

Bicycle parking space assured in Utrecht.

LumiGuide digital bicycle parking guidance system and Axis network cameras make life easier for cyclists.



Organization:
Municipality of Utrecht

Location:
Utrecht, Netherlands

Industry segment:
Government

Application:
Remote monitoring

Axis partner:
LumiGuide

Mission

The city of Utrecht wanted a digital bicycle parking guidance system to help cyclists find empty bike parking spaces in the numerous parking facilities in the greater Central Station area and the inner city. The Nijmegen city center wanted to get a better view of 'abandoned bicycles' and increase its bicycle parking capacity.

Solution

A smart camera system from Axis partner LumiGuide was installed inside the bicycle parking facilities. In contrast to traditional systems that monitor occupied spaces, this solution detects empty spaces in the bike racks. Two Axis cameras installed on the ceiling work like human eyes, scanning for open spaces several times a minute. The system also 'sees' if there is not enough room to park a bike in a particular slot: for example, next to a bicycle with panniers on both sides. Compared to other solutions, this system has a minimal margin of error and is much cheaper to install.

Result

The newest LumiGuide system is being used in bicycle stations in the greater Central Station area and the inner city of Utrecht, as well as at the newest bicycle parking station in the Nijmegen city center. What started out as a pilot has expanded into a full-blown solution within a year. This is important to Utrecht, a city whose ambition is to become a "Global Velo City" in 2016. The 21 digital parking guidance displays will help by ensuring that available bike parking spaces in the designated areas will be better utilized. In addition, the system provides the city government with management information that is easier to access and that can also be supplied using open data formats. This means that not only can the city respond quickly when parking stations are filled to capacity by providing pop-up bike racks but it can also allow third parties to come up with solutions.



LumiGuide was asked to provide an electronic bicycle detection system for the newest bike parking station in the Nijmegen city center, initially as a test program. Shortly afterwards, when the city of Utrecht wanted a complete digital bicycle parking guidance system for the greater Central Station area and the inner city, the company's new solution fit the bill perfectly. Information from parking stations had to be available on digital display signs in real time so that cyclists could find a dry spot for their trusty bikes. This requirement was no problem for LumiGuide's accurate patented system. It works just like a pair of eyes, replacing a human monitor with a pair of Axis HD network cameras. The easy-to-install system provides a solution that is both highly scalable and easily adaptable. In addition, LumiGuide's software provides management information that offers even more advantages.

The LumiGuide story is practically a fairy tale. CEO Roel van Dijk tells us how it all started with a couple of inventors who quickly developed intelligent software for bicycle detection. "We had already installed a number of car detection systems in the city of Nijmegen. Then the government official in charge of that project told us that the city had an even bigger problem with bicycles. The bike parking stations were a mess. The city wanted to increase capacity and significantly simplify tracking of abandoned bikes. However, the outline of a bicycle is more difficult to recognize than that of a car. The ultrasound technology we had used previously wouldn't work, so we needed to come up with a visual solution, something using cameras."

Clear and efficient

The eureka moment came when the developers realized they could create a solution that recognizes where there are no bikes present. "We found that you can solve that problem by using a pair of reliable cameras to look for available spaces, just like a pair of eyes. Using special software, we translate this into data that is easily accessible in the right place, such as digital information displays and management information, for example."

"And that was precisely what the Utrecht government asked us for, just as we were about to start in Nijmegen. Specifically, the bicycle parking stations in the greater Central Station area and the inner city were both over-full and underutilized. In addition, Utrecht is currently building the biggest bicycle parking station in the world. Under those circumstances, you want everything to move forward in a clear and efficient manner. The fact that another system was already in use was no problem for us. We linked that system to the five LumiGuide systems. They now provide the 21 digital display signs in the city center with the right information. The demand for these types of modular systems becomes increasingly more specific," says Van Dijk.

Reliability and image quality

The strength of the LumiGuide Bicycle Detection System, which is the full name of the technology, lies in its conceptual simplicity. Van Dijk notes, "That is precisely the quality of our system. The Axis IP cameras are essential for accurate recording and simple installation. Indoors we use the AXIS M3004-V and AXIS M3005-V Network Cameras, and outside, the AXIS M3026-VE. Power and Internet are all provided through the same connection. We can also connect them in series, ensuring that there are just a few cables with no large cable ducts needed. The cameras' reliability is not just important for image quality. They are very durable, which is also a requirement. You could save some money initially by buying cheaper cameras, but if you have to replace them all after four years you end up paying significantly more. We chose Axis because we want to be able to use our cameras for ten years. They are also very discreet. You might miss them completely if someone didn't point them out to you. They completely blend into the landscape of smoke detectors and tube lighting. We consider that a desirable characteristic. A bicycle parking station is crowded enough as it is."





Individually responsive

According to Van Dijk, the real sophistication of the LumiGuide system lies in the cameras. "They are the foundation. The cameras stay installed where they are now, but the software design gives us unlimited opportunities for development. The number of applications is huge. Needless to say, the cameras do help with that."

"The cameras are all individually accessible. In short, Axis delivers everything we expect with its products. The favorable price/quality ratio is very important to us, because we compete with other providers on the market on that basis too. There are no fewer than 42 cameras installed in the bicycle parking station under the renovated Plein 1944 in Nijmegen, totalling 21 sensor points. We chose specific Axis models depending on the viewing angle. High resolution is also very important, as well as performance in low light. The software tracks details on bikes. The solution works with every conceivable light level. If a human is still able to see something, then our system is capable of doing that just as well."

Scalable and shareable

Although Nijmegen already has a sizable collection of cameras, Utrecht's inventory tops that considerably. Roel van Dijk concludes, "In Utrecht there are eighty cameras indoors and as many as a hundred outdoors."

The system is capable of finding parking spaces for 3,000 bicycles. They're very satisfied with it in Utrecht. They intend to equip future parking stations in the same way, tying in to the current system. Meanwhile, we'll continue to work on optimizing the current solution.

We don't want to leave any room for the competition. We have competitive prices, and we've set the bar for now in this area. But it's the accuracy of our bicycle detection system that actually makes the difference. For instance, it recognizes that a seemingly available space can't be used because two panniers are in the way, or that a slider can't come down because there's a child's bike seat in the way.

In addition to quickly tracking down abandoned bikes and available parking places, we can also accurately monitor occupancy. That information is not only available through the matrix displays but also online. All the data is open format. This last aspect was a requirement for the Utrecht city government in the specifications for the project. Information needs to be easy to share. The data that our system generates will only be used to analyze available parking spaces and won't be stored. All data will be deleted after analysis. In short, we provide a complete, scalable and secure system. From camera to software and from matrix display to management information."

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Roel van Dijk, CEO
LumiGuide BV.



About Axis Communications

Axis offers intelligent security solutions that enable a smarter, safer world. As the global market leader in network video, Axis is driving the industry by continually launching innovative network products based on an open platform - delivering high value to customers through a global partner network. Axis has long-term relationships with partners and provides them with knowledge and ground-breaking network products in existing and new markets.

Axis has more than 2,000 dedicated employees in more than 40 countries around the world, supported by a network of over 75,000 partners across 179 countries. Founded in 1984, Axis is a Sweden-based company listed on NASDAQ Stockholm under the ticker AXIS.

For more information about Axis, please visit our website www.axis.com.