

Case Study

Compact Monitoring System Facilitates Mobile Air Quality Study on Major European Highways

True mobility allows monitoring of multiple locations whilst remaining cost effective



Project

Egnatia Odos S.A.

Location

Greece

Date

2012 - 2013

Services

2 x AQM60 outdoor air quality stations

Measurements

NO₂, NO_x, CO, PM₁, PM_{2.5}, PM₁₀, TSP

Sector

Construction



The customer

Egnatia Odos S.A. is the company ensuring the construction, maintenance and operation of the Egnatia motorway, one of the major road construction projects carried out in Greece and, one of the largest in Europe. It constitutes one of the 14 TENT (Transportation European Network) priority projects and is co-funded by the European Union. It is a 670 km modern motorway which is the communication link spanning Northern Greece from its western to its eastern border. The origins of the Egnatia motorway trace back to the Via Egnatia built by the Romans between 146 and 120 BC to connect Europe. Today it continues to be vital infrastructure driving economic development in Greece as well as between Western and Eastern Europe.

Mobility is a key to quality of life and vital for competitiveness in the European Union. However, transport emissions

and pollutants in European highways threaten human health and the natural environment, negatively affecting local environmental quality and making a significant and growing contribution to climate change.

The Egnatia Motorway is one of the first large-scale public works to apply a system of environmental management, that is, a method of organising and implementing environmental protection measures in the design, construction, operation, and maintenance stages of the project.



Through the “Environmental Highway Observatory E-HIGHWAY” project, within the framework of “Greece – The former Yugoslav Republic of Macedonia IPA cross border programme 2007-2013,” Egnatia Odos S.A. aimed to support better operational management of the highway and the protection of natural environment by establishing environmental monitoring and early warning systems (air/water/noise pollution).

The problem

The challenge faced by the project was how to establish effective air, water and noise monitoring along the Egnatia motorway and its vertical axes, without incurring a level of cost that would compromise the viability of the project.

In addition, Egnatia Odos S.A. is primarily responsible for construction, maintenance and operation of the motorway, without calibration and maintenance facilities or expertise necessary to support reference monitoring equipment. The mobility and small size of the system was also a factor – this would allow a greater range of sites to be selected as well as the ability to easily move the units from one place to another without the need for expensive site works and construction approvals.

The solution

Following an open tendering procedure, Egnatia Odos S.A. purchased two AQM60 compact air quality monitoring stations and worked with Aeroqual’s local partner, ScientAct S.A. to design and deliver an effective solution.



One of the AQM60 stations is housed within a vehicle along with calibrator, gas cylinders and a telemetry system which delivers data back to the control centre. The mobile unit conducts studies in multiple locations along the highway. The other AQM60 is deployed semi-permanently and is used to study air quality in each location over a period of 15 days. In locations where the mobile system identifies high variations or patterns which require deeper investigation, the second AQM60 is deployed for periods up to several months.

Both stations are configured to measure gaseous and aerosol air pollutants including nitrogen dioxide (NO_2), oxides of nitrogen (NO_x), carbon monoxide (CO), and particulate matter fractions of PM_{10} , $\text{PM}_{2.5}$, PM_1 and total suspended particulates (TSP).

The data is gathered and processed by Egnatia Odos S.A. in collaboration with the Aristotle University of Thessaloniki, which also participates as a partner in the E-HIGHWAY project.



Evaluation

After several months of operation Egnatia Odos S.A. is building up a rich and detailed understanding of air quality along the transport corridor.

The AQM60 offers a real-time air quality monitoring platform that is truly mobile, stable and accurate. The customer finds the equipment easy to use and calibrate. Overall they are extremely satisfied with the ratio of performance and cost.