



# LIFE+ INTEGRREEN

## Integration of Traffic and Environmental data for improving Green Policies in the city of Bolzano

*Project LIFE+ 10 ENV/IT/000389 implemented with the financial support of the European Community*



Città di Bolzano  
Stadt Bozen



## Layman's Report

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### THE ENVIRONMENTAL PROBLEM TARGETED

The project has dealt with the issue related to the air pollution levels and the greenhouse gases emissions produced by urban traffic in the city of Bolzano.



**Figure 1: A top view of the city of Bolzano.**

Under certain unfavorable meteorological conditions, the orographic characteristics of the city facilitate the accumulation of air pollutants over the city. These pollutants are produced by several emissions sources (in particular traffic, domestic heating systems and factories) and can have negative externalities on the urban environment as well on the health of local citizens.

The most relevant concern is related to the high values of nitrogen dioxide (NO<sub>2</sub>). In the past year, the annual average has in fact exceeded the limit of 40 µg/m<sup>3</sup> set by law. This pollutant is responsible for several illnesses of the breathing apparatus, such as asthma and chronic cough. It has been estimated that about 60% of NO<sub>2</sub> emissions is caused by urban and highway traffic. Another important challenge is related to the need to reduce the local contribution of greenhouse gases emissions, in particular of CO<sub>2</sub>, which are responsible of the global climate changes. In this case, the contribution associated to freight and passenger transport is less relevant but not negligible, and originally estimated in the order of 30%.

## THE OBJECTIVES OF THE INTEGREEN PROJECT

In the past, most of the cities have tried to address such environmental problems with drastic and often unpopular solutions, like the policy of the alternate number plates or even worse the prohibition of the circulation of motorized vehicles. In order to target traffic needs, the traditional approach has always been to build new road infrastructure: typically very expensive and with non-immediate effects.

Through the INTEGREEN project, carried out by the Municipality of Bolzano in strict cooperation with TIS innovation park and the Austrian research center Austrian Institute of Technology (AIT), the objective has been to demonstrate that these environmental problems can be prevented and more efficiently managed by simply governing traffic and more generally mobility in a different way, with the intention to maximize the capacity of the available road transportation network.

The INTEGREEN in numbers	
Total budget	€ 1.344.069,00
Contribution of the LIFE Programme of the European Commission	€ 614.610,00
Duration	42 months
Number of people involved in the project	30
Local companies involved	6
Number of technical outputs produced	22

## THE TECHNICAL SOLUTIONS IMPLEMENTED

In order to understand how it is possible to change the urban traffic system, it is necessary to analyze it in a very detailed way. For this reason, a new system has been developed which has the capability to measure accurately both traffic and air pollution conditions in the city. Moreover, through automatic elaborations it is possible to have, on a real-time basis, an overall and quantitative overview of what's happening in this respect.

All available information (including those put at disposal by the official air quality stations managed by the Local Agency for the Environment of the Autonomous Province of Bolzano) have been integrated, and new measurement systems with a high experimental and innovative character have been introduced.

In Siemens - and Roma Street two new air pollution measurement stations have been installed, and coupled to traffic detectors. These integrated stations allow today to make very detailed correlation analysis between traffic and air pollution conditions.



Figure 2: The new air quality measurement station in Siemens Street.



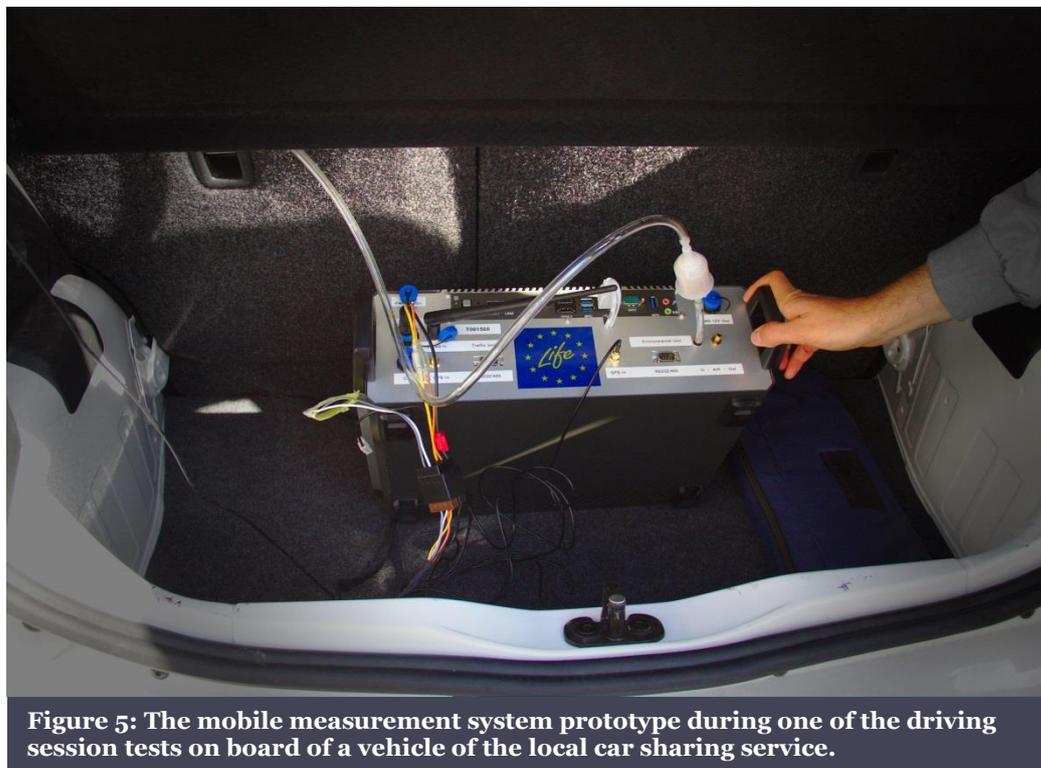
Figure 3: The new air quality measurement station in Roma Street.



**Figure 4:** One of the Bluetooth detectors installed in the city of Bolzano.

An innovative system for the measurement of the vehicular travel times has been installed on the major streets of the city. It is a very low cost system, which is based on the anonymous detection of the Bluetooth devices on board of the transit vehicles. This information has revealed to be very important during the joint assessment of the situations of traffic and air pollution.

Moreover, a system for the mobile measurement of traffic and air pollution on the local roads of the city has been developed. Since October 2014 a prototype of this unit is installed on one of the public transportation vehicles of SASA. In this way, it has been possible to collect a completely unique dataset for better understanding these phenomena.



**Figure 5:** The mobile measurement system prototype during one of the driving session tests on board of a vehicle of the local car sharing service.

All this data is collected and automatically elaborated in a central data base management system, and are displayed to the technical staff of the Municipality of Bolzano through a proper interactive control panel. In this way, the different traffic and air pollution conditions can be evaluated in an analytic form, and efficient measures can be introduced in order to prevent air pollution peaks caused by urban traffic.



## THE RESULTS

Through a detailed analysis of all the data that is today available, in particular related to critical situations like the days with bad weather or peaks of tourists arrival in the city, it has been possible to define the amount of emissions that is possible to reduce through proper traffic management strategies.

Through a more efficient management of traffic and mobility demand, the reduction of emissions can be even more than 30%. During the implementation of the project, first tests of eco-friendly policies have been carried out, and the INTEGREEN system has been used in order to evaluate its environmental performance. The introduction of speed enforcement detectors has been the action that has given the more evident impact, in particular immediately after their installation: the emission gain has been estimated in the order of 10%. Other tests covering the change of the cycles of the traffic lights and the launch of a new set of advanced informative services for the local travelers have shown at present a less evident impact. On the other side, these actions have revealed to be very important in order to guarantee the stability of traffic conditions and reduce the formation of localized air pollution peaks.



Figure 7: A typical situation of traffic jam during bad weather conditions.

## THE IMPORTANCE OF THE USERS' INVOLVEMENT

In general, the most promising way to reduce the emissions generated by urban traffic is to induce people to choose sustainable transport means, or if this is not possible to decide the best route and the best timing to carry out a motorized trip. A lot has been already accomplished in the past years, thanks in particular to intense awareness-raising campaigns and structural works such as new sidewalks and cycling paths aiming at promoting walking and cycling.

According to recent surveys carried out by the Municipality of Bolzano, from 2009 to 2012 the share of motorized travels during working days has decreased from 34% to 30%, and trend is continuously decreasing.

In order to further promote sustainable mobility habits of local citizens, in particular during critical situations, the project has put at disposal of everybody, for free, two new applications.

**BZBus.** The application is accessible at the link <http://bus.bz.it> and allows to know the real-time positions of the buses of SASA. In this way, taking a bus has become a more comfortable and quicker option to be considered.

**BZTraffic.** The application is accessible at the link <http://traffic.bz.it> and allows to know on a real-time basis the vehicular travel times on the most important streets of the city. Not only: the current trend is compared with the historical one, and times are put in relationship with what one could experience by bicycle. A simple way to demonstrate that very often there is no advantage to move by car in the city.

These two applications are completed by a third one, that has been launched in the scope of the complementary project "Bolzano Traffic", supported by the European Regional Development (ERDF):

**BZParking.** The application is accessible at the link <http://parking.bz.it> and allows to know the current and predicted conditions of the parking areas in the city. A service which can be particularly useful for tourists, who may want to know in advance if they will find a parking slot in one of the parking areas of the historical city centre.



A collaborative process of transformation of the urban mobility has been started, involving in particular **local students**. It is essential to create a new responsible and aware mobility culture, in particular in the tomorrow's main actors.

During large-scale public events, the project has also tried to transfer to the local population concepts which are not very widespread, such as **eco-driving**. One of the simplest way to not pollute and save fuel is in fact to follow the recommendation of the on-board systems that are today more and more common in new cars, such as when to shift gear or which cruise speed one should follow.



Figure 8: A n awareness-raising initiative on the concept of “eco-driving” during the Innovation Festival 2012.

## THE FUTURE PERSPECTIVES

The project has created a milestone in the local comprehension of the correlation phenomena between traffic and air pollution. This enhanced knowledge will be in the future further extended thanks to new monitoring stations, and will allow the development of new and more efficient measures, such as:

1. the dynamic change of traffic lights' cycles as a function of the current traffic, air pollution and meteorological conditions;
2. the improvement and the extension of the traveler information services;
3. the definition of dynamic policies for the management of heavy transit vehicles through the city.



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