Building on a Flexible Foundation

Innovators in France use Trimble technology to simplify development of customized solutions.

Trimble OEM positioning solutions streamline integration and add high performance to specialized applications.

Solution

Trimble MB-TWO Compact OEM Module

- High performance GNSS receiver
- Configurable options to meet wide range of requirements
- Low power consumption with dual GNSS engines

overview

For cities and municipalities faced with providing essential public services on limited budgets, cost efficiency is a fundamental requirement. One of the most visible services is the illumination of streets and public spaces. Street lighting is an important component of public safety, transportation, commerce and general aesthetics.

Location
FRANCE

The costs of lighting systems can occupy a significant portion of a city's budget. Expenses include installation, electricity, inspection and maintenance. In order to optimize the use of public funds, cities need timely, comprehensive information on how their lighting systems are working. Operators use the data to monitor system performance and plan maintenance, repairs and upgrades.

In addition to looking at the performance of existing lighting, cities also seek information on illumination coverage, which can reveal areas where more lighting is needed.

THE NEED FOR FLEXIBILITY

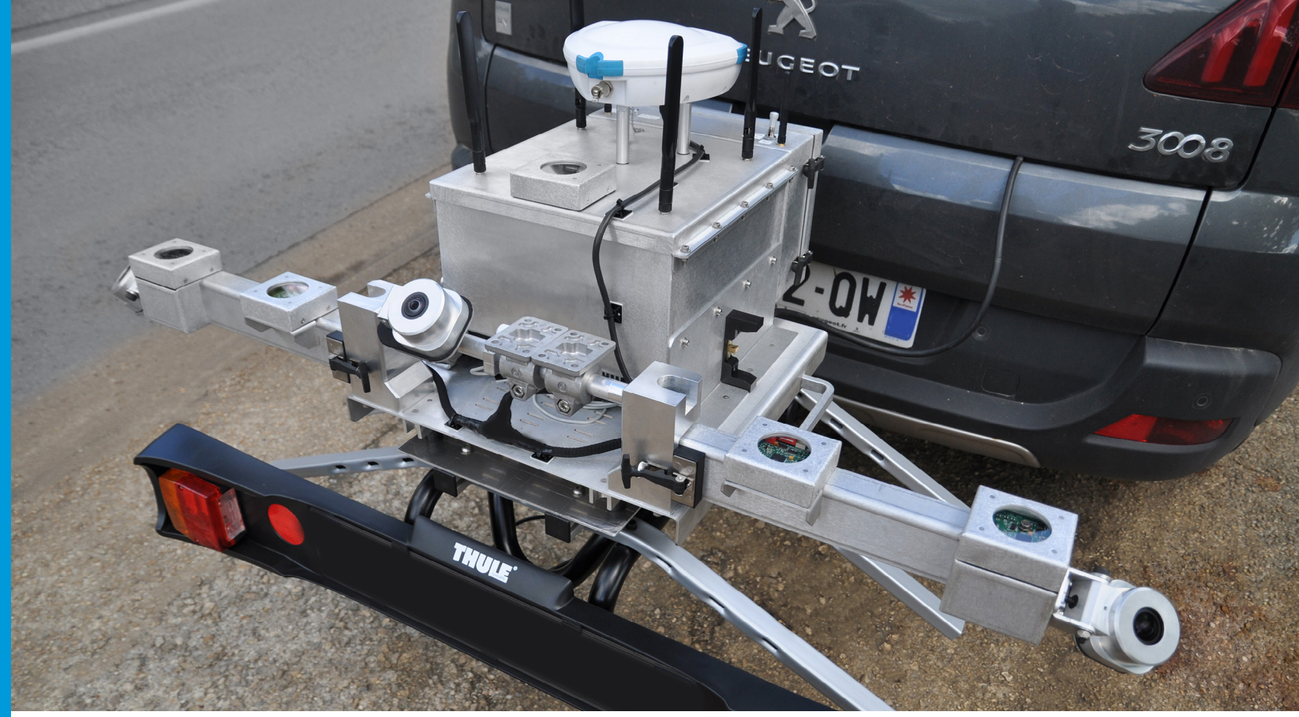
Gathering data on street lighting is often performed manually. Technicians carrying photometers and clipboards visit individual light poles to collect information on the lighting output. The work, which must be performed at night, is slow and labor-intensive and can pose safety issues for the field technicians. In addition, manual data collection may not identify dark areas that result from gaps in illumination coverage.

Compiling the different types of data into usable information adds time and cost to the effort. The difficulties in collecting and processing the data presented an opportunity to anyone who could significantly improve the process.

From its headquarters near Paris, Bouygues Energies & Services (BYes) works to provide solutions that help cities operate efficiently. According to Business Solutions Manager Jean Lebret, the company recognized the need for a mobile, automated system that could reduce the expense of data collection and processing as well as deliver results accessible by a variety of users. "We began an in-house project to reduce costs and add value to our efforts to help cities improve their efficiency," Lebret said. "Our clients quickly recognized the value of the data."

CREATING A SOLUTION

The opportunity evolved into the BYes "GetYourSpace" service, which collects and analyzes lighting and other facets of urban environments. BYes determined that a GIS-based approach would provide mapping and visualization functions to make it easy for non-technical users to understand and apply the information.



In collaboration with the renowned ESIGELEC Graduate School of Engineering, Lebret set out to develop a compact platform that could detect and measure sources and characteristics of light. The platform, which is the basis for the GetYourSpace service, could carry and manage a series of sensors. In addition to measuring lighting, the platform could be adapted to include additional sensors for noise, odors and gases, and wireless communications signals.

Lebret said (that) the design of the platform also included weight and size restrictions, low power consumption and the ability to be operated by people with little or no technical training. Development of software and controls was focused on rapid data processing and delivery of location-based results.

To be able to present information using GIS, the GetYourSpace platform needed to include reliable geolocation. BYes knew that GNSS could provide the location data, but they lacked positioning expertise. Lebret called on Cadden, a Nantes-based developer of location systems for marine and industrial applications. Based on its broad experience with GNSS and system integration, Cadden was tasked to provide the positioning component for the GetYourSpace platform.

For the GetYourSpace collaboration, Cadden proposed a version of its G-Nav smart antenna, a product from Cadden's® brand. According to Cadden Business Development Manager Marc Lefloch, the G-Nav is built around a Trimble MB-TWO compact OEM GNSS module. The MB-TWO is an advanced GNSS receiver in a compact form designed for easy integration. The module provides a range of GNSS configuration options, which allowed Cadden to produce a positioning system tailored to the BYes requirements.

The communications ability of the MB-TWO enabled Cadden to streamline the development process. The module provides multiple input/output options and can be configured and controlled using a Web interface as well as a simple ASCII command set. Cadden leveraged the module's small size and low power requirements to embed it into a compact, robust GNSS unit that combines power and data into a single connection.

Cadden's implementation of Trimble GNSS provided key enabling technology for GetYourSpace. With an area of just 1 square meter the mobile platform includes the GNSS, light and environmental sensors, system controller and data logging. The MB-TWO rapid update rate (up to 50 Hz) allows the GetYourSpace platform to capture accurate information even while moving at high speed. The platform may be mounted on a small car or towed behind a bicycle and requires minimal interaction with the operator or driver.

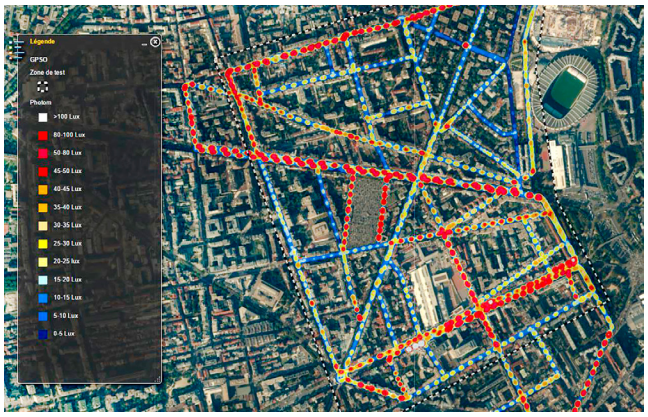
RESULTS

Bouygues Energies & Services put the GetYourSpace platform to work on a project in Istanbul, Turkey. Like many older cities, Istanbul had little hard data on its street lighting. The city engaged BYes to capture illumination data over much of the city to develop and maintain a lighting inventory.

As part of GetYourSpace, the G-Nav smart antenna could provide positioning information even among Istanbul's tall buildings and congested areas. BYes combined the lighting and GNSS data to produce GIS heat maps showing the sources and concentrations of light in the city. Analysts can compare the lighting between areas and gauge the efficiency of the lighting effort.

The GetYourSpace platform can evolve to meet the expanding needs of its clients. In addition to lighting, the solution can provide map-based data on color and intensity of light, location and field intensity for radio frequencies (used for determining coverage of cellular communications), ambient noise, and odors or air pollutants.

"GetYourSpace is an open platform," said Lebret. "We can add sensors as needed by our clients. Geolocation is always the key to visualizing what exists on the ground, so reliability and flexibility of the GNSS solution is essential."



"The MB-TWO provides excellent performance in urban environments where GetYourSpace is used. Integrating it into the G-Nav was straightforward. The module has plenty of I/O capabilities and we can update and change options to provide needed functionality."

Marc Lefloch
Business Support Manager
Cadden

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