



# ITS

## Integrating Video Surveillance



Plešivička 3,  
10431 Sveta Nedelja, Croatia  
tel: + 385 1 /3388 503  
fax: +385 1 /3388 566

Ltd.  
Design, Production, Installation and Maintenance of Intelligent Traffic  
Systems and Telecommunication Infrastructure

e-mail: [info@telefon-gradnja.hr](mailto:info@telefon-gradnja.hr)  
[www.telefon-gradnja.hr](http://www.telefon-gradnja.hr)  
Reg. no.: 3695174



## Integrating Video Surveillance

**Introduction:** Video surveillance (Closed Circuit Television – CCTV) is a mandatory system in all intelligent traffic control systems. Even though today's highways are equipped with variety of high-tech sensors that superbly depict current traffic situations at any given time, a picture from a live video feed is, after all, worth a thousand words.

CCTV System consists of several parts. Cameras alongside highways and tunnels, and monitors or video-walls inside the command center are the fundamental parts of the system. The CCTV System is more complex the more cameras are used. Part of the complexity is the function to show feeds from any camera on any monitors or video-wall. Another part of the CCTV System is a Camera Remote Control System (CRCS), which enables the user to zoom in, zoom out or rotate cameras. Camera manipulation is feasible through a specialized keyboard and joystick at the command center.

Often times there are more cameras on the road than monitors available at the command center. In those situations an operator needs assistance of Video Detection System (VDS) to keep checking the entire traffic area uninterruptedly.

Video Detection System (VDS) has the capability to analyze video snapshots and detect possible irregularities or critical situation in traffic flow. Most common VDS analysis algorithms are: vehicle

detection, vehicle driving the wrong way, speed and size of the vehicle, stopped vehicle, smoke, fire, etc.

Integrating the VDS with CRCS could be of great assistance to the operator. VDS points out the camera feed where the alarm came from, and the operator can switch the feeds to the appropriate monitors, focusing all of the attention to only the alarmed area out of hundreds of live camera feeds.

The question is – is that enough? Does this integration mentioned above give us enough data to act promptly and keep the roads safe enough? Most of the operators will answer "no" to that question. The complaint is, most of the cameras show similar environment with not enough characteristic details to recognize on which kilometer of the highway the accident happened at. Telefon-Gradnja's **topXview** offers the technological solution to that problem as well.

## **Operating the Video System**

Operating Video System is easy because it is integrated, together with all other implemented systems, in one graphical user interface (GUI). Just like for other systems, GUI follows easy-to-use, intuitive way to navigate through Video System eliminating confusion, elaborative operator procedures, search for the correct system keyboard, etc.

Centralized control allows the operator to select desired camera feed on GUI. The position of the camera on GUI is arranged precisely to reflect its actual location on the road (Figure 1). It is also possible to show different video-wall feed layouts.

**Picture 1:**  
**CCTV**  
**integration in**  
**topXview™**  
**program**  
**system**

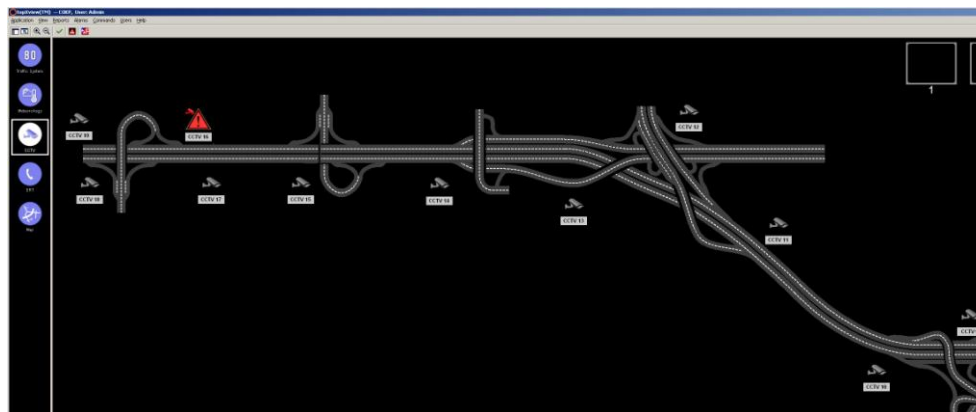


Picture 1: CCTV integration in topXview™ program system

**Integrating**  
**the AID**  
**System**

Integrating the Automatic Incident Detection (AID) System in Central Operating System gives room to implement automatic procedures, and allows the operator to quickly become aware of the precise accident location (Figure 2). It is of great help and importance for an operator to be able to locate the alarm/accident and, at the same time, see the video feed from the camera at that very location.

**Picture 2:**  
**Integration of**  
**AID system in**  
**topXview™**  
**program**  
**system**



Picture 2: Integration of AID system in topXview™ program system

When integrating AID system in Central Operating System, it is important to know that AID is not totally reliable. One should not rely solely on data from AID before employing completely automatic

procedures. To circumvent the drawback of AID, it is of great importance the system interacts with the operator (Figure 3 = diagram 1)

AID detects smoke inside the tunnel and triggers the alarm. This starts the automatic procedure for closing the tunnel in case of fire. However, the reliability of this alarm is too small to allow such an immense action. The following steps should precede the tunnel closing algorithm:

- after receiving the alarm show the video feed from the camera detecting the smoke
- automatic procedure must offer the operator to confirm or cancel the alarm
- based on operator's decision, the automatic procedure is started, or the system returns to normal operation mode

**Diagram 1:  
Reaction of  
automatic  
process on  
AID alarm**

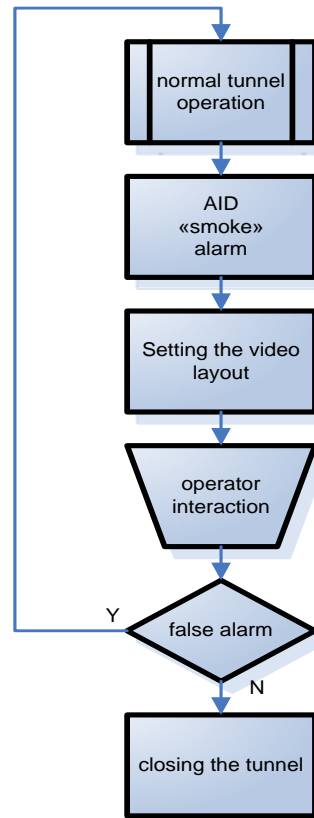


Diagram 1: Reaction of automatic process on AID alarm

The steps described above will ensure the shortest response time, the simplest interaction and no traffic interruption in case of a false alarm. The fire alarm response time described above is even shorter (by a few minutes) than the response time of a completely automated reaction received from the fire alarm station/fire department.

**Ergonomic  
Integration**

Showing video feed on Central Operating System GUI has a great advantage. The operator's focus is drawn directly to the segment of the road the video feed is coming from and can immediately see what kind of traffic control equipment is available at that location. It is important to point out that the number of simultaneous video



