



Project INTEGREEN

Integration of traffic and environmental data for improving green policies in the city of Bolzano



air pollution

integrated mobility

sustainable mobility

land use planning

PROJECT DESCRIPTION

Bolzano, because of its orographic and territorial characteristics, suffers much the problems of traffic, air pollution and consequent high rate of greenhouse gas emissions. These problems are further amplified also by the city's geographic position located in a basin where most of the pollutants emitted tend to remain concentrated, and by its proximity to the corridor of the Berlin-Palermo trans-European transport network (TEN-T 1) route exposed to high transit flows of goods that cross the Brenner Pass. The **Integreen** project, fully in line with the strategic guidelines of the Municipality of Bolzano^[1] for the reduction of air pollution and vehicular traffic, was designed precisely **to deal with these problems in a systemic and multidisciplinary manner** through the innovative use of ICT technologies applied to mobility and transport (intelligent transport systems - ITS) combined with a wide-ranging action to **raise awareness among citizens and local actors**.



OBJECTIVES

The main objective of Integreen was to **test an integrated system of traffic monitoring correlated with environmental parameters**, aimed at reducing emissions **without compromising mobility** and able to provide the public authorities of Bolzano with **combined information on traffic and environment**.

The testing of the monitoring system was made through the integration of **fixed detection stations and mobile probes** that allowed to **detect in real time** different criticalities and **indicate the traffic conditions**, such as the presence of traffic jams and **local peaks of air pollution**. This innovative approach allowed to respond dynamically to the problems detected by:

- **eco-friendly systems** of traffic control measures, such as use of instruments for changing traffic lights cycles and speed limits;
- **innovative solutions** for addressing and centrally piloting the movements of local travelers through the use of different info-mobility channels, such as: variable message signs (VMS), web portals, smartphone applications, etc.

Integreen gave also great importance to **outreach and environmental education activities** among the beneficiaries of the interventions with the aim of promoting in them the awareness that **certain mobility choices have an environmental impact** and therefore the active involvement of everyone is essential to determine and ensure the optimal achievement of traffic and pollution reduction.

Furthermore, the project, transposing the provisions of the Directive 2008/50/ EC, also wanted to contribute to the updating of the existing Community policies, with the promotion of new integrated approaches for the combined management of traffic and air pollution in urban environments.



[1] The city administration for many years has been developing integrated strategies to promote sustainable travel in the city and the neighboring extra-urban areas. In this regard see the 2020 Urban Mobility Plan of the Municipality of Bolzano: http://www.comune.bolzano.it/mobilita_context02.jsp?ID_LINK=3555&area=19.

PROJECT PHASES

The implementation of Integreen had three dimensions:

1. **technology**, which included development, testing and technical implementation of the INTEGREEN system.
2. **social** dimension, which was focused on dissemination to external stakeholders and networking with local travelers in order to ensure a durable positive impact of the project actions, even after its conclusion.
3. **project management**, that provided the organizational support necessary to achieve the project objectives with high work quality in accordance with the time and budgetary limits.

The project was structured in 10 actions; the most relevant for the implementation and testing of interventions and the system were as follows:

- **Action 2 "Requirements"**. The main objective of this action was to define the requirement characteristics of the components and sub-components, parts of the system-structure tested within Integreen. In this action the components useful for the Eco-Friendly Traffic Control Unit were assessed and analyzed and the data necessary to calculate the environmental impact of the project were collected and analyzed. At last the functional requirements of the INTEGREEN mobile systems were defined.
- **Action 3 "Design"**. In this action the technical specifications and operating procedures for the implementation and integration of the system components were designed and defined. Specification of the logical and functional structure of the single components and of the integrated system, as a whole, was done, hardware components, where necessary, were chosen and engineered and the software components, interfaces, communication aspects and related protocols were detailed.
- **Action 4 "Development and integration"**. All the components of the Integreen system have been implemented and integrated with each other on the basis of the technical specifications identified in the engineering work.
- **Action 5 "Testing and validation"**. This action was the core of the project. In fact the aim of this action was to test and verify, in the real context of the city of Bolzano, the environmental and operational benefits that the INTEGREEN system allowed to achieve. In particular the correct functioning of each system component was assessed in compliance with the technical specifications already defined and the interoperability of the new components with the existing ones was tested. Also the INTEGREEN system was validated, collecting and analyzing data through an experimental test campaign, and the environmental benefit produced by experimental measures and strategies for traffic management was quantified. Finally, the eco-friendly traffic management policies were analyzed and strategies were defined to reduce the environmental impact of traffic.
- **Action 6 "Awareness raising"**. The aim of this action was to raise awareness of local travelers, including tourists, and stakeholders that individual mobility choices have a certain environmental impact and that everyone can contribute to improving the quality of traffic and air.
- **Action 7 "Networking at EU level"**. The focus of this activity was to spread the culture of more integrated approach for the traffic's eco-friendly management and to increase the presence of local actors in EU networks which deal with issues of environmental sustainability of the transport.

PROJECT RESULTS

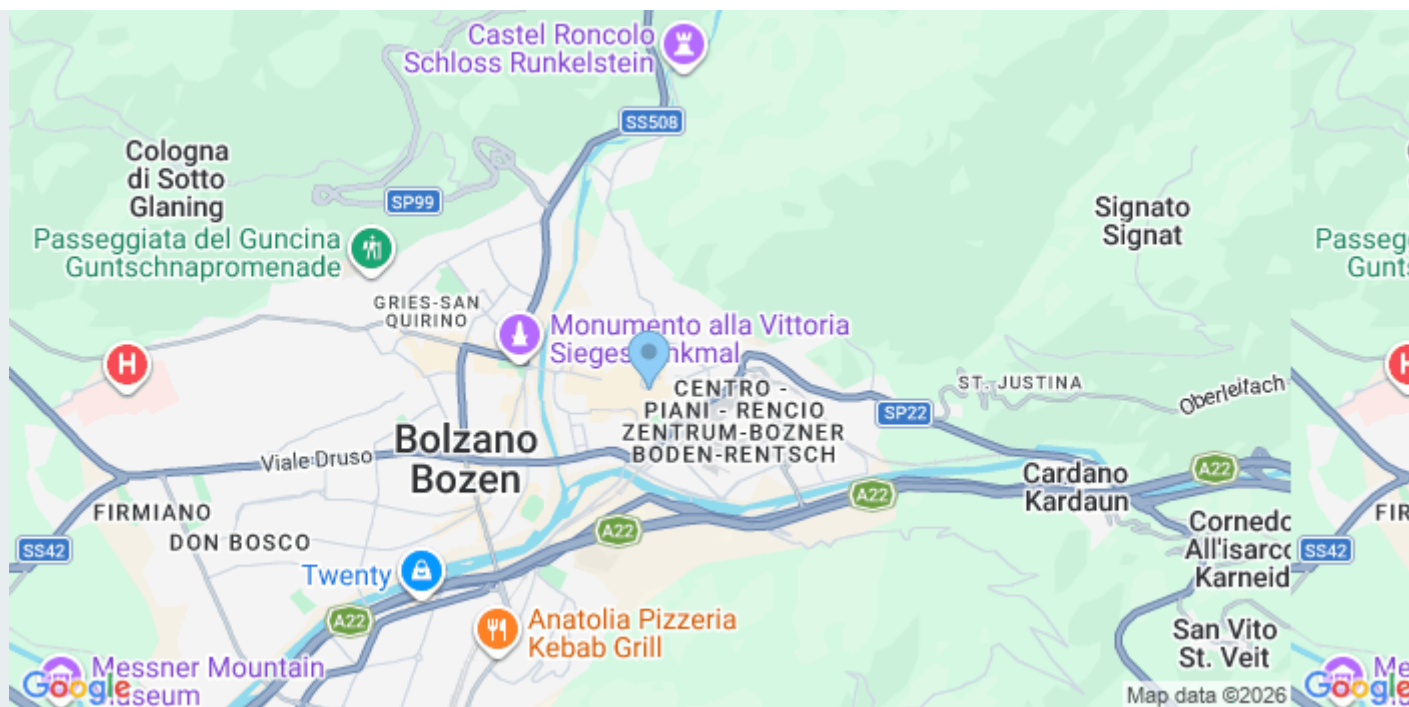
The **integrated system of advanced dynamic mobility measures** tested in INTEGREEN has proved to be a valuable tool for the implementation, updating and development of the EU environmental policy and national and local legislation, both in terms of innovative technological solutions, and integrated approaches for the **joint management of traffic and air pollution in urban areas**. The main results achieved include:

- Implementation of an **integrated analysis system of the traffic conditions and state of pollution in the city**, through which to produce automatic processing able to offer in real time a global and quantitative view.
- Installation of two **pollution measurement stations** paired with traffic detectors, which allow an accurate and detailed correlation analysis.



- Installation of an **innovative system, bluetooth detector**, on the main urban roads for **low-cost measuring** of the vehicular travel times, based on anonymous scan of the vehicles' Bluetooth devices.
- Implementation of a **traffic and pollution concentration measuring system** on road. This system has been installed on public fuel cell vehicles supplied by SASA (Company for the management of urban and extra-urban services for public passenger transport) and other test vehicles and has allowed the collection of a unique information heritage to deepen the knowledge of these phenomena.
- Preparation of a **centralized database: 'BzAnalytics'** in which all the data are collected and processed automatically and managed by the experts of the Municipality of Bolzano through an interactive control panel. In this way **traffic and pollution situations are analyzed in order to prevent acute pollution due to city traffic**.
- Implementation of web-based applications for traffic operators and managers as well as local travelers: **Bztraffic**, **BzParking** and **BzBus**, providing in particular real-time information on traffic and parking and information on public transport.
- development of a **set of indications to promote ecological driving: "Eco-Driving"**, where simple precautions to prevent pollution and save fuel are enhanced.

The combined action of ITS solutions and widespread awareness campaigns promoted by Integreen has achieved some significant results such as: **3% reduction of the vehicular transit and reduction of the NO₂ levels by 5% - 10%**. Moreover surveys conducted by the Municipality of Bolzano found that the **percentage of motorized mobility in the city on weekdays dropped from 34% to 30%**, and this decreasing trend still continues. Finally, in conclusion of the project it was noted that with a more efficient management of the traffic and the mobility demands, **reduction of the emission contribution can be even over 30%**. The introduction of speed checks (speed camera devices placed at short distance from each other) resulted in a **10% overall reduction of the emissions**. Integreen is a system easily replicable in other similar urban areas because not only technically valid, but also economically sustainable and easily exploitable in other sectors.



Acronym
INTEGREEN

Number of reference
LIFE10 ENV/IT/000 389

Reference Programme
[LIFE](#)

Beneficiary Coordinator



Comune di Bolzano

Contacts

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EU contribution

614.610,00

Call Year

2010

Start Year

2011

End Year

2015

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Region

Trentino-Alto Adige

Description

Bolzano