

# AUTO WORLD NEWS

## SEEING THE LIGHT: WHY AUTOLIV'S NIGHT VISION SYSTEM IS THE BIGGEST NIGHTTIME BREAKTHROUGH SINCE THE HEADLIGHT

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Picture this: It's the ordinary evening commute home. From the rearview mirror, the sun is setting, leaving a dusky glow. As the sky turns completely dark, and there is little ambient illumination, headlights seem to be the only tool for looking forward. Unlit, the road can be a daunting setting.

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You turn your head to adjust the radio knob, and an icon suddenly flashes on the windshield head-up display as an alert of moving objects in the distance. A bicyclist in dark, unreflective clothes is up ahead. So is a deer. A low but precise beam of light points from the car and illuminates the dangerous objects ahead—one on the pedaling cyclist and a discrete light on the ambivalent whitetail—without causing much distraction, with plenty of time to slow down for both obstacles.

This isn't a futuristic demo drive: It's a test of Night Vision Dynamic Light Spot, a technology developed by Autoliv to help drivers see more clearly in the dark, as fitted—in our case—to a standard BMW X5.

We traveled to Santa Barbara, Calif., where Autoliv designs and manufactures the advanced hardware, to experience the system first-hand.

### **The company you know but haven't heard of**

You may not have heard of Autoliv before, but the company's products and innovations touch almost every aspect of automotive active and passive safety, from seatbelt pretensioners and airbags to radar cameras. The 62-year-old company, based in Sweden, is a Tier-1 supplier to major automakers around the world.

"We don't promote our own brand very much," said Autoliv general manager Richard Seoane, understating the ubiquity of his company's products.

Autoliv bases its night vision operations at a nondescript business park just north of Santa Barbara, where it manufactures the hardware for advanced night vision systems. Although Autoliv has offices in 29 countries, the night vision operation in Santa Barbara is situated particularly because of its close proximity to military research centers and a hub of related technology hardware companies.

### **A set of eyes you didn't know you had, and a little ESP**

Our visit to Autoliv focused on a technical demonstration of Dynamic Light Spot in the aforementioned X5 sport-utility vehicle, using technology that is already for sale. Let's get the bad news out of the way: Dynamic Light Spot isn't yet approved by the National Highway Traffic Safety Administration for use on American roads, and is therefore not offered by any of the four automakers currently affiliated with Autoliv. (The company hopes to grow that to six manufacturers in the United States by 2015, and add two more by 2016.)

That's a shame, because the system has the potential to change the way that most people approach driving in the dark. Blame outdated regulations on the acceptable level of lumens from forward-facing lights, which the system exceeds with bright, fog light-mounted lamps.

Using Autoliv's third-generation night vision camera system—which has shrunk, thanks to advancements, to fit in the palm of the hand—the driver's seat becomes a veritable command center. Autoliv manufactures the radar-based hardware for which Audi, BMW, Mercedes-Benz, and Rolls-Royce develop unique software and user interfaces. The hardware is mounted to the exterior of the vehicle, whether in an Audi's rings or a BMW's grille, as thermal cameras cannot "see" through glass.

### **A bright road ahead for the masses**

What is Dynamic Light Spot? Part "neighborhood watch," part futuristic sci-fi film come to life, and part ESP, it utilizes radars and heat-sensitive machinery to activate a beam of light on people and animals in the distance generally undetected by human eyes. It works with thermal night vision technology, which generally appears on in-car navigation screens as roughly as it would from a military-grade tank.

Dynamic Light Spot takes night vision to an entirely more sophisticated level. Autoliv engineers developed algorithms that can recognize humanoid and animal shapes at rest or in motion, and share that information with the driver through alerts and on-screen visual cues. Sifting through just a portion of the shapes that the camera can recognize in a conference room, as we did, is like taking a Rorschach test.

Once a shape is recognized, the thermal display locks onto and shades the warm target, following it until it moves off-screen. Given enough lead time, the system provides alerts to the driver in several stages based on vehicle speed, and can sense whether a pedestrian or animal is in the vehicle's path or nearing it.

In an everyday night vision system, that's where the assistance ends. Dynamic Light Spot adds a low-powered, visible beam of light—where the fog lights usually reside—to the mix.

Each automaker that uses Autoliv's technology creates its own interface, although there is some commonality to the display functions. On the BMW X5 like our tester, a head-up display complements the night vision display on the center stack.

### **Out of the darkness**

Our first test of the system first focused on night vision fundamentals. Weaving our way through a completely empty parking lot, we received a signal that the system sensed heat off in the distance and the corresponding HUD-displayed icon. On the night vision screen, the yellow shading became larger as we neared the object, which was a specially designed stationary deer with a heat element inside. Nicely done.

To test Dynamic Light Spot's accuracy, I stood on the side of an unlit service road as Seoane sped toward me along it in the X5. From a half-mile away, the large BMW was barely visible. As the X5 neared, Dynamic Light Spot had already started working. As I stood still, a barely visible light locked onto me like the laser from a sharpshooter's rifle and refused to budge. The X5 neared, and the beam of light became brighter although unobtrusive, and remained pointed at my body. Just as the X5 was about to pass me, the light shone right at me, alerting the driver (Seoane) of my presence.

On a second run, Autoliv's PR representative stood on the side of the road, and I watched the system in action. Dynamic Light Spot identified a warm body, coloring it yellow and illuminating the icon on the head-up display. There was no faulting the technology's accuracy.

In another scenario, Autoliv's PR representative was again dispatched to stand motionless in a secluded alley as Seoane pointed the X5 directly at her. As she awaited what seemed like certain death, Night Vision began to kick in. Although the system immediately spotted her in the road and recognized her outline in yellow, it took a couple of close-call attempts before the beeping sensors were activated and the brakes were activated.

No sweat. We all survived.

### **Bicycles are everywhere!**

But the most telling use of the technology came during a late-evening drive through the neighboring town of Isla Vista, which is home to many students at University of California, Santa Barbara. Seoane described the area as ideal for understanding just how much the human eyes and brain can miss without proper illumination. As we turned onto a main street, it seemed like an ordinary night.

That's when the bicycles started appearing. Tens of them. From all over. Dynamic Light Spot began to furiously light up cyclists, pointing both beams at anything that was moving. Pedestrians—aka kids who couldn't care less about sidewalks and striped crossings—began to appear. Without the assist from Dynamic Light Spot, nearly all of them would have been missed. The system earned its "dynamic" qualification in spades.

### **Shedding the light**

While it's easy to emphasize the importance of a system like Dynamic Light Spot, the more relevant piece of news is that it works. At first, the system can seem like a distraction, shedding light on unforeseen bumps in the night and taking attention away from other key

concerns of driving—like the other cars on the road. Give it a few miles of use, and the alerts, beeps and visual cues become second nature.

After using Dynamic Light Spot, you'll wonder how you could ever drive in the dark again without it. It plays on the psychological curiosity that "something else" is in the distance, but that something remains unearthed. But, like most gotta-have-it technology available in a select few vehicles, you go right back to old habits of constantly scanning the road in the absence of technology.

### **The desirability factor**

A system as advanced as Dynamic Light Spot remains limited to a small set of high-end automobiles, but hopefully not for long. Autoliv has plans to establish partnerships with additional manufacturers and spread the tech as quickly as is practicable. Seoane—who worked on the first widespread application of automotive night vision in the 2000 Cadillac DeVille—was tight-lipped about which manufacturers might be interested in the tech next.

Would we want the system on a car of our own? Absolutely. With little barrier to entry and a very shallow learning curve, Autoliv's night vision system is easy to use, and Dynamic Light Spot seems like a no-brainer for drivers looking for an extra sense of security when driving at night—or for those who want to feel like they're driving in the evening of the future.

Read more: <http://www.autoworldnews.com/articles/11890/20150107/seeing-light-why-autolivs-night-vision-system-biggest-nighttime-breakthrough.htm#ixzz3O9Ob6cu9>