

# USE CASE

# ROAD TRAFFIC MONITORING

## A busy roundabout in Lyon with Safe-T



**180**  
minutes  
flight



**5**  
defined  
gates



**7826**  
vehicles  
detected

## Lyon & Traffic Growth

The Automobile has become the most common way of transportation in urban areas across more than 30 million km of worldwide road network. Indeed, vehicle traffic congestion and monitoring has become one of the most critical issues in road transport and haulage.

Located in the Auvergne-Rhône-Alpes region in France, the city of Lyon is at crossroads between Paris and the second biggest French city of Marseille. With more than 2 million inhabitants, the metropolitan area of Lyon is the second largest behind the French capital. Swiss and Italy borders nearly located, Lyon is definitively a major junction of traffic in France. In fact, Lyon and its suburb neighbour city Villeurbanne are the French most densely populated provincial cities, after Paris metro area. In this way, suburb areas in Lyon counts for a lot and it steadily keeps the traffic growing.

Economically, Lyon is a major centre for banking and for the pharmaceutical, chemical and biotech industries. Today, the city attracts more people and its trading keeps expanding, which raises even more serious and essential concerns regarding Lyon's roads surveillance. In fact, roundabouts represent nowadays complex and costly junctions to monitor as it requires smarter counting systems. Furthermore, it remains tricky for authorities today to deploy static sensors in urban areas without high costs and constraints on implementation and human resources.



## The Solution



Tethered drone with the Elistair Safe-T station

Elistair provides tethered drone solutions offering continuous and real-time aerial video fully adapted for road traffic monitoring. As Lyon's suburb concentrates much of the road traffic, Elistair conducted during rush-hour time road traffic measurement sessions located at a busy roundabout employing a civilian drone attached to the Safe-T tethered station.

The roundabout location has been especially chosen as it seriously meets criteria raised around vehicle monitoring stakes. Linking Lyon's North main high way, this roundabout strategically serves the local commercial zone and it also permits to reach Lyon's major ring roads. In traffic monitoring, roundabouts represent complex junctions because they concentrate high-speed output and include all range of vehicles from motorbikes to wide load trucks.



**Unlimited valuable data**

The drone can collect traffic data for hours, in fact days if necessary.



**Wide coverage & discrete operation**

Strategically placed ahead of the traffic, the video frame covers largely the zone of interest. In this way, the system remains non intrusive.



**Quick deployment**

The system is easy and fast to deploy, both on setting up and repacking.



Transportation sector is responsible of 130.5 million tons of CO2 equivalent, which represents 29.6% of the total French greenhouse gas emission. In 2014, 94.7% of greenhouse gas emission came from road transport."

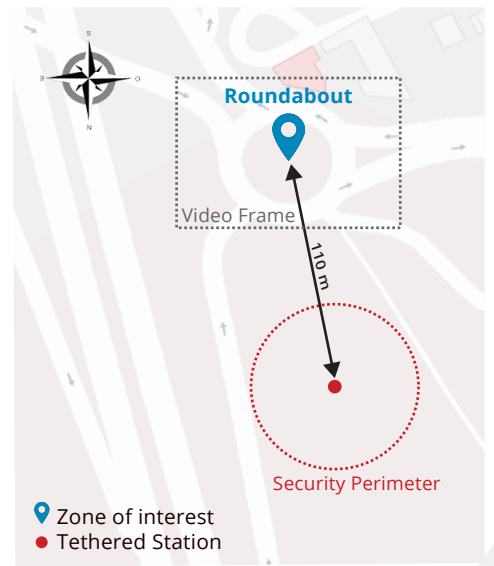
Road Transportation in France, French Minister of Energy.

# The Operation

Embarking video camera equipment, the hexacopter drone is tethered to the Elistair Safe-T station which constitutes the complete operational system. The drone performed a 3 hour non-intrusive static flight positioned at a strategic observatory ahead of the traffic. In this configuration, the system is able to ensure continuous monitoring up to 70m high. For security, a 50m radius zone is demarcated under the drone to keep clear of populated areas and prevent any danger.

Depending on the nature of the mission, it is possible to customize the tethered drone with different types of video cameras and equipment. In this traffic monitoring operation, a standard digital Sony PJ 810 Full HD video handy-cam has been used at zoom x3 which truly shows the simplicity of the set-up in this application. There is no necessarily need for expensive video equipment or any additional sensor to ensure long vehicle traffic monitoring.

The system is easy to deploy and safe on the field thanks to the micro-tethered Kevlar cable. To control precisely the setting of the camera in the air when flying, the real-time video is a safe bet as data transfer is securely made through the micro-tethered cable and directly visible on the real-time video display.



# The Result

Elistair partnered with DataFromSky who provides advanced tools for traffic flow in road analysis by directly processing video recordings. The process is easy: record, upload and download. After processing the video, data matrices are obtained providing precise speeds, accelerations and trajectories of all the vehicles detected on screen. It also provides the categorization and the total number of vehicles circulating throughout the defined roundabout gates.

- Total number of vehicles: **7826**
- Average speed: **33 km/h**
- Number of defined gates: **5**
- Duration: **3 hours**

	Gate 34	Gate 36	Gate 38	Gate 35	Gate 37
Min speed [km/h]	1.89	4.26	2.18	13.71	7.59
Max speed [km/h]	27.95	61.68	50.75	55.79	64.08
Average speed [km/h]	9.75	34.99	27.59	34.91	38.06
Number of cars	176	1516	1638	1760	1563
Number of medium vehicles	28	136	187	210	136
Number of heavy vehicles	19	21	67	96	31
Number of buses	0	9	5	5	11
Number of motorcycles	0	48	58	57	49
Number of bikes	0	0	0	0	0
Number of pedestrians	0	0	0	0	0
Number of all vehicles	223	1730	1955	2128	1790

**Statistics** | Turning movements - summary | Turning movements - Car | Turning movements - Medium Vehi | Turnin ...

This result shows how easy and accessible it is to create a robust solution for handling traffic analysis. Aerial monitoring surpasses traditional methods of traffic data collection due to its mobility and ability to cover broad areas. It permits to deploy a single tethered UAV for counting roundabouts but also other type of intersections and gates. The tethered station permits to benefit fully from a stable and continual aerial eyesight. Measuring speed, vehicle gap and acceleration, the traffic analysis software processes road volume data by classifying all road users. In this way, the Elistair tethered drone system permits fast-acting deployment to securely handle robust traffic monitoring.

# Safe-T



SMART TETHERING STATION FOR DRONES  
TRULY SMART, SIMPLY POWERFUL

To learn more about the Safe-T, click [here](http://elistair.com/safe-t-tethered-drone-station/) or go to <http://elistair.com/safe-t-tethered-drone-station/>

Get your free voucher with the Safe-T for up to 100 km of traffic analysis trajectories with our partner DataFromSky

