



PHILIPS



Tunnels

Public lighting

Case study

A Philips TotalTunnel  
lighting system for the A4:  
maximum **safety**  
and **sustainability**

With the tunnel lighting in the Kethel tunnel, which forms part of the new A4 Dutch highway between Delft and Schiedam, Philips has raised the bar for safe and sustainable tunnel lighting again. The tunnel's lighting installation not only meets the high expectations of the new national tunnel standard (LTS) 1.2, it also fulfils the desire for the tunnel and its access roads to integrate invisibly with the surrounding landscape.

Safe and sustainable with  
**100% LED**





Tunnel & Underpass

“

We chose Philips for their expertise in lighting and their **vision of tunnel technology.**”

Frans van den Blink

project manager of infra company Heijmans



## Background

“The missing link of the A4 between Delft and Schiedam.” It sounded so simple, but this national highway was not easy to build.

For decades, local and environmental organizations had tried to prevent the natural rural area of Midden-Delfland being intersected by a busy highway. With a 7 km road stretch, which is attractively integrated into the landscape, supporters and opponents now appear to be agreed. Once car drivers have traveled along a partly sunken 2.5 km road and a further 1.5 km stretch of completely sunken carriageway, they enter the 2 km long Kethel tunnel... and exit on the other side towards the Kethelplein intersection. Although the road leading to the tunnel can still be seen, the tunnel itself is practically invisible. It was built to the same height as the ground level, and thanks to the embankment over the tunnel structure, blends very well with the surrounding landscape.

## The Project

“For us, this was one of the biggest projects we had ever undertaken,” says Frans van den Blink, project manager of infra company Heijmans, not without some pride. “I get a good feeling looking back on it, and this certainly has a lot to do with the lighting installation.” Heijmans, which was part of the consortium set up for the A4ALL project, which also included Boskalis and VolkerWessels, chose Philips as their lighting partner. “The most important reason was their know-how in the field of lighting, and their vision for tunnel technology,” he explains. “What’s more, we didn’t want any surprises. With such a complex project, something is always bound to go wrong. After all, there’s no accounting for human error. But that’s exactly when you need things to be sorted out swiftly and properly. And we have had that experience with Philips for many years now: you know everything will work out fine. And it was the same with this project.”

## Philips Lifecycle Services

We have signed a Lifecycle Services Essential contract with Philips to give us peace of mind and relieve us from certain maintenance tasks, like preventive maintenance via system health checks or specialist expertise diagnostics and fault finding, spare parts availability over lifetime and 24/7 helpdesk. Even more interesting is that this is the first signed tunnel lifecycle services contract in the Netherlands and this project was used as pioneer.

Pleasant  
**white light**,  
adjusted to visual  
adaptation of  
the eyes



## Benefits

“What makes this tunnel special is that we achieved a 100% LED lighting solution,” says Van den Blink.

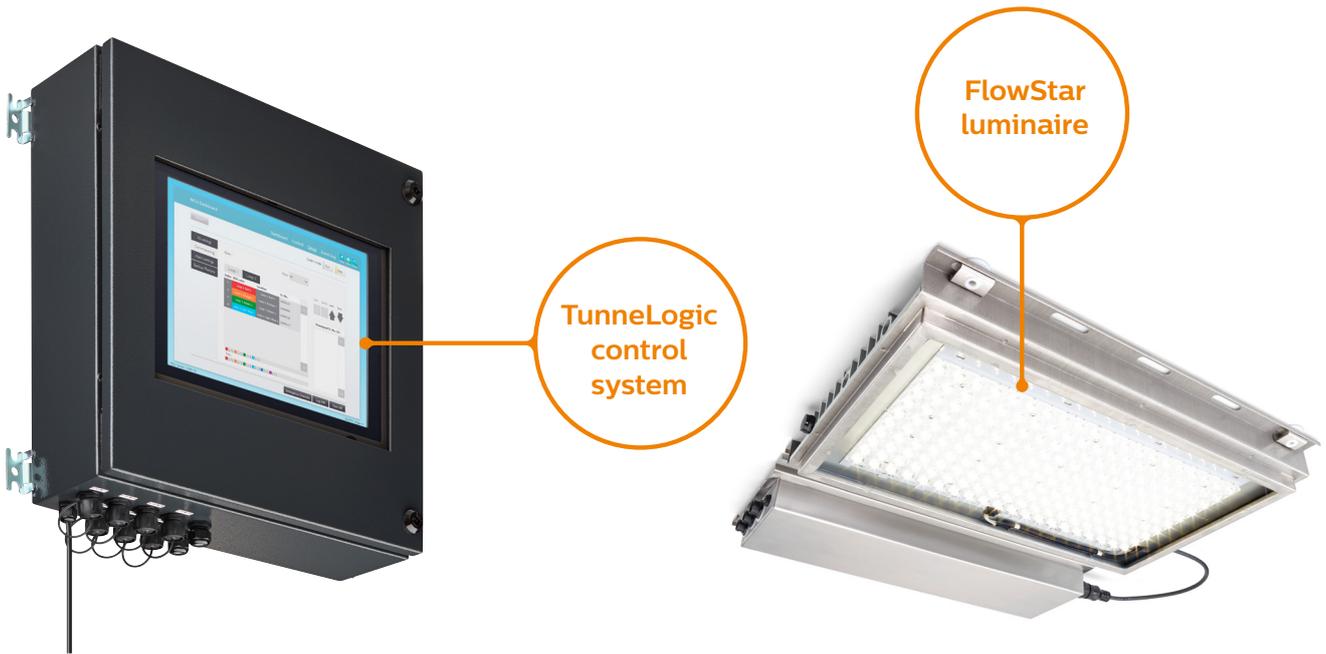
“The Department of Waterways and Public Works assumed a solution of 90% energy-saving LED lighting, supplemented by conventional, high-capacity lighting. In the end, we were able to design the tunnel entirely with LED, thanks to Philips FlowStar point-source lighting.” FlowStar offers other advantages too. The luminaire has a height of just 6.5 cm, as a result of which less fitting space is needed and therefore savings on installation can be realized. This makes it possible to install point-source lighting in a single row, with the driver boxes integrated in the same row.

What’s more, due to the product’s long life cycle, the tunnel will need almost no servicing, which improves tunnel availability. Or as the Department of Waterways and Public Works put it: fewer ‘vehicle hours’ will be lost.

The FlowStar lighting in the Kethel tunnel is fine-tuned in two areas: the entrance zone and the interior zone of the tunnel. In order to make the change from light to dark during the day as smooth as possible, the entrance zone has a high light level. After acclimatization (eye adaptation) the tunnel lighting takes over, with a light level in the interior zone that is 40% lower than in the entrance zone. The white light is also more comfortable to the eyes, and provides optimum color recognition, which is important for driver safety.

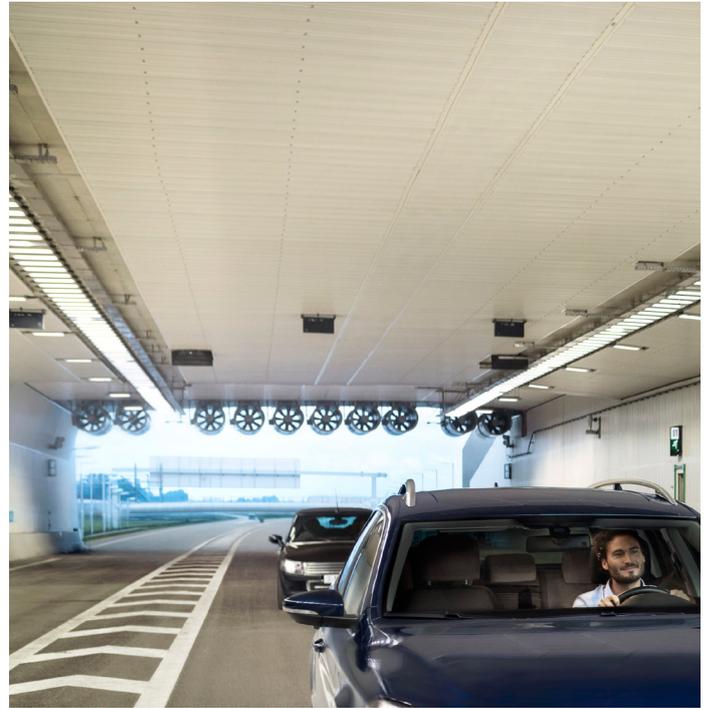
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The tunnel is equipped with **FlowStar point-source lighting** instead of linear lighting.”





**Kethel tunnel**  
 Schiedam - Delft  
 The Netherlands



**Integrated approach**

However, Philips delivers more than just good LED lighting: an end-to-end solution in which safety and availability are the predominant features. Every luminaire can be individually controlled via the Philips TunneLogic dynamic control system. The tunnel operator can see the status of the lighting in real time at their work station, and can take immediate action when necessary. Each zone is made up of a number of sections too, so that if a fault occurs, the entire zone is not affected. “Since the Salland-Twente tunnel in Nijverdal, this is the first large tunnel to comply with the new national tunnel standard,” says Arjan Tromp, technical installation manager at the Department of Waterways and Public Works. “The most significant difference to the previous situation is that we now impose fewer technical requirements in principle, but more functional requirements. That’s why we asked for one operating, control, and surveillance system that ensures that all of the individual functions in the tunnel interact in the correct way. Lighting is one of these so-called function requirements. We have secured this in such a way that in the event of an emergency, the right

installations can be controlled by simply pushing a button, boosting the light levels up to 100%.”

**No light pollution**

Outside the tunnel, the LED lighting speaks for itself once again. As an extra architectural accent, the opening to the tunnel is surrounded by shrubs, illuminated by LEDs, which makes entering the tunnel particularly attractive. The sunken access roads on either side of the tunnel are illuminated by Iridium<sup>2</sup> luminaires. These luminaires are installed on 4.5 meter high poles at the same height as the level of the ground. The angle of the luminaire is designed so that only the road is illuminated, and no light pollution escapes ‘upwards’. So this road lighting can’t be seen from ground level in the evenings or at night.

Tromp is very satisfied with the lighting installation supplied by Philips, as is van den Blink. He admits that during construction, the most stressful moments were about delivering the project on time. “Thankfully, I never had to worry about the lighting.”



Energy savings 50%



Installation and maintenance costs reduction



Fewer vehicle hours will be lost



Improved comfort and safety by 100% LED lighting



Lifecycle Services protecting your investments

“

Lighting is an integral component of an operating, control and surveillance system that ensures all **of the individual functions** in the tunnel interact in the correct way.”

**Arjan Tromp**

Technical installation manager  
of Department of Waterways and Public Works

**Iridium<sup>2</sup>**  
illuminates access  
roads with no light  
pollution





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