DIFFERENT BY DESIGN™

KING WILLEM-ALEXANDER TUNNEL

Unique solution ensures powerful cellular connectivity

The King Willem-Alexander Tunnel helps to alleviate congestion for the residents of Maastricht

CASE STUDY: KING WILLEM-ALEXANDER TUNNEL

Driving Mobile Communications in King Willem-Alexander Tunnel with JMA Wireless Connectors

OVERVIEW

Novel Roadway Requires an Innovative Connector

The King Willem-Alexander Tunnel, located in the city of Maastricht in the Netherlands, is not your typical roadway tunnel built to alleviate traffic congestion. This 2.3-kilometer tunnel is actually four tunnel tubes stacked on top of each other, with two above and two below. The two upper tunnels are for local traffic while the lower ones are for through traffic. Each tunnel includes two lanes. Above the tunnel at the surface is a two-lane, dual roadway with cycling and walking paths in the middle surrounded by more than two thousand linden trees. This roadway is intended only for local traffic.

While the King Willem-Alexander Tunnel was built to alleviate traffic congestion, system integrator, Unique solution ensures powerful cellular connectivity VolkerWessels Telecom (VWT), was hired to ensure cellular coverage throughout this new double-decker roadway. In order to provide robust mobile communications, an extensive wireless network was deployed throughout the tunnel. However, VWT knew that the network would only be as good as the connectors installed; therefore, they turned to JMA Wireless, a global leader of wireless communications solutions. JMA Wireless offered a superior compression connector technology, unmatched by the competition. VWT needed to ensure the integrity of this wireless network and partner, JMA Wireless, delivered.

Increase
guest satisfaction

Seamless
Mobile connectivity

Streamlined
business operations

The VolkerWessels team successfully finished the wireless network deployment in eight short weeks.

SITUATION

Unique Solution Needed to Overcome the Outdoor Elements

A wireless network in an outdoor environment, such as the King Willem-Alexander Tunnel, brings with it a host of challenges that adversely affect a network's performance and cause signal degradation. First, the outdoor climate itself can be an issue for wireless networks. Since the tunnel is in Maastricht, the network must deal with broader temperature fluctuations than those in coastal areas. The winters are often colder while the summers tend to be warmer. Also, the winters bring a higher amount of snow. This increased level of moisture can wreak havoc on the performance of a wireless network.

Next, the network is in a tunnel with a high level of daily traffic, which means an excessive level of vibration. These vibrations can impact the structural integrity of a wireless network because antenna line connectors may become loose and unreliable.

Outdoor equipment is more susceptible to signal disruptions due to its constant exposure to polluted air, dirt, and the development of corrosion or rust. These environmental conditions can result in signal performance issues classified as PIM (passive intermodulation). PIM causes a form of interference that is generated in passive components such as antennas, cables, and connectors, or duplexers with two or more high-power input signals. An outdoor wireless system must be built to guarantee the best possible PIM performance even under the most difficult conditions.

In addition to the outdoor elements, VolkerWessels Telecom also needed to consider the ease of installation of the wireless network. The team had only eight short weeks to install the entire network. It had to be fully deployed and provide support for all four mobile operators before the tunnel's opening day.

Ease of repair and network reliability were critical considerations for this project. Rerouting lanes of traffic for hours to bring in a crew to repeatedly repair a network would be unacceptable for this highly trafficked tunnel. If the network needed repair, the process had to be completed as quickly as possible.

These types of repairs are not only inconvenient for drivers, but are also very costly because of the expenses associated with bringing a crew onsite.

Finally, during high traffic hours, the King Willem-Alexander Tunnel also presented an issue known as densification. Mobile operators encounter this issue when there is a highly concentrated area of mobile subscribers with a high demand for cellular connectivity, which can be prevalent during the daily commute. It was critical to ensure customer satisfaction even during peak commuting times.

SOLUTION

Exceptional Connector Triumphs Over Performance Issues

A critical component of any wireless network is the connector; therefore, VWT wanted to make sure that a superior product was deployed in the King Willem-Alexander Tunnel. Three hundred UXP-DM-12S connectors from JMA Wireless were installed throughout the wireless network to provide connectivity for four mobile operators (KPN, Vodafone, T-Mobile and Tele2) four bands (800, 900, 1800 and 2100 MHz), and six sectors.

With a short, eight-week installation timeframe, it was crucial that the network's components be easy to install. The UXP-DM-12S connectors were no exception. Unlike competitive offerings with multiple parts, the JMA Wireless connector is a solid one-piece solution, including both the mating interface and the cable attachment, which meant valuable time in the field was not spent assembling piece parts. Furthermore, UXP-DM-12S connectors were installed quickly using standard tools.

The JMA Wireless connector had no issue with the cold temperatures encountered during the tunnel's November / December deployment because it can be installed and serviced in virtually any temperature, from –40°C to +85° C. Many connectors from other manufacturers can be deployed only when temperatures are above freezing.

In-vehicle data usage rates have been increasing exponentially; therefore, it was critical that the quality of service (QoS) and downloads over the network be excellent. The client wanted satisfied commuters with a positive network experience, even during periods when densification was expected. The UXP-DM-12S connectors helped guarantee this satisfaction thanks to their unmatched mechanical stability even during these intermittent periods of high data usage.

Passive intermodulation, which directly affects network performance and ultimately customer satisfaction and profitability, was a critical issue. With JMA Wireless solutions, the network is 100 percent PIM optimized, resulting in robust cellular connectivity and satisfied mobile subscribers.

JMA Wireless' solid one-piece connectors provide **superior network integrity and reliability.**

JMA Wireless stands behind its connectors with a lifetime warranty. If a crew does have to repair a connector in the field, JMA Wireless will pay for this added expense, making the UXP-DM-12S a very cost-effective offering when compared to the competition.

RESULT

Connecting Commuters

Since the wireless network's activation date, commuters using the King Willem-Alexander Tunnel have experienced the ultimate in mobile communications. The UXP-DM-12S connectors are a critical component of the network, helping to combat the outdoor elements that can degrade signals and adversely affect overall network performance. Even in the harshest winters or hottest summers, these compression connectors help to ensure that drivers and passengers have the cellular connectivity needed during their travels.

About JMA Wireless

JMA Wireless is the leading global innovator in mobile wireless connectivity solutions that ensure infrastructure reliability, streamline service operations, and maximize wireless performance. Employing powerful, patented innovations their solutions portfolio is proven to lower the cost of operations while ensuring lifetime quality levels in equipment and unrivaled performance for coverage and high-speed mobile data.

JMA Wireless solutions cover macro infrastructure, outdoor and indoor distributed antenna systems and small cell solutions. JMA Wireless corporate headquarters are located in Syracuse, NY, with manufacturing, R&D, and sales operations in over 20 locations worldwide.

FOR MORE INFORMATION:
jmawireless.com

About VolkerWessels Telecom

From people to machines, everything around us is connected day and night. That's what we call 'total connectivity'. It has rapidly become a modern necessity, as essential to our lives as energy, light and water. And connectivity relies on the network. VolkerWessels Telecom designs, builds and maintains that network. We do so everywhere you look, and in places you can't even see: high in the air, under the ground, inside people's homes. Our fully integrated approach and end-to-end solutions facilitate all types of social interaction. We support economic progress through ongoing innovation. VolkerWessels Telecom is cost-conscious, transparent and adaptive. We work alongside our clients to achieve the best results, unrivalled in quality, safety and sustainability.

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