# SATELLITES GOING LOCAL


eurisy
acting collectively to bridge space and society

Eurisy would like to thank the contributors to this publication for their readiness to share their experiences, and the time and effort they have put into helping Eurisy to produce this collection of good practices.

# Contents

# Editorial

***Dear Reader,***

It is my pleasure to present *"Satellites Going Local – 30 Regions, Cities and SMEs share good practice"* a collection of selected success stories in the use of satellite solutions by local or regional authorities and SMEs. It is the outcome of four years of work by Eurisy to collect and disseminate good practice, in the framework of its User Programme. I have been following the progress of European space programmes such as GMES and Galileo since they began. I am glad to see them bear fruit, as proved with so many local initiatives which are putting advanced technologies to work delivering practical solutions in a variety of professional areas.

I hope these success stories plant the seeds of new ideas on how to reach your professional goals by offering some alternative routes or complementary tools. If you share some of the challenges described, these pioneering experiences can suggest new solutions on how to confront them. If you have already been considering innovative solutions, but are wondering how to evaluate and put them into practice, these practical, down-to-earth examples, may give you helpful clues on how to go about it. You may even be inspired to learn from experiences in sectors other than your own, and find that a satellite application may be transferable to different challenges.

I invite you to explore this collection of good practices and to pass it on to others who may benefit from it. If you want to go further, consider Eurisy as a resource at your disposal.

**Colin Hicks,** *President, Eurisy*

# Endorsements

*Eurisy has made an essential contribution to raising public awareness over the years through its important activities. This brochure «Satellites going local» is another good example of the very concrete help Eurisy is offering local and regional authorities. I look forward to seeing the 30 good practices broadly disseminated, thus ensuring that a large number of public authorities benefit from the information and take up the ideas.*

**Gerhard Stahl,** *Secretary General, Committee of the Regions*

*The Assembly of European Regions (AER) welcomes this Eurisy initiative to showcase the good practices in the use of satellite applications by regions, cities and SMEs. AER began its cooperation with Eurisy in 2007, and since then we are keen to disseminate its work to our 270 members in wider Europe. The research carried out by Eurisy represents a real added value in the fields of energy and innovation, and we are convinced that our member regions will learn more thanks to this publication.*

**Michèle Sabban,** *AER President*

*The European Confederation of Associations of Small and Medium-sized Enterprises (CEA-PME) supports and values Eurisy's initiative to inform SMEs of simple and effective ways to enhance their business performance. Sharing the experience of European enterprises in an easily accessible and attractive format is an effective step towards making entrepreneurs benefit from innovation in satellite applications.*

**Stefan Zickgraf,** *Managing Director, CEA-PME*

*The Council of European Municipalities and Regions (CEMR) welcomes the publication on "Satellites Going Local" as it makes an important contribution towards informing municipalities, cities and regions of the innovative solutions available to them to tackle some of the crucial challenges local and regional government face today.*

***Frédéric Vallier,*** *Secretary General, CEMR*

*All European territories have to be able to include innovation as a daily topic in their political agendas. To achieve the objectives of the EU 2020 Strategy, regional innovation will play a leading role. Therefore, initiatives like those developed by Eurisy in the last years are crucial in order to provide regions and municipalities with new tools to better understand their territory, its impact and its opportunities for development. This is particularly evident in European border areas, and that is why the Association of European Border Regions (AEBR) welcomes very much this set of good practices presented by Eurisy.*

***Martín Guillermo Ramírez,*** *Secretary General, AEBR*

*Facilitating the peer-to-peer exchange of experiences and success stories is an important contribution to helping SMEs access the benefits of innovation. The European Association of Craft, Small and Medium-Sized Enterprises (UEAPME) values and supports Eurisy's activities in favour of European SMEs' growth and competitiveness.*

***Frank Baumeister,*** *Head of Sector Policies, UEAPME*

# Introduction

This collection of good practices in the use of innovative satellite applications by regions, cities and SMEs in Europe provides down-to-earth, operational examples and testimonials as to how society can profit from space, in areas as diverse as the protection of the environment, air and water quality monitoring, bridging the digital gap to stimulate rural development, risk management, resource efficiency and many others.

In the context of heavy European investments in space infrastructure, in particular through programmes such as Galileo and GMES (Global Monitoring for Environment and Security) more cities, regions and SMEs should know about them and be in a position to use them to solve challenges.

By its very nature, this collection of good practices fosters a peer-to-peer exchange, unhampered by technical jargon, focusing not on the technology itself, but on how it can serve its users, from their own point of view.

Behind every success story in this publication is a seasoned professional who agreed to present their experience to Eurisy and its readers, because they believe the solution they have found is worth sharing.

Eurisy is grateful to every professional who has taken the time to talk to us about their work, their pioneering initiatives in using innovative applications, their results and the difference they made, for their job, and ultimately, for society.

# ENERGY

9

# ENVIROS: ESTABLISHING ENERGY AUDITS OF PHOTOVOLTAIC POWER PLANTS

Czech energy consultancy Enviros has reduced cost and time spent on the establishment of energy audits and strengthened its market position by using information freely available online.

© galam| Fotolia

### The Company

Enviros is a small company based in Prague, with 16 years experience in energy consulting, about 25 employees and an annual turnover of approximately €3,5 million. Enviros specialises in areas such as energy efficiency, renewable energy and waste-to-energy projects, waste water treatment, Environmental Impact Assessment (EIA) and others.

### The Challenge

Enviros has benefitted from favourable renewable energy policies, which guaranteed feed-in tariffs for producers of solar energy and thus boost the investment in photovoltaic plants, to develop its activities in this business.

Since 2010, an important part of the company's project portfolio in the renewable energy sector are the energy audits for photovoltaic plants. As a core document, an energy audit is required by banks for co-financing investments in PV plants. The energy audit assesses the anticipated energy yields and financial returns.

### The Satellite Solution

Enviros uses satellite information from free sources in carrying out the audits, in order to assess the best location for the plants according to land plot ownership, appropriate shading, and information on historic levels of solar radiation, daylight times and temperatures in the area.

In addition to commonly used tools such as Google Earth and the satnav collection of geo-referenced data, some of the free information sources used by Enviros are the Photovoltaic Geographical Information System (PVGIS) and Satel-Light – The European database for daylight and solar radiation. The two databases are updated monthly and hourly, respectively.

### The Results

With minimal investment, Enviros was able to draw substantial benefits for their business, while offering a quality service. It is now possible to evaluate the site 'from the desk', from a combination of different data sources, reducing travel time and costs. Enviros no longer needs to purchase meteorological data from stations on the ground, since satellite information is free and readily available online, which also reduces total project times. Finally, Energy Audits can be delivered to high standards of quality and accuracy, for any location, including those with no meteorological stations in the vicinity.

**Delivering a quality service with minimal investment**

In view of these benefits, today, the use of satellite information has become a standard for the PV plant energy yield calculation for Enviros. Since 2010, satellite information has been used by Enviros to deliver about 100 Energy Audits with a total installed power of about 150MWp (megawatt peak, a measuring unit for the maximum output of a power plant), and has enabled the company to hold a leading position on the PV consulting market in Central Europe.

*"Satellite information has helped Enviros significantly increase its competitiveness in the field of renewable energy consultancy, by reducing cost, saving time and increasing accuracy."*

**Jan Pavlík,** Enviros



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# HESPUL : MONITORING SOLAR ENERGY PRODUCTION

HESPUL uses satellite data to estimate the hourly output of its photovoltaic (PV) plants and detect malfunctions by measuring their performance compared to estimates.

© photlook| Fotolia

## Efficient management of solar power production

### The Organisation

Hespul is a not-for-profit association based in Lyon, France, whose members include several local authorities interested in promoting energy efficiency and renewable energy systems. It was funded in 1991 and currently employs 29 staff. Among its missions, HESPUL acts as the Local Energy centre of the Rhône Department (www.infoenergie69.org) in partnership with the national and local authorities: the French Environment and Energy Management Agency (ADEME), the Rhône-Alpes region and Rhône department. It also manages the French photovoltaic information centre (www.photovoltaique.info) co-financed by ADEME.

### The Challenge

Hespul owns several PV plants, among which the first grid-connected PV system in France, in operation since 1992. Hespul needs to ensure that all PV systems operate properly in the long term for two reasons: firstly, in order to make sure energy production reaches the local RES political goals (Agenda 21, Climate Action plans...). Secondly, in order to sell electricity at the feed-in-tariff so as to pay back the debt contracted to finance the PV system.
Moreover, it was difficult to have comprehensive and accurate information on potential and output, in the long term and at low cost, especially since most PV systems do not have an irradiation sensor.

### The Satellite Solution

Satellite irradiation data derived from Earth Observation is used to assess the expected hourly output of each PV system. The estimated hourly output is compared with actual production data. In case there is a difference, an alert is sent to Hespul so that the faulty PV system can be repaired as soon as possible. In addition to using this service to monitor its own PV systems, Hespul has developed a subsidiary in order to offer this service to other interested users under the brand Epices.

### The Results

Thanks to satellite data, all PV systems are controlled each day to make sure that they operate properly and malfunction is detected very quickly. Through its subsidiary, Epices, satellite data is now used to monitor several installations in the Lyon region, for example the large-scale urban project Lyon-Confluence.

*"Satellite is an easy way to assess the hourly irradiation data of many different sites."*

**Bruno Gaiddon,** PV Unit Manager



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# HEALTH

# MIDI-PYRÉNÉES REGION: PREVENTING AND MONITORING DIABETES COMPLICATIONS

Diabetics living in rural areas of Midi-Pyrénées have better access to medical care thanks to satellite communication.


©DIABSAT

## The Region

Midi-Pyrénées is a large region situated in the south-west of France. The region covers an area of 45,348 km$^2$, and has a population of 3 million people, Toulouse being its major urban area. The University Hospital of Toulouse (Centre Hospitalier Universitaire de Toulouse) is the main health centre in the region.

## The Challenge

In 2010, almost 4% of the regional population were affected by diabetes, with a growing progression rate every year. Diabetes can entail serious complications, such as cardiovascular and chronic kidney diseases, blindness and amputation. Good prevention policies and monitoring are essential to avoid and control such complications, and to reduce human and social security costs.

Although diabetes needs to be monitored through regular examinations, many reasons prevent a number of patients from undertaking periodical check-ups: the limited number of medical facilities in the region's rural areas, difficulty of access and transportation, or a delay of several months for an appointment with a specialist that discourages patients.

**Improving access to medical care**

## The Satellite Solution

Within the framework of the project DIABSAT, a vehicle driven by paramedical staff and equipped with a satellite antenna and the medical devices needed to screen diabetes' complications travels regularly to isolated areas to perform the medical exams of diabetes' patients. The results of the tests are sent to specialists at the Toulouse Hospital through the satellite connection. The analyses of the results are then sent directly to patients and their personal doctors.

The DIABSAT project was launched in July 2009 by the French Space Agency CNES, in partnership with the Toulouse Hospital, with the support of the Regional Council of Midi-Pyrénées.

## The Results

Thanks to the itinerant truck, patients living in 100 towns and villages in Midi-Pyrénées are encouraged to check their health more regularly, thus receiving earlier diagnoses and better oriented therapies, while reducing health costs. The truck permits the screening of around 20% of diabetes complications among the 519 examined patients.

The DIABSAT project could inspire other programmes targeting illnesses needing regular monitoring.

*"Improving diabetes care is really necessary near peoples' homes in rural areas by providing better information to diabetics and by optimising the interaction between health professionals to reach international health targets."*

**Jacques Martini,** Hospital practitioner



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# LONDON: IMPLEMENTING A PUBLIC HEALTH ADVICE PROGRAMME (AIRTEXT)

airTEXT have implemented across London a programme based on satellite information that sends early pollution alerts and health advice for people vulnerable to air pollution.

© Iunaj Fotolia

### The Organisation

airTEXT is a consortium of the 33 local authorities that make up Greater London in partnership with regional & national government - the Greater London Authority, the Environment Agency and the Health Protection Agency.

### The Challenge

London is often affected by peaks in air pollution. While air pollution and health advice was widely available, it was passively and not actively disseminated. The consortium wanted to become pro-active in informing vulnerable people about air quality, allowing them to take effective prevention measures and self-manage their symptoms. It was expected that this would improve the patients' quality of life and address health inequalities, while reducing costs incurred by the National Health Service.

**Quality of life improved for 68 % of sufferers**

### The Satellite Solution

airTEXT is an air quality information service based on satellite data, available to people vulnerable to air pollution who subscribe to it. Automated airTEXT alerts are triggered on days of elevated air pollution and sent daily to subscribers via text, voice message, or email. The service was launched across London in 2007 and since October 2010 has also been available on Twitter and RSS with a smartphone application currently under development. Alerts across London inform subscribers of the air pollution levels expected (moderate/high/very high) with the UV index, pollen and temperature information being available in 2012. A description of the likely symptoms and advice on how to handle them is also provided. The range of new environmental alerts for UV, pollen and temperature will be of strategic interest to health care providers and emergency planners, as well as to leisure and tourism services and the general public.

The project has been implemented by the airTEXT consortium under the ESA PROMOTE programme and as part of the 7th framework EU project PASODOBLE.

### The Results

airTEXT research by the University of Brighton illustrated that 68 % of those with a medical condition would alter their behaviour in response to receiving an airTEXT alert message. Survey participants were asked what action they took in response to a message. Increased preparedness was overall the most common response with actions including remembering to keep inhalers nearby (27 %) and taking an extra dose of medication to prevent symptoms (14 %). Avoiding exposure was the second and third most popular answer including staying indoors (19%) and reducing strenuous exercise (15 %).

Finally 87.4 % of participants stated that the airTEXT service had raised their awareness of air quality issues.

*"A useful additional tool in managing what can be a distressing 'invisible' chronic illness."*

**A citizen using airTEXT**



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# FRENCH GUIANA: ASSISTING PEOPLE IN ISOLATED AREAS WITH TELEMEDICINE

Satellite communication allows doctors in French Guiana to receive enquiries and diagnose patients living in areas without medical facilities.

© CHC Cayenne / CNES

### The Region

French Guiana is a French overseas region, located on the northern Atlantic coast of Latin America. It has a surface of 83 534 km² and 229 000 inhabitants, half of whom live in its capital city, Cayenne. Most people and infrastructures are concentrated in the north-east coastal zone.

### The Challenge

In French Guiana, the access to medical care of people living in isolated areas is severely limited, as hospital facilities are only available in urban areas.

**3 162 patients benefitted from remote care**

### The Satellite Solution

Since 2000, portable medical examination equipment has been made available in 15 isolated areas. A satellite communication system links the portable telemedicine stations to the Andrée Rosemon de Cayenne Hospital. The satellite connection transmits all data about the patient as collected on the spot by the paramedical staff. Results of medical exams (including electrocardiogrammes, blood tests, etc.), and images of the patients are transmitted in real time to the hospital. There, specialists interpret the results also in real time and offer a remote diagnosis accordingly.

Patient data confidentiality is 99 % guaranteed by the Telemedicine network and validated by the National Commission for Information Technology and Civil Liberties.

The service was implemented by the Regional Council, the Andrée Rosemon de Cayenne Hospital and the French Ministry of Health in collaboration with the French space sgency CNES and MEDEcine Spatiale (MEDES).

### The Results

Since 2001, 3 162 patients benefited from remote access to specialised health care, 477 of whom during 2010, in an increasingly large number of fields ranging from dermatology, parasitology, ophthalmology, gynaecology and obstetrics, to cytology, haematology, cardiology, neurosurgery, paediatrics, traumatology, cancerology, diabetology and radiology.
Since the beginning of 2011, the Andrée Rosemon de Cayenne Hospital has been testing a robot for echography, allowing for remote screening thanks to a satellite connection.

*"Satellite connections are the only means of communication in 80 % of Guiana's territory. They were the ideal solution for granting access to care to patients located in remote areas."*

**Dr Thierry Le Guen,** Chief Doctor



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# MUNICIPALITY OF PAVIA: MAPPING THE CITY'S ACCESSIBILITY FOR TOURISTS WITH REDUCED MOBILITY

People with disabilities can plan trips to and in Pavia using satellite navigation.

© Studio DER| Fotolia



### The City

Pavia is a city in the Northern-Italian region of Lombardy. Though a relatively small city, with a population of approximately 71 000 people, Pavia has a significant historical and cultural heritage; it hosts one of the most ancient European universities, and welcomes thousands of tourists every year.

### The Challenge

Its architectural features make Pavia's city centre, where most sites of interest are located, difficult to access by people with reduced mobility. After an initial effort to map some tourist areas accessible to the disabled, the Municipality sought to go further in its efforts to foster tourism for all, notably by providing accurate, up-to-date information on accessibility.

### The Satellite Solution

Since 2009, MapAbility provides an interactive online service offering accurate and up-to-date geo-localised information for the disabled, with regard to the level of accessibility of sidewalks, squares, crossroads, public buildings, car parks and tourist attractions in general. The map allows people using wheelchairs to plan their trip according to both accessibility criteria and touristic interests. MapAbility also allows citizens to take geo-localised pictures and update the map, thus ensuring the accuracy of the information.
The project was promoted by the civil society organisation "MapAbility" and supported by the Tourist Information Office of Pavia.

**Promoting social inclusion**

### The Results

The interactive map represents a valuable tool for disabled people wanting to visit Pavia, and has received numerous appreciations since it was first made available. In the future, MapAbility will not only allow users to visualise itineraries, but also to download them on their GPS and be guided in real time. The map is also useful to the city authorities in better targeting efforts to improve accessibility for the disabled.

The MapAbility service has proved so effective in Pavia that it has been implemented in 9 other Italian cities since the beginning of 2011.

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# ENVIRONMENT

# NORTH RHINE-WESTPHALIA'S ENVIRONMENT AGENCY: MONITORING AIR QUALITY

The State Agency for Nature, Environment and Consumer Protection uses a satellite-based solution to monitor air pollution and improve air quality and public health in the region.

© GOVERT NIEUWLAND | Fotolia



## Identifying sources of pollution

### The Organisation

The State Agency's Department for Air Quality, Noise, Vibrations, and Radioactivity is responsible for the survey of the air quality, including measurements, forecasts and information to the public. It contributes to mitigating measures (low emission zones, traffic restrictions, renewing industrial filter systems, etc.). It also implements European Commission directives on air quality and reports on the region's compliance with them. The objective is to protect the health of the region's citizens.

### The Challenge

North Rhine-Westphalia has two distinct characteristics: it is home to Germany's most important industrial sites as well as having a high population density of 524 inhabitants/km$^2$. The region accounts for 28 % of Germany's nitrogen oxide (NOx) emissions (e.g. caused by traffic) and 50 % of industrial fine particle (PM10) emissions (such as soot or ash). Air pollution therefore is high and represents a major health hazard.
Mitigating air pollution efficiently depends on correctly identifying its sources. However, until recently, the Department for Air Quality had relied on ground measurements and air quality modelling. To investigate supra-regional pollution episodes remained a difficult task.

### The Satellite Solution

To monitor air quality efficiently, the Department for Air Quality obtains 3-day forecasts twice a day from the Rhenish Institute for Environmental Research (RIU). The information, visualised as animations similar to weather forecasts, is derived from satellite images, air quality model forecasts and measurements on the ground. Pollution does not stop at the regional border. Satellite imagery has the advantage of providing border-free air pollution data, thus allowing a better overall view on the progress of pollution episodes (such as forest fires, volcanic ash, etc.).

### The Results

The Regional Air Quality Forecast provides more comprehensive information on air pollution and its causes, contributing to a better adaptation of mitigating measures. The visual quality of the forecasts makes them easy to understand for the general public, helping to inform citizens about air pollution on the state agency's website and in public communications.

*"The information is very helpful to identify PM10 exceedance days caused by long range transport. This is an asset for our duty to report to the EC. The comprehensive pictures of the forecasts help inform the general public."*

**Sabine Wurzler, Head of Department** - Air Quality Modelling, Atmospheric Changes

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# CITY OF POTSDAM: MONITORING ENVIRONMENTAL SUSTAINABILITY AT A LOCAL LEVEL

The department for environmental monitoring uses satellite images to monitor the effects of urbanisation on the evolution of natural habitats and soil sealing.

© schaltwerk/ Fotolia

## The City

Potsdam is the capital city of the German federal state of Brandenburg and home to over 155000 inhabitants and UNESCO – world heritage site. Bordering on Berlin, the city is part of the metropolitan region Berlin-Brandenburg that is characterised by highly urbanised areas (Berlin and Potsdam) surrounded by rural, natural landscapes.

## Nourishing public debates

## The Challenge

The city attaches great importance to the reconciliation of urbanisation and the respect for natural habitats, and ecological sustainability is an important factor in the formulation of the city's public policies.

However, the city officials considered the environmental monitoring information provided at regional level insufficiently detailed. The city administration therefore provided a budget and mandated its Department for Environmental Monitoring to survey the evolution of natural habitats (biotopes), the volume of the city's vegetation that contributes to maintaining air quality (green volume), and the loss of soil to the construction of roads and buildings (soil sealing).

For this mission, a source of information needed to be identified that was readily available, easily comparable at regular intervals and at a reasonable cost.

## The Satellite Solution

Satellite images proved to be the most appropriate solution for the Department's need for information on a relatively small area at a precise point in time: the city's territory is covered by a single image which can be purchased when needed at low cost.

The satellite images are interpreted by an external service provider who extracts the information regarding natural habitats, green volume and soil sealing. The Department for Environmental Monitoring then feeds this information into the city administration's Geographical Information System, combining it with information from other sources (archive aerial images, habitat maps, topographic maps, statistical data, etc.).

## The Results

The results of this regular, in-depth analysis are available as a basis for the city council's public debates on sustainability, providing tangible information that allows public policies to target issues touching on the city's ecological balance. For example, in expanding neighbourhoods where the balance between urbanisation and the respect of green spaces and natural habitats may be threatened, the city council can react by adapting urban planning.

The information, illustrated by satellite images, also serves as an important tool in the city's public relation activities to demonstrate its performance in terms of sustainability.

*"Without the use of high resolution satellite images to measure soil sealing and green volume, effective environmental monitoring at municipal level with data available elsewhere would have been difficult to achieve otherwise."*

**Steffen Tervooren,** Environmental Monitoring Department, Potsdam



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# POITOU-CHARENTES AND LIMOUSIN: PROTECTING BOOTED AND SHORT-TOED EAGLES

Tracking these species has improved knowledge about the species migrating, reproduction and hunting habits and has allowed for better protection measures to be implemented.

© Coll. Hiepen 2008 - O. Schiltz



### The Regions

Poitou-Charentes and Limousin are regions in Central Western France covering about 42000 km$^2$. The Natural Area Conservatory is an association of regional stakeholders aiming to preserve and promote natural areas of ecological interest and outstanding beauty. The Conservatory intervenes directly in managing these sites and supports regional actors with similar objectives, such as the Limousin Society for Bird Studies and Protection.

### The Challenge

While globally the Booted Eagle and the Short-toed Eagle are not threatened species, in France they are classified as vulnerable. In the two regions, the Natural Area Conservatory, and the Limousin Society for Bird Studies and Protection, sought to improve their knowledge of the birds' migration, reproduction and hunting patterns in order to take better informed decisions about protection measures. Furthermore, the organisations sought to raise awareness of the species among nature lovers and other relevant organisations, such as the Forest Administration, and to provide objective advice about their conservation.

## Quiet zones for vulnerable species

### The Satellite Solution

The birds of the two species are tracked thanks to a solar-powered transmitter mounted on their backs, which emits GPS signals indicating the birds' location. Since 2007, several couples of Booted Eagles in Limousin and two juvenile Short-toed Eagles have been equipped with transmitters in Poitou-Charentes, allowing observers to follow their migration across the Strait of Gibraltar to Central-Western Africa (Nigeria, Mali, Burkina-Faso) and back. The GPS locations were pinpointed on Google maps and posted on the Conservatory's website.

### The Results

The tracking of the birds has provided the information necessary to calculate the surface needed around the nests to ensure the peace and quiet needed for the birds' successful reproduction (between 15 and 25 hectares).

In 2009, this knowledge has led Poitou-Charentes to buy approx. 50 hectares of land surrounding the nests of two couples of birds, while a similar programme is being put together in Limousin. The notion of a 20 hectare "quiet zone" around nests has also been included in the Natura 2000 objectives of the protected site "Vallée de la Dordogne" in Limousin.

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# BASILICATA REGION: IMPROVING FIRE RISK ASSESSMENT AND PREVENTION

The Civil Protection Office of the Italian region Basilicata uses satellite maps to monitor fire risks and to manage human and material resources efficiently to prevent fires.

© Andrew Orlemann| Fotolia

### The Region

The Basilicata region covers 10 000 km$^2$, has 131 municipalities and a population of about 600 000 inhabitants. The Civil Protection Office of the region is in charge of risk assessment, monitoring and prevention in the territory.

### The Challenge

## Assessing risk at municipal level

In Basilicata, forests represent one third of the regional territory and are threatened by numerous fires every year, caused by dry conditions during the summer and human activity. Such fires do not only cause a loss of trees, biodiversity and habitats, but also increase $CO_2$ levels in the atmosphere and affect the landscape stability.

The Civil Protection Office needed to monitor constantly the high risk zones on a municipal level and to make a more efficient use of the resources deployed in fire prevention. In particular, it needed satellite images with a higher resolution than those provided by the national fire assessment system, RISIKO, in order to concentrate fire prevention activities where the danger level is highest.

### The Satellite Solution

In 2008, the Civil Protection Office created the permanent unified operative room (SOUP - Sala Operativa Unificata Permanente), a special unit coordinating fire prevention, monitoring and extinction efforts of all the local and regional entities involved in the management of fire risk in Basilicata.

Within the framework of the regional fire control plan, which foresees the development of innovative satellite techniques to prevent fires, the National Research Council (CNR) produces risk assessment maps on the basis of high resolution satellite images that are used by SOUP to coordinate fire prevention activities.

Satellite images are fundamental in monitoring some key factors in the evaluation of fire dangers, such as the humidity of the air and of the natural combustibles present in the territory, which can change significantly in a short period of time. By combining such information with other data, such as meteorological forecasts and fire records, daily or weekly maps are produced to assess the fire danger level of each municipality, thus concentrating monitoring measures (for example flights and monitoring patrols) in the areas that present a higher risk. The fire risk forecast maps are uploaded on the SOUP unified platform and are also available on the Basilicata Civil Protection Office website.

### The Results

The Civil Protection Office benefits from more accurate information about fire risks on a local level. The periodic maps allow the Office and the competent regional bodies to optimise risk management and better mobilise material and human resources, by increasing land controls only in the zones that are considered more at risk.

*"Fire forecast maps facilitate the region's tasks in preventing and monitoring fires."*

**Guido Loperte,** Basilicata Civil Protection Office



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# ROTTERDAM : UNDERSTANDING AND MITIGATING THE EFFECTS OF CLIMATE CHANGE

The Municipality of Rotterdam uses satellite imagery and navigation to understand the phenomenon of Urban Heat Islands (UHI) in order to improve the urban environment.

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## Knowledge for intelligent urban planning

### The City

Rotterdam is the second largest Dutch city and a rail, road and air transport hub, connecting the largest port in Europe to its hinterland. The Municipality is committed to preserve its image of a healthy and attractive city for citizens as well as for businesses.

### The Challenge

Urban areas react differently to solar radiation than their rural surroundings. They accumulate heat more rapidly and retain it for longer. Therefore, the air temperature is normally higher in cities, especially at night. This phenomenon is called an Urban Heat Island (UHI). Its magnitude depends on building density, vegetation coverage, facades and paving materials, among others. The heat waves of 2003 and 2006 caused between 1000 and 2200 extra deaths in The Netherlands, a country warming up twice as fast as the global average and whose urbanisation rate is expected to increase by 20 % by 2040.

Since 2009, the city of Rotterdam participates in a research programme aimed at quantifying the UHI and identifying causes and possibilities for mitigation[1].

### The Satellite Solution

Ground observations were carried out using fixed stations and bicycles equipped with mobile meteorological stations assessing air temperature, radiation and air quality. The precise location of measurements was logged using GPS. Similar equipment has been installed on trams crossing the city each day. To analyse the spatial distribution pattern of surface temperature, a measurement of the UHI in Rotterdam was implemented with satellite imagery, allowing for the detection of correlations between surface characteristics and temperature. Based on the satellite images, an indicative map was elaborated showing the relative UHI-intensity for different neighbourhoods.

### The Results

The collection of spatially quantified information on the extent of the UHI effect in Rotterdam enables the Municipality to prioritise its climate adaptation activities. The Departments of Public Works and Urban Planning can count on reliable information to identify the areas needing more vegetation or water coverage. The choice of materials for facades and paving may now be based on their heat reducing capacity. Furthermore, policy makers and health organisations can have a better understanding of the relationship between individuals' health and their physical environment. Finally, the research programme will produce an insight on the relation between climate conditions, energy and climate management within buildings.

[1] The Heat Stress research programme in Rotterdam was implemented by the Municipality of Rotterdam, TNO, Deltares, Wageningen UR and GGD,under the framework of the Rotterdam Climate Initiative "Climate Proof" and the Knowledge for Climate national programme.

*"Satellite imagery has helped Rotterdam get a better understanding of how climate change may affect our city and to target our efforts to cope with it."*

**Jos Streng,** Rotterdam Public Works Department



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# AGRICULTURE FORESTRY

# FARMERS' COOPERATIVE CAPSEINE: OPTIMISING CROP YIELD

The Cooperative organised the set up of a crop information and consultancy service, based on satellite imagery, helping farmers optimise fertiliser use and improve crop yield.

© Slyj Fotolia

## Modernising farming practices

### The Organisation

The CapSeine Farmers' cooperative was established in 2000. It represents the economic interests of 3500 farmers (livestock and grain) via 177 elected farmers' representatives. The cooperative employs nearly 600 staff who work on mutualising and optimising procurement and retail for the benefit of their members. It maintains its own network of local retail outlets (24 Gamm Vert shops) and in the season 2009-2010 collected 1.6 million tons of cereal.

### The Challenge

With rising production costs and falling prices, it is increasingly difficult to maintain a profitable business in agriculture. In addition, ecological considerations, in particular the use of fertilisers, introduce both production constraints and marketing opportunities, as consumers become more concerned with their choices. In this context, the cooperative sought to offer its members innovative services and advice that would enhance their competitiveness and contribute to the modernisation of their farming practices.

### The Satellite Solution

Since 2004, and in near real time, CapSeine farmers receive advice and guidance on fertiliser needs, parcel by parcel, for every key stage of the plants' development from the service FARMSTAR. They can thus adapt their treatment to the needs of each parcel. Subscribing to the service for a fee of 8-10 Euros/ha gives them access to this information via a dedicated web platform or on paper.

In providing this service to its members the CapSeine cooperative contracts a consortium of a satellite image provider and two agronomy research institutes, who work together in acquiring and interpreting satellite imagery according to needs.

### The Results

This innovative information service allows farmers to make efficient use of fertilisers in order to optimise their crop yield and revenues. Since its introduction, the service has expanded from 4000 ha in 2004 to 42000 ha in 2010, significantly contributing to the modernisation of farming practices and to a growing environmental awareness among farmers.

*"Precision agriculture is available to all our members with one click at key stages of production."*

**Bruno Fourcin,** CapSeine



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# HYÖTYPAPERI OY: SUCCESSFULLY TAPPING INTO THE BIOFUEL MARKET

Finnish paper recycling company Hyötypaperi Oy expanded its business into the biomass market using a workflow management system based on satellite information.

### The Company

Hyötypaperi Oy was established in South-East Finland in 1987. In addition to its paper production activity, the company collects and processes paper and other materials from companies in industry, trade, logistics and other areas. It also collects forest owners' and companies' logging residue, long-length logs and stumps for solid biofuel production. Hyötypaperi Oy employs 61 staff and has an average annual turnover of 12.2 million €.

### The Challenge

As public environmental awareness grows and the notion of sustainability becomes a focal point of political attention, Hyötypaperi Oy chose to orient its business towards the expanding market for biofuel, in particular from forest biomass.

The energy content (MWh) of wood largely depends on its qualities (e.g. humidity content). In order to get the most out of it, it is important to manage and trace the product efficiently along all supply chains.

### The Satellite Solution

Hyötypaperi Oy uses a management tool based on satellite navigation that allows it to geo-localise the residues for collection according to their readiness and to guide the supply chain fleet efficiently .

© Hyötypaperi Oy

The tool allows for coordination between the back-offices and work in the field, who use mobile devices to connect to a central platform. It allows users to document biomass resources (location, volume, qualities), to take pictures, to calculate the easiest access route to it and decide on the closest transporter to contract. In terms of back-office use, the system allows the company to manage invoicing and traceability vis-à-vis its customers.

### The Results

Hyötypaperi Oy's business model rests on the principle that the customer pays according to the quantity of MWh contained in the biomass delivered. Thanks to the satellite navigation based system, Hyötypaperi Oy knows the exact energy content and can calculate costs and profits per load. A more efficient management of the supply chain means increased MWh content per load and per driven kilometre, thus saving time, effort and transport related costs to increase profits.

**5-10 % cost savings**

Moreover, electronic information management enables contractor-based business models that require less supervision. Contractors collecting biomass plan their daily work by themselves and can save 5-10 % by reducing working hours due to better route planning.

*"The solution is easy to use cost-effective. We at Hyötypaperi Oy are using it to manage our biomass business, but any kind of business that collects and manages different materials can use it."*

**Seppo Hovi,** Customer Manager



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# CAMPANIA: ENCOURAGING THE SUSTAINABLE USE OF WATER IN THE REGION

The Department of Agriculture of the Campania Region provides a personalised information service to farmers to help them reduce the quantity of water used without compromising yield.

© Robbicj Fotolia

### The Region

Campania is a Southern Italian region whose flourishing agro-food industry makes it one of the leading regions in this sector in Italy, with agriculture covering 16 % of its territory.
Within the Regional Administration of Campania, the Assessorship of Agriculture is in charge of measures to improve the economic return without compromising the environmental sustainability of agricultural production, together with the implementation of the Common Agricultural Policy and other European Directives for this sector.



### The Challenge

Subjective and empirical assessment of irrigation practices showed that water was used in excessive amounts, compared to the maximum needed to guarantee optimal yield. In the context of agricultural challenges brought about by climate change, the Agriculture Department needed to take innovative measures for informed water management as part of the Regional Irrigation Advisory Plan.

**1 € spent on the information service is worth 5 € of savings**

### The Satellite Solution

Through "IrriSat" (www.consulenzairrigua.it), the Agriculture Department provides personalised irrigation information, based on high spatial resolution satellite data (10-20 m), on the actual irrigation needs of each plot managed by the farmer. This information, delivered every 7-10 days, indicates to farmers how much irrigation water to use, without compromising yield. In addition, farmers get a map of the development of the crop, indicating non-uniform growth due to irregularities in agronomic inputs (not only water, but also fertilisers) and soil heterogeneity.
The service is available to farmers and other water managers at all levels, who can subscribe for free, and receive the information through text messages, MMS or on the web.
In addition to providing the service, the Agriculture Department accompanies the programme with particular communication efforts to get an ever bigger number of farmers to subscribe, including through TV ad campaigns.

### The Results

A post-evaluation of the application of the Regional Irrigation Advisory Plan since 2007 confirms a reduction of irrigation volumes, which has both direct and indirect economical and environmental benefits for farmers, water distribution bodies and local communities.
The service was extended from covering 400 ha in 2006 – the beginning of the programme – to 4 200 ha in 2010, i.e. 5 % of the total irrigable areas in Campania. As a consequence, the cost of the service per unit area has decreased considerably.

*"Offering personalised information in an easy-to-use and intuitive form has encouraged participation in the scheme and is contributing to the overall goals in terms of sustainable use of water resources."*

**Amedeo D'Antonio,** Campania Region

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# FARMER IAIN MCMORDIE: REDUCING THE USE OF FERTILISER THROUGH SATELLITE NAVIGATION

Northern Irish farmer Iain McMordie is using satellite navigation to reduce the quantity of fertiliser used on his fields and to improve his yearly yield.

© Iain McMordie

### The Business

Iain McMordie started his business as a cereal and grass farmer in the Lecale District in Northern Ireland, and recently decided to concentrate his business entirely on the production of grass for horse feed. Up until this change, Iain was part of the Lecale buying group, a small group of local farmers who grouped their buying power in order to be able to buy goods such as meal and fertiliser in bulk at lower prices. The group has been in operation for twenty years, representing ca.2000 ha of arable land and grassland.

**10 % fertiliser saved per year**

### The Challenge

With rising production costs and falling prices, it is increasingly difficult to maintain a profitable business in agriculture. In addition, ecological considerations, in particular the use of fertilisers, introduce both production constraints and marketing opportunities, as consumers become more concerned with their choices. Traditionally, farmers apply the same treatment of fertiliser to a field as a whole. Being able to precisely match soil needs and input was seen by these farmers as an opportunity to save on production costs and to comply with ecological constraints.

### The Satellite Solution

The farmers have access to a Geographic Information System (GIS) that holds detailed, cartographic information about their land (soil type, topography, etc.) and previous applications of fertiliser. They are also equipped with a handheld, GPS-enabled PDA, used by Iain on his own land and that of the other group members, making it possible to access this information and take decisions on where and how much fertiliser to apply. The equipment provides a record of where the fertiliser spreader has been to provide traceability and to ensure the accuracy of spreading. The record is in the form of a track on a map of the spreader's path, combined with information about quantity and product(s) used. The Lecale group of farmers initially benefitted from the funding scheme "Increasing Access to ICT" run by the Department for Agriculture and Rural Development Northern Ireland (DARDNI), providing them with a GIS and GPS-enabled PDA. Iain teamed up with two of his peers to fund the annual maintenance costs of roughly 200£. Iain became proficient in using the equipment thanks to training provided by the College of Agriculture, Food and Rural Enterprise in partnership with DARDNI and by the service providers. A group of eight farmers now benefit from the information.

### The Results

The farmers were able to repay their initial investment within six months, through the savings on fertiliser and fuel alone. Iain estimates that the group is now saving about 10 % per year on fertiliser. Work rate and profit margins have increased and the records of fertiliser use help them comply with reporting obligations.

*"The solution has been so successful that we now have two GPS systems and another member of the group has purchased his own equipment."*

**Iain McMordie,** Farmer



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# UTILITIES

# MAVERIC CONTRACTORS: COMPLETING BUILDING WORKS TO EXACTING STANDARDS

Maveric Contractors uses a satnav application to create 3D models of building sites and to guide earth-moving equipment according to the GPS coordinates in the models.

### The Organisation

Maveric Contractors is a small Irish company specialising in civil engineering, which carries out site development projects from the survey, design and costing stage through the handover. It employs 30 staff and has an annual turnover of €5 million. It has been in existence since 2005.



### The Challenge

Maveric Contractors needed to rely on a relative advantage, especially when competing for large-scale civil engineering projects in Ireland and the UK. An example of this was a night-only project in Galway airport. This project was to provide a runway extension and a new aircraft turntable. In the past, this would have had to be done with timber profiles of the ditches to excavate and batter rails, and manually checked, which is a challenge enough during the day, but even more so at night.

### The Satellite Solution

Maveric uses GPS to map a site's contours and generate a 3D model, which serves as an invaluable reference for machines, once site development begins. The GPS coordinates are linked directly to the earth-moving equipment, which is computer-controlled according to the digital models. In the case of the Galway project, the setting out and quality control were carried out with GPS-guided excavators and tractor dozers according to information displayed on in-cab GPS monitors. The underground infrastructure, such as water pipes and electric cables, were shown on screen in the cab in real time, guiding Ground Engaging Tools with GPS, to avoid damage to the infrastructure.

© Maveric

## Safety and cost-effectiveness

### The Results

The accurate information in the 3D models of the sites helps design and costing decisions. Using GPS to guide machinery allows Maveric Contractors to achieve millimetre-accurate results and virtually eliminate driver errors. Thanks to these technologies, the Galway airport project, among others, was completed to an exacting standard, exactly as per drawing, more safely, efficiently and cost-effectively.

*"We were very impressed with the results achieved with this new technology and how it was delivered by Maveric."*

**Piotr Wojtusik,** Engineer EPSA Internacional S.A., Maveric Client

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# LAÂYOUNE : IMPROVING URBAN LIVING CONDITIONS

The Moroccan Ministry of Housing and Town Planning uses satellite images to eliminate slums.

© philipus| Fotolia

## Improving living conditions for 60 000 people

### The Region

The region of Laâyoune-Boujdour-Sakia El Hamra is located in the Western Sahara territory of Morocco. It covers an area of 139 480 km² with a population of 256 152 inhabitants. The region includes the provinces of Laâyoune, Boujdour and Tarfaya. The capital of the region is Laâyoune. With a population of approximately 200 000 habitants, it is the largest city in Western Sahara.

The Moroccan Ministry of Housing and Town Planning, relying on the competencies of the Urban Agencies and Al Omrane Company, is in charge of carrying out a number of studies and projects aimed at increasing the quality of the urban environment and enhancing the attractiveness of the region's cities.

### The Challenge

Urban habitats have been long characterised by overpopulation and lack of basic facilities and accommodations, causing the flourishing of slums. With the aim of eradicating such habitats, the Moroccan government launched the programme 'Cities Without Slums' in 2004. Its objective was to make an assessment of the existing slums, together with the establishment of upgrading and re-housing programmes and the development of new urban areas.

In order to identify existing slums and monitor the progress of the programme, conventional methods such as field visits/observation and the use of databases and statistics soon proved to be insufficient.

### The Satellite Solution

In carrying out the programme, high resolution satellite images are used as a base to assess the state of slums and evaluate changes in terms of extension and demolition of shanties. Aerial images are then taken every three months in targeted areas, enabling the assessment of the programme's progress by comparing images taken on different dates.

The programme was made possible thanks to the collaboration between the Ministry of Housing and Town Planning and the Royal Centre for Remote Sensing.

### The Results

In July 2008, Laâyoune became the first South-Moroccan city to be declared "city without slums". The demolition of the unhealthy habitats allowed to eradicate 10 989 shanties and to relocate over 60 000 people. More than 8 000 households benefitted from the initiative, each receiving a terrain of 120 m².

Urban planning in the areas freed from shanties is made more efficient thanks to satellite images, which, along with other information sources, have become an essential tool at the service of planners.

*"The satellite images have allowed the officials in charge of this programme to take the appropriate decisions for each city. It ensured non-regression and non-proliferation of slums in the majority of the target cities."*

**Mohammed Belbachir,** Director General Al Omrane Al Janoub



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# CITY OF ALBAN: MANAGING DRINKING WATER SUPPLIES

The French village of Alban, in the region of Midi-Pyrénées, manages its drinking water supplies with the help of a satellite communication system.

© iStock/ Fotolia

### The City

The commune of Alban is located in the eastern part of the Tarn department of the Midi-Pyrénées region, with a population of about 1 000 people. The only reservoir providing drinking water to Alban is situated on the hills outside of the village, and is also used by a neighbouring municipality.

### The Challenge

The commune of Alban decided to manage not only its main water reservoir remotely and efficiently, but also the village's two pumping stations. The local authority had to control the correct distribution of the drinking water and its quality, by monitoring chlorine levels. This required the creation of a communication and control system between the main reservoir and the pumping sites, on the one hand, and the technicians in charge of the daily management of the water supplies in Alban, on the other. Finally, such a system had to enable the municipalities' technicians to access the information from anywhere, instantaneously and in a secured manner.

**Efficient use of natural resources**

### The Satellite Solution

In 2009, the commune of Alban developed, in partnership with three service providers[1], a system allowing instant flow of information and remote control of the water reservoir and the pumping sites. A satellite modem was placed in the main reservoir and connected to the remote management equipment through a parabolic antenna. Information on the water quality and quantity is generated by automats and transmitted by satellite or radio to a central server, constantly accessible to authorised staff through an internet portal. The bidirectional satellite connection allows for remote, real time activation of the equipment regulating the water flow and to immediately communicate alerts by email or SMS.

### The Results

The satellite communication system to manage drinking water supplies enables the commune of Alban to control its main drinking water reservoir and the pumping points, also guaranteeing real-time management and security of information. It also allows for the supervision of the equipment via internet, with no need for visits in the field. Moreover, by installing a satellite antenna, the installation of telephone lines in isolated areas was not necessary and thus avoided bigger expenditure and a more important environmental impact on the territory.

[1]SATMOS (Satellite Monitoring Service), AMDEC (Automatisme Maintenance Développement Electricité Câblage) and SIREA (Solutions en électricité et automatismes).

*"The satellite solution enables the technical staff responsible for managing the city's drinking water supplies to constantly monitor the parameters of the good functioning of the reservoir."*

**Marin Pousthomis,** Mayor of Alban



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# TOURISM

# EKKERØY HOLIDAYHOUSE: PROVIDING GUESTS WITH A GPS SELF-GUIDING SYSTEM TO TRACK BIRDS

The Norwegian tourism business Ekkerøy Holidayhouse rents a GPS navigator that allows its guests to find points of interest and discover natural habitats.

© Ekkerøy Holidayhouse

## The Company

Ekkerøy Holidayhouse is an eco-tourism business located in the Varanger area, close to the arctic zone, in eastern Finnmark, Norway. The guesthouse has been open since 2001 and is composed of two flats and a house that can accommodate up to 16 people. It is run mainly by its owner, the journalist and writer Ingjerd Tjelle. The location is excellent for bird watching, since Ekkerøy has the richest diversity of birds in Norway.



## Eco-friendly tourism

## The Challenge

Tourists hoping to have the chance to observe birds in their natural habitat are often disappointed by the difficulty of identifying the fauna in an unknown region. Varanger has a large variety of bird species but little information is available on the species themselves and the places and periods in which they are most likely to be seen. Moreover, tourists going around the territory to find birds run the risk of getting lost in unfamiliar environments or damaging the natural habitats in which such animals live.

## The Satellite Solution

Inspired by the experience of another firm organising nature trips in Norway, which mapped Norwegian fauna on the territory, Ekkerøy Holidayhouse decided to experiment a GPS self-guiding system allowing the tracking of birds in the area surrounding the guesthouse. The system consists of a GPS navigator with pre-programmed points of interest, each of them accompanied by an information folder/book describing in detail the birds that are likely to be found there and the best strategies to spot and observe them. The points of interest are rated according to the number of species and their quantity, for the users to decide how to plan their stay in Ekkerøy. The system was first offered to the guesthouse customers for free, so as to test its accuracy and usefulness and since the beginning of 2011 it is rented to the guesthouse customers who wish to use it during excursions.

## The Results

Ekkerøy Holidayhouse is offering a unique service, thus attracting more and more birdwatchers. The system is considered easy to use and allows birdwatchers to make the best of their stay. It prevents guests from getting lost during excursions or disturbing the environment by leading them directly to the locations where birds are. Even though it is early days yet to quantify the economical advantages of the system, the guesthouse has already experienced an increase in the number of its customers since January 2011. Moreover, Ekkerøy Holidayhouse has acquired a better and well-known reputation as the perfect destination for birdwatchers and nature lovers.

*"The bird watching system allows us to offer a unique service to our customers, making us different to any other tourist firm and more popular as our customers share their experience with other birdwatchers."*

**Ingjerd Tjelle,** Ekkerøy Holidayhouse

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# COTEAUX DU LAYON: PROMOTING VINEYARDS AND REGIONAL CULTURAL ASSETS

The Community of Local Authorities of the Coteaux du Layon introduced GPS-guides for tourists seeking to tour the reputed local vineyards and other touristic sites of the region.

© Communauté de Communes Coteaux de Layon

### The Organisation

The Community of Local Authorities of the Coteaux du Layon was created in 1994 as an association of 12 village administrations, representing a total of 14131 inhabitants. It aims to organise projects of local interest and to offer new public services in the territory. In 2003 a dedicated tourism department was created.

### The Challenge

The Coteaux du Layon region has a richness of beautiful landscapes, and it possesses significant cultural and historical heritage, as well as reputed vineyards. The Community wanted to introduce new, innovative methods to promote these assets, while supporting the local wine economy. It was anticipated that digital tourist guides would reduce the field work in surveying and replacing tourist information signboards, as well as allow for a complete removal of the signboards in some areas, especially in areas of outstanding natural beauty.

**20 visio-guides available**

### The Satellite Solution

Tourists can borrow GPS devices allowing them to follow the two itineraries developed so far – the hiking and the traditional village circuits – and to learn about the history, architecture, biodiversity and wine-making in points of interests referenced on the GPS maps. The devices can be borrowed for free at four lending spots, in exchange of a small deposit. The itineraries can also be downloaded on smart phones.

Content production took several months and it involved pooling together information from a variety of public and private stakeholders.

### The Results

Early results show that after an initial reticence to the technology, tourists readily adopted the tools and appreciated them as being easy to use. There is a growing interest in the system from a number of tourist operators, which now promote it on their websites. In view of this success, the project is to be further extended with three more circuits in the short term. In addition, it recently became possible for the Local Authorities from the Community to create their own tourist circuits, with technical support from the Tourism Department of the Community, which is likely to lead to a further extension of the service.



*"In addition to the obvious benefits to tourism and the local economy, the direct involvement of the Local Authorities in taking the project from an idea to reality created a strong sense of cohesion."*

**Florence Petit,** Tourism development officer

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# NORTH TIPPERARY COUNTY COUNCIL : GIVING TOURISM A BOOST

The team of Shannon Development realised tourism information about the county was mostly missing from the maps commonly available on satnav devices, before deciding to give tourism a boost.

© Banner| Fotolia

### The Organisation

Shannon Development is focused on developing the industrial and tourism potential of North Tipperary as part of its mandate in the Shannon Region. It is Ireland's only dedicated regional economic development company.

### The Challenge

"Nothing came up when I searched for a restaurant in North Tipperary on my GPS. I was sent to Limerick!" This anecdotal but significant experience prompted Bernie Leonard, Shannon Development Tourism Officer for North Tipperary & Offaly, to do something about making it easier for tourists to enjoy County Tipperary. "We wanted to provide visitors with accurate tourist information on their SatNav's and encourage more of them to holiday in our Region" she says.

**1000 points of interest inventoried**

### The Satellite Solution

The Head of Tourism took the idea up with two of the main companies producing satellite-navigation systems. Together they initiated a project aiming to reference all points of interest in North Tipperary on navigation systems' maps. These included restaurants, hotels, activity providers, tourist attractions, emergency services and others. The Head of Tourism has worked closely with North Tipperary County Council and Shannon Broadband Ltd. in seeing the initiative through.

In total 220 Points of Interest for the region were collected, analysed and mapped accordingly. The staff in charge of the project at the tourism office of Tipperary were given geo-referencing tools to collect the geographic coordinates of the points of interest they inventoried, according to a pre-defined format, compatible with the existing satellite navigation systems. A letter was sent to all the local tourism trade who were mapped as part of the project, asking for permission to include them on the maps.

### The Results

Shannon Development now provides website links for the general public to download the application directly on to their personal satnav unit.

This pilot North Tipperary SatNav initiative proved so successful that Shannon Development decided to roll out their GPS project throughout the Shannon Region in a bid to make it easier for visitors to get accurate tourist information digitally.

Over 1000 points of interest in counties Limerick, Clare, Offaly and North Tipperary have now been made available to tourists and the business community for download to satnav units. The initiative was a result of a need identified for independent travellers looking for free, instant and accurate guidance and mapping information on 'where to go' and 'what to see and do' in the area they are visiting. It is anticipated that the information on accommodation and visitor attractions will entice more overnight stays in the Region, and lead to a range of spin-off benefits for tourism businesses and the service sector in the area.



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# PAYS DE MONTFORT: PROMOTING THE MEDIEVAL CITY OF MONTFORT-SUR-MEU

Since 2009 the Tourist Office of Montfort-sur-Meu and its neighbouring municipalities offer an interactive tourist guide allowing visitors to discover the ancient medieval city, autonomously and at an affordable price.

© bobroyzaj| Fotolia

## Increasing visitor satisfaction

### The Region

The Pays de Montfort is an administrative association of municipalities (Communauté de Communes), situated in the heart of the French region of Brittany, including 8 communes and is home to 20000 inhabitants. The area has a variety of natural and historical places of interest, among which the medieval city of Montfort-sur-Meu, built in the 11th century.
The Tourist Office of the Pays de Montfort was created in 2006 to promote the development of tourist services in the area and its many sites of interest.

### The Challenge

The mediaeval city of Montfort-sur-Meu has a significant historical value and touristic interest. Nevertheless, tourists were struggling to visit the place since its historical heritage is not always easy to reach or to recognise. Moreover, guided tours of the city were mainly offered to groups of tourists, while individuals or families could not always afford a professional guide.

### The Satellite Solution

Tourists can rent a mobile device, equipped with GPS and a touch screen, which guides them along the touristic itinerary developed by the Tourist Office. The device allows users to enjoy a one-hour itinerary around the medieval battlements of Montfort-sur-Meu. As visitors make their way along the ancient ramparts of the medieval city, the palm device provides details and interesting information in real time. Clips, quizzes, archive images and recorded texts are automatically programmed to appear at specific points, enabling the visitor to visualise the town during the Middle Ages and to engage in interactive games, such as treasure hunts, guided by GPS.

### The Results

Tourists appreciate the application which allows them to visit the medieval city of Montfort-sur-Meu in complete autonomy, choosing their timing and itinerary, with no need to contract a tourist guide to access complete and in-depth information.
The satnav solution, financed by the Communauté de Communes and by the Regional Council of Haute Bretagne, has proven so successful that by 2010 it was implemented in 40 other municipalities. The interactive guided tours of the Pays de Montfort have been awarded the trophy in the category "Communication supports" of the Haute Bretagne Tourism Awards of 2010.

*"Satellite technology allowed us to inform the public about the city's history and to develop innovative ways to visit it. Visitors' satisfaction encourages us to develop other animations and itineraries."*

**Florian Villain,** Tourist Office of the Pays de Montfort



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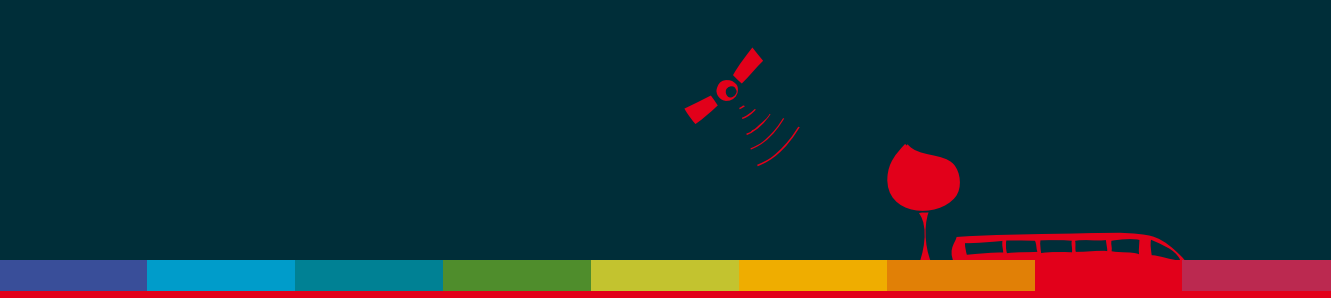

# TRANSPORT
# MOBILITY
# LOGISTICS

# PROVINCES OF VIENNA, LOWER AUSTRIA AND BURGENLAND: OPTIMISING TRAFFIC

The three provinces have taken an interregional approach to coordinate traffic flow management and information more efficiently .

© ITS Vienna Region

## eGovernment for real-time coordination

### The Organisation

ITS Vienna Region was co-founded by the three provinces in 2006 as an independent, cooperative traffic management project within the regional public transport association (VOR). Partners of ITS Vienna Region are local and regional public transport providers, local and regional authorities, motorway and national railway operators (ASFINAG, ÖBB), the police, Vienna's taxi fleets and the public radio's (Ö3) traffic editorial office. Its mission is to develop and implement a dynamic, intermodal traffic information system that responds to current and future mobility needs.

### The Challenge

The Vienna Region, encompassing the three provinces, covers an area of 23 500km$^2$, 3.5 million inhabitants and an estimated 200 000 commuters every day. The increasing volume of traffic has led the three provinces to take an interregional and intermodal approach to traffic management.
Making traffic safer, smoother and more respectful of the environment are key objectives in and around Vienna. The main challenges are to alleviate road traffic and congestion by encouraging the use of alternative modes of transport.

### The Satellite solution

ITS Vienna Region has created a geographic information platform (GIP – Graph Integration Platform) that combines traffic data from a variety of sources. The data sources are both static (road works, public transport timetables) and dynamic (traffic jams, public transport delays, etc.). This information is referenced to a base cartography of the region's traffic network. The innovative solution is the inclusion of geo-localised information emanating from GPS devices on board the city's fleet of 3 500 taxis. With the technical support of the Austrian Institute of Technology, this information helps model the traffic situation in real-time, and increases the accuracy of the geographic information platform.

### The Results

AnachB.at (www.AnachB.at, iPhone App, Widget, iGoogle Gadget) has become a reference for citizens to calculate their ideal route from A to B, encouraging them to use public transport.
The GIP allows public authorities to optimise their efforts in identifying and removing bottlenecks. A range of administrative services now use the GIP cartography and traffic information as a reference framework for the implementation of administrative procedures and planning decisions, such as authorisations of road works, road closures, measures to improve traffic flow. These eGovernment processes enable public authorities to increase their efficiency by interacting and coordinating their actions in real-time, on the basis of an up-to-date cartography and mutualised traffic information.
The success of the ITS Vienna Region Project led to a decision, in 2010, to extend its innovations to the whole of Austria within the projects GIP.at, GIP.gv.at and VAO.

*"The traffic model of ITS Vienna Region is linked with a dynamic traffic data pool. GPS based Floating Car Data (FCD) provided by 3 500 taxis is one of the key factors making accurate, real-time traffic information possible."*

**Klaus Heimbuchner,** ITS Vienna Region



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# SIEBER TRANSPORT AG : REDUCING FUEL CONSUMPTION BY MONITORING TRUCKS WITH SATELLITE NAVIGATION

The Swiss logistics company Sieber Transport AG uses satellite navigation to reduce the fuel consumption of its truck fleet by monitoring the driving style of its staff.

© Sieber Transport AG

### The Company

Sieber Transport AG is a Swiss company operating in the sector of logistics, offering transport and warehousing services, using a fleet of 230 trucks, 460 employees and a 100 000 $m^2$ floor space.

### The Challenge

With rising fuel prices Sieber needed to monitor and analyse fuel consumption and trip mileage to assess the possible ways of reducing its internal costs and monitoring the state of its truck components without affecting the welfare of its staff and the quality of the services provided. In order to do so, Sieber invested in telematics solutions involving the use of satellite navigation to decrease the fuel consumption of its trucks.

**2l of fuel saved per 100 km**

### The Satellite Solution

Sieber decided to install a telematics system in its trucks that allows for the monitoring of the vehicles and enables a direct communication between the dispatch department and each driver. The system, based on satellite navigation, monitors the drivers' driving behaviour and the trucks' performance and allows direct communication between each driver, the dispatch department and the repair shop staff, thus enabling the optimisation of route planning, order processing and vehicle maintenance. The drivers have been trained on the use of the system and integrated in the implementation and installation phases and have been informed of the benefits the system provides to their work, in order to facilitate their adherence.

### The Results

At least two litres of fuel per 100 kilometres are being saved, since the constant communication between the drivers and the fleet management helps to improve driving styles and to optimise route planning. The savings resulting from the reduction of fuel consumption and slower component wear represent twice the cost of the system's implementation and maintenance.

In addition, Sieber contributes to environmental conservation with reduced fuel consumption, but also due to the continuous monitoring allowing Sieber to identify optimised truck servicing intervals. This in turn reduces the number of replacement parts, hence leading to less pollution and consumption of natural resources.

Finally, thanks to the system, drivers are more qualified and contribute to the company's strategic efforts to cut costs and improve quality.

*"Do not save on education and communication while implementing telematics solutions."*

**Christian Sieber,** CEO



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the way of logistics

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# ENGINEERING COMPANY BES GMBH: EFFECTIVE MOBILE WORKFORCE MANAGEMENT

German mechanical and electronic engineering SME BES Gruppe are using a satnav application to save time on paperwork, streamline work processes, and to improve customer relation management.

© Temistocle Lucarelli/ Fotolia

### The Company

Founded in 1992 as a small, local, mechanical engineering company, BES GmbH has continually grown and innovated its business practices. Today, BES is an important competitor in the market for the construction of cutting-edge photovoltaic power plants and water treatment facilities. BES employs over a hundred staff, of which about half are mobile, being in charge of setting up and servicing machinery at customers' sites.



### The Challenge

Until recently, employees manually filled in time sheets and filed receipts and documentation of their missions, which were then manually processed by the management team. Not only was this practice particularly time-consuming, it was also prone to errors (poor handwriting, wrong time records, lost paperwork, etc.).

**140 000€ saved per year**

### The Satellite Solution

BES GmbH implemented a workflow software based on satellite navigation. Automatically and in real time, the application creates and processes time sheets, receipts and documentation of maintenance missions carried out by the mobile workforce. These are then fed directly into the company's central information system.

A mobile version of the satnav application is used by maintenance staff to check-in upon arrival at the customer site, document the work to be carried out and the result (e.g. a time- and geo-referenced photograph of the machinery before and after repairs), and check out upon completion. The generated data is sent instantaneously to central processing and can be consulted via a web portal. BES GmbH can thus supply its customers with geo-referenced and time-stamped documentation of the maintenance work carried out. In the long run, this data is also used to improve workforce and fleet management.

BES GmbH funded the equipment of its mobile workforce with GNSS-enabled mobile phones and pay an annual licence fee for the use of the workflow software.

### The Results

BES GmbH now save an estimated €140 000 per year on internal administration alone, allowing it to invest in the future. Customer invoicing is now based on transparent, tamper-proof documentation and contributes to customer satisfaction.

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# MADRID'S MUNICIPAL TRANSPORT COMPANY: ENCOURAGING BUS USE

The Spanish bus transport company EMT uses satellite navigation to foster and facilitate the use of urban public transports in Madrid.

### The Company

EMT Madrid, Public Transport Operator of the City of Madrid, runs a fleet of 2 100 buses on 216 lines 24 hours a day, 365 days per year, serving over 425 million passengers. EMT Madrid is committed to operating at the highest quality standards, and the use of innovative technologies is at the heart of these efforts.

### The Challenge

A survey on the public bus service highlighted user discontent over disrespect of punctuality and frequency. EMT sought to respond to this concern, help customers to plan their trips more efficiently, thus encouraging a more intensive use of public transport and a reduction of $CO_2$.

## Increasing passenger satisfaction

### The Satellite Solution

EMT Madrid developed a web platform, Movilidad 2.0, allowing bus users to position themselves on the bus network, identify surrounding streets and bus stops, calculate the walking time between two stops, the arrival times of the buses, and thus better plan a door-to-door trip. Users can access interactive maps and information on incidents and provide real time feedback to the company's customer service. The application can also be downloaded on smartphones.


© EMT Madrid

### The Results

Since the creation of the platform, 100 000 daily connections related to mobile applications (Java, Android, iPhone), to use online information, to access Geocoding and to calculate buses' arrival times have been registered. "Movilidad 2.0" enhances the offer of services and user experience, thus fostering the use of public transport and better air quality. Given the pioneering nature of the experience, this service is also integrated in Google Transit.



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# LEWISHAM BOROUGH COUNCIL : PROMOTING LOCAL ASSETS AND PUBLIC HEALTH

The Borough Council have adapted a web-based route planner for walking in Lewisham, an application encouraging people to reduce car travel, exercise as well as enjoying what the local area has to offer.

© walkit.com

### The Organisation

Lewisham Borough Council is the local authority managing Lewisham – a South London district, one of the 33 administrative units of Greater London. Its mission is to manage the territory and look after the welfare and interests of its citizens and the community, in terms of infrastructure, safety, environmental standards and health.



### The Challenge

Ensuring that people can actively participate in maintaining and improving their health and well-being is one of the main strategic priorities for the Borough Council. In order to achieve this, the Council sought innovative ways of translating strategy into action at a community level.

### The Satellite Solution

Walkit.com, a web-based urban walking route planner, allows people to plan and choose walking itineraries according to various criteria: art and culture, local interest points, parks and others. Information on air quality, one of these criteria, is derived from satellite images. The application can be downloaded on a smart phone and allows the user to follow the chosen path thanks to GPS.

In implementing the application for Lewisham, the Borough Council gathered and geo-localised all relevant content that conditions the route planner in Lewisham. This is an on-going effort to valorise the Borough's assets and encourage walking for public health.

**Requests for walking routes have doubled**

The project was carried out in association with other London Boroughs, to create economies of scale, and benefitted from support from the UK Department for Environment, Food and Rural Affairs (DEFRA).

### The Results

The people of Lewisham now benefit from a new on-line service that is easy to use and encourages them to walk more. A walkit.com survey shows that 75% of customers are taking more exercise as a result, and that over 90% have been persuaded at least once to walk - rather than taking a bus, taxi, car or tube. Consistently positive consumer feedback reports savings in both time and money whilst helping people to lose weight, keep fit and avoid crowded public transport.

*"Walkit.com proves to be a useful and motivational tool for people who live, work and visit Lewisham to make their journeys on foot, thereby benefitting from all the advantages that walking in the local area has to offer."*

**Dave Trew,** London Borough of Lewisham

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# RUEIL-MALMAISON: SUPPORTING CITIZENS' ACCESS TO GREEN TRANSPORT

The French city Rueil-Malmaison helps reduce air pollution and encourages the use of alternative modes of transport by supporting an electric car rental service.

© andrea lehmkuhl/ Fotolia

## The City

Rueil-Malmaison is located in the county of Hauts-de-Seine in the suburbs of Paris, with a population of approximately 80 000 people. Since the establishment of a local Agenda 21 in 2001, the city is engaged in a series of initiatives aiming to promote sustainable development, reduce $CO_2$ emissions and increase the quality of life in general.

## The Challenge

Benefitting from a privileged geographical location, Rueil-Malmaison is concerned with sustainable development and set itself the objective of becoming an example of a "virtuous city" in this field. Within the framework of the green actions implemented to promote sustainable development by reducing energy consumption, air pollution and traffic levels, the city already offered "green" transport modalities: the website of the municipality proposes pedestrian itineraries to enjoy the city, cycling paths and a bike station were built and the city equipped itself with 38 bikes. However, the city welcomed further diversification and expansion of this offer.

## Green transport alternative

## The Satellite Solution

The municipality decided to expand its actions in favour of sustainable transport by encouraging and supporting an experimental project implementing a rental service of electric cars available in the city (Moebius).
The fleet consists of 10 vehicles, which can be rented by any person who has registered for the service, at any time of the day. Each car is equipped with a GPS navigator connected to a fleet management system. The users communicate their position by telephone or internet to the service managers, who indicate to them the closest available car. Vehicles are equipped with a touch screen indicating kilometres, duration of use and battery charge level. The managing system also allows to localise the cars that need to be recharged, while customers can indicate any problem with the vehicle.

The city of Rueil-Malmaison offered the parking spaces dedicated to the recharging of the electric vehicles and plays an essential role in raising awareness about the service.

Moebius is a service implemented by VU Log, IFP (Institut Français du Pétrole) and Arts & Métiers Paris Tech/Institut de Chalon-sur-Saône and Institut Image, within the framework of the project «Ville Mobilité Energie" (VME), funded by the French Environment and Energy Management Agency (ADEME).

## The Results

Rueil-Malmaison succeeded in increasing the transport alternatives of its citizens by offering environmentally friendly solutions. Since June 2010, the ten electric cars have become an innovative way to move freely in the city. The vehicles are easy to use, small and silent . Finally, the vehicles are 100 % electric and thus contribute to improving the air quality of the city and to enhancing standards of living for everyone.

*"Moebius offers a valuable solution to move around the city in an environmentally friendly way."*

**Isabelle Ruffaux,** Head of Sustainable Development



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# EAST BELGIUM: ENCOURAGING GREEN TOURISM

The East Belgium Tourist Office provides downloadable interactive maps and GPS tracks for mountain bikers.

© East Belgium Tourist Office

### The Region

Bordering on the Netherlands, Germany and Luxembourg, East Belgium has a significant diversity of landscapes, from castles and farms in the north to the High Fens in the centre and lakes and valleys in the south. Such a diversified landscape attracts nature lovers for hiking, cycling, mountain biking, horse back riding and other outdoor activities. The East Belgium Tourist Office is the entity in charge of promoting tourism and assisting visitors in planning and enjoying their stay in the region.

### The Challenge

The territory of East Belgium has a very interesting natural and historical heritage. The Tourist Office promotes green tourism in various ways and puts an emphasis on enhancing cycling and mountain biking as a means to discover the region's beautiful landscapes. 850 km of cycling itineraries covering the whole region ("Velo-Tour"), and 450 km of mountain bike itineraries have been created, together with paper maps which enable visitors to discover the area autonomously. Recently, more than 100 km of the old railway tracks were converted into cycle paths (Ravel).

As the demand for biking itineraries grew, the Tourist Office looked for a way to make a better use of the already existing infrastructure and to reach a greater number of potential visitors by creating online services.

**Thousands of GPS itineraries downloaded**

### The Satellite Solution

Since 2006, the Tourist Office created sections on its web portal dedicated to cyclists and mountain bikers wanting to discover the diversity of East Belgium in a more active and environmentally friendly way. The "Vélotourisme" section offers 18 thematic biking itineraries designed to meet the demand of cyclists with different levels of ability. Combining urban and rural road stretches, they show the length of the proposed cycling paths, their degree of difficulty, the nature of the road surface and circulation. Moreover, the website hosts a section especially dedicated to mountain bikers, which provides downloadable GPS tracks that can be visualised on Google Earth maps. The Tourist Office also offers a rental service of GPS devices for mountain bikers.

### The Results

Since the creation of the downloadable interactive maps and GPS tracks, the Tourist Office can reach new users, who could previously consult the itineraries only on paper maps. The number of visits on the website of the Tourist Office has increased considerably, while the GPS tracks provided are downloaded thousands of times per year. The GPS rental service, applied for the moment to mountain bikes, should soon be used also for walks.

*"The positive evolution during the last few years encourages the Tourist Office to promote East Belgium as a top cycling destination in Europe by using new technologies."*

**Sandra De Taeye,** Director



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# THE DIGITAL DIVIDE

# SCOTLAND: CLOSING THE GAP IN BROADBAND COVERAGE IN REMOTE AREAS

A Scottish Government initiative provided around 2 400 households and businesses in rural areas with broadband access - using satellite or wireless technology - where no alternative connections were available.

© Mellimage| Fotolia

## Supporting the rural economy

### Scotland

Scotland is part of the United Kingdom and borders on England to the south. The Scottish Government is the executive of Scotland's devolved government (since 1999) and is competent in the areas of health, education, justice, transport, rural affairs and economic development. Scotland is characterised by vast remote and sparsely populated areas, notably in the highlands and islands.

### The Challenge

In 2006, following commercial rollout and a number of Scottish Government-led demand-side and supply-side initiatives, coverage of broadband in Scotland had reached over 99%. However, the remaining (less than) 1% of premises – principally located in rural and remote areas – were still left without access to a broadband connection. The Scottish Government considered that broadband access was vital to the development of the rural economy.

After careful examination, the Scottish Government concluded that conventional (fixed-line) broadband was unlikely to be able to bridge the remaining gap in coverage, and therefore considered alternative technical solutions.

### The Satellite Solution

In 2007, the Scottish Government provided a grant of £3 million in the framework of the Broadband Reach Project, which sought to identify and provide broadband connections in areas without access. An awareness-raising programme to identify demand – including targeted local radio and press campaigns – was launched. This resulted in over 4000 registered expressions of interest.

Following an open procurement process, a combination of satellite and wireless emerged as the most appropriate technology for delivery of this project, in terms of technical feasibility, installation cost and sustainability of the service.

The Scottish Government's grant covered the cost of customer premises equipment (for example: satellite dish/ wireless antenna) and associated installation fees when a customer signed up to be connected. The customers then took out a subscription for broadband access directly with the service provider. This ensured that citizens would be offered an affordable and sustainable broadband service.

### The Results

Approximately 2400 connections were set up by the end of the project in April 2010, out of the 4000+ registrations. The remaining registrations did not result in connections for a variety of reasons. Some had registered to bolster local demand in certain areas without actually wishing a connection themselves; others had found alternative solutions (e.g. 3G+) in the meantime.The Broadband Reach Project successfully bridged the digital gap in Scotland. It responded to all known broadband demand by offering a basic service and supported many rural businesses, households and communities.

*"The Scottish Government's intervention provided around 2 400 premises with an affordable, sustainable broadband service where, due to the lack of commercial viability, no other solution was available."*

**Harry Emambocus,** Enabling Technologies Team



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# PIEDMONT: STIMULATING THE REGIONAL ECONOMY THROUGH BROADBAND ACCESS

Piedmont Region uses satellite telecommunications in the broadband mix aimed at covering blank areas.

© e_anne/i Fotolia

### The Region

Piedmont is Italy's second largest region, covering an area of about 25000 km², of which 43.3% is mountainous (Piedmont is surrounded by the Alps on three sides). Piedmont Region manages the regional broadband development programme called WI-PIE. Among the implementing bodies, CSI Piemonte is a public consortium that includes the Region of Piedmont, and whose services are entirely dedicated to the different departments of the regional administration. In particular, CSI Piemonte is in charge of Piedmont's information systems and infrastructure.

### The Challenge

The particularities of Piedmont's landscape with its extensive mountainous area meant that, in 2004, broadband connectivity was available to 81% of the population, over only 32% of the territory. The region decided to take measures to bridge this long-term digital divide most efficiently and cost effectively, while maintaining a technologically neutral angle and ensuring no overlapping on the market.

### The Satellite Solution

The regional programme "A wireless territory", operational since 2004, has made use of the most modern satellite telecommunication systems and wireless technologies to offer broadband connectivity to local authorities and their associations, schools, mountain and hill communities.

The particularity of the project was that it financed representatives of candidate communities – typically private companies or consortia – to carry out the connection work and ensure the sustainability of the broadband service in the long term.

### The Results

**50% of mountain huts connected**

43 local authorities and local authority associations applied for funding from the Region to implement satellite broadband, from the beginning of the "Wireless territory" programme (2004-2005), for a total value of €7 million. By 2009, 50% of public mountain huts along the Piedmont part of the Alpine Way, without previous access to broadband, were covered. While users showed some reticence to the technology in the first place, satellite broadband soon proved a good solution in the broadband mix, and a first-choice for secluded areas, like the mountain huts. The economic impact of broadband availability is considerable, since it often made the difference as to whether local SMEs in inaccessible areas stayed in business or not.



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It is mandated and financed by its members to increase the access of society to the benefits of innovative satellite information and services.

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