

**OSMOS WIM+D**

■ **DETECTION, WEIGHING AND  
COUNTING OF OVERLOADED  
AXLES AND TRUCKS**

■ **ANALYSIS OF STRUCTURAL  
DEFORMATIONS**

■ **REAL-TIME VIDEO AND TRUCK  
IDENTIFICATION VIA CAMERAS**



**WEIGH-IN-MOTION & MONITORING OF STRUCTURAL DEFORMATION**

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

The OSMOS SAFE 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 SAFE WiM+D tool, you have access to unique information that will be useful in decision-making and that will help to reduce your operating costs.

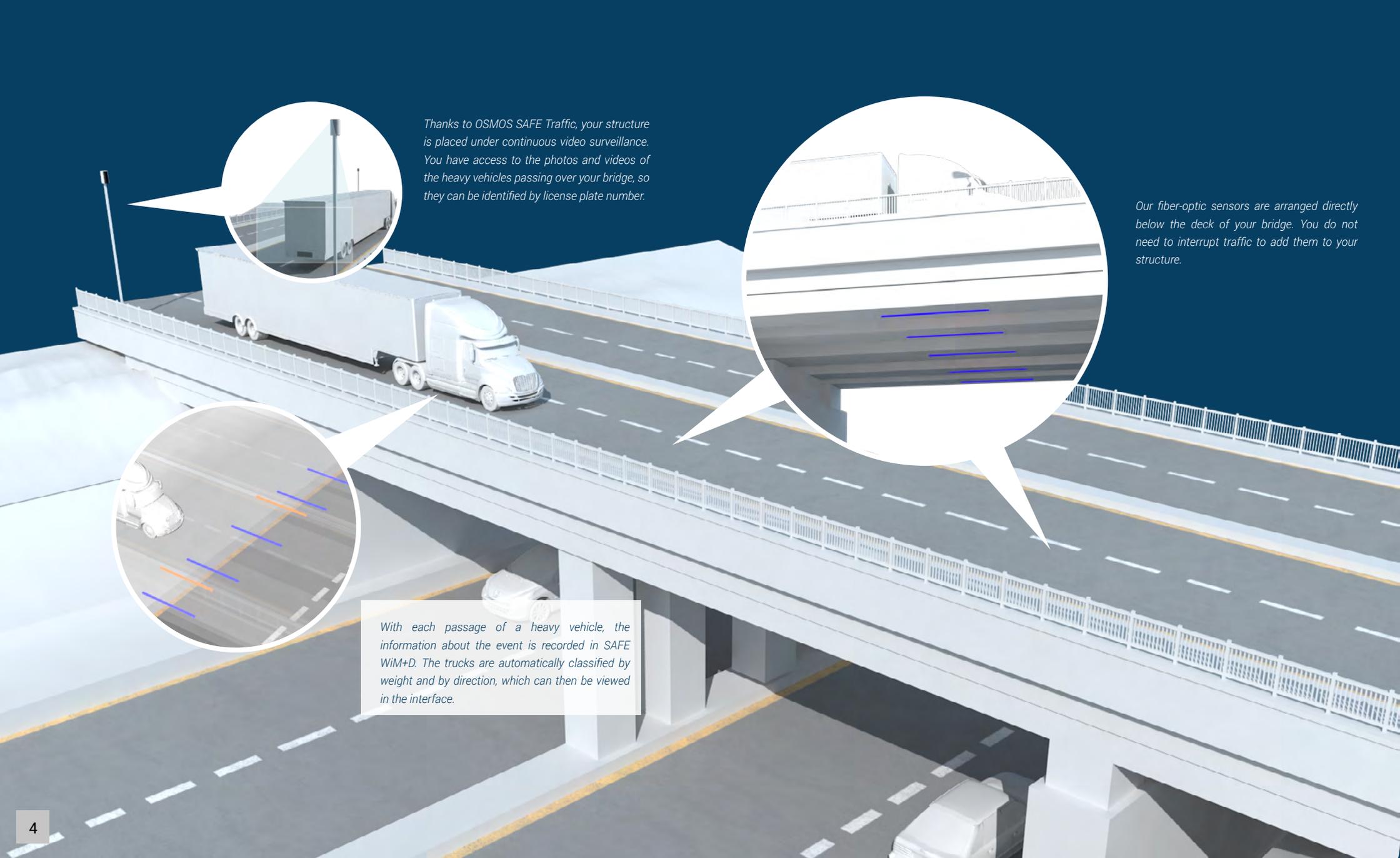
The real-time cameras installed on-site further enrich the monitoring process and are able to record the license plate numbers of any vehicles that cause significant dynamic events.

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).



#### ■ 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 management via SAFE, our dedicated control interface;
- 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 are arranged directly below the deck of your bridge. You do not need to interrupt traffic to add them to your structure.*

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

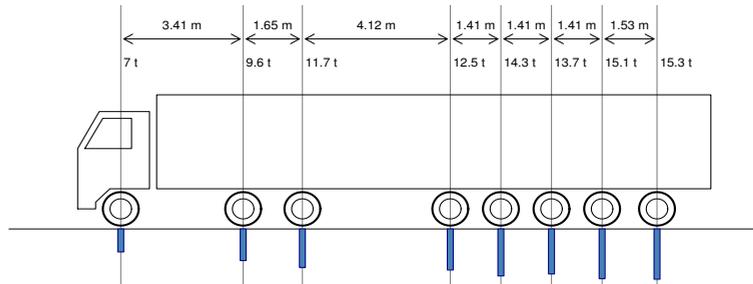
## Passage Data Sheet

Transit ID : 3743999  
 Time : 2018/09/27 at 06:22:43 UTC  
 Maximum Strain (mm/m) : 0.135  
 Gross Weight (tons) : 99.3  
 Number of Axles : 8  
 Speed (km/h) : 42.4  
 Direction : S-N  
 Plate :  
 Confidence Level : 0 1 2 3 4 Reliable Result with good similarity to the load test cases

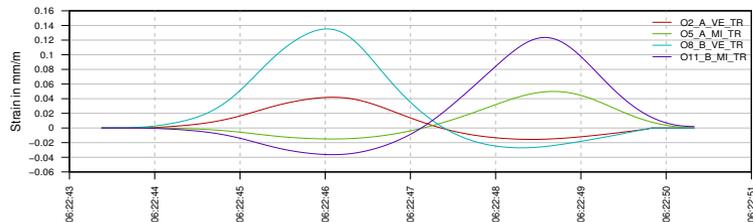


Plate : AH25819

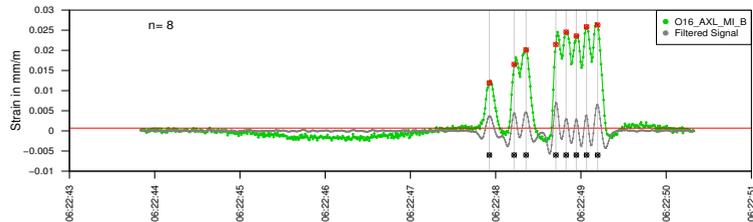
ID : 3743999



2018/09/27 at 06:22:43



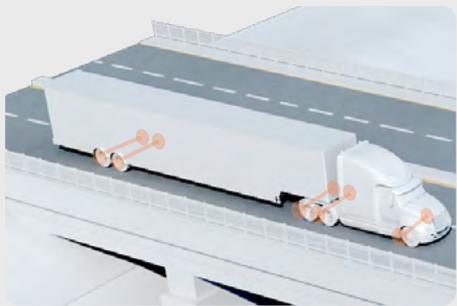
2018/09/27 at 06:22:43 - Axle Identification



### KEY INFORMATION WITHIN YOUR GRASP

*OSMOS SAFE 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.*

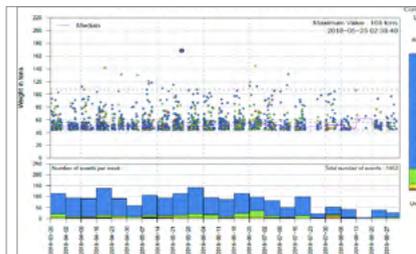
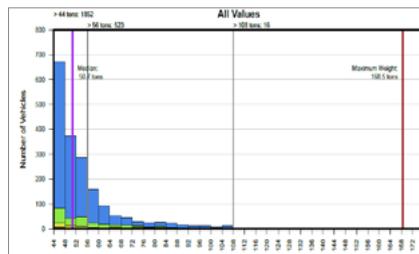




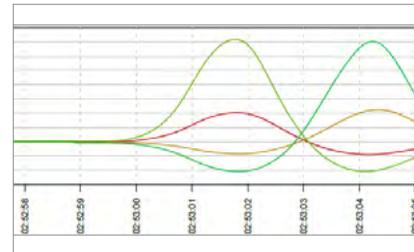
- Estimation of the total weight of each vehicle that could affect structural behavior
- Detection of overweight vehicles
- Detection of the number of axles per vehicle
- Estimation of the weight on each axle, per vehicle



- Bridge instrumentation via the quick and easy installation of our sensors under the deck
- Use of a non-destructive control method, to avoid major, costly work
- Simple, light maintenance of the system: robust sensors that are easy to access, to prevent the need for road work or for shutting down the carriageway

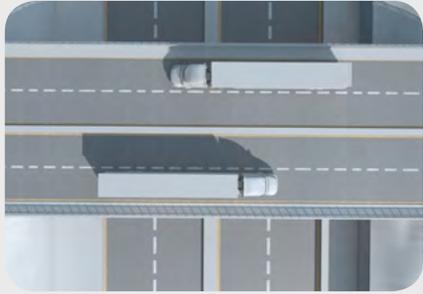


Statistical study of all the recorded passages of heavy trucks: classification by weight and by time frame, and detection of overweight vehicles. Knowledge of the structure's actual rate of use.



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

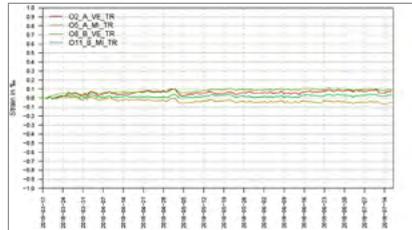
Verification of the deck's normal behavior under moving loads: actual level of deformation, continuity, height of neutral axis, blockages on supports, etc.



- Differentiation between and identification of heavy vehicles by video cameras
- 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
- Controlled margin of error for weight calculations, in the case of unusual configurations, by means of a calculated reliability index

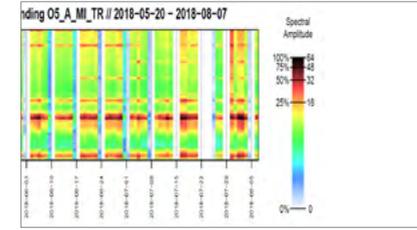
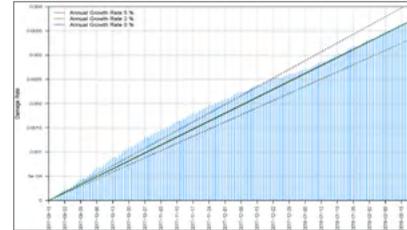


- Establish behavioral health records for your structure
- Estimate the structure's lifespan, based on its usage
- Launch an efficient, cost-effective maintenance policy



**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.)



Advanced calculations based on deformation measurements:

- Actual rate of fatigue damage to the metal components and estimated lifespan taking fatigue into account
- Analysis of deck vibrations, identification of fundamental modes of vibration and estimation of their evolution over the long term





[info@osmos-group.com](mailto:info@osmos-group.com)

37 rue La Pérouse, 75116 Paris, France – Tel: +33 (0)1 71 39 85 15 – Fax: +33 (0)1 40 67 10 38  
[www.osmos-group.com](http://www.osmos-group.com)

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