

## Comfort and safety in new generation trams.

Modern low-floor access trams with several sections cannot exist without surveillance cameras.



Organization:  
Škoda Transportation  
a.s.

Location:  
Czech Republic

Industry segment:  
Transportation

Application:  
Onboard surveillance,  
remote monitoring

Axis partner:  
AMiT, spol. s r.o.

### Mission

Škoda Transportation a.s., a leading engineering company with international participation was searching for a suitable solution for low-floor access trams to manufacture new 15T ForCity trams, models 26T and 28T. A camera surveillance system installed in these low-floor access trams with several sections is necessary in order to allow the driver to monitor the situation inside and outside of the vehicle. The system also serves a security purpose – to allow video recording and analysis of the recording in case of a traffic accident, act of vandalism or other criminal acts.

### Solution

AMiT, spol. s r.o. specializes in electronic systems used in railway vehicles and designed a solution which may be paired with all additional technologies such as the tram public announcer system, information system and camera systems and which uses a unified ethernet network. Vehicles are fitted with 8 to 20 AXIS 209FD Network Cameras (based on the model, length and modification) – always with several outdoor cameras above each door and inside the vehicle.

Video from cameras, without the need to be stored first, is projected directly to a 15 inch IP display installed above the driver's head, which replaces rearview mirrors installed in older models.

### Result

The solution supplied by AMiT, which uses Axis network cameras, completely satisfies surveillance demands used in modern low-floor access trams with several sections simply because the driver cannot do without cameras. Cameras also provide the driver with better comfort – the driver can better monitor the situation inside the entire vehicle. The option to record video and remote surveillance elevates the driver and passenger security by one level. The system is easily expandable because it is based on a unified ethernet network. The video feed from cameras complies with high quality requirements even when lighting conditions are not perfect and the system does not suffer from frequent breakdowns as analog systems often do.

"We bring cutting-edge technologies to our customers, which comply with current requirements for security and reliability of public transportation systems. Axis IP camera systems designed by AMiT offer a reliable and cost-effective solution for IP camera video surveillance, and experiences obtained from already working systems have demonstrated that it provides better security and comfort for drivers and passengers."

Radek Elhota, 15T Project Manager at Škoda Transportation.

### Why cameras are necessary

Modern trams with several sections must be fitted with camera surveillance systems. For example, when a long vehicle stops in a curve, the driver has no way to control and see whether a person is standing around the door. Cameras installed above vehicle doors help the driver to see movement of passengers on IP displays. Further, these cameras supplement another three electronic systems, which eliminate the risk that the passenger will be caught in the door and pulled by the vehicle. As far as petty criminality is concerned – another risk affecting public transportation – research showed that just the installation of security cameras inside a vehicle acts as a preventive element.

### Analog cameras installed in trams are not reliable

Amit gained a lot of experience thanks to previous installations of analog cameras. This experience proved that transmission of signals from analog cameras installed in vehicles using tracking poles suffer from many defects due to power in the tram poles. Therefore, in comparison with IP cameras, analog cameras are very unreliable and must be fitted with additional protection elements. "Based on our experience, IP technology is much more reliable," says Roman Ulrych, Managing Director of AMiT.

