

# Centrico BRIEFING NOTE

Using ITS to manage Europe's busiest roads



## Automatic Incident Detection and Fast Alert

### SUMMARY

CENTRICO partners have implemented various methods in order to improve driver safety, limit the risk of accidents and secondary accidents, improve traffic fluidity and better inform motorists of upcoming events. SAPN has recently tested various methods to reduce the delays in informing vehicles approaching traffic hazards. This innovative approach relies on the link between the Automatic Incident Detection system and various information media such as VMS, motorways traffic radio (107.7FM) and in-car SMS.

### INTRODUCTION

Like many road operators who are facing heavy traffic flows in the CENTRICO area, SAPN is particularly concerned with the problem of secondary accidents. The fast detection of incidents is one of the principal requirements for motorway managers to reduce the probability of such situations. The immediate detection and the localisation of an event not only enable more efficient reactions to the incident but also allow operator to warn approaching drivers in the very few seconds following the incident.

In order to ensure that drivers receive traffic or event information as quickly as possible, SAPN has developed an automatic link between the detection system and the subsystem that controls VMS signs. The TCC operator can later verify the actual traffic condition and eventually corrects the VMS messages. The project also considers interfacing the automatic coupling of AID with various information media such as VMS, motorways traffic radio (107.7FM) and alternative solutions such as in-car SMS.

### AUTOMATIC INCIDENT DETECTION

The solution imagined by SAPN requires a reliable Automatic Incident Detection (AID) system. The tests were carried out on the A13 motorway, at Guerville viaduct which comprises a strong gradient on a curve with no hard shoulder and which is particularly prone to accidents. SAPN was confronted with the constraints of covering significant lengths in

both directions with only one existing camera. The tests were carried out in two phases:

#### 1. AID ON FIXED CAMERA

The fixed camera was connected to a scene analysis system, able to detect decelerations, debris, slow-moving vehicles, stops during congestion, stops in fluid traffic, pedestrians, and contra-flows. The Results of this phase showed that the most unfavourable weather conditions for AID were rainy nights, strong sunlight and fast passing clouds which dazzle the camera. Moreover, the "contra-flow" detection function was proved to be sensitive to the shadows cast by trucks overtaking on the centre or left lanes.



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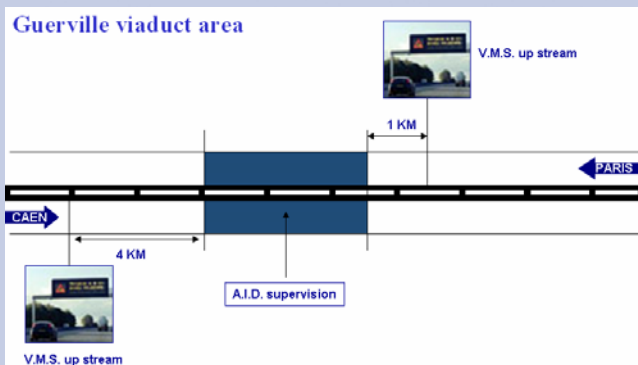


## 2. AID ON MOBILE CAMERA

Trials were also conducted on PTZ surveillance cameras. The size of the image was adjusted to correct the side effects due to the lack of precision when repositioning the cameras. The detection options were limited to decelerations, large debris (> 1 m<sup>2</sup>), stops in congestion, stops in fluid traffic, and pedestrians. This set-up revealed a worse level of detection and more false alarms, due to a lack of precision in repositioning cameras in pre-programmed position.

## DIVERS' FAST ALERT

Based on the previous results, SAPN decided to use the AID Video system on fixed cameras, which is monitoring both directions of traffic on the Guerville viaduct. At this stage, the rate of false alarms was limited to 8 %. The Guerville viaduct is framed in both directions by VMS, which are now automatically controlled in case of events.



The Fast Alert System processes the following operations:

- Upon detection of an incident, the AID analyser generates a video alert to SAPN Motorway Supervision System, specifying the location and direction of the event.
- It triggers a warning message on the appropriate VMS and informs the traffic control centre operators

The operators qualify the alert, which can be either:

- A false alert: the TCC operator declares the end of alert and removes the VMS posting after video check.
- A confirmed alert: TCC operator creates a daybook file or links the alert to an existing event daybook file, and activates required actions.



## EVALUATION

Thanks to this project, the average interval of time between the posting of a message on the VMS and the moment the AID detects an incident is less than 5 seconds. The first results showed that the rate of false alarms remained low (~10 %). Since its implementation, alert VMS messages have been typically activated more than once a day in both directions. The operating feedback is positive and the system is well accepted by TCC operators in Les Essarts.

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For further information on other CENTRICO activities visit:

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