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challenging limits

Kapsch TrafficCom

The future of road tolling has arrived

Around the world, vehicle traffic has major negative impacts for governments and citizens. As well as increasing journey times and negatively impacting economic productivity, excessive traffic also creates major environmental and public health challenges – with contaminants from vehicles killing millions of people each year.

In areas where space and investment potential allow, the key strategy for reducing congestion has been to increase the number of available lanes on highways and other key routes. However, increasing road capacity and 'supply' has been highly ineffective in terms of controlling and reducing congestion.

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.[1]

With limited space to increase road lanes, and traffic demand that will always outpace supply, governments and authorities are increasingly turning to smart technology solutions to combat congestion. Collectively, these are known as Integrated Mobility Management (IMM), and range from smart signalling and mileage-based city congestion charging, to next-generation apps that optimize navigation and help drivers to avoid sharp braking and other factors that cause congestion.

Tolling meets IMM

As a critical element of an effective IMM strategy, many authorities are now implementing next-generation road tolling strategies. In particular, the latest technologies for tolling can help to keep traffic flowing, optimize the cost/value equation for motorists, and support funding for infrastructure projects that deliver long term mobility benefits for the population.

In this folder, we look at how tolling is changing and discuss the key ways that next-generation All Electronic Tolling solutions can help authorities overcome their congestion and infrastructure funding challenges – while also delivering a far better experience for road users.

[1]https://t4america.org/wp-content/uploads/2020/03/Congestion-Report-2020-FINAL.pdf

Key tolling challenges

Traffic volumes are increasing on road networks globally, requiring ever more effective approaches to congestion management and tolling. Increased demand is also putting existing systems under pressure, with more vehicles to monitor from the roadside and greater capacity required to weigh heavy goods vehicles without requiring them to stop and wait.

Other significant tolling challenges include:

Static pricing

which fails to account for changing traffic conditions and demand, and may require road users to pay even when there is no other traffic on the road.

High hardware costs

with the need for extensive roadside equipment, a large number of gantries, and expensive onboard devices such as tags.

Lack of integration with smart traffic management technologies

which means that road users are often unaware of changing conditions on the road network, with no clear view of alternative travel options that could be better for them on a given day.

Reduced user convenience and complex experiences

caused by disparate systems and payment methods for city congestion charging, tolling, public transport and other transport services that citizens need to access.

Reduced ability to set charges at the lowest effective level

due to a lack of vehicle and usage data that makes it difficult to set prices at the lowest level to both manage demand and to secure funding for required infrastructure projects and investments.

Solving it all with next-generation tolling solutions

The good news for authorities is that next-generation approaches to tolling can help to address these challenges, reducing congestion and improving road-user experiences. However, every successful tolling initiative begins with a comprehensive and forward-looking business and technology strategy that reflects the specific needs of the local, regional, or national road network and user population.
To build such a strategy, it's necessary to consider a range of factors including road capacity, traffic demand, and requirements for funding new infrastructure projects. For 'brownfield' tolling initiatives.
In addition to these considerations, authorities need to ensure that tolling schemes are open, interoperable and – therefore – future proof. It's important, for example, to ensure that new applications, such as mobile applications for road users, can be deployed seamlessly in the future with no need for forklift upgrades to hardware or software infrastructure.

The value of experienced tolling partners

By choosing to work with experienced tolling technology and business partners, authorities can ensure that their scheme meets a range of specific requirements. In particular, choosing a partner who takes a consultative approach to defining your business and technology needs can help you:

- Implement the best tolling strategy based on tolling on certain stretches of the road network, or mileage-based charging on regional or national road networks
- Establish which parts of the road network should be subject to tolling based on real-world traffic demand data
- Decide which types of vehicles should be charged at which times of the day to meet traffic reduction goals and to provide adequate funding for road maintenance and new infrastructure projects
- Set up schemes such as tolling on dedicated 'fast-track' highway lanes
- Implement dynamic toll pricing based on real-time traffic conditions on key corridors
- Roll out innovative mobility applications that make it possible for road users to plan their journeys and pay tolls with a swipe of their smartphone
- Choose the right technology to support and enforce the scheme, from on-board tags to motorists' mobile devices or vehicles' on-board GPS systems

How to boost your tolling efficiency, effectiveness and ROI

With a well-designed, fit-for-purpose tolling strategy in place, authorities can select from a broad range of next-generation tolling technologies to support their schemes and road users. Critically, these technologies allow you to implement new, greenfield tolling initiatives, or to migrate from static tolling on defined routes to much smarter, fairer, mileage-based schemes that keep traffic flowing optimally across your network.
Another major benefit of next-generation tolling solutions is the ability to minimize CAPEX and maintenance requirements for expensive roadside infrastructure.
This can be achieved with satellite tracking and geo-location technologies that reduce the need for enforcement cameras and other infrastructure at the roadside. Additionally, next-generation cameras and other roadside monitoring equipment provide far greater accuracy and coverage, which allows you to consolidate and streamline your tolling infrastructure and minimize your CAPEX and maintenance costs.
All of this helps to dramatically reduce the costs of deploying tolling schemes – and your total cost of ownership – while also improving convenience for users and keeping traffic moving. Some of the key technologies that support these improvements are:

1

All Electronic Tolling as an integrated element of a broader Mobility Management approach – including urban congestion schemes

Next-generation tolling approaches integrate with Integrated Mobility Management (IMM) solutions that increase 'supply' – or road traffic capacity. This can be achieved with solutions such intelligent route guidance, which coordinates traffic information with GPS navigation providers to ensure cars are sent to locations via appropriate and diverse routes (i.e. not all on the same route at the same time). Combined with optimized signal control across the road networks, this can reduce traffic demand (and jams) by up to 60%.
With IMM, regional and nationwide tolling schemes can also be integrated with city congestion charging schemes and other traffic management systems to further reduce congestion and increase funding for new infrastructure projects.
For more information on IMM solutions that can help to maximize the effectiveness of your tolling schemes, click here.

2

'Free-flow' tolling solutions that use onboard units or tags

With onboard units, it's possible to identify when vehicles enter and leave tolling zones, with no need for drivers to stop at tolling plazas. With journey data collected by free flow roadside stations and passed automatically to back-end systems, you can collect tolls quickly and reliably to maximize revenues and reduce manual enforcement workloads and costs. Data from tags can also be collected to provide a real-time view of traffic demand, to inform road users of current road conditions and travel alternatives, and more.

3

Video-based tolling solutions – including vehicle detection and classification

Using the latest smart video cameras and image processing technologies, it's possible to identify and classify vehicles entering tolling areas. In particular, smart cameras and stereo camera technology can be used to recognise vehicle number plates and to determine the vehicle type based on axel height, weight, height, and other key characteristics – improving tolling automation and accuracy.

4

Satellite tolling solutions that support innovative, fair, mileage-based charging

Satellite Tolling solutions combine a back-end geo-location platform with smart camera enforcement and other technologies to support mileage-based tolling. This allows authorities to ensure that tolls are applied fairly and opens the way for innovative schemes that replace fuel tax and road tax with per-mile or per-kilometre driving charges on regional or national road networks.

5

Smartphone tolling solutions that reduce CAPEX and OPEX costs

Next-generation schemes allow road users to download an app for route planning and toll payments. While improving convenience and transparency for motorists, this kind of solution also reduces the cost of deploying and running a tolling scheme, with no need for onboard devices/tags and reduced requirements for expensive roadside enforcement equipment.

6

Next-generation back-office systems for increased scalability and management efficiency

To support the broadest possible range of tolling schemes and technologies, next-generation back-office systems are needed. Critically, back-office systems need to be scalable to handle rapid growth in user numbers. Additionally, they must be built on open technologies to ensure full compatibility with current and future tolling solutions, including geo-location-based solutions and user-facing mobile apps.

7

Open-standards-based tolling systems that reduce vendor lock-in risks

In the past, many tolling systems were monolithic and based on proprietary technologies from a single vendor. However, times have changed and hundreds – if not thousands – of organizations contribute to the tolling technology market, offering a wide range of hardware infrastructure components, systems, and applications – including user-facing smartphone apps. This proliferation in the market means that tolling solutions should be moving towards open industry standards where possible to streamline integration with all available infrastructure and software tools. This ensures that authorities can continue to deploy innovative and best-of-breed technologies.

Why Kapsch TrafficCom for tolling?

Kapsch has been a leading provider of road tolling systems and infrastructure for more than two decades. Since deploying the world's first multi-lane free-flow system in Australia in 1999, we have constantly evolved and innovated our solution portfolio. Today, we are a pioneer in free-flow tolling, video tolling and enforcement, and satellite tolling, and we continue to invest heavily in R&D to drive our solutions forwards.
Kapsch offers a number of unique benefits for authorities looking to deploy greenfield or brownfield tolling schemes.
These include:

Our consultancy led partnering approach

Kapsch has experience of delivering end-to-end tolling solutions for regional and national authorities based on a wide range of vehicle identification, classification, and enforcement technologies. Based on this experience, we are able to help authorities define their tolling requirements, and to deliver technology solutions that meet their precise needs: both in terms of reducing traffic congestion and securing funding for infrastructure projects and road-network maintenance.
With a clear tolling strategy in place, we work with our customers to roll out your scheme and provide the end-to-end support you need. Our partnering approach means we look far beyond the deployment date to ensure your scheme is a long-term success.

Our broad technology and solutions portfolio – including satellite tolling

We are able to support all kinds of tolling schemes, whether they rely on onboard 'tags' for vehicle tracking and classification, or whether they rely on camera enforcement or satellite tolling using Global Navigation Satellite System (GNSS) technology. This breadth and depth of technology capability means we can create future-proof solutions that meet the specific needs of your authority.

Our innovative mobile capabilities – including our Uproad app for road users

To improve road-user experiences, Kapsch has created our Uproad mobile app. This allows road users to plan their trip, calculate toll costs, and pay tolls, all from their smartphone.
In the future, the app could be integrated with other systems – including public transport and city congestion charging systems – to give road users an even more joined up experience, and even more convenience for every journey.

Support for all manner of RSS to vehicle technologies

In just a few decades, the tolling market has proliferated from just a few vendors to thousands of solution providers. To ensure you can deploy any current or future technology in your scheme, we build our solutions on open standards and support all key tolling technologies, including CEN DSRC 5.8 GHz, US based 915 MHz technologies including multiprotocol RFID and RFID-63 protocol, ANPR (automatic number plate recognition) as well as GNSS-based, be it from connected vehicle data, mobile phone data, or dedicated GNSS OBUs (for commercial vehicles). We are also compliant with European standards, including EETS (Directive 2004/52/EC and Decision 2009/75/EC).

Our efficient, modular back-end and flexible deployment options

Kapsch back-end systems for tolling are highly scalable and able to increase the efficiency of your toll-collection operations. Additionally, you can deploy our back-end systems in house or in a hybrid cloud environment, and a full cloud-based version is on the way.

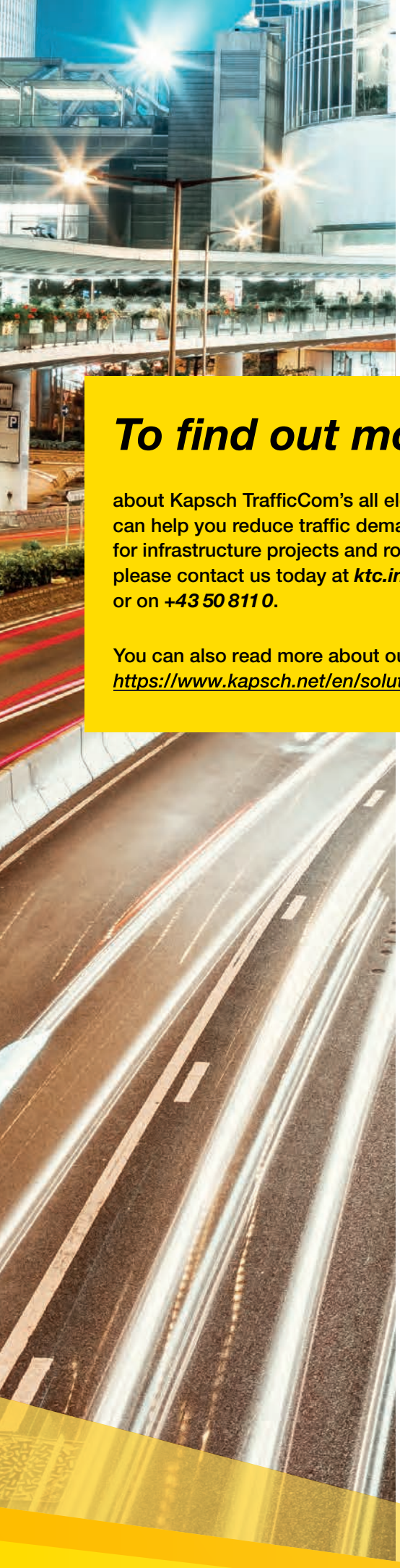
Roadside products and services

We offer unique products that enhance your tolling capabilities based on dynamic pricing, image validation for tolling enforcement, trip building, and occupancy detection for real-time traffic status updates.

In action: GNSS assisted tolling in the US with our innovative user-facing mobile app Uproad

Road users in California are enjoying stress-free toll-road travel with our innovative mobile app, Uproad. This allows them to calculate their tolls before they leave home, and they can pay digitally with a swipe of their screen, with no need to stop at toll plazas or carry cash with them.
The Uproad application has been a major success in California and will soon be available to road users in Texas.

>>> www.uproad.com



To find out more

about Kapsch TrafficCom's all electronic tolling solutions and how we can help you reduce traffic demand and increase funding for infrastructure projects and road maintenance, please contact us today at ***ktc.info@kapsch.net*** or on ***+43 50 811 0***.

You can also read more about our AET solutions at:
https://www.kapsch.net/en/solutions/tolling

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)

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