

## **OSMOS WiM+D**

- DETECTION, WEIGHING AND COUNTING OF OVERLOADED AXLES AND TRUCKS
- ANALYSIS OF STRUCTURAL DEFORMATIONS
- REAL-TIME VIDEO AND TRUCK IDENTIFICATION VIA CAMERAS



### **WHY USE WiM+D?**

- FOR INCREASED SAFETY OF HIGHWAY USERS.
- FOR OPTIMIZED MAINTENANCE TO HIGHWAY OPERATORS.

## OSMOS WiM+D: WEIGH-IN-MOTION REINVENTED

The OSMOS WiM+D tool will revolutionize how you manage your bridges. Backed by our experience in infrastructure monitoring, we focused on developing a unique, automated solution that combines weigh-in-motion techniques with the analysis of structural deformation. The resulting OSMOS WiM+D is a major innovation in the field of bridge monitoring, as it does much more than simply studying traffic over your structure. Today, thanks to structural health monitoring, we are able to determine the impact of your bridge's operations on its state of structural health, so that you can improve its management and guarantee user safety.

### ■ WEIGH-IN-MOTION AND BRIDGE DEFORMATION MONITORING IN A SINGLE SOLUTION

Thanks to the algorithms and mathematical modules developed by our teams, we go above and beyond the classic weigh-in-motion methods: we link them to our data analyses, to deduce the impact of traffic and usage on the health of the structure. When you opt for the OSMOS WiM+D solution, you have access to unique information that will be useful in decision-making and that will help to reduce your operating costs.

The real-time cameras installed on-site further enrich the monitoring process and are able to record the license plate numbers of any vehicles that cause significant dynamic events.

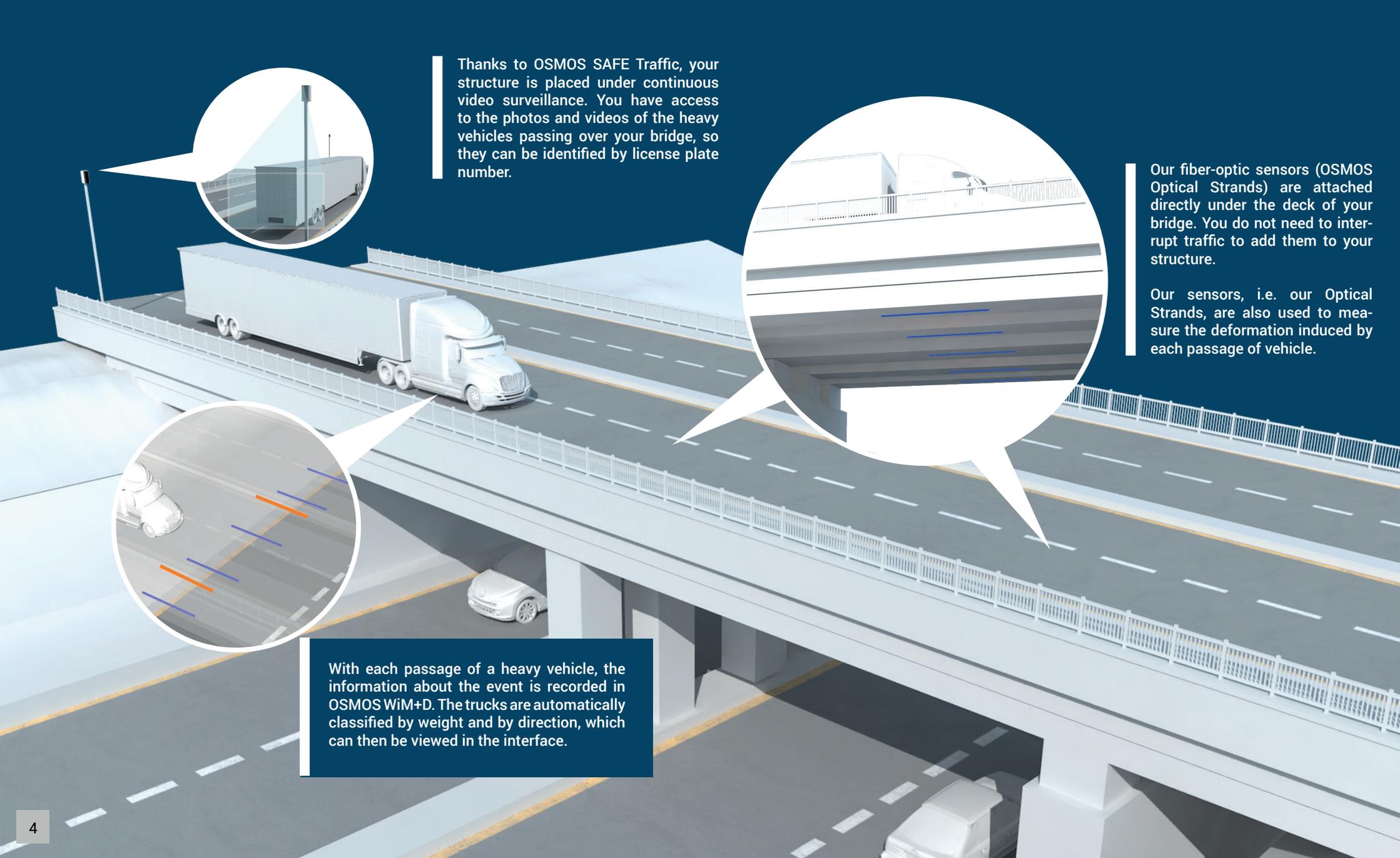
Founded in 2001, OSMOS has become a major player on the structural health monitoring market, namely in terms of behavioral studies carried out on engineering structures that undergo significant stress (operating conditions, traffic, environment, etc.). With its internationally-renowned expertise, the company's innovative technology and know-how have been illustrated through multiple projects, including the Austerlitz Viaduct (France), Champlain Bridge (Canada) and Seyssel Bridge (France).



Pont de Noblens, Département de l'Ain, FRANCE

#### ■ OSMOS WEIGH-IN-MOTION + DEFORMATION MEANS:

- Access to your bridge's state of health;
- Maintenance of your structure in working condition and prevention of shutdowns;
- Real-time monitoring of usage, traffic and their impact on the structure;
- Identification and classification of passing trucks using cameras;
- Precision detection and weighing of each axle;
- Alerts in the event of overload and/or structural anomalies;
- Optimized maintenance scheduling and budget control;
- Simplified structural asset management via SAFE suite, our unique integrated software platform;
- Extremely easy installation for activation in record time.



Thanks to OSMOS SAFE Traffic, your structure is placed under continuous video surveillance. You have access to the photos and videos of the heavy vehicles passing over your bridge, so they can be identified by license plate number.

Our fiber-optic sensors (OSMOS Optical Strands) are attached directly under the deck of your bridge. You do not need to interrupt traffic to add them to your structure.

Our sensors, i.e. our Optical Strands, are also used to measure the deformation induced by each passage of vehicle.

With each passage of a heavy vehicle, the information about the event is recorded in OSMOS WiM+D. The trucks are automatically classified by weight and by direction, which can then be viewed in the interface.

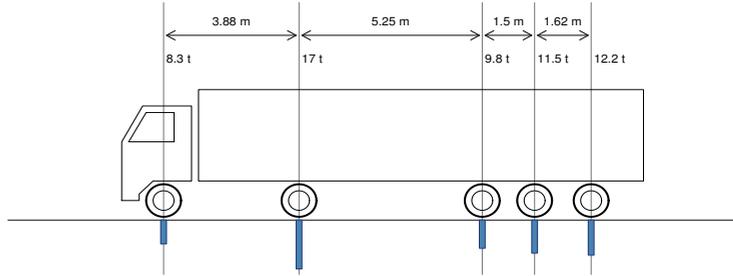
### Passage Data Sheet

Transit ID : 11029580 / 11029581 / 11029583  
 Time : 2019/04/03 at 08:25:46 UTC  
 Maximum Strain (mm/m) : 0.0773  
 Gross Weight (tons) : 58.8  
 Number of Axles : 5  
 Speed (km/h) : 45  
 Direction :  
 Plate :  
 Confidence Level :

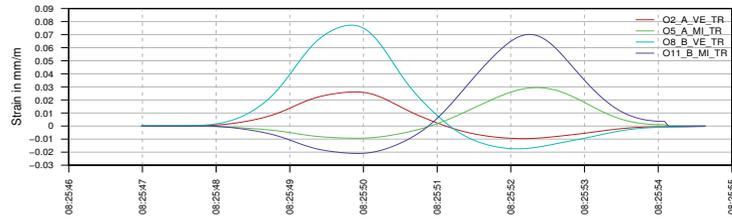


ID : 11029580

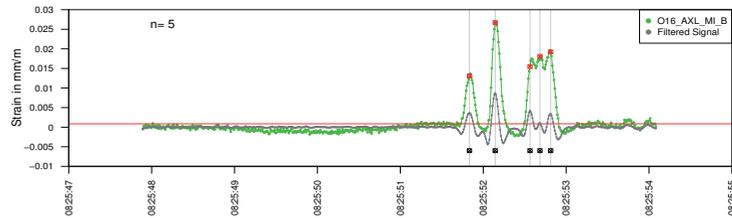
Confidence Level : 0 1 2 3 4 Reliable Result with good similarity to the load test cases



2019/04/03 at 08:25:46



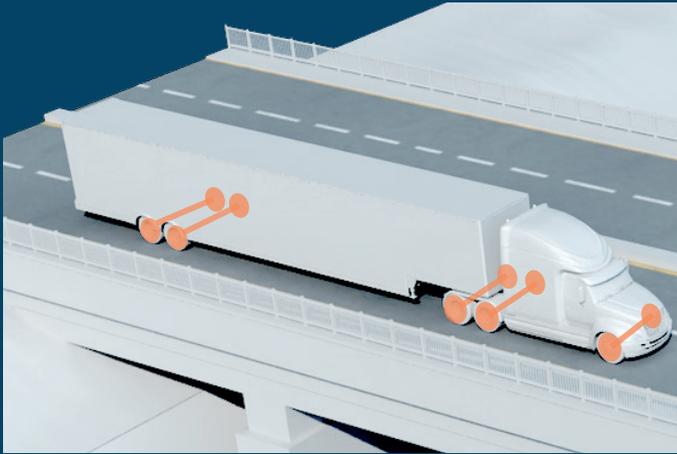
2019/04/03 at 08:25:47 – Axle Identification



#### KEY INFORMATION WITHIN YOUR REACH

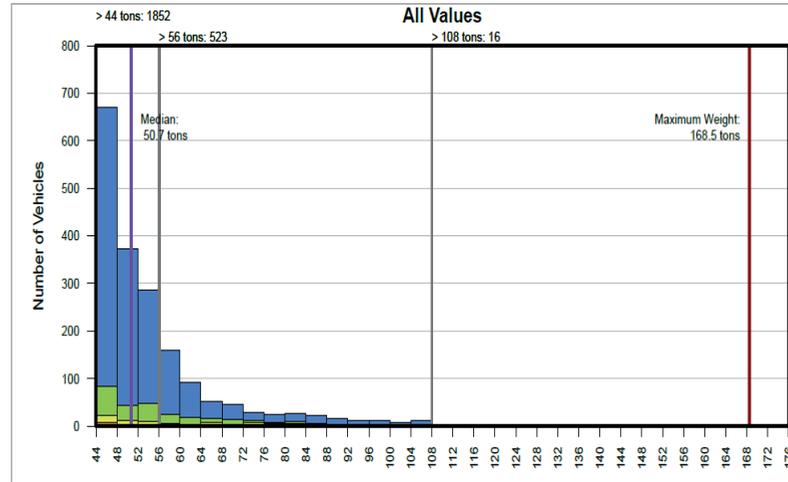
*OSMOS WiM+D provides comprehensive information about the structure's usage. Every noteworthy event is recorded and can be viewed directly in the WiM+D module of the SAFE interface. This gives you access to a variety of information, such as speed, length, driving direction, distribution per axle, total vehicle weight, license plate number and the maximum strain generated by the event.*





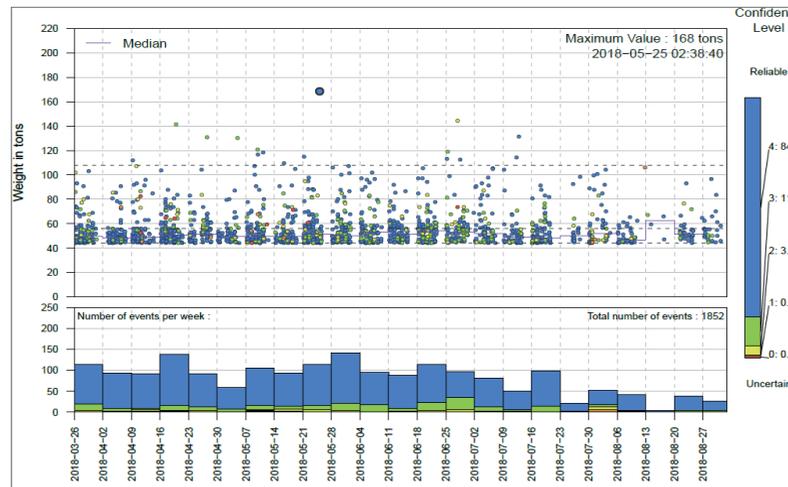
## WEIGHT CONTROL

- Economic as the same sensors provide weight and deformation
- Estimation of the total weight of each vehicle that could affect structural behavior
- Estimation of the weight on each axle, per vehicle
- Automatic alert in case of overweight vehicle
- Detection of the direction of movement of each vehicle



## Statistical study of all the recorded passages of heavy trucks by weight

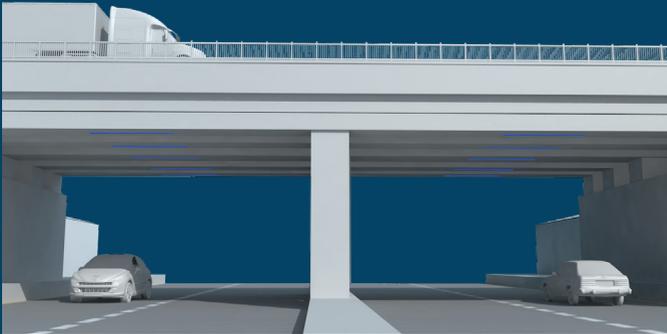
*Statistical study of all the recorded passages of heavy trucks: classification by weight, and detection of overweight vehicles*



## Statistical study of all the recorded passages of heavy trucks by time frame

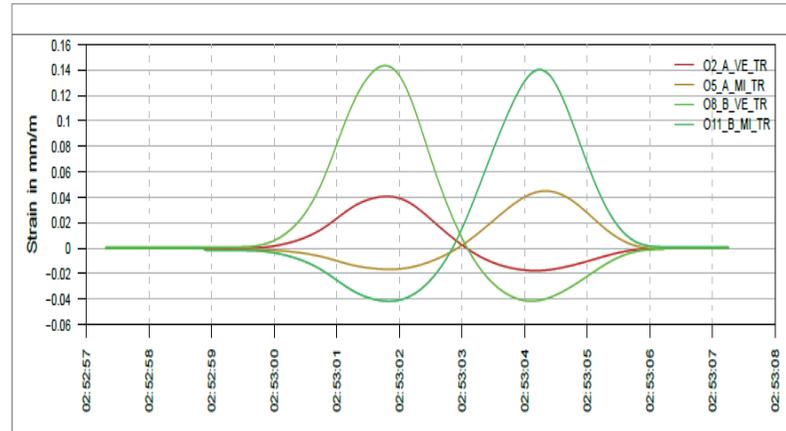
*Statistical study of all the recorded passages of heavy trucks: classification by time frame, and detection of overweight vehicles.*

*Knowledge of the structure's actual rate of use.*



### BRIDGE STRUCTURAL DEFORMATION CONTROL

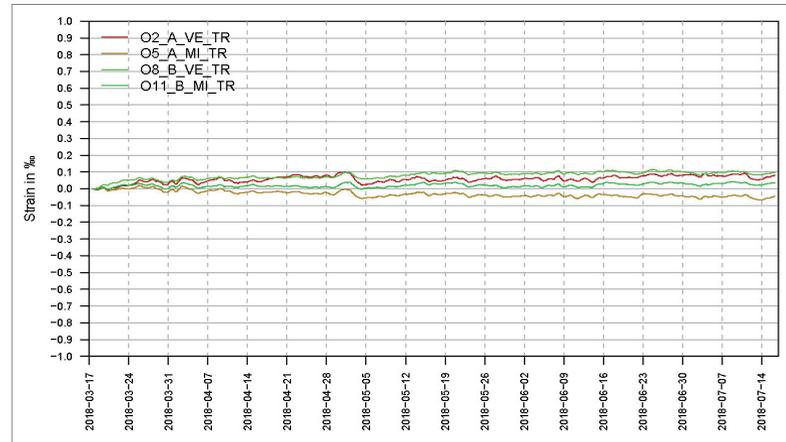
- Classification of passages by weight and detection of overweight vehicles.
- Timestamping of the passage of each vehicle
- Detection of the direction of movement of each vehicle
- Evaluation of the speed of each vehicle
- Calculation of the maximum strain generated by each passing vehicle
- Non intrusive contrary to other weigh-in-motion systems
- Maintenance free



### Dynamic measurement

*Reproduction of the deformation measurements used to calculate weight, for each heavy vehicle.*

*Verification of the deck's normal behavior under moving loads: actual level of deformation, continuity, height of neutral axis, blockages on supports, etc.*



### Analysis of measurements taken over the long term:

- *Effects of temperature fluctuations and identification of any clamping on supports*
- *Correction of temperature effects for precise knowledge of long-term changes due to aging (creep, loss of rigidity, compression of supports, etc.)*



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