TVILIGHT

Case Study

Motion Sensor Adaptive Street Lighting Across Dutch Train Stations

Nearly 400 Railway Stations Become Energy-Efficient, Safe and Sustainable

The Dutch railway operator ProRail/NS chooses Tvilight's smart adaptive street lighting solution

- Nearly 400 railway stations and adjacent parking areas and yards across the Netherlands are equipped with Tvilight's revolutionary motion sensor, CitySense Plus
- Adaptive lighting significantly minimizes energy waste and carbon footprint
- Light-on-demand makes passengers and railway personnel feel safer and comfortable
- Residents living nearby as well as nocturnal animals experience pleasant surrounding, thanks to the lower light pollution

Customer Need

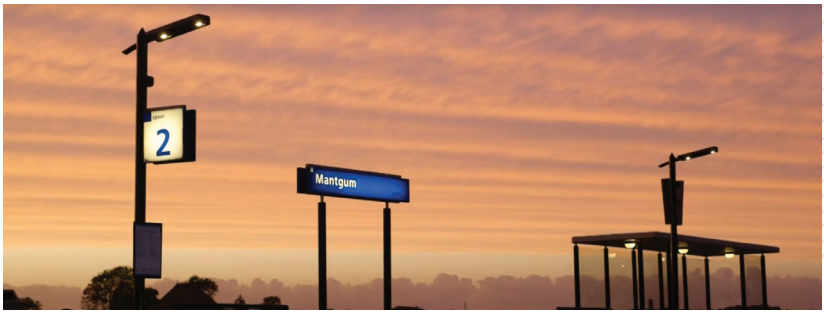
Reduce energy consumption and light pollution while maintaining safety

The Dutch railway system is one of the busiest in Europe, with millions of passengers using the trains every day. The train stations in the Netherlands are important hubs for transportation. They serve a key role in the country's infrastructure.

There are nearly 400 railway stations across the country. Each station as well as the adjacent parking areas and yards are equipped with standard lighting for general nighttime safety. Bright lights keep the darkness away. However, limitation of conventional lighting is that they remain fully lit all night – even when there is no one around. This resulted in a massive energy waste. It also created unwanted light pollution, discomforting the neighboring residents as well as the nocturnal wildlife.

ProRail/ NS wanted to address these issues and make the railway infrastructure energy-efficient, safe, and sustainable.

ProRail was searching for a smart solution that would addresses these challenges.



> We wanted to accomplish a number of goals, namely to reduce the energy consumption at the stations as well as lower light pollution for people living in the area. At the same time, we wanted to ensure public safety
>
> **Eelco Krakau, Contract Manager, Dutch Railways**

Solution

Smart adaptive street lighting

ProRail selected Tvilight's state-of-the-art motion sensor street lighting solution, CitySense Plus. The selection was made after running extensive tests on a handful of stations.

During the test, the motion sensor adaptive lighting solution proved to be energy efficient, saving over 40% energy every night. Furthermore, the "light-on-demand", which brightens street lights only in the presence of humans, also seemed to increase the sense of safety for commuters and railroad personnel. Since the lights remain dim when no one is around, light pollution was also reduced, making people residing nearby happy. The tests received positive reviews from everyone involved, and thus, formed a strong ground for ProRail to deploy this solution across the stations throughout the Netherlands.

"ProRail has always been committed to reducing our environmental footprint while ensuring the safety of our passengers and employees. Tvilight's CitySense Plus motion sensors have been a game-changer for us. By deploying these sensors, we've significantly reduced energy consumption. The lights now activate only when needed, and it's had a positive impact on our energy bills," explains a spokesperson from the Dutch Railway.

Solution

They further added, “Minimizing light pollution for the neighboring communities was also one of our key concerns. The adaptive lighting allowed us to achieve this goal effectively. We’ve received positive feedback from residents living nearby, appreciating the reduced light spillage during the night. It’s a win-win situation for everyone.”

All the motion sensor street lights are connected to Tvilight’s central light management system, CityManager. It enables ProRail to monitor and control each street light remotely through an intuitive dashboard. They can even change the settings of the motion sensors, like the lamp hold time (how long the lamp should remain lit at 100% when a person is detected), light rate up and down (how quickly the illumination and dimming should take place), neighbors (adjacent street lights), and so on, in order to tailor specific lighting needs for a particular station.

Another huge advantage ProRail sees is the CityManager’s automatic fault/ alert notifications. The system emails a status report on a daily or weekly basis. For ProRail, it reduces the number of inspection rounds, and the breakdown service no longer depends on passengers’ complaints. This turns expensive reactive maintenance into economical proactive maintenance. Plus, it keeps the lighting infrastructure up-to-date, ensuring public safety.

Results & Benefits

Energy-efficient, safe and sustainable railway infrastructure

The decision to invest in adaptive street lighting on platforms, parking areas as well as yards, proved beneficial for ProRail. With motion sensor street lights, ProRail is now able to deliver energy-efficient, safe and sustainable infrastructure that is welcomed by everyone, including the passengers, railway personnel as well as residents living nearby.

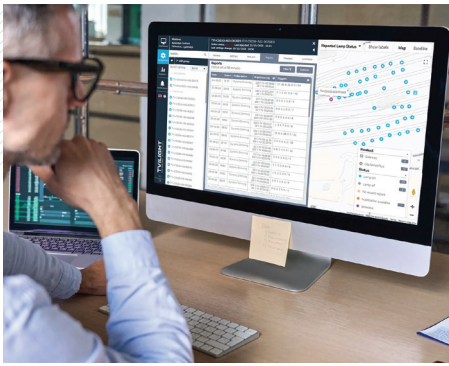
Benefits For Railway Infrastructure Management

Energy Efficiency

Smart adaptive lighting which can be tailored as per the needs of different areas of different stations results in significant reduction in energy usage. With light-on-demand, the railway stations as well as the adjacent parking areas and yards save an average of 45% energy every night!

Optimized Maintenance

Smart street lighting optimizes maintenance by remotely monitoring each light's performance. The system can detect and report faults or failures in real-time, allowing the maintenance crew to carry out targeted and efficient repairs. This proactive approach reduces the downtime and maintenance costs, ensuring that street lights remain operational with minimal disruption.



Improve Convenience

Motion sensor smart street lighting helps railway authorities understand how the passengers use the platforms. Through heatmaps, generated in CityManager software, authorities can identify where passengers spend more time on the platform and strategically place service kiosks, amenities, and traveler facilities. This in turn increases the overall convenience for people and boost economy for the railway authorities.

Enhance Safety

Motion sensor street lighting at certain places, such as the edge of train stations & level crossings, increases safety by creating a subtle lighting environment. It can change the color of street lights, for instance to blue, when someone enters this zone. This in fact raises the alertness and prevents negative thoughts, making the railway infrastructure safer for everyone.

Positive Public Image

Implementing adaptive street lighting in platforms and parking areas showcases the railway authority's commitment to sustainability and passenger safety. It enhances the stations' aesthetics, increases safety, and reduces energy waste, portraying the authority as environmentally responsible and passenger-focused, thus improving its public image.

Sustainability

Adaptive street lighting supports sustainability for railway authorities by cutting energy use and reducing carbon emissions. ProRail, for instance, has lowered energy waste by over 45%, avoiding nearly 94 tonnes of CO_2 in just six months. It also minimizes light pollution, extends luminaire lifespan, and streamlines maintenance through remote management - keeping infrastructure well-lit with less environmental impact.

Benefits For Railway Personnel

Better Safety

Adaptive street lighting in a railway yard enhances safety for railway personnel by providing optimal illumination where and when it is needed most. It adjusts light levels based on activity and movement, reducing dark spots and ensuring clear visibility, which helps prevent accidents and improves overall safety in the yard.

Optimized Operations

Adaptive street lighting in a railway yard optimizes operations by dynamically illuminating specific areas in real-time. It responds to personnel presence and activity, ensuring well-lit work zones while conserving energy in less-used areas. This enhances efficiency, reduces costs, and facilitates smoother railway operations.

Benefits For Passengers

Improved Safety

Adaptive street lighting on platforms and in parking areas enhances passenger safety by adjusting light levels based on presence. It ensures clear visibility, deters hazards, and helps passengers navigate confidently, reducing accidents and improving security.

Pleasant Experience

Smart street lighting also helps create pleasant and comfortable experiences for the passengers. With automatic adjustment of the light level and color temperature, travelers will feel a more welcoming and inviting atmosphere that enhances their overall journey.

Benefits For Locals

Lower Light Pollution

Adaptive street lighting reduces light pollution by dimming street lights when no one is around. With less light pollution, residents can sleep better and improve their health. They can also enjoy the dark sky and stargazing, which is quickly disappearing across cities. Nocturnal ecosystems benefit as well.

Future Prospect

An excellent model for railway infrastructure worldwide

The success of this project sets an inspirational example of the adoption of smart street lighting in the railway sector worldwide. The excellent energy efficiency while improving safety and reducing the impact on the environment prove smart adaptive street lighting as an ideal solution for railway infrastructure anywhere in the world.

> Tvilight's adaptive street lighting has been a game-changer for our railway stations. We have achieved remarkable energy savings, and at the same time, the enhanced safety and sustainability aspects have exceeded our expectations. It's a pivotal step towards our commitment to a greener and safer rail network.
>
> **ProRail Executive**

> Motion sensor street lighting aligns perfectly with our sustainability goals. It's been instrumental in reducing our carbon footprint, making our stations eco-friendly, and showcasing our commitment to a greener future for rail travel.
>
> **ProRail Sustainability Officer**

> Nighttime safety is essential, whether in a residential neighborhood, highway, bicycle path, or railway station. Adaptive lights play a crucial role, offering the right light, at the right time, at the right place, balancing illumination, safety, energy efficiency, and the environment. We are proud to be part of this monumental project and help make stations safe and sustainable. We hope rail authorities worldwide follow this great model by ProRail/NS.
>
> **Heide Jeuken, CEO, Tvilight**

Project Summary

Location :
Stations, Adjacent Parking Areas, Railway Yards Across the Netherlands

Client(s) :
ProRail

Application Areas :
Railway Infrasuructure

Products :
CitySense Plus
(motion sensor with in-built controller)

CityManager
(light management platform)

About TVILIGHT

TVILIGHT PROJECTS B.V. is a European market leader specializing in motion sensors, wireless lighting controllers, and a complete portfolio of street light management software – to manage, monitor, operate and maintain citywide public lighting infrastructure. Our smart lighting platform and open API allow integration to city's preferred software platform and thus constitute an open, reliable and future-proof base for Smart Cities and the Internet of Things. The company has installed over 600 projects globally across 20+ countries, including iconic cities and critical infrastructure around the world. Tvilight's international projects include Amsterdam Airport Schiphol, Dutch Railways, Port of Moerdijk, Seoul, Beijing, as well as some of the largest German cities such as Düren, Münster, Cologne, Dortmund, and Berlin. To discover more about us and our products, visit **www.tvilight.com**

References: International Rail Journal, ProRail, Sustainable Light at Railway Stations, Duurzaam Licht op Stations