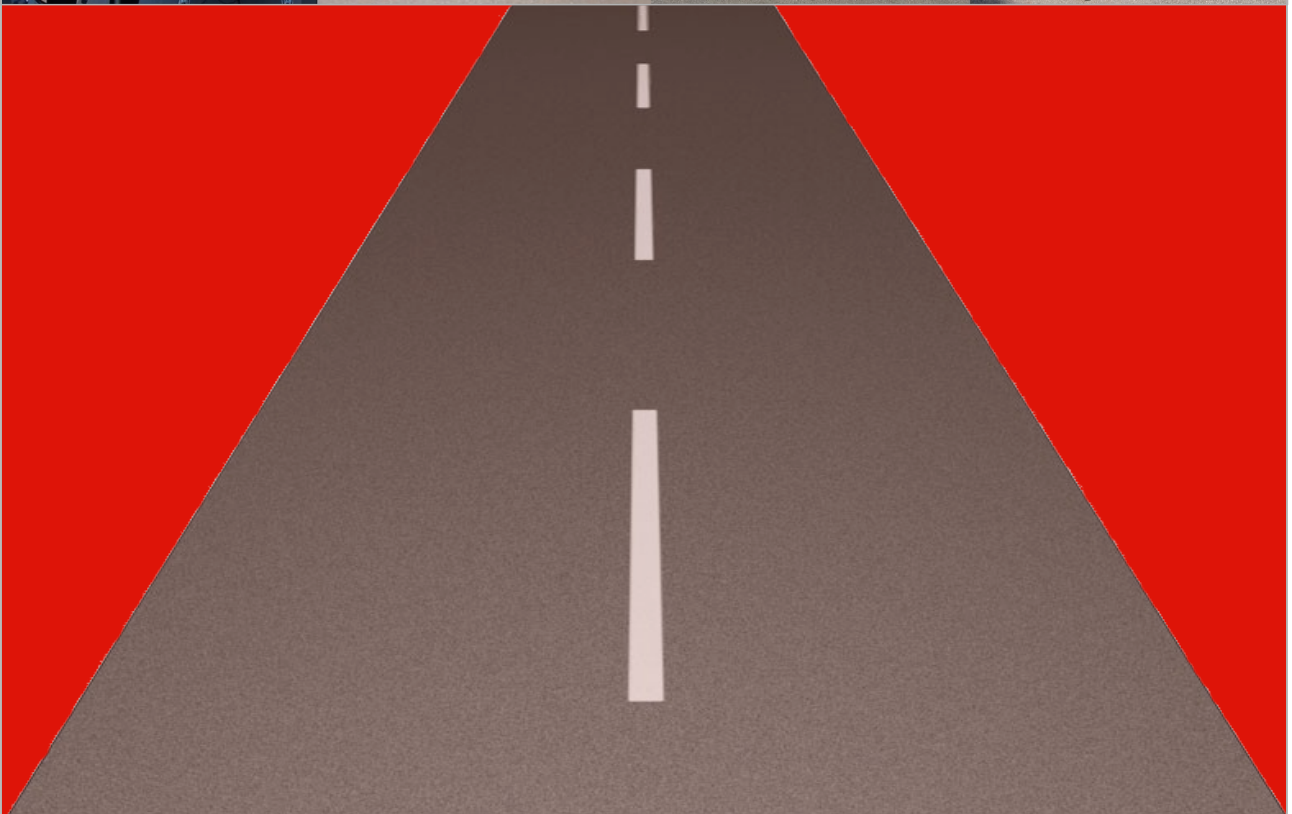


BALISEUR

by  **pto**
Machines

**Patented system for
laying and retrieving traffic cones**

**Four versions for more security and
better ergonomics**



Every day, road workers use traffic cones on motorways and freeways for protecting and securing the drivers.

The laying and retrieving of the traffic cones is **heavy physical work** and constitutes a **high security risk**:

- They lean out of the vehicle – mostly without any protection – holding the traffic cones with the arm stretched.
- During retrieving, the traffic cone hits against the heel of the hand and the wrist.
- In a single shift, the workers move several hundred kilograms.

Severe falls or injuries caused by passing traffic or work-related longterm musculoskeletal disorders - such can be the consequences.



In partnership with a French motorway company, OPTOmachines has developed the **concept of BALISEUR**. The **four versions** represent a **practical and ergonomic solution** for secure laying and retrieving of traffic cones responding to different conditions: **working habits, lane widths, type of vehicles and budgets**. Common to all versions are the general benefits, the functional principles and the fact, that they can be used under normal road conditions except snow, ice and storms (severe rain and wind). The BALISEUR is designed for cones of 75 cm, but can be adapted to cones of other sizes and to different types of vehicles.

General functional principles:

- A sloping, motorized ramp with a conveyor belt
- Laying in forward gear, retrieving in rear gear
- A patented dynamic toppling bar for retrieving: arc that tips the top of the cone.



Ramp & toppling bar

General benefits:

- **Higher security:**
The operators are distanced and protected from passing traffic.
- **Better ergonomics:**
The operators don't need to lean out of the vehicle and lift cones from ground level anymore. No more shocks on the heel of the hand and wrist during retrieving.
- **Improved visibility:** marker lights and reflecting signage



Operator working at ergonomic height, protected inside the vehicle from traffic

BALISEUR Trailer

Robust and mechanical only solution preserving the multi-functionality of the vehicle

Functioning:

The BALISEUR Trailer is transported and works **always outside of the vehicle**. So the whole space inside the vehicle can be used for storing cones and the **vehicle remains multipurpose and its total load capacity is preserved**. The operator works at the back of the vehicle at ergonomic height secured by a bar or a harness.

The maximum speed in forward gear for cone laying is 20 km/h.

Installation:

The BALISEUR Trailer is transported to the working zone in "trailer mode". The operators install the BALISEUR in « laying mode » once they are in the safety zone: They disengage it from the middle coupling and lift up the tiller. They set up the deflector, couple the BALISEUR on 2 couplings and plug in the electrical connector.

The whole set-up takes **less than 1,5 minute**.

Dimensions:

- Width: 1,10 m
- Length in trailer mode: 3,35 m without deflector / 4,60 m with deflector in operating mode
- Weight: 198 kg – not included in the payload of the vehicle but in the driving weight
- Weight of electrical cabinet: 18 kg



BALISEUR Automatic

Fully automated solution combining state-of-the-art technology and optimal protection of operators

The BALISEUR Automatic is the solution **without any human intervention** on the road.

The driver **controls the deployment of the system, the storage, the placing and removing** of taper cones and cone lengths, and their spacing (26 or 39 m) for 6 or 10 km via a **user-friendly HMI** and visual indicators at the driver's cab. Control screens help the driver to monitor the operations without stepping onto the road.

The BALISEUR Automatic is integrated in a tarpaulin structure on a raised floor which is to be mounted on a compatible heavyweight van.

The **storage housing of 264 cones** feeds a loading system allowing to lay and remove cones at a speed of 15 km/h.

The structure also serves as a **holder for signage**, like warning arrows and flashing lights. Furthermore, there is space for four traffic signs and some equipment.

A **remote controller at the rear of the vehicle** loads and unloads stacks of cones in the storage housing.

Dimensions:

- L 6,29 m, l 2,25 m
- installed on a Renault MASTER 3,5 t



HMI



Control screen

BALISEUR Rear version

Semi-automatic solution for narrow lanes
without operators' intervention on the road

Functioning:

The BALISEUR Rear version is **fixed at the rear of the vehicle** equipped with a special frame. Cones laying forward, retrieving backwards.

A camera fixed at the back of the vehicle increases the driver's visibility of the traffic. The **operator is secured by a harness**. He lays and retrieves the cones at the rear of the vehicle. The BALISEUR is **fixed on a rotary table** in order to be oriented to the right or the left side.

As the cones are set in line with rear corner of the vehicle without offset, the BALISEUR Rear version is **especially adapted to narrow lanes**.

The maximum speed in forward gear for cone laying is 20 km/h.

Installation:

- 1) Loading and discharging on the back of the vehicle with a motorized system, driven by the operator inside the van. The BALISEUR is put down on the road effortless, and remains fixed to the van during the whole process.
- 2) The operator remains inside the vehicle during the deployment and the functioning.

The whole set-up takes 1 minute.

Dimensions:

- Storing at the rear inside the vehicle: 1x 1,1 m (floor area).
- Weight: approx. 100 kg
- Weight of electrical box & other mechanical parts: 50 kg
- Dim. deployed: L 2,2 m ; l 0,78 m

This configuration is currently in use in Switzerland.



BALISEUR Lateral

Nearest solution to existing working habits

Functioning:

The BALISEUR Lateral version is fixed to the left or right side of the vehicle equipped with sliding or roll-up doors. Cones laying forwards, retrieving backwards or forwards.

A camera fixed to the outside mirror increases the visibility of the traffic for the driver and the operator.

The operator remains inside the vehicle during the setting and retrieving.

The maximum speed in forward gear for cone laying is 20 km/h.

Installation:

- 1) Loading and discharging at the back of the vehicle, with a motorized system. The BALISEUR is put down on the road effortless.
- 2) The road workers prepare the BALISEUR on the road at the back of the vehicle, within the safety zone. They push it like a trolley to the lateral door and fix it to the vehicle.

The whole set-up takes 2 minutes.

Dimensions:

- Storing on the back of the vehicle: 0,80 x 0,85 cm (floor area).
- Weight: approx. 100 kg
- Weight of the electrical box and other mechanical parts : 30 kg
- Dim. deployed: L 2,2 m ; l 0,78 m

This configuration is currently in use in France and was awarded by Eiffage with the « Innovation Trophees » in 2016.

