



Advanced Highway Patrol Vehicles with Live Video Streaming and GPS Tracking

Introduction

The Highway Patrol Vehicle (HPV) is a customized, fully equipped, robust vehicle, outfitted with specialized surveillance, communication & monitoring equipment for emergency response on highways. These first responder vehicles are designed for patrolling and preventing crime on highways. They provide an enhanced sense of safety and security to highway Commuters by ensuring smooth traffic flow and managing any impediments due to accidents or other crimes.

This case study showcases Mistral's expertise in design, integration, and commissioning of advanced highway surveillance and patrol vehicles, that features sophisticated monitoring, control and communication systems.



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The Customer

The HPV is designed for Karnataka State Police who were keen on inducting these patrol vehicles with modern highway surveillance and monitoring systems to their fleet.

The Requirement

Karnataka State Police under the directive of the Hon'ble Supreme Court had approached the industry for solutions to enhance road safety and reduce accidents on the highway. Mistral was awarded the contract to design and integrate a modern surveillance system into an SUV platform for 24x7 patrolling of highways and smooth traffic management. The vehicle had to have the below-mentioned equipment to ensure that traffic discipline is maintained, and valuable lives are saved in case of any emergencies.

Requirements of customer:

- ▶ Public Address System
- ▶ Search/Emergency Light
- ▶ Pan-tilt Zoom Surveillance Cameras
- ▶ Network Video Recorders and Communication Console
- ▶ Central Monitoring Station
- ▶ Alcohol Breath Analysers
- ▶ UPS Power Supply
- ▶ GPS Tracking & 4G based Video transmission
- ▶ Rescue tools – Crowbar, Axe, Snatchstrap

Solution Provided

Mistral designed and integrated HPV with special-purpose equipment and custom-made components such as PTZ surveillance camera, Top-Bar LED light, Pan-Tilt searchlights, etc for patrolling and monitoring the traffic on Highways. The HPV was based on a newly launched Toyota Innova CRYSTA which was supplied by the Karnataka State Police Department.

Below listed are the details of equipment integrated into HPV:

1. Surveillance

- a. Custom-designed PTZ Camera – A 30X Pan-Tilt-Zoom Surveillance camera to provide a panoramic/long-range view of the traffic, even during critical conditions. It allows remote adjustment of the camera to pan, tilt and zoom into objects with the high-resolution video quality.
- b. Fixed Camera – A 1/2.8" CMOS, full HD camera is fitted on the rear side of the vehicle.
- c. Advanced Video Analytics (at Control Rooms) – To enable traffic enforcement, various customer-centric analytics like ANPR, Speed Monitoring, Triple Riding, Helmet detection, etc. have been enabled at the central control room effective traffic and safety management.

2. Monitoring & GPS Tracking

- a. Real-time Positioning
- b. Geo-Fencing
- c. Tracking of HPVs
- d. Live Video Feed Monitoring from Central Command centre, & designating officers through their mobile devices

3. Command & Dispatch – An IP based Command & Dispatch communication system is provisioned inside the Vehicle enabling Control Room operators to communicate with the police personnel in HPV and vice versa.

4. Statistics & Reports – Malfunction, Alarm, Business & Illegal reports, Device Logs, Operation Logs.

5. Vehicle CAN data – The VMS software provided by Mistral allows the officers in Command Control Room to access the CAN data like speed, remote start and stop in case of emergency, fuel level, etc of the vehicle for remote monitoring and decision making.

6. Public Addressal and Traffic Management

- a. PA System
- b. Expandable Reflective Traffic Delineators / Barricades

7. Rescue & Emergency response

- a. Rescue Tools (Snatch Strap, Foldable Saw, Crowbar)
- b. First Aid, Stretcher

8. Managing Traffic Violations

- a. Breath Analyser
- b. Speed Gun, ANPR

The vehicle helps in:

- ▶ Traffic management
- ▶ First Responder during Accidents
- ▶ Emergency Response
- ▶ Highway Robbery Response and Patrolling
- ▶ Maintain Law & Order on Highways.

The Challenges

- ▶ The selected vehicle was a ready-made platform and hence mounting the surveillance payload and cable tunnelling without impacting the interior electrical system of the vehicle was a challenge. Mistral achieved this by analysing the interior design and identifying the optimal path for cabling beneath the roof with minimal interference to the existing aesthetics and electrical system of the vehicle. This also ensured that Vehicle OEM Warranty was not annulled.
- ▶ Ensuring that all the electrical equipment fitted into the vehicle works smoothly without getting damaged or dismantled when the vehicle travels on bumpy/marshy roads at high-speed was a challenge. Mistral addressed this by using high-quality shock mounts and rugged panels to ensure that the electrical equipment would not be impacted by this and perform as expected ensuring a highly reliable system that operates seamlessly 24/7.

Customer Benefits

- ▶ Mistral was a one-stop integrator who took the complete ownership of executing the turnkey project and delivering multiple units of the product.
- ▶ The officers from the Command Control room can view the live video streaming of the HPVs and monitor the highway traffic, manage and control the law and order on the highways, delegate specific area officers through their mobile devices for preventing road mishaps and supervise the traffic flow.



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