved for weight enforcement (by OIML recommendation)
A political decision

- Announcement of the Minister of September 8th, 2004
- Creation of a new preselection network of overload HGVs

Aims of the WIM network

- On-road high speed detection of Overload HGVs (axle and GW)
- Select companies for inspections
- Statistical study of the HGVs traffic
- the Sterela company

The network

29 operational sites

Mainly on the long-distance corridors and at the borders
Description of the WIM project on direct enforcement

- Cooperative project lead by IFSTTAR, carried out with Cerema
- Objective: implementation of HS-WIM for direct enforcement of overloading
- 2 phases:
  - Phase 1: feasibility study for marketed HS-WIM systems to meet the OIML requirements for a type approval
  - Phase 2: Preparation of a type approval procedure and feasibility study of enforcement procedure (blank test)
OIML class 5 tolerances

- OIML Class 5, for 100% of the validated measurements, after sorting:

<table>
<thead>
<tr>
<th></th>
<th>GW</th>
<th>SA</th>
<th>GoA</th>
</tr>
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<tbody>
<tr>
<td>Accuracy (±)</td>
<td>5 %</td>
<td>8%-10 %</td>
<td>7%-8 %</td>
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Phase 1 : Feasibility study for marketed HS-WIM systems to meet the required tolerances

- sensors response and external factor effects

- developing built-in sorting algorithms to meet the required tolerances of the OIML class 5

- pre-qualifying two commercial road sensor WIM systems and a B-WIM system on concrete integral bridge eligible for direct enforcement
Phase 1 : Results

- Behaviour of road sensor response
  - influence of the lateral position of the truck ⇒ correction law or elimination
  - piezo-quartz sensor = the most suitable current WIM sensor for direct enforcement

- B-WIM (SiWIM)
  - eligible on integral bridge, but still requires a sorting algorithm
  - not yet adapted on steel orthotropic decks (weighing algorithm not fully optimized)
Test site overview

- Test site located on A4 motorway in Eastern France (SANEF) between Paris and Strasbourg
- 35 km loop between 2 interchanges = 30’ rotation time to collect {dynamic + static weighing}
Test site overview

- **2x2 lanes highway**; mean HGV rate, HS WIM-E for screening overloaded
- Site **class (III)** according to COST323 → most prevalent in France
- WIM systems provided by **industrial partners**
- 5 km downstream: **control area** fitted with an approval static weighing system: **Precia Molen Onyx 3** – 20t /100 kg
- **Periodical static weighing operations** on this site with the police
Industrial partnership

- Call for participation (ISWIM): accuracy ≥ C(15) COST323
- Convention and Non Disclosure Agreements.
- Suppliers install, calibrate and maintain their devices

1. **French company ; leader in France**
   - 4 piezo-quartz lines
   - V-shape dual tires & pos. sensor

2. **Austrian company**
   - 3 piezo-quartz lines
   - Bias dual tires & pos. sensors

3. **French company**
   - 2 piezo-ceramic lines
   - Bias position sensors
Phase 1 : Test Results (GW)

- 25 days of testing from 2015 to 2018
- 1,161 vehicles weighted both in static and in motion

- Best results obtained
  - Without sorting algorithm: 96.6% of all the GVW measurements are in OIML 5
  - Using a sorting algorithm: 97.5% of GVW measurements in OIML 5
Phase 2: Preparation of type approval procedure and feasibility of direct enforcement procedure

About to begin, ongoing work
- type approval and certification procedure according to the defined specifications
- features specifications and test continuation

Several French ministries involved in phase 2:
- Economy and Finance: French Legal Metrology bureau
- Interior: integration of WIM in the direct enforcement frame (as for speed radars)
Blank test - Participation of manufacturers

- Additional manufacturers are welcomed to take part in the phase 2
- If they can prove that a marketed system meets the tolerances of the OIML class 5 for at least 95% of the measurements before sorting or 98% after sorting
- Objective of the blank test: to assess the false positive rate (wrong detection of overload) and to simulate the due fines, to assess the efficiency of the system (non detection rate)
- IFSTTAR/CEREMA will issue the specifications to take part in this project (participation agreement) + organize meetings
- Contact person:

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The End