

Ghost vehicles detection Project

Overview

Accidents caused by ghost vehicles, although few in number (merely 0.3% of total accidents in 2017), are often very serious (almost 14% of deadly accidents in 2017) and generally produce a strong media impact.

The responses to prevent such incidents are often insufficient.

To develop new ideas and experiments, one must rather look at the implementation of a warning system as quick as possible to warn car-drivers riding the right direction and facing such behavior.

The Ghost vehicle detection project which has been deployed on French motorway network of APRR and AREA concessionaires, aims to try to respond to that Issue.

Site description

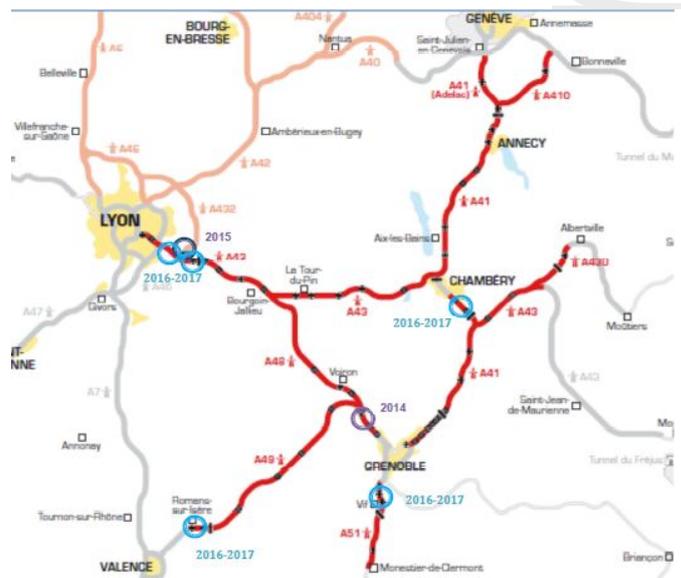
APRR group is a French motorway concessionaire, including a subsidiary motorway company (AREA) which operates around 430 km of motorway network between Lyon Region and the French Alps.

That network has a key role during winter holidays, with high peaks of traffic periods (January to April) serving the numerous ski resorts of French Alps.

During those periods, Area network has to manage high level of traffic with a lot of foreign motorists, difficult weather conditions and often, particularly on Week-ends, high volumes of congestion.

That networks also serves 5 urban areas (Lyon, Grenoble, Chambéry, Valence), whose toll plazas approach are particularly sensitive to ghost vehicle accidents.

The circles, on the map below, show the location of those toll plazas and sites to be equipped with the Ghost vehicle detection system.



Project Description

The motorway operator assessed that, facing that critical situation, it was necessary to try to alert immediately motorists in case of ghost vehicle presence.

To respond to that situation, it was decided to develop an integrated system able to:

- detect immediately with appropriate sensors the ghost vehicle
- transmit immediately to the Traffic Control Center that alert information
- display immediately on various medias that alert information (VMS, Radio 107,7 MHZ)

After preliminary accident data analysis, and preliminary experimental solutions, it was decided to deploy a full ITS system mixing Detection, Alert and information displaying.

The main developments and deployments are regarding the detection system of ghost vehicles. The choice of detection devices and solutions has been made after an experiment involving 5 equipments:

- Camera with automatic incident detection
- Thermal camera with automatic incident detection (AID) (truck detected by camera)
- Doppler sensor
- Micro-wave sensor
- Multi-sensors syst
- Inductive loops detection system detecting wrong way traffic by software extension

Due to their performance, three detection devices have been selected after experiment:

- Thermal camera automatic incident detection (AID)
- Micro-wave sensor
- Inductive loops detection system detecting, by software extension, wrong way traffic.

The project has been completed as foreseen, all devices and systems have been installed on the specific areas where ghost vehicles are frequently seen. Those devices and systems are on operation since beginning of 2017.

Results

The evaluation has been carried out since beginning of 2017.

For 18 months (1/01/2017 – 30/06/2018), the system helped to detect 20 confirmed ghost vehicles, so, an average number of 13.33 confirmed events per year. These events generated no accident.

In 2017, on the whole APRR network, 100 “ghost vehicle” events have been identified and confirmed; they led to 11 accidents, two of them fatal; these 11 ghost-vehicle accidents represent 11% of confirmed ghost vehicle.

At this stage, safety gains are already significant. Of course, these elements have to be confirmed on a longer period, to allow Before/After comparisons, made using actual and verified data.

However, they are very encouraging and prompt to continue to monitor it attentively through time. 21 additional sites have been equipped in 2018-2019 on the APRR network.

Member states involved

France

Implementation Schedule

Project design and deployment: from beginning of 2015 to end of 2017

Budget

Action promoter: APRR, French motorway operator, Member of ASFA (French motorways association)

Total project cost: 320 000 €

EU support: 36 000 €

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