Deploying a state of the art Automatic Incident Detection system to favor clean modes of transportation

Tunel Charitas Cafuba – NitTrans – Niterói, State of Rio de Janeiro, Brazil

Mission

With the opening of the tunnel Charitas-Cafuba in 2017, "Oceanic Region" and "Southern Area" got much closer. Almost 2 years after the beginning of the digging, the tunnel now links Charitas and Cafuba neighborhoods enabling circulation in both ways.

NitTrans (Niterói Transporte e Trânsito) is responsible for planning and managing the transport and traffic system of Niteroi according to the public policy voted by the municipal government.

Its mission is to modernize the road network enabling Niteroi citizens to move faster, safer, in a greener way and with an equal access for all neighborhoods.

In order to achieve these ambitious goals, NitTrans needed a system to assure mobility and security in the Charitas-Cafuba tunnel as it is a very sensitive and unusual infrastructure.

There are two tubes with each 2 traffic lanes: one for cars and trucks and the other one for buses and bicycles. Indeed, one of the goals of this project was to favor using public transport and clean modes of transportation.

Mixed modes of transportation in neighboring traffic lanes made the operation of the tunnel and more complex and for that reason NitTrans needed a very reliable safety system.

Solution

The core of the solution is the Automatic Incident Detection that detects incidents and accidents inside and outside the tunnel.

In order to ensure an efficient deployment and an easier maintenance of the system, NitTrans chose an edge-based video detection system, i.e. a system embedded in the video surveillance cameras. Axis and Citilog offer a global solution using Axis cameras

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and hosting Citilog's SmartTraffic-AID application.

40 Axis P1365-E cameras are deployed in the Charitas tunnel.

The SmartTraffic-AID application automatically monitors the traffic and detects events such as stopped vehicles, wrong way vehicles or traffic congestion. The system also collects traffic data across the entire tunnel infrastructure.

Events are signaled to the traffic operator at the Nitrans operation center who can then investigate using the video surveillance cameras and the recordings of the incident. They then take action based on their assessment of the issue: sending a highway patrol, the police, an emergency crew…

Results

Bruno Amaral, Road Infrastructure manager in NitTrans, explains:

"From the minor engine break to the fire inside the tunnel, every events impacting traffic into the tunnel can provoke dramatic consequences.

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After a year of operation, more than 10 million of vehicles have travelled the tunnel Charitas-Cafuba.

It now takes about 2 minutes to cover this 1,350 meter long tunnel (at the maximum speed allowed, that is to say 80km/h for cars and 60km/h for buses and trucks).

With an average of 40,000 vehicles per day, the prefecture declared that this tunnel has changed all the local transport dynamic as it is not necessary to pass through "Largo da Batalha" anymore in order to

reach the "Oceanic Region". What used to be a 1-hour drive at rush-hour is now a 20 minutes trip.

Nitrans operation center

Automatic Incident Detection GUI

2 traffic lanes on the right

1 bus & bicycle lane on the left

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