

Wien 2004

Driver fast alert on the A13 motorway

Domitille NOURY (SAPN)



Drivers Fast Alert on the A13 motorway

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Context

SAPN : Paris-Normandy Motorway Company

- 367 km motorway network
- high traffic volume
- access to several urban areas and ports
- weekend destinations :
Deauville, Honfleur, ...,
from April to November
- regular traffic jams on
Sunday evenings



Context

- High traffic volume between Poissy and Mantes
 - AADT > 100 000 vehicles near Paris

To reinforce safety :

- Improvement of the substructure (joint , surface,...)
- Lighting of some zones
- Reduction of the authorized speeds
- Setting up of a reinforced human surveillance (patrols)
- Total video camera monitoring system on the entire section
- Means of communication

Needs :

- **Help for TIC operators for monitoring video screens and decreasing the time to detect events**

Automatic Incident Detection

Solution : a video A.I.D.

2 phases :

- Test of a video A.I.D.
- Use it to alert drivers more quickly

Constraints :

- To use the existing cameras
- To cover the 2 directions of circulation with 1 camera
- To cover significant lengths with video

Automatic Incident Detection

Experimentation (2001-2002)

2 parts :

- Phase 1 : A.I.D. installation on fixed camera – 1 month
- Phase 2 : Use of A.I.D. on mobile camera – 1 month

Test environment :

- 1 camera : monitoring of 2 directions
- Video mask : ~ 400 m
- Place : A13, viaduct of Guerville, 2x3 lanes without hard shoulder
 - Traffic : ADDT > 100 000 vehicles
 - Zone with strong geometric constraints (viaduct, curves, slope, short visibility)
 - Events more frequent than on the whole section
- System provider : CITILOG

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Automatic Incident Detection

Experimentation

A.I.D. area



Automatic Incident Detection

Experimentation – Phase 1

Parameters of detection :

- Deceleration
- Slow vehicle
- Stop in congestion
- Stop in fluid traffic
- Pedestrian
- Debris
- Contra-flow

Results :

- Most unfavourable weather conditions :
 - Rainy nights which dazzle camera
 - Strong sunlight and fast-passed clouds
- Contra-flow : sensitive to shadows thrown by trucks overtaking

Automatic Incident Detection

Experimentation – Phase 2

Modifications

- **Mobile camera**
- **Parameters of detection :**
 - Deceleration
 - Stop in congestion
 - Stop in fluid traffic
 - Pedestrian
 - Debris > 1m²
- **Mask : adjustment of the size to correct effect due to lack of precision when repositioning camera**



Automatic Incident Detection

Experimentation – Phase 2

Results :

- More false alarms, due to lack of precision from camera pre-programmed repositioning
- False alarms appear as soon as the operator moves the camera for visualisation need
- Good level of event detection
- Automatic relocating mask tests are not positive

SAPN choice after tests :

- Installation of A.I.D. on a fixed camera to supervise traffic on the Guerville viaduct in 2 directions
- Rate of false alarms limited to 8%, thanks to those tests

Fast Alert

SAPN Objectives (2003)

To alert drivers more quickly on accident-prone zones to avoid second accident

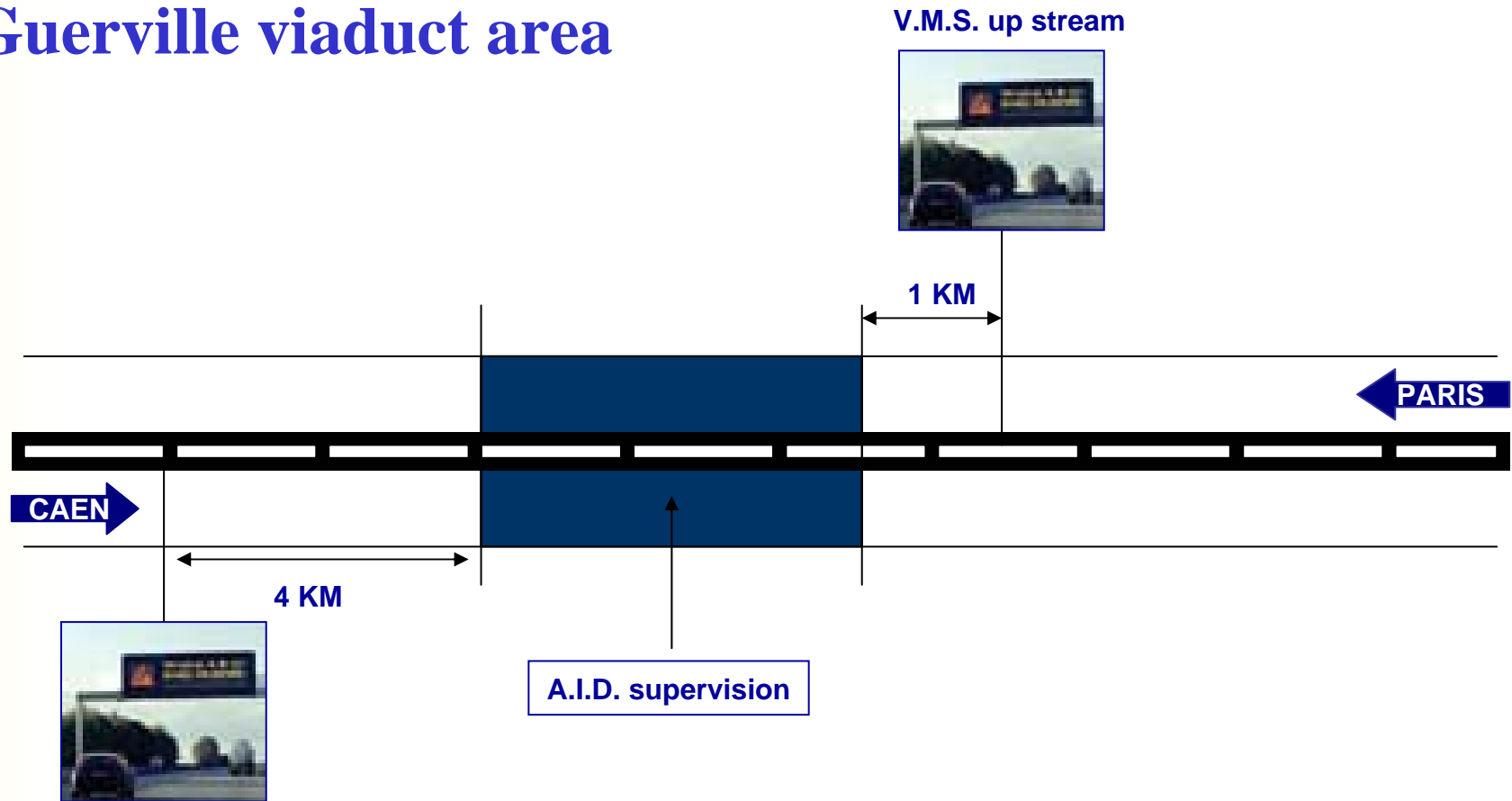
- Necessary to decrease the time between detection of event and dissemination of event information

SAPN idea : joining a very reliable video A.I.D. system to a V.M.S. information system

- Place : **Guerville Viaduct**
 - supervised by A.I.D.
 - 1 V.M.S. up stream, in both directions

Fast Alert

Guerville viaduct area



V.M.S. up stream



Fast Alert

Functionalities

- 1. To generate an alert**
 - A.I.D. analyser generates a video alert to SAPN Motorway Supervision System (distinguishing both directions)
- 2. To send a message on V.M.S. and inform operators**
 - SAPN Motorway Supervision System (directly connected to the V.M.S. controller) automatically enables a message on the correct V.M.S. and informs TIC operators
- 3. To display the message on the V.M.S.**

" TRAFFIC DISTURBED AT 4 KM, SLOW DOWN "



Fast Alert

Functionalities (2)

4. To qualify the alert

➤ **False alert :**

TIC operator enables the end of alert and removes the V.M.S. posting after video check

➤ **Real alert :**

TIC operator creates a daybook file or link the alert to an existing event daybook file

Results

- **Alert V.M.S. messages have been activated more than once a day in both directions**
- **Rate of false alarms remains low (~ 10%)**
- **Average message posting time on V.M.S. from detection is less than 5s.**
- **Positive return from TIC operators, bringing them invaluable help**

Conclusion

The objectives of the experiment have been all achieved :

- ✓ **Reliable**
- ✓ **Personalized**
- ✓ **Precise**

Drivers Fast Alert could be installed on other sites with other means of information (central dynamic panels).

Next Step

- **Analyse of Fast Alert effects on customers behaviour by installing an speed observatory**
- **Improvement of the system such as, for example, the opportunity to obtain types of events from the A.I.D. with precision and certainty which could allow to post even more precise messages on V.M.S.**

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Thank you for your attention !

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