

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. While congestion charges are a growing trend, these kinds of solutions are often planned and executed with static charging schemes and are unable to react quickly to changing traffic conditions. Additionally, with unconnected traffic management systems, public transport systems, signalling systems, navigation providers and others, traditional demand management approaches are often highly limited in their effectiveness.

The great news for city and highways authorities is that a range of next-generation solutions are changing the game in terms of demand management. These allow predictive and dynamic responses to real-time traffic conditions, including higher charges at busy times, and temporary restrictions for particular vehicle types, for example.

This means that demand management solutions now support more than just flexible charging. By connecting different data sources and traffic stakeholders, it is possible to complement pure traffic data with analytics tools that model multimodal demand and user behaviour, and add real time routing capabilities to dynamic pricing schemes.

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 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 increase traffic flow, such as recommendations for the ideal driving speed on specific roads or streets.

“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 builds a picture of traffic conditions in real time, and predicts how demand is likely to change in the near future. This predictive visibility allows authorities to increase congestion charges at peak demand times, intelligently re-route traffic in partnership with satellite navigation providers, and suggest alternative journey options for citizens via a mobile app.

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:

- **Dynamic charging**
based on analysis of real-time traffic data and adjustment of pricing based on current and predicted demand – i.e. higher charges during peak periods, lower charges when roads have excess capacity, additionally taking into account environmental aspects, e.g. emissions
- **Direct communication with road users via CCAM technology, electronic signage and mobile apps**
which enables authorities to advise motorists when traffic is heavy and suggest a recommended speed, an alternative route or public transport options. Informing about the upcoming traffic signal states (GLOSA) allows improvement of the drivers' experience and reduces stops and emissions.
- **Intelligent traffic routing**
where navigation providers re-route traffic to reduce congestion on busy roads or streets and choose the best route in terms of green waves, also aligned with City-wide policies and clean-air-zones.
- **Support of non-motorized road users**
with information about optimal speeds to pass the green light for bicycles and e-scooters, with public transport routing and navigation capabilities

These capabilities can be augmented with solutions that increase road supply. An example of this is signalling optimization, where traffic light timings are set dynamically to avoid traffic build-up at junctions. This alone has been shown to reduce congestion and journey times by up to 30%.

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). In its 2020/21 financial year, around 4,660 employees generated revenues of EUR 500 million.

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