

Kapsch TrafficCom

Optimizing safety and efficiency for bridge and tunnel operations

Introduction

Tunnels and bridges present unique management challenges for operators. To keep traffic flowing optimally, and to maximize safety for drivers, responses to traffic incidents must be fast and effective. Additionally, inspections and maintenance must be carried out quickly and efficiently, and specific challenges – such as maintaining good air quality in tunnels – require sophisticated, 24x7 monitoring, with the ability to trigger appropriate actions in real-time.



Added to this complexity, bridge and tunnel operators typically depend on multiple systems, from radio communications systems and variable message signs that display temporary speed limits and other instructions to drivers, to ventilation management systems, and supervisory command and data acquisition systems (SCADA). These kinds of systems are often deployed over time to meet specific and evolving needs, leading to a patchwork of technologies that is difficult to operate, manage, maintain, and support. Even if technology deployments are 'greenfield', deploying multiple plant and traffic management systems inevitably creates significant cost and efficiency challenges.

But while disconnected systems increase management complexity and costs, they can also have negative impacts for driver safety. In particular, the need to generate commands in disparate systems can slow down responses to critical, and potentially life-threatening situations, leading to unnecessary delays in treating injured people, or clearing lanes.

As an additional challenge, siloed systems reduce an operator's ability to manage bridges and tunnels in an effective and cohesive way. It becomes difficult, for example, to initiate complex responses to situations, such as vehicle breakdowns, which require a new traffic plan to be put into place, information to be sent to the police, answer calls from incident management partners, etc. – all at the same time. With no way to manage such situations without complex manual workflows and multiple siloed systems, response times are increased, causing increased safety risks and having a negative impact on travel times for drivers in the area.

In the face of these operational, efficiency, and safety challenges, forward-thinking tunnel and bridge authorities are looking to replace their siloed or 'stovepipe' systems with more integrated solutions. This approach makes it possible to achieve a 360° view of bridge and tunnel operations, speed up management decisions and incident responses, and deliver even better experiences for drivers.



The key technology building blocks for 'unified' bridge and tunnel management

Conceptually, breaking down system siloes and adopting a single, unified bridge and tunnel management approach is simple. However, the reality of delivering all of the technology infrastructure, features and functionality needed to effectively manage a bridge or tunnel, and traffic flow around and over the asset, is far more complex. To enable this transition – and to unlock the efficiency and safety benefits of unified bridge and tunnel management – operators need:

1

Plant automation capabilities

including the full range of plant automation subsystems typically required for bridge and tunnel environments, such as: ventilation systems (in the case of tunnels), lighting systems, energy systems, fire detection systems, deluge systems, HVAC systems, drainage systems, and more.

2

Advanced, automated traffic management capabilities

including all of the subsystems needed to optimise traffic flow and to minimise accident risks, such as tolling systems, signage systems, signalling systems, over-height vehicle detection, enforcement systems, and more. These need to be fully integrated to provide a comprehensive, real-time view of traffic flow over the bridge or tunnel and to support fast, effective decisions to optimise flow and safety.

3

A single management dashboard

to replace multiple interfaces and to ensure that teams have a real-time view of bridge or tunnel operations. With a single interface for viewing and controlling plant and traffic management, teams can also identify and respond to incidents faster, and generate commands more quickly and easily – with no need to toggle between multiple systems, or to learn different applications or toolsets.

4

Expert, end-to-end integration services

which support the integration of hardware and software infrastructure from multiple vendors, including datacentre and end-user hardware and software, roadside sensors, smart video cameras, decision-support software, and much more.





Delivering the vision of unified, more efficient, and safer bridge and tunnel operations

To meet the need for unified, fully integrated bridge and tunnel operations, and to help authorities and agencies overcome the efficiency and safety challenges associated with siloed plant and traffic management systems, Kapsch TrafficCom offers an industry leading Bridge & Tunnel Solution. This is built on our DYNAC software platform, which provides mission-critical support for integrated bridge and tunnel management across safety management, power management, and integrated SCADA capabilities.

Based on end-to-end engineering and integration support, we bring together all the sub-systems, hardware, and software, needed for bridge and tunnel management into a single, unified, easy to manage environment and interface. DYNAC's next generation UI provides a single-pane view with drag-and-drop modules giving operators full situational awareness and control from a single operator interface. As a result, operators can trigger effective responses to both plant and traffic incidents just a few keystrokes.

Wherever possible, routine control requirements – such as energy efficient, compliant lighting and ventilation settings – are automated, helping authorities and agencies to reduce manual workloads and administrative costs.

“Our Bridges & Tunnels solution optimises responses across integrated tunnel and traffic management sub-systems with our decision-support software. Using a single, intuitive dashboard interface, operators can initiate commands to all connected devices and functions, from audio communications and sign messaging, to dispatching, ventilation fans, and opening and closing of dampers. These com-mands can typically be initialised in 4 to 6 keystrokes, in just 2 or 3 seconds, maximizing the speed and efficiency of incident responses, and minimizing health and safety risks for drivers using bridges and tunnels.”

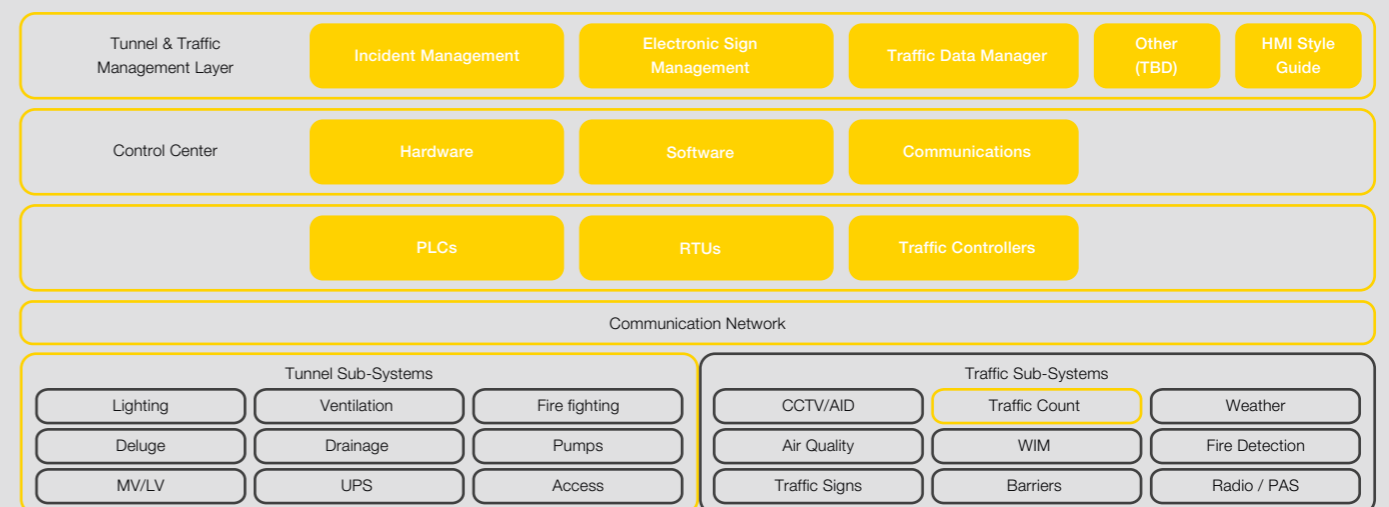
Jim Montgomery, Vice President of Regional Support & Systems Engineering, Kapsch TrafficCom North America

Key solution components

Key elements of the Kapsch TrafficCom solution include engineering and integration support for all hardware and software components, and an integrated tunnel and traffic management layer, a unified control centre system, and an integrated SCADA system – all provided by DYNAC. Operators can choose to connect the different solution components with an existing or third-party network, or with network infrastructure provided by Kapsch.

Our Bridge & Tunnel solution can also be integrated with broader Integrated Mobility Management (IMM) systems on the city or highway network. This ensures that traffic continues to flow as freely as possible on roadways surrounding bridges and tunnels, and that vehicles can be rerouted optimally in the event of an incident that blocks lanes. Multiple bridges and tunnels can also be integrated into the same, single management system to support a broader view of KPIs.

KTC Tunnel Solution Overview



The Kapsch TrafficCom Bridges & Tunnels solution integrates all of the hardware and software components and sub-systems needed for effective bridge and tunnel management, with real-time alerts and decision support to speed up incident responses and to reduce manual workloads and costs.

Why Kapsch TrafficCom for Bridge & Tunnel management?

Kapsch TrafficCom offers a number of key differentiators for authorities and agencies looking to

optimise management efficiency and safety for bridge and tunnel operations. There are:

1

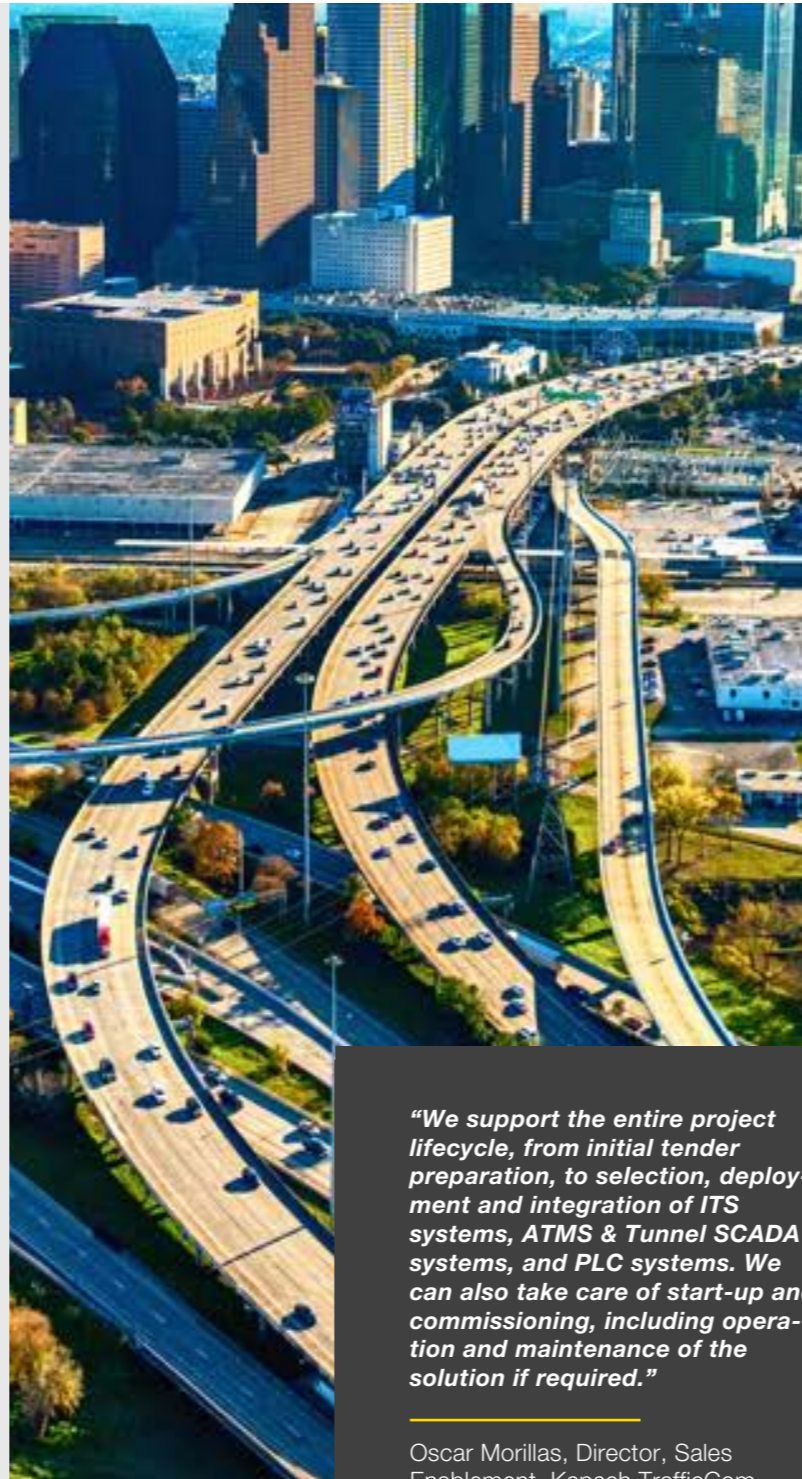
Integrated plant and traffic management for improved efficiency and safety

By integrating plant automation and traffic management controls and alerts into a single, easy to manage solution, we can help your agency dramatically increase efficiency and respond to safety incidents more quickly and effectively.

2

End-to-end project delivery, with a single point of contact and support

Kapsch has experience of delivering integrated, highly efficient bridge and tunnel management solutions from end to end. In particular, we can design and plan the ideal solution for your agency; select best-in-class third-party hardware and software (including smart cameras and sensors) to support the solution; integrate the entire technology stack; deploy and configure the entire solution; and operate and maintain the system on an ongoing basis (as needed). This gives your agency a single point of responsibility for the entire solution – reducing risk and ensuring rapid support to ensure ‘always-on’ operations.



“We support the entire project lifecycle, from initial tender preparation, to selection, deployment and integration of ITS systems, ATMS & Tunnel SCADA systems, and PLC systems. We can also take care of start-up and commissioning, including operation and maintenance of the solution if required.”

Oscar Morillas, Director, Sales Enablement, Kapsch TrafficCom

3

Advanced ‘simulation’ capabilities to streamline staff training

With our solution, your agency can create software simulations that speed up operator training, without impacting live operations. Additionally, you can test and assess the potential impact of changes – such as modifications to signalling or access control processes – before they are implemented.

4

Integration with broader IMM systems for enhanced city or regional traffic management

Because our solution is built on standardised technologies and workflows, we can share operational and traffic information from your bridge or tunnel with other IMM systems or transit agencies to support broader congestion, air quality, or traffic management objectives in the city or on the highway network.

The industry's trusted partner for bridge and tunnel management

Kapsch TrafficCom is a global leader in the delivery of next-generation, fully integrated tunnel and bridge management systems, and advanced IMM and traffic management solutions. As a result, we have the skills, industry knowledge, and delivery experience needed to de-risk your transition to unified, efficient, safe bridge and tunnel management.



Backed up with a large, global installed base and major reference projects

In total, we have deployed management infrastructure and systems for more than 200 road tunnels and bridges globally, comprising more than 250 km of roadway. These deployments span all regions, and cover all of the possible settings and scenarios, from bridges and tunnels in mountainous terrain and on urban road networks, to highway and sub-sea tunnels. Our deployment portfolio includes a large number of high-profile reference projects.

These include control and management infrastructure for the Metropolitan Transportation Authority, which manages seven tunnels and two bridges in New York City, for the Boston Central Artery Tunnel in Massachusetts, and all bridges and tunnels for the New York and New Jersey Port Authority (PANYNJ). We also have many other reference projects worldwide, including, Sidney's Eastern Distributor, M2 & NorthConnex in Australia, and in Spain, Brazil, and many other countries worldwide.



On-time, on-budget delivery – with the highest quality standards

Based on our extensive industry knowledge and experience, Kapsch ensures on-time, on-budget delivery for agencies' mission-critical bridge and tunnel management projects. We ensure the highest quality standards to minimize risk at every stage of project delivery and to ensure the best business outcomes.



To find out more about Kapsch TrafficCom's industry leading Bridges & Tunnels solution, or to discuss your specific plant and traffic management challenges, please contact us today at:

ktc.experts@kapsch.net

Kapsch TrafficCom

Kapsch TrafficCom is a globally renowned provider of transportation solutions for sustainable mobility with successful projects in more than 50 countries. Innovative solutions in the application fields of tolling, tolling services, traffic management and demand management contribute to a healthy world without congestion.

With one-stop-shop-solutions, the company covers the entire value chain of customers, from components to design and implementation to the operation of systems.

Kapsch TrafficCom, headquartered in Vienna, has subsidiaries and branches in more than 25 countries and is listed in the Prime Market segment of the Vienna Stock Exchange (ticker symbol: KTCG). In its 2021/22 financial year, 4,220 employees generated revenues of about EUR 520 million.

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