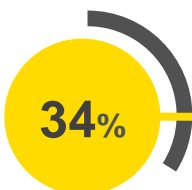


Kapsch TrafficCom

Faster, greener, safer...

*How to cut congestion and improve road user experiences
with Integrated Multimodal Traffic and Mobility Management*





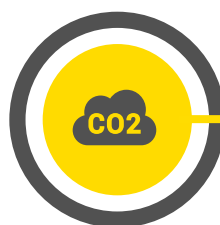
World population is estimated to increase by 34% by 2050.

Congestion related costs are expected to increase by 50% between 2013 and 2030.



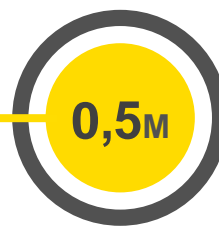
Road traffic accidents cause more than 1,35 million fatalities a year globally.

Major productivity losses due to congestion and slow traffic reduce GDP in USA by 1,7% and in Europe by up to 1,5%.



Pollution from vehicles increases health risks and negatively impacts quality of life.

500.000 people die from the consequences of traffic related air pollution every year.



Why existing mobility management approaches are no longer enough.

In the past, many city authorities and highways agencies have used multiple systems and processes to control traffic flows. Often, traffic monitoring and controls are also highly manual, which makes it difficult or impossible to scale operations effectively, or to react quickly enough when traffic and environmental conditions change.

One key factor holding authorities and agencies back is the siloed nature of their operations and divisions, which prevents effective data sharing and incident responses. Additionally, stand-alone systems for traffic lights and road-sign management, access controls and congestion charging, and video and sensor systems, it is difficult or impossible to gain an accurate, real-time view of traffic on the roads.

Beyond disparate data, cities and highways agencies often lack the technology tools to predict traffic peaks or to identify and react to incidents in real time. This is not surprising, as most legacy technologies focus on simply keeping traffic lights and other signals running, with no way to adapt as traffic conditions change and roads become more congested.

Even if systems exist for real-time traffic monitoring, these are often unconnected and unable to automate responses in the subsystems responsible for controlling traffic flow – including traffic-light signalling systems. With systems that use data from multiple sources to understand and predict traffic flow, automation is critical to enable real-time or rapid responses to changing traffic conditions and traffic incidents.

“There’s a common perception that simply collecting and analysing data enables proactive traffic management. However, a team of humans is far from having the resources or time needed to implement the appropriate responses to changing traffic conditions in de-facto real-time, and at scale, based on manual processes. That means that analytics and AI systems must be fully integrated with automated decisioning and actioning tools that improve traffic management on a constant and ongoing basis.”

> Michael Ganser, Vice President for Solution Consulting at Kapsch TrafficCom

The good news for city, motorway and transit agencies is that these challenges can now be overcome with the right technology platform and tools. In particular, the latest generation of Integrated Multimodal Traffic and Mobility Management solutions can help to significantly increase the capacity of the existing road network, automate traffic management actions and incident responses, speed up traffic flow, reduce vehicle-related air pollution, and improve economic outcomes for your city or region.

Addressing growing traffic challenges with Integrated Multimodal Traffic and Mobility Management (IMM)



What is IMM and how does it work?

IMM is a blend of organizational and technology solutions that allow cities, highways agencies, and public transport authorities to address current and future congestion challenges. It incorporates 5 key elements that help to move from legacy and manual traffic management to smarter, more effective, more automated congestion controls that greatly improve the impact and the productivity of any traffic and mobility management operations:

1

Frameworks for inter-agency and cross transport mode collaboration

With Integrated Multimodal Traffic and Mobility Management (IMM), cities, public transport authorities, and private industry work together seamlessly to solve traffic challenges. One example of this are response plans that are commonly executed across multiple road operators who are responsible for looking after different sections of the road network. When an incident takes place in one sub-section of the road network, an action plan often has to be implemented that involves a road operator responsible for an adjacent area to support a joint incident response. Another example of collaborative traffic management would be public transport providers – including bus operators sending vehicle positions to city authorities to support public transport vehicle priority at traffic lights. This kind of solution can be easily extended to other public and private operators of special fleets as first responders, or overweight and hazardous goods vehicles.

2

'Umbrella' systems that integrate traffic management systems and data

IMM builds on an umbrella system that bring together data from multiple traffic management systems – including traffic-light systems, signage systems, congestion charging and access control systems, and others. This data is then combined with other rich data from vehicles, mobile phones, and navigation systems to support far better routing and management of traffic. By processing data from a wide range of sources with powerful AI and prediction tools, the IMM umbrella system generates a comprehensive, real-time view of traffic condition. This lays the foundations for better informed decision making. To increase the effectiveness of traffic management still further, real-time traffic data is integrated with automated decisioning tools that initiate coordinated and real-time responses to changing traffic conditions – such as adjusting traffic light timings at specific junctions, shaping traveller routes by virtual message signs, increasing the capacity of free-ways by adjusting ramp metering parameter settings, and more.

3

Predictive and proactive traffic management

As IMM uses sophisticated algorithms and models to analyse data from vehicles, sensors, video footage, users' mobile phones, social networks, and more, it enables cities and public transport authorities to predict and effectively manage fluctuations in traffic volumes. This enables authorities to effectively manage regular demand peaks, such as weekend football matches, as well as to predict how traffic conditions are likely to change in the coming 15 or 30 minutes. With predictive analytics and AI, authorities can manage traffic proactively by implementing routing strategies, using user-facing apps to suggest alternative transport options or routes, and with a range of other measures. This capability is especially useful when predictive models show that traffic conditions are about to become abnormal, which is when controls are most needed to reduce congestion and ensure the best road-user experiences. With this kind of predictive capability, measures are taken to avoid traffic jams before they even occur.

4

Adaptive traffic light and signal optimization

Route and traffic data from IMM umbrella systems can be fed into automated signalling systems to optimize the flow of traffic through busy junctions. Experience from many real-world installations shows that advanced, adaptive signalling has given proof to be very efficient: specifically, data on traffic demand allows authorities to optimize timing for traffic lights on an ongoing basis, which can reduce congestion by up to 30%. For this reason the adaptive traffic signalling layer should be incorporated into any IMM installation to achieve the best outcomes.

5

Integrating vehicles into traffic management solutions

Using data from vehicles' onboard systems, or from drivers' mobile devices, it's possible to create more intelligent, effective traffic management strategies. Vehicle data, for example, can be used to power innovative navigation applications that route traffic more effectively as well as to streamline compliance with traffic authorities' standards. Vehicle data combined with AI and machine learning can also be used to support smartphone and in vehicle apps that allow drivers to see if upcoming traffic lights are red, amber, or green as they approach – helping to increase safety – or setting a recommended optimal driving speed which is proven to significantly improve traffic flow while reducing fuel consumption (by up to 15%) and thus improving air quality.

6

A consultancy led approach

Each city and highways authority has specific needs. This means that any IMM strategy should be underpinned with consultancy that bridges from technology and features to business outcomes. While some configuration is essential to support local needs, the leading IMM solutions will provide all of the key functionality needed to collect, analyse and act on traffic data as standard, with minimal need for third-party consultancy or custom development work.

The unique benefits of IMM for cities and highways authorities.

By bringing together data and decision making information from multiple traffic control systems and agencies, and by supporting real-time and predictive analysis based on AI, IMM provides unique benefits for cities, highways agencies, and citizens.

Proactive traffic management for reduced traffic congestion

With IMM, it is possible to detect and react to changing traffic conditions in real time. This means you can adjust traffic light timings, change signage and implement and disseminate recommendations, policies and rule settings where necessary to keep traffic flowing as quickly as possible. This is all possible thanks to powerful predictive analytics and decision-making capabilities that allow you to predict congestion and to implement control measures automatically.

Integration with third-party congestion and incident-response solutions

IMM supports a wide range of third-party solutions that combat congestion and speed up responses to incidents on the road network. One example is smart navigation, which avoids private navigation services sending hundreds or thousands of vehicles on the same route. Instead, the routes are harmonized among navigation providers to ensure that traffic continues to flow freely on the road network.



Improved environmental outcomes and air quality

With IMM, it's possible to integrate environmental data from sensor stations and models into the traffic management strategy, and to predict how air quality will change in the coming 30 minutes on a rolling basis. This means traffic signalling and dynamic road signage can be adjusted – or even access controls or congestion charging connected to the IMM – to ensure that air quality is not compromised. Additionally, you can keep citizens informed of any traffic controls that have been implemented due to environmental conditions, allowing them to plan alternative routes or travel options before they begin their journey as well as when their trip has already commenced.

Improved public transport operations and better mobility services for citizens

Using data from Integrated Multimodal Traffic and Mobility Management solutions, public transport operators can optimize their operating efficiency and service performance. It becomes possible, for example, to anticipate periods of high demand, maintain the most appropriate traffic signal priority, and even to send additional buses or larger buses to certain stops as required to meet high demand. Public transport organisations can also use innovative solutions, such as variable message signs or in-vehicle information that reduce fuel consumption and increase driver and passenger safety.





Accelerate your journey to IMM with Kapsch TrafficCom.

Kapsch TrafficCom has been working with cities and regional authorities to improve the quality of life for local citizens for more than 60 years. We have deployed traffic management and monitoring solutions in around 200 cities worldwide, and our real-time and traffic management tools are used in approximately 30 major cities, from Madrid in Spain and Buenos Aires in Argentina, to Dallas in the USA.

In addition to our unique experience, Kapsch TrafficCom is the only partner with expertise and capability across the full mobility management spectrum. This includes everything from traffic management for cities and highway networks, access controls and congestion charging, tolling, interacting with public transport management systems, and more. This gives our customers a single point of contact for all of your mobility management needs.

Many of these capabilities are based on our unique IT skills as well as deep experience in the traffic domain, including V2X connected vehicle data. Additionally, we offer industry leading AI and analytics capabilities, which allow us to convert data from multiple sources and of multiple types into real-time traffic management insights and decisions.

Equally importantly Kapsch TrafficCom provides the consultancy required to assess your current mobility management strategy and capabilities. To do this, we bridge the gap between technology tools and features and the outcomes you need to achieve with your scheme in terms of integrating multiple data sets, supporting specific applications, or even integrating with public transport and private vehicle data. This level of consultancy is essential for the success of your IMM initiatives, while also ensuring that your systems can be configured in the most efficient way, with minimal custom development.

As an additional benefit, we work with you to facilitate higher levels of collaboration between your city or agency and other parties involved in traffic management – including private industry and developers of innovative new congestion-busting and public transport apps.

Last, but not least, Kapsch TrafficCom itself operates IMM solutions for a number of large cities on a fully outsourced basis. This results in an in-depth experience of delivering traffic and mobility management services on a day to day basis, thereby ensuring that Kapsch understands and meets the needs of a city or highway network operation from an inside and hands-on perspective.

The Kapsch TrafficCom Integrated Multimodal Traffic and Mobility Management solution at a glance

Our Integrated Multimodal Traffic and Mobility Management solution incorporates:

Expert consultancy

to help you understand your traffic management challenges and design an appropriate solution for your needs

Our EcoTrafiX Suite

which is our IMM umbrella platform that brings together data from multiple data sources, both from within and outside your organization

Our leading decision-support engine

that allows you to deploy human-defined business logic to reduce traffic congestion and improve mobility for citizens

Our intuitive data insights that can be shared via a mobile app

for fast, simple traffic monitoring and incident responses

Our simulation test beds

to optimize your traffic management strategies before they go live in production

Our traffic management optimizers

that help to define optimal parameters for your traffic lights, signs, and excess/congestion charging

Our advanced AI algorithms

for predicting changing traffic conditions and handling traffic management proactively



In action: Kapsch TrafficCom Integrated Multimodal Traffic and Mobility Management solutions help to reduce traffic congestion in Madrid, Spain.

Madrid's road network experiences constant high demand, with limited or no space to add lanes or otherwise increase capacity. The result is significant traffic congestion and related impacts such as air pollution and increased risk of accidents.

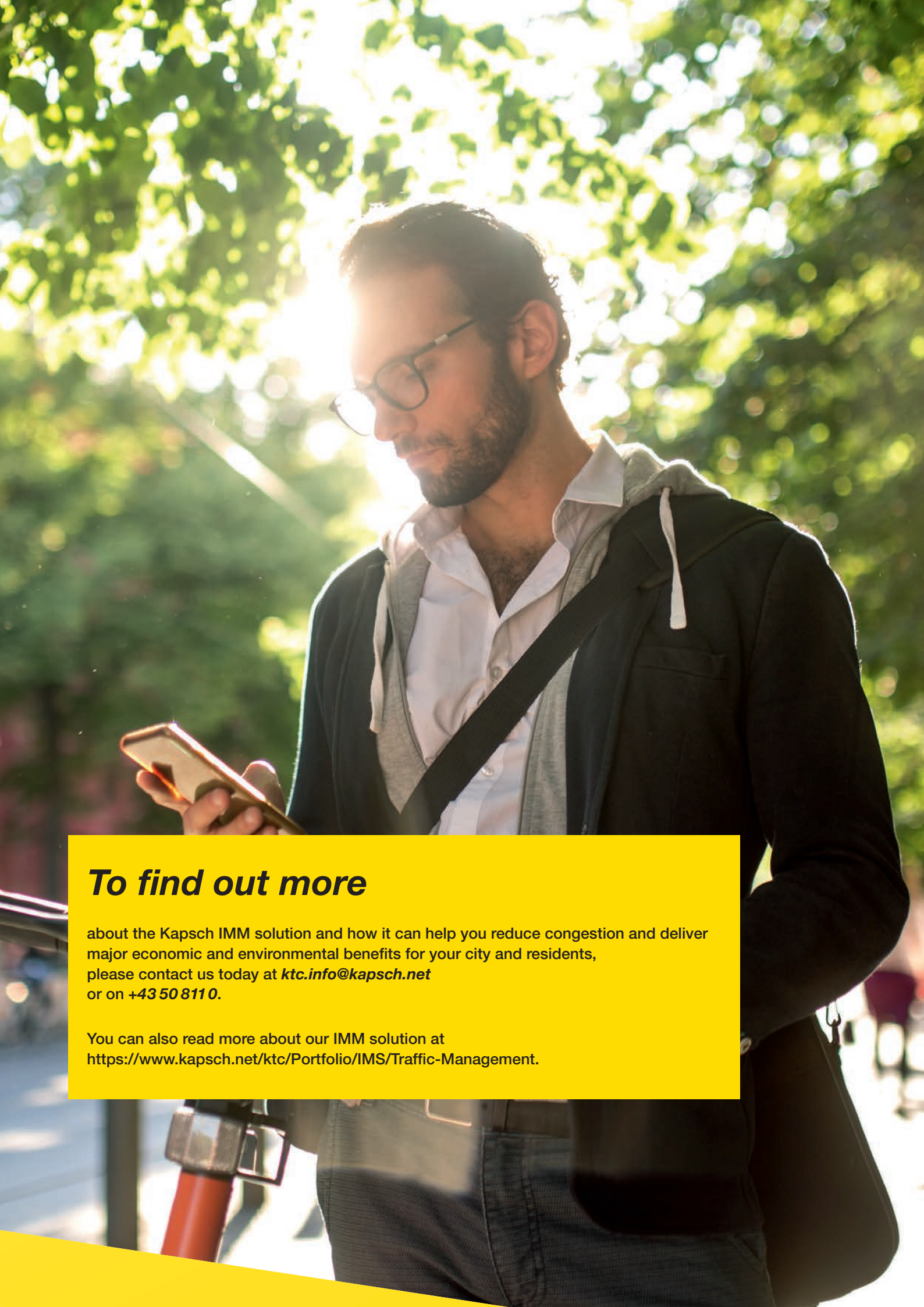
The Kapsch solution:

To minimize congestion, reduce pollution and public health risks, and improve road user experiences by speeding up journey times, the City of Madrid has implemented an IMM solution from Kapsch.

One key element of the solution is real-time adaptive signal control, which allows traffic light timing to be adjusted based on current traffic flows and queues.

Key outcomes for the city

Real-time adaptive signal control has helped Madrid to reduce delays and stops. Together, these benefits have helped to improve quality of life for local citizens, both in terms of reduced congestion and pollution, as well as reduced risks of accidents.



To find out more

about the Kapsch IMM solution and how it can help you reduce congestion and deliver major economic and environmental benefits for your city and residents, please contact us today at ktc.info@kapsch.net or on +43 50 8110.

You can also read more about our IMM solution at <https://www.kapsch.net/ktc/Portfolio/IMS/Traffic-Management>.

Kapsch TrafficCom

Kapsch TrafficCom is a globally renowned provider of transportation solutions for sustainable mobility. Our innovative solutions in the application fields of Tolling, Traffic Management, Demand Management and Mobility Services contribute to a healthy world without traffic congestion.

We have brought projects to fruition in more than 50 countries around the globe. With our one-stop solutions, we cover the entire value chain of our customers, from components to design and implementation to operation of systems.

As part of the Kapsch Group and headquartered in Vienna, Kapsch TrafficCom has subsidiaries and branches in more than 30 countries. It has been listed in the Prime Market segment of the Vienna Stock Exchange since 2007 (ticker symbol: KTCG). Kapsch TrafficCom's about 5,100 employees generated revenues of EUR 731.2 million in financial year 2019/20.

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