

Safer motorway rest areas with IoT technology: The Autostrada del Brennero case

Autostrada del Brennero S.p.A. is the management company of the A22 motorway, one of the main axes of the Italian motorway network which connects the Po Valley and the A1 motorway with Austria and Germany. The Company, which actively participates in numerous European projects aimed at experimenting with increasingly automated and autonomous driving and more efficient heavy transport management, is among the most advanced in terms of safety and the environment.



1 CHALLENGE

From the analysis of the data provided by the motorway radio rooms, arise that the overcrowding of service areas is a serious and shared problem, which goes well beyond the difficulties of accessing and managing spaces. More often than one might think, congestions in the area put the motorist in a position to risk dangerous maneuvers for himself and for others; the danger is obviously aggravated if heavy vehicles are involved. There are frequent cases of trucks that, having taken the entrance ramp to the parking area, are forced to have to go out in reverse due to jams; other times, even if they manage to access, they are unable to stop and try to reach the exits but find them blocked by other vehicles. At this point they try to return to the highway in the wrong direction, directly from the entrance track, and then make very dangerous maneuvers to take the right direction on the roadway.

Some motorways have already tried to remedy this problem by equipping themselves with deterrent systems which, however, have not given the desired effects as the deterrent effect only occurs once the dangerous maneuvers have already begun.

2 SOLUTION

For this situation we have developed the StArS (Stop Area Safety) system: a network of easy-to-install IoT sensors that continuously and automatically detect the occupation of critical spaces and/or the overcrowding of parking areas and immediately alert the radio control room when it registers the situation of maximum or dangerous occupancy thus allowing the intervention of the Traffic Police or the personnel in charge.



Figure 1 example of IoT sensors used in the project

Furthermore, thanks to the interaction with the video surveillance systems present in the radio rooms, it is possible to immediately activate the positioning of any video surveillance cameras in order to allow the operators of the radio room to personally verify the different situations.

The alert is also sent to commercial users, via the available communication channels (variable message panels, radio channels, applications for mobile devices, the internet), thus making them aware of the crowding situation and preventing them from entering these areas.

Furthermore, by reducing non-essential interventions, there will be significant improvements in personnel and cost management. The sensors used can also be used to count the vehicles in transit at a given point, with the consequent improvement in the efficiency of some management processes.

The approach therefore is to prevent the problem and not to remedy dangerous situations that have already arisen.

3 CONCLUSION

The proposed solution has been designed and developed to measure for motorway rest areas: the extremely simple and fast installation does not require major infrastructural works or the presence of electricity on site; the sensors (battery powered) last up to 8 years and do not require maintenance. StArS is an intelligent and extremely customer-friendly solution, born from listening to the customer and from the study of competent technicians; it is recognized as a reliable and innovative solution by Autostrada del Brennero, one of the most technologically advanced motorway management companies in Europe. For years now, we have been supplying and developing ad hoc systems for multiple applications, including the complete management of the motorway radio room.