

Kapsch TrafficCom

***Tackle traffic
congestion head on
with next-generation
demand management***

Around the world, growing traffic congestion is a major challenge for authorities and citizens. Slow journey times caused by excessive traffic cost up to 2% of GDP in Europe, the US, and other developed economies. Additionally, slow-moving traffic on highways and in cities dramatically increases air pollution and related health conditions, not to mention increasing the risk of accident and injury.

One response to growing congestion challenges is to create additional capacity on road networks, usually by adding new lanes. However, this is often impossible, either due to space limitations, or the extremely high cost of such large-scale infrastructure projects. Additionally, adding road capacity is typically only a temporary fix, with wider roads ultimately leading to more traffic demand over time.

In the US, for example, more than \$500 billion has been invested in the highway network in urbanized areas between 1993 and 2017. However, traffic congestion has grown in those 100 urbanized areas by 144 percent, far outpacing population growth. This is largely due to a major increase in miles driven per vehicle, which has increased by 20% over the same period.



The Demand Management imperative

For these reasons, effective Demand Management is critical for minimizing traffic congestion globally. The experience of the last few decades has shown that traditional traffic management techniques, which influence traffic lights and inform drivers about traffic conditions and roadworks, are not sufficient to address the growing traffic problems. Unconnected traffic control systems, public transport systems, navigation providers, and traffic management approaches are highly limited in their effectiveness.

The great news for city and highway authorities is that it is now possible to tackle the problem from a different perspective: we can guide drivers in a way that not only takes the current and upcoming traffic situation into account but also considers the impact of each driver's route, leading them through uncongested paths in the road network to their destination.

This means that demand management solutions now control not only the infrastructure, but can also influence the drivers in the right way, guide them to Park-and-ride car parks for events and help them throughout their journey to get to their destination with the least impact on the environment and the city itself.

In this short folder, we look at legacy approaches to demand management and consider why static and unconnected solutions are no longer fit for purpose. Additionally, we explore a number of next-generation demand management techniques and solutions, and explain how they can help authorities reduce congestion, speed up journey times, and improve quality of life for local people.

Typically, cities and highways agencies only need to reduce traffic demand by between 4% and 8% to achieve dramatic improvements in journey times and reductions in air pollution. With next-generation demand management solutions, this is a very modest target and something that all authorities can achieve today.

Michael Ganser,
Vice President Demand Management,
Kapsch TrafficCom

What current demand management approaches are lacking

For cities and highway authorities that have yet to implement any kind of demand management strategy, excessive traffic congestion is the only factor limiting traffic demand. The results are extremely slow journey times, major economic losses due to lost productivity, and high emissions resulting in poor local air quality and broader environmental damage.

Even where cities have implemented congestion charging to manage traffic demand, schemes are typically static and configured for peak periods, leaving spare road capacity at other times of the day.

Three key factors that limit the effectiveness of demand management strategies are:

1

Lack of integration and communication between traffic stakeholders (private and public)

Most traffic stakeholders – such as city authorities, public transport providers, emergency services, and private satellite navigation providers – work with stand-alone systems and processes. This means that it is difficult, or impossible, to achieve a real-time view of traffic conditions, or to implement a coordinated and effective response to keep vehicles moving.

Additionally, the lack of integration between city authorities and public transport providers makes it hard to suggest viable alternatives to driving to work or school. Equally, separation between city authorities and private partners, such as satellite navigation providers, can result in too many vehicles routed via busy corridors – resulting in unnecessary traffic jams.

2

Static demand management approaches

Traffic conditions in cities and on highways change constantly, influenced by everything from an accident to heavy rain. With traditional demand management approaches – such as static congestion charging schemes – these unpredictable spikes in traffic congestion are not addressed. Instead, responses are initiated only after the problem occurs, which results in rapid traffic build up and prolonged congestion.

In addition to this challenge, many static demand management schemes are perceived as unfair by road users. This is because the same charges are applied, irrespective of whether viable public transport alternatives are available, or not. Charges are also applied at times of day when traffic demands are relatively low, with drivers paying to use virtually empty roads.

3

No way to communicate travel conditions and routing options to citizens directly

Typically, city authorities have no easy way to inform drivers in real time when traffic conditions are bad, and when time savings can be achieved by taking an alternative form of transport such as a bus or tram. This lack of direct communication with citizens means that authorities miss a major opportunity to influence their travel choices, and that the car remains the default choice for most journeys.

Without direct communication with citizens, it also becomes difficult to make alternative routing suggestions that reduce congestion and speed up journey times. It can also be difficult to display instructions to adjust the travel speed, in order to reduce unnecessary stops and emissions at traffic lights.

“City congestion charging is a critically important step in the battle against congestion. However, sophisticated data integration and real-time analytics technologies support dynamic pricing, intelligent routing and other smart solutions that take demand management to the next level and free space on the road network for priority lanes, bicycle lanes and other sustainable transport schemes.”

Michael Ganser,
Vice President Demand Management,
Kapsch TrafficCom



Overcoming the challenges with next-generation demand management

What is next-generation demand management and how does it work?

Next-generation demand management consumes data from multiple traffic management systems and rich data from vehicles, navigation systems, and users' mobile devices, all following strict private data compliance rules.

With access to all of this data, next-generation Demand Management can analyze, fuse, and predict the traffic conditions in the entire road network in real time.

Knowledge of the routes that people take allows them to influence their paths by re-routing and load-balancing over uncongested streets, by guiding them to the proper Park & Ride stations, and by helping them with mode choice.

Together, these kinds of measures can flatten the traffic demand curve throughout the day, creating 'spare' road capacity. This can be used for priority lanes, bicycle lanes and other initiatives that help to reduce congestion, improve air quality, and minimize economic impacts of unnecessarily long journey times.

What are the key capabilities of next-generation demand management solutions?

Next-generation demand management gives authorities a number of specific capabilities and features. These include:

Direct communication with road users

Empowers traffic authorities to provide real-time recommendations to motorists, including suggested speeds (GLOSA) and dwell times. This feature enhances the driving experience, reduces unnecessary stops, lowers fuel consumption, and minimizes emissions. Additionally, it can be extended to support public transportation and active mobility options.



Events and rules management

Allows authorities to plan the approved routes for event visitors (concerts, football games, etc.) to Park & Ride sites, spread traffic alerts, and generate dynamic restrictions (in cases of vulnerable areas or air pollution-sensitive zones). This influences passing drivers to take different routes via our mobile app and data hubs, which publish information to third parties.



Vulnerable area protection routing

- Compliant with agency rule settings
- "Take back control"

Air Pollution sensitive routing

- Meeting air quality standards

Munich field test "SLIM"

Intelligent traffic routing

Leverages advanced traffic routing algorithms to intelligently distribute vehicles across available routes. This feature prevents congestion build-up by implementing smart load-balancing algorithms and considering traffic signal states (e.g., red lights) to provide the quickest routes. The result is improved traffic flow throughout the city, surpassing conventional shortest-path routing.



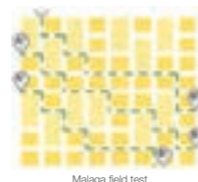
Green wave routing

Circumvents red signals in real time

Worlds fastest navigation

-10% travel time

Case study University of Munich



Anti congestion routing

Balances network load, thus, avoids oversaturation

-25% congestion
-10% emissions

Malaga field test

The top benefits of next-generation demand management

By implementing next-generation demand management solutions, cities and highways authorities can dramatically reduce congestion, while increasing throughput on your network.

Other anticipated benefits of next-generation demand management include:

1 Reallocation of road space for 'green' transport options

This has been achieved in several European cities, where the local authorities have reallocated traffic lanes on roads as bicycle lanes, giving local people a safe, green, and healthy way to get to school or work. This can be a far more cost-effective solution than building new public transport infrastructure.

2 More flexible, fairer pricing structures

with charges that change dynamically throughout the day based on fluctuating demand. The Managed Lane projects in the US, for example, where charges are increased during peak times, prove that this can greatly reduce demand and improve the traffic quality.

3 Increased road throughput

based on automated signal optimization, dynamic pricing, intelligent routing and other key solutions. Even when just one of these solutions has been implemented, local authorities notice significant increases in traffic throughput and register a reduction in congestion.

The new mobility landscape will demand new ways of managing and understanding mobility: Why Kapsch TrafficCom for next-generation demand management?

Kapsch TrafficCom has been working with cities and regional authorities to improve the quality of life for local citizens for decades. We have deployed traffic management systems in around 200 cities worldwide, and our real-time and predictive 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, to public transport management, access controls and congestion charging, tolling, and more. This gives our customers a single point of contact for all of their mobility management needs.

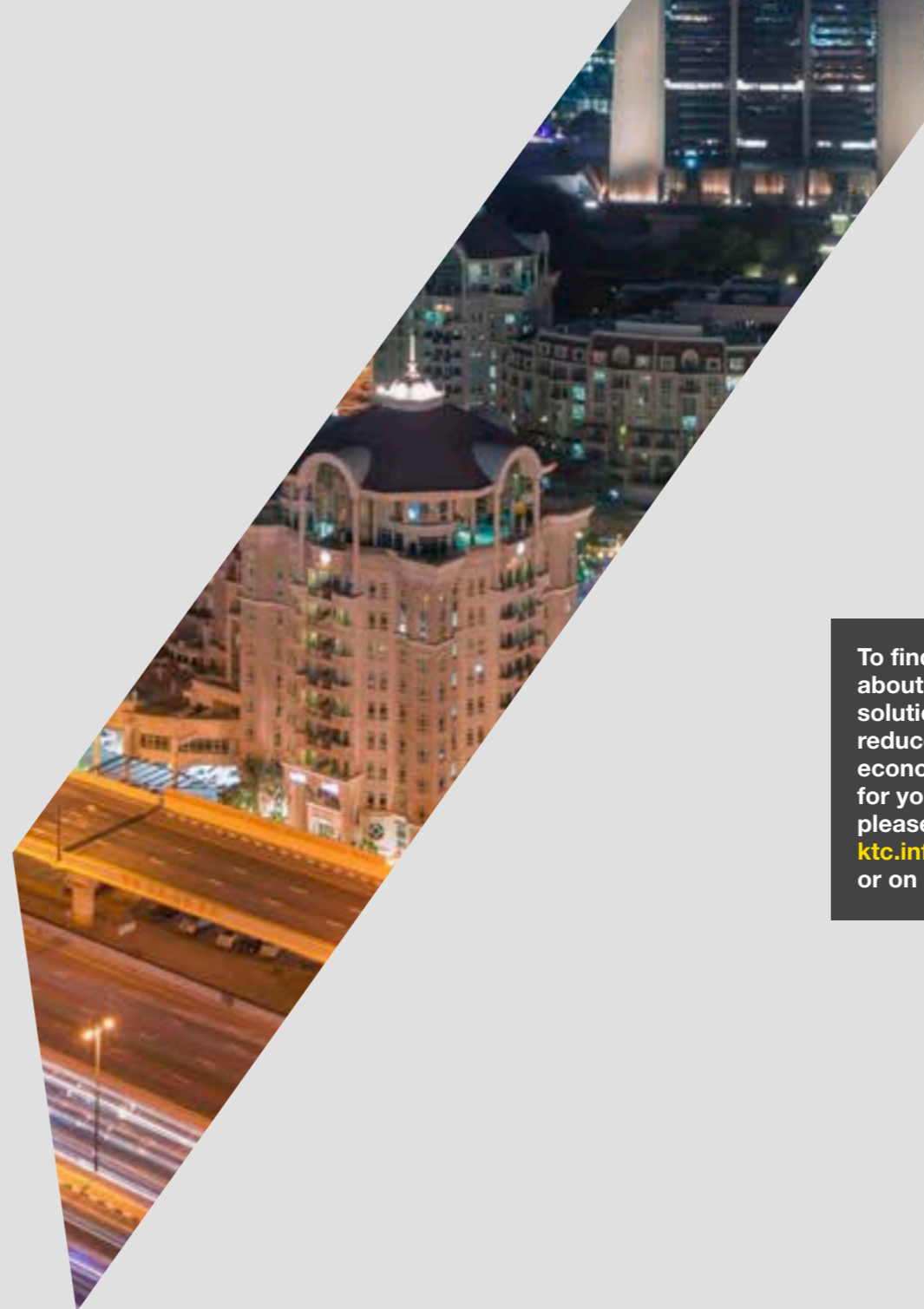
Many of these capabilities are based on our deep experience in the traffic domain, including V2X connected vehicle data. Additionally, we offer industry leading AI and analytics capabilities, which allow us to convert data from multiple sources and of multiple types into real-time demand management actions.

Equally importantly Kapsch TrafficCom provides the consultancy required to assess your current demand management strategy. 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 successful demand management, both now and in the future.

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 can help cities to operate their traffic management systems on an ongoing basis. Our experience of supporting large-scale traffic management schemes on a day to day basis ensures we can understand and meet the needs of your own city or highway network.





To find out more about Kapsch Demand Management solutions, and how we can help you reduce congestion and deliver major economic and environmental benefits for your city or highway network, please contact us today at ktc.info@kapsch.net or on +43 50 811 0.

Kapsch TrafficCom

Kapsch TrafficCom is a globally renowned provider of transportation solutions for sustainable mobility. Innovative solutions in the application fields of tolling, tolling services, traffic management and demand management contribute to a healthy world without congestion. Kapsch has brought projects to fruition in more than 50 countries around the globe. With one-stop solutions, the company covers the entire value chain of customers, from components to design and implementation to the operation of systems. As part of the Kapsch Group and headquartered in Vienna, Kapsch TrafficCom has subsidiaries and branches in more than 25 countries. It has been listed in the Prime Market segment of the Vienna Stock Exchange since 2007 (ticker symbol: KTCG).

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