

Kapsch TrafficCom

Next generation Urban Traffic and Mobility Management Solutions



A new way of understanding traffic

Mobility is changing

The evolution of society and technology has led to a transformation of the traffic and mobility landscape, creating the so-called Connected Mobility Ecosystem. Traffic and mobility management is evolving towards a scenario where the deployment of infrastructure on the road becomes less important, while the importance of data management and the ability to derive greater value from its analysis increases, just as connectivity with external stakeholders and drivers becomes critical.

With continuous changes in traffic, mobility and environmental conditions, traditional traffic control and traffic lights alone are no longer enough to manage traffic in cities. The age of data has paved the way for a new chapter in traffic management: managing not only traffic, but also mobility behavior.

With next-generation traffic and mobility management, data from multiple sources, including connected vehicles, can be collected and analyzed in real time to provide a clear picture of traffic conditions and compared with historical data to predict demand, both in the near future and at regular peak times. These types of solutions also support demand management initiatives that help influence road user behavior and ensure that cities can meet their congestion and emissions reduction goals, while satisfying the public's demand for more effective environmental protection and easier mobility.

About Kapsch TrafficCom

Kapsch TrafficCom is a globally recognized supplier of transportation solutions in the areas of tolling, toll collection, traffic and demand management, with successful projects in more than 50 countries and annual revenues of approximately EUR 550 million. The company is headquartered in Vienna, Austria, has subsidiaries and branches in more than 25 countries with more than 4,000 employees and is listed in the Prime Market segment of the Vienna Stock Exchange.

Kapsch TrafficCom is an industry leader in urban traffic and demand management. We have been working with city governments and local authorities for more than 60 years to improve the quality of life for local citizens. Around 200 cities worldwide already benefit from our traffic management and mobility solutions. In about 30 of the world's largest cities - from Madrid to Buenos Aires - our real-time management and traffic management tools are successfully deployed.

In addition to our unique experience, Kapsch TrafficCom is a key partner in terms of expertise and capabilities across the mobility management spectrum. This is based on our ability to design, deploy and maintain multiple traffic management systems for cities or highway networks, access control and congestion charging, interaction with public transport management systems and more. By providing our customers with a single point of contact, we ensure that all their mobility management needs are addressed efficiently and comprehensively.

Many of our capabilities are based on our unique IT skills and deep experience in the traffic domain, including the V2X connected vehicle technologies developed by Kapsch. Taking this a step further, we offer industry-leading artificial intelligence (AI) and analytics capabilities that allow us to transform data from multiple sources and of multiple types into real-time traffic management insights and decisions.

Furthermore, our customers have access to the necessary consulting services to evaluate their current mobility management strategy and capabilities. We do this by bridging the gap between technology tools, capabilities, and the outcomes needed in each case to achieve the project goal, whether it is integrating multiple data sets, supporting specific applications, or even integrating with public transportation and private vehicle data. This level of consulting is essential to the success of your ITS initiatives, while ensuring that your systems are configured in the most efficient and sustainable way.

Portfolio

Every city has unique circumstances, road conditions, capacity, and traffic demand.

Our mobility management solutions, which focus on the three areas of traffic optimization, decision intelligence and mobility operations, are built on standardized technology platforms that can be adapted to meet the specific and rapidly changing needs of city authorities.

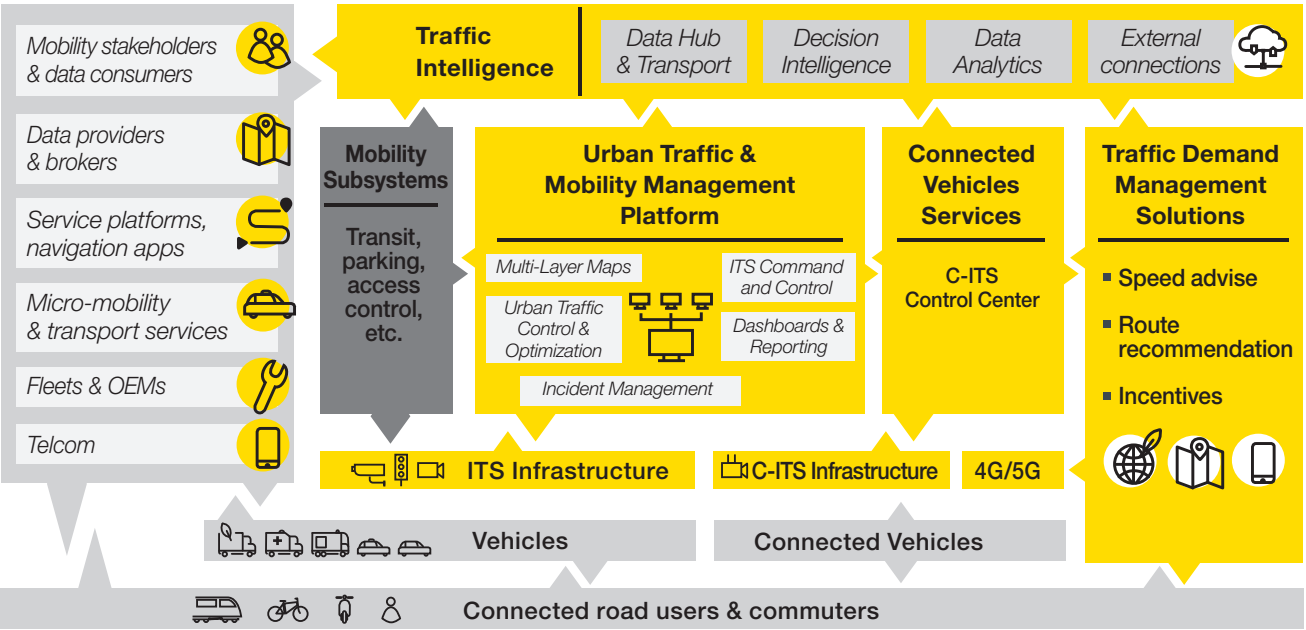
Kapsch TrafficCom designs, supplies, installs and operates complete traffic management solutions as well as individual components to upgrade and optimize existing systems.

Our portfolio for cities consists of an integrated suite of traffic management solutions based on open, modular and extensible platforms for the operation and management of traffic and mobility in cities. Kapsch TrafficCom offers a broad toolbox of systems that can be deployed together or separately to support intelligent traffic and mobility management, delivering benefits to cities, mobility agencies and citizens.



Kapsch solution ecosystem for cities

Tools and modules for efficient urban mobility management



Kapsch TrafficCom’s integrated suite of next generation solutions for urban traffic and mobility management includes



Urban Traffic and Mobility Management Solution

Helps cities managing mobility to cope with the existing challenges. The solution provides an overview of a city’s overall traffic situation, with supervisory and control functionality for the different ITS field equipment, in an integrated and flexible User Interface - helping to optimize traffic management, prevent congestion, and reduce emissions based on our highly scalable enterprise-class Advanced Traffic Management System (ATMS) platform



Traffic Intelligence Solution

Our Traffic Intelligence solution is based on Kapsch’s Mobility Data Platform for authorities to complement the management system by providing business intelligence through advanced use of data (from the agency and partners), enabling them to be part of and benefit from the new connected mobility ecosystem.



Cooperative Intelligent Traffic Management

The Cooperative Intelligent Traffic Management solution extends and builds on the conventional traffic and mobility management solutions by connecting vehicles to Traffic Management Centers and providing more digitally based connected vehicle services. These services are enabled via the mobility data hub, edge computing services, and road monitoring or orchestration. It is about digitizing the infrastructure and enabling a connected vehicle landscape for traffic management operators and providing feasibility for future automated/autonomous vehicles.



Urban Access & Congestion Management Solution

Access management allocates scarce road space among competing users by setting the right incentives. This can take various forms of free and charging schemes, such as Clear Air Zones, Limited Access Zones, Low Emission Zones or Congestion Charing. They all aim to address the associated problems of air pollution and improve public health and the environment.



Traffic Demand Management Solution

Provides a comprehensive set of tools to manage road user demand (private vehicles and public transport) by influencing and incentivizing behavioral mobility changes to improve traffic flow, reduce congestion and vehicle emissions, thereby enabling cost savings and meeting climate goals in the urban mobility sector. Direct communication with road users via CCAM technology, electronic signage and mobile apps which enable 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.



Urban Traffic and Mobility Management Solution

Our nearly 60 years of experience in providing traffic engineering, consulting, field services and operations to cities enables us to offer unique technologies and capabilities to move cities towards intelligent mobility solutions. Pioneering features such as a map-centric user interface, mobility data hub services for cities, and integrated multi-agency and multi-modal event management (public transport and micro-mobility) confirm Kapsch TrafficCom as a reference in the advanced urban mobility management segment.

Urban Traffic and Mobility Management (UTMM) brings the future of a control room into today's operations, resulting in high efficiency, safety and intelligence for sustainable mobility.

Portfolio

Urban Traffic and Mobility Management is a comprehensive solution consisting of the EcoTrafIX™ Controller hardware and the EcoTrafIX™ Suite software - from the traffic controller to the City Mobility Center - that solves the problem of integrated mobility management.

EcoTrafIX™ Suite

It is Kapsch TrafficCom's mobility management solution for optimizing operations across all road modes by providing fully map-based situational awareness based on our highly scalable and modular EcoTrafIX™ Advanced Traffic Management Systems (ATMS) platform.

The advanced suite accelerates collaboration between multiple stakeholders, improves safety and response plans by automatically detecting incidents, provides a proactive strategy by predicting future traffic conditions, and decision support tools to make mobility more efficient, safe and sustainable.

The EcoTrafIX™ Software Suite includes:

EcoTrafIX™ Command

for real-time monitoring and control of city signals and ITS devices

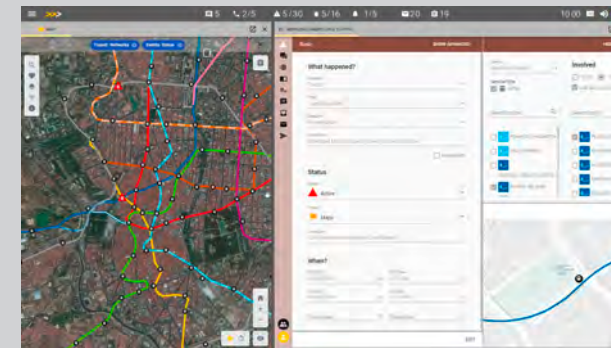
- Map-centric user interface
- Operation of traffic devices (traffic signal controllers, VMS, traffic sensors, weather stations, etc.)
- Signal management (global standard signal multi-protocol support)



EcoTrafIX™ Expert

which includes a whole set of expert modules to optimize mobility management.

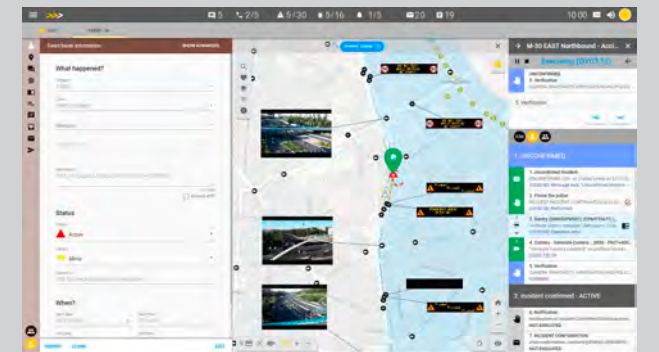
- Advanced capabilities (events management using predefined processes, automated response plans, interaction with asset management systems,)
- Real-time traffic capabilities (automated incident detection and alerts, resources dispatching, and actions log, alerts and events import from diverse sources such as agencies, media, social networks and more)
- Business intelligence (decision support system, traffic forecasting capabilities and "differential views", real-time and historical operation dashboards)



EcoTrafIX™ Mobility

which enables collaboration on events between multiple agencies or between multiple departments within one agency.

- Shared situation awareness
- Coordinated events
- Data exchange with mobility subsystems (transport and micro-mobility).



Kapsch's Traffic Signal Optimization Solutions that complement the EcoTrafIX™ Suite

Intelligent Adaptive Traffic Control Area (ITACA)

Kapsch's ITACA is a real-time adaptive traffic signal system that complements the traditional features of the EcoTrafIX™ Signals solution by providing advanced performance control strategies for efficient mobility and to optimize the flow of traffic through busy junctions. Experience accumulated over the years in real-life traffic projects demonstrated the efficiency that Adaptive Signal systems can bring to the mobility environment. A key aspect in this scenario is the traffic demand data, which allows authorities to optimize timing for traffic lights on an ongoing basis, translating up to 30% congestion reduction when integrating adaptive traffic signaling layer into the Urban Traffic and Mobility management installation.

ITACA focuses on adjusting the optimal timing at groups of intersections as a result of dynamic traffic conditions but is also capable of elaborating patterns that result in providing global solutions to the local traffic timing plan.

Arterials Optimizer

The Arterials Optimizer adaptive system is an advanced calculation engine that provides flow-based timing adjustments to reduce traffic congestion and efficiently manage major urban corridors.

The solution calculates arterial timing parameters according to short-term past or future traffic flow, generates traffic plans to be implemented in traffic controllers, and improves capacity by fine-tuning green waves (offset) in addition to green splits and cycle lengths.

Arterials Optimizer is designed for corridors with changing traffic conditions throughout the day and supports bi-directional traffic flow.

Wireless Signal Optimization

Uses all available information from traffic lights and data collected from various sources to optimize and recommend the optimal times for the road network through various rules and predictive algorithms, without the need to invest in new infrastructure.

EcoTrafIX™ Controllers

EcoTrafIX™ controllers are the high-performance result of an advanced generation of traffic controllers for efficient, safe and sustainable mobility. They offer advanced performance control strategies, both local and centralized, able to adapt to local regulations to prioritize public transport, emergency vehicles, bicycles or pedestrians. They are capable of operating with different standard protocols with the ability to operate in isolated mode, under centralized control strategy or with adaptive traffic control systems (optional).



The EcoTrafIX™ Software Suite Features

Easy to deploy and maintain

EcoTrafIX™ is built using a Web Services Oriented Architecture (SOA), including an Enterprise Service Bus (ESB), combined with modern database design and data interface techniques such as Extract Transform-Load (ETL). It can be deployed on-premises or as a hosted application (cloud).

Flexible and modular

EcoTrafIX™ is agnostic to hardware or devices such as traffic controllers, meaning there is no dependency on a particular make or model; a wide range of devices can be integrated to monitor command and control using standard protocols. The possibility to adapt to different regional protocols can be considered.

Situational Awareness

EcoTrafIX™ is designed to collect, aggregate and archive all data, status and alarms, providing a common operational view that each operator and stakeholder can tailor to their needs and area of responsibility.

Operational Efficiency

EcoTrafIX™ software combines 45 years of experience with the best of new technology to maximize the functionality and usability of the software suite to support mobility management and operational efficiency.

Advanced Event Management Tools

EcoTrafIX™ includes advanced event and incident management and response capabilities. The solution combines data fusion and analysis with alarm management and incident detection. It uses geospatial map-centric operations to locate restrictions and link incident response plans and resources such as CCTV, DMS and service patrol vehicles to improve incident response and clearance activities.

Decision Support System (DSS)

Helps make efficient decisions about alternative responses and find the best fit for the situation. DSS capabilities include rule-based incident detection and response according to the agency's Standard Operating Policies & Procedures (SOPs).

Mobility Management, all in one

EcoTrafIX™ can connect all the different aspects of transportation. Subscriptions to mobility services such as parking, public transport, events, etc. and external information sources are a key factor in enriching in-house data. EcoTrafIX™ can integrate data from: traffic, public transit, events, collaborative and crowd-sourced incident reporting, weather, pollution, parking and more.

Reporting and Dashboard

EcoTrafIX™ uses real-time and historical data to create dashboard displays and performance measurement reports. A pre-defined set of dashboards and canned reports are available, as well as the tools and templates required for user-customizable reports.

Highlights

- Unique user interface based on HTML5 technology to efficiently control and manage all traffic-related systems used by cities and provide superior user experience.
- Integrated event management to reduce response time to expected or unexpected events through automated actions & Decision Support Systems (DSS).
- Up to 20 % faster response time to incidents and
- Up to 15% reduction in travel time and traffic delays based on real project cases
- 300kg of CO2 emissions can be saved with EcoTrafIX™ Controller (per intersection) *according to 2016 studies

Selected Reference projects

Spain, Madrid: Integrated Mobility Management

Spain, Valladolid: State-of-the-art Urban Traffic Control, traffic maintenance and operation

Spain, Málaga: Mobility Control Center (MOVIMA)

Spain, Vitoria: Traffic light priority monitoring system

Argentina, Buenos Aires: Integrated Mobility Management System (SGIM Sistema de Gestión Integral de la Movilidad)





Traffic Intelligence Solution

The mobility landscape is undergoing a significant transformation due to societal evolution, including environmental concerns, changing consumer behavior, the rise of micro-mobility, and ubiquitous connectivity.

Technology progress, such as mobile and connected device integration, easy information access, data processing and analysis capabilities, cloud services, artificial intelligence, and the rapid growth of connected vehicles via 4G/5G connectivity or specific communication protocols (CV/C-ITS), is driving this paradigm shift.

These changes have given rise to the connected mobility ecosystem, where traffic and mobility management now require effective data analysis and connectivity with external stakeholders for efficient operations, diminishing the importance of traditional infrastructure deployment.

Portfolio

Mobility Data Platform is a data platform for authorities that complements management systems by providing decision intelligence through the advanced use of data (from the agency and partners), enabling the authorities to be part of, and benefit from, the new connected mobility ecosystem.

It consists of a data transportation / warehousing / processing layer, Mobility Data Hub, and an analytics and visualization layer, Mobility Data Insights.

Mobility Data Insights

A set of already developed use cases ready to deliver value from day one.

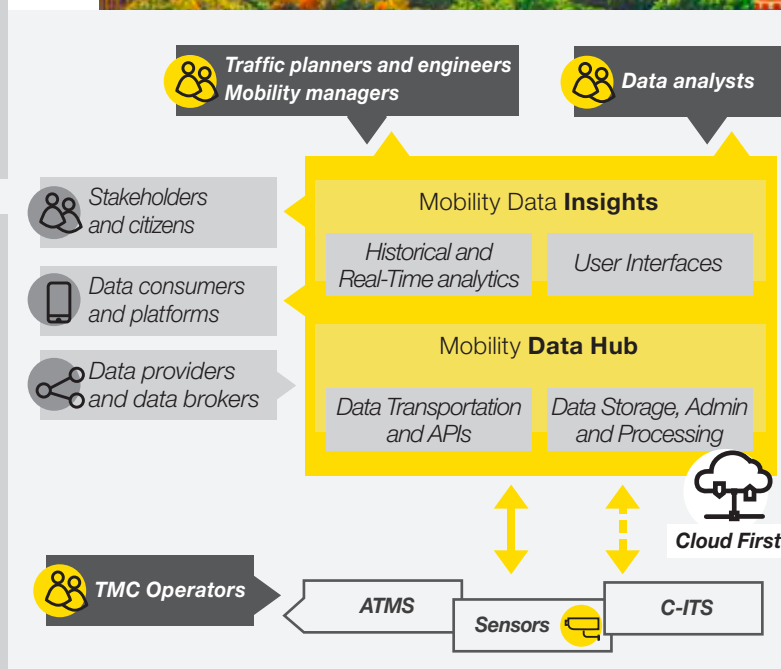
Solutions for descriptive, diagnostic and predictive analytics:

- Performance Measurement (traffic, incidents, etc.)
- Detailed analysis on the main routes
- Travel time calculation
- Traffic patterns discovery
- Anomalies detection
- Traffic prediction
- Origin-destination analysis and matrices

Mobility Data Hub

A set of tools, services, and data models that form the infrastructure of an open and extensible traffic and mobility data hub. Traffic and Mobility Data Hub ready for connected drivers.

- Data ingestion and data transportation layer
- Generic APIs (publishing and consuming data)
- Data administration and storage
- Common Data Models for reusability & easy access
- Connectors to data providers (traffic and FCD)
- Data combination and aggregation (traffic networks)
- Data discovery and governance
- Connection to consumers and platforms (e.g. Waze)



Benefits, among others:

- **Modular set of services**
- **Configurable**
- **Analysis user interface**
- **Easy to integrate with Kapsch Advanced Traffic Management System**
- **Cloud native**
- **Scalable**
- **Expandable**

Highlights

- Greater insights and visibility into road conditions
- Increased performance across a range of traffic management KPIs for municipalities and road authorities
- Preventative actions based on predictive insights
- Improved long-term traffic planning and management

Selected Reference projects

Spain, Bilbao: Data Driven Traffic Management

Argentina, Buenos Aires: Integrated Mobility Management System (SGIM Sistema de Gestión Integral de la Movilidad)

Australia, Melbourne: AIMES Connected Corridor and Intelligent Intersection solutions



Cooperative Intelligent Traffic Management Solution

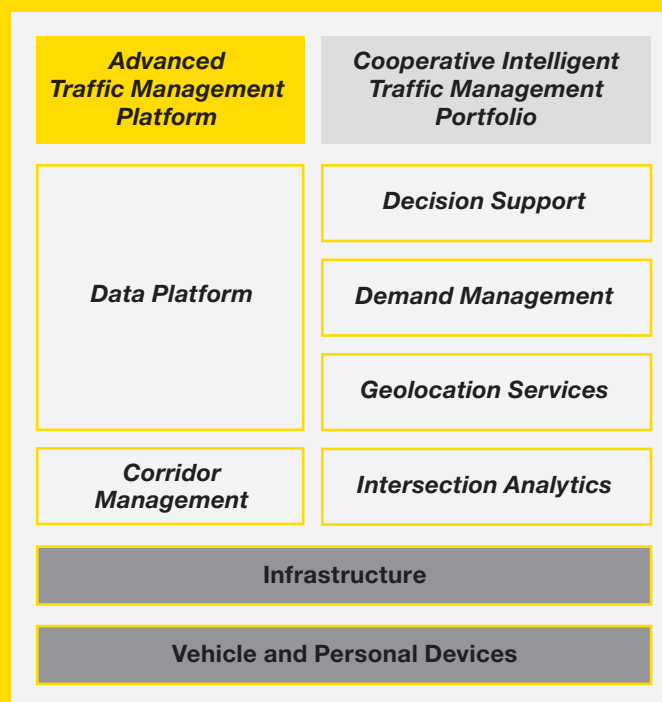
For city authorities around the world, managing traffic congestion and ensuring the safety of road users is a major and ever-increasing challenge as road users, pedestrians, cyclists and micro-mobility services become more mobile. Traffic management is becoming networked and data-centric, with the role of the road operator shifting to traffic monitoring. As a result, there is a shift towards doing more with less infrastructure.

The widespread adoption of connected vehicles/devices and advances in data processing and analytics are fundamentally changing the industry and our business. Variable traffic signs and signals are no longer the only means of dynamically communicating with drivers. Traffic and mobility management is no longer a simple one-way communication.

Kapsch's Cooperative Intelligent Traffic Management solution is the first end-to-end traffic orchestration solution that enables the digital transformation of highways and urban environments to provide connected vehicle services as a bridge to the future of mobility and paves the way for cooperative autonomous driving.

Our solution is built on a suite of software platform and hardware technologies that enable authorities to digitize road networks, optimize traffic through advanced data use and analytics, improve operations and planning with intelligent decision tools, and access the connected mobility ecosystem to intelligently add value and exchange their data for proactive safety and connected services for everyone.

By combining connected vehicles with advanced data collection and processing platforms at the network edge and in the cloud, Kapsch's Cooperative Intelligent Traffic Management provides real-time traffic management capabilities and insights that support a range of innovative safety and traffic mobility use cases, such as green light optimal speed advisories, bicycle awareness, and emergency vehicle priority.

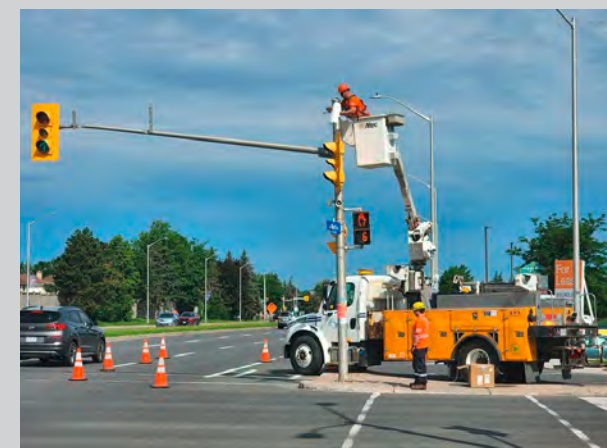


Portfolio

The Kapsch Connected Vehicles hardware and software portfolio enables the first step towards enabling the Cooperative Intelligent Traffic Management Solution. It consists of the following:

V2X Roadside Unit

Our portfolio includes ITS-G5, C-V2X and Dual-Mode Roadside Units. The Kapsch 5.9GHz V2X Roadside Unit (RSU) provides short-range, ultra-low latency wireless communication between infrastructure and vehicles for ITS such as traffic management centers, signal controllers or edge applications to enable the full capabilities of cooperative connected vehicle systems. Our open interface and modular architecture enables a scalable and future-proof V2X Roadside Unit that provides C-V2X wireless communication for both the ETSI ITS G5 and IEEE WAVE standards for applications within the Cooperative ITS (C-ITS) environment and for ITS applications based on communications technology in general.



V2X Onboard Communication Unit

Our portfolio includes ITS-G5, C-V2X and Dual-Mode On-Board Communication Units. The Kapsch 5.9GHz V2X On-Board Communication Units provide short-range, ultra-low latency wireless communication between vehicles and infrastructure for ITS applications, enabling the full functionality of cooperative connected vehicle systems. The mobile unit completes Kapsch's complete end-to-end Connected Vehicle portfolio, consisting of V2X Roadside Units and the dedicated Connected Mobility Control Center (CMCC) central software.

Whether used in emergency vehicles to ensure traffic light preemption, in public transportation to keep buses on schedule, to increase safety while raising awareness of service vehicles, or in various pilot projects to demonstrate the current and future possibilities of Connected Vehicles (V2X), the V2X On-Board Communication Unit covers all these possibilities in one unit.

Connected Mobility Control Center (CMCC)

A cloud-based or on-premises operations and maintenance control software platform that manages and monitors the connected vehicle environment while enabling direct communication with connected road users. It manages, configures, and operates the customer's V2X system, standalone or integrated into the customer's traffic management center. It is the gateway between C-ITS roadside infrastructure and connected vehicle services. A user-friendly visualization of selected information to monitor real-time events and create standardized cooperative ITS messages to enable fully interoperable intelligent transportation systems.

Enables easy integration with additional solutions and third-party data providers via a dedicated Mobility Data Hub API.



vRSU – V2X virtual Roadside Platform

A cloud-based or on-premises solution that enables hybrid cellular-based communications for the Connected Mobility Control Center to exchange information with hybrid C-ITS in-vehicle units and smartphone applications.

Provides the ability to consume and distribute information where physical roadside units are not available, extending the coverage of cooperative ITS systems while enabling secure and reliable message exchange using dedicated connectivity.

Connected Mobility Control Center Features

Monitoring & Supervision - Operational Efficiency

Configuration & monitoring of the health & performance of the V2X environment (stationary & mobile & virtual roadside units).

Automated C-ITS Message Management – Full Automation

Automated ITS processes; Optimized Message distribution to reach desired area by utilizing use case specific algorithms; Integration into automatic response plans.

Live View & Data Collection – Real-Time Feedback

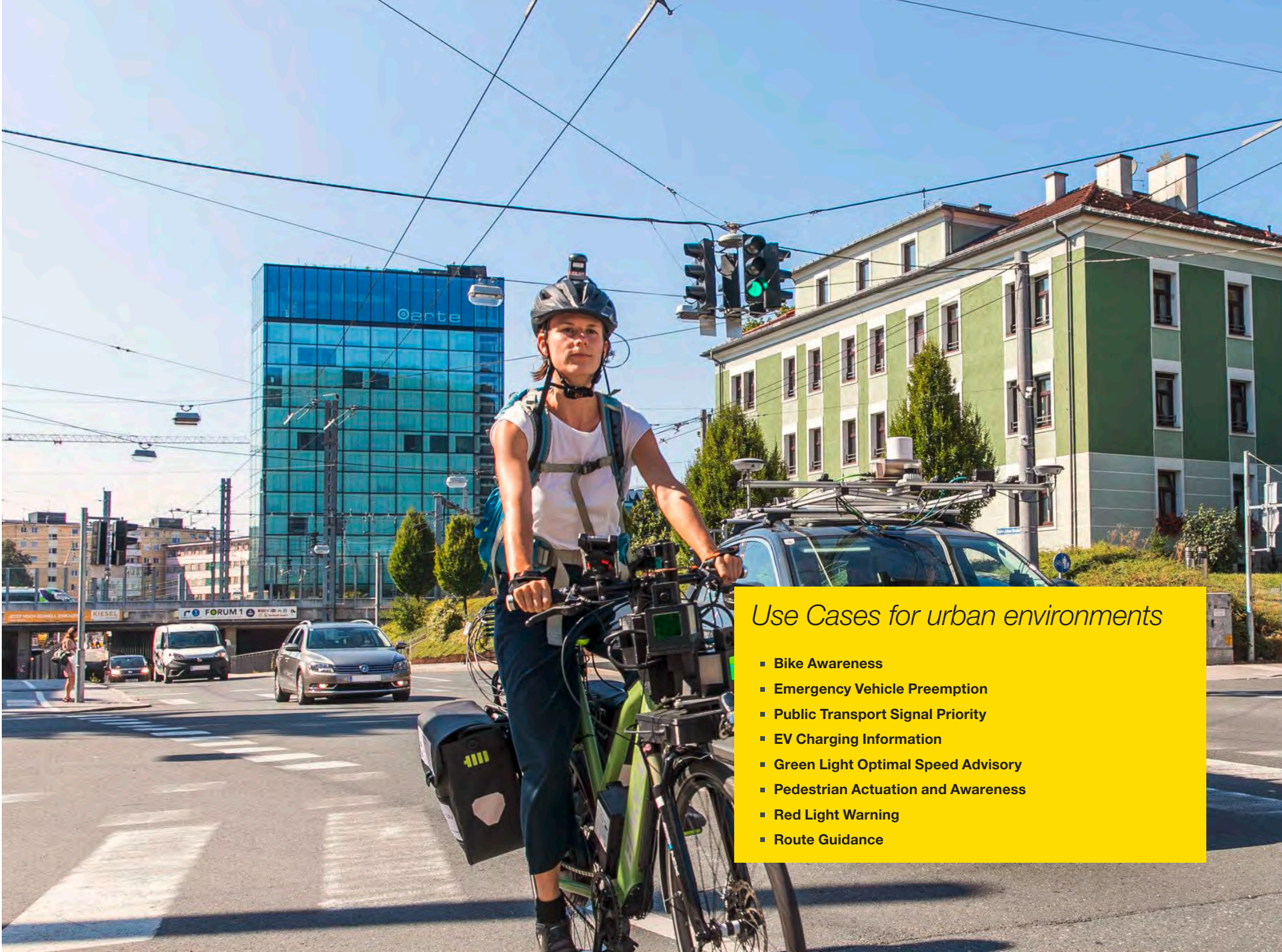
Analytic view of the operating status of the connected environment; Real-Time Feedback; Persistent data logging and exporting for further analysis.

Hybrid Communication - Connecting the Unconnected

Virtual RSU and dedicated mobile (smartphone) application to deliver safety and efficiency information where it is needed.

Cooperative Intelligent Traffic Management Solution Highlights

- Traffic service platform that leverages V2X technologies from pavement to cloud to operations
- Manage traffic corridors based on real-time data insights
- Cohesive, consolidated, and modular services that enable road operators to select services today and expand as needs change
- Single platform suite for highway and urban environments



Use Cases for urban environments

- Bike Awareness
- Emergency Vehicle Preemption
- Public Transport Signal Priority
- EV Charging Information
- Green Light Optimal Speed Advisory
- Pedestrian Actuation and Awareness
- Red Light Warning
- Route Guidance

Selected Reference projects

Austria: C-ROADS C-ITS initiative

Spain: Bizkaia Orchestrated Corridor

Ireland, Network Intelligence and Management System (NIMS):
C-ITS Pilot

USA, Ohio, Columbus: Connected transportation

Australia, Melbourne: Integrated Multimodal EcoSystem (AIMES)



Urban Access & Congestion Management

Cities currently suffer the most from congestion, poor air quality, noise pollution and reduced road safety - all caused by traffic.

Urban Access & Congestion Management is a proven and effective tool that can serve a range of objectives in addition to congestion relief, such as environmental protection, revenue generation, road safety and modal shift to sustainable modes, by setting the right incentives for urban restriction zones and/or pricing. This can take various forms of free and charging schemes, such as restricted access zones, low emission zones or congestion charging.

Non-charging systems are designed to ensure compliance with certain restrictions, such as limiting access to a designated zone to permit holders or residents (Limited Access Zone) or to vehicles that meet emission standards (Low Emission Zones). Restrictions are typically enforced by license plate recognition cameras placed around the perimeter of the zone.

Charging schemes, on the other hand, use pricing to control demand for access to congested urban areas. This distinguishes them from non-pricing schemes in that they can generate revenue not only to cover operating costs, but also for investment in urban transport infrastructure and sustainable mode.

Urban Access & Congestion Management is also capable of supporting mixed schemes to provide incentives, such as allowing a compliant vehicle to pass through a low emission zone free of charge, while a non-compliant vehicle has to pay to enter. In this mixed scenario, cities can maintain connectivity by avoiding congestion around restricted areas and allowing clean traffic flow.

Clear Air Zone

- Clean Air Zones (a.k.a. Low Emission Zones / Clean Transport Zones / etc.)
- Targeted to improve air quality
- Limited access based on vehicle emissions classification
- Usually permanent
- May require a sticker issued by the authorities
- May charge to access or ban

Low Emission Zone

- Limited Access Zones (a.k.a. Limited Traffic Zones / Access Regulations / etc.)
- Targeted to address multi-factor issues like damage to historic buildings, noise, tourist / pedestrian zones, etc.
- Usually permanent
- Ban access except exempts (residents, hotel guests, etc.)

Congestion Charging

- (a.k.a. Urban Road Tolls)
- Targeted to reduce traffic congestion or traffic jams
- Usually during peak hours
- Charge to access

Portfolio

Kapsch TrafficCom solutions deliver maximum reliability and performance with a cloud-native approach that reduces deployment and maintenance costs.



Intelligent sensors



Identification (ANPR)



Classification (DLVP)



Control of access rights



Invoicing or fining

Intelligent Sensors

VRX cameras

Kapsch TrafficCom's high-end Automatic Number Plate Recognition (ANPR) camera is a high-performance license plate camera designed for advanced toll collection and traffic management systems. It is an autonomous image capture device optimized for license plate reading and traffic scene documentation.

Kapsch VRX uses the latest sensor and image processing technology to provide high resolution, high quality image capture and automatic license plate reading with the highest possible accuracy.



DLVP - Deep Learning Versatile Platform

The Deep Learning Versatile Platform (DLVP) is based on artificial intelligence and machine learning technologies. It processes and analyzes video streams to provide real-time analytics and event detection such as automatic vehicle/object detection, tracking and classification, incident detection and situational awareness.

VDX cameras

It is a video-based, high-performance road user detection, classification, and front and rear license plate recognition system. This groundbreaking and innovative sensor combines the functionality of vehicle detection, tracking and classification with front and rear license plate recognition in a single device with industry-leading performance. VDX is a natural choice for any system that requires the highest performance video transactions while minimizing infrastructure and environmental impact. By mounting VDX above traffic, either on a gantry or on a pole, it outperforms any side-mounted system that inherently suffers from occlusion in dense traffic scenarios.



Operational Back Office

Kapsch Operational Back Office provides high-end Automatic Number Plate Recognition (ANPR), grouping, compliance check and rating features, when needed. Advance automation rules are used to identify license plate numbers from the road with high confidence level, by running second OCR analysis and applying fingerprinting algorithms to deliver the most automated solution experience.

It is a state-of-the-art system with a modular design to maximize reliability and performance while minimizing infrastructure costs. Each module can be configured to meet the specific needs of the city. It can be deployed on-premises, in the cloud, or using a hybrid approach where different modules use different strategies.

Main Modules and Features :

- Emission Compliance Verification: an interface to query an external system (e.g. vehicle registration authority) for the emission compliance level of a given vehicle.
- Automatic Image Validation: a module designed to apply multiple automatic rules to a vehicle image to automatically recognize a license plate.
- Manual Image Validation and Revalidation: a state-of-the-art manual validation module designed to minimize the time required to process, validate and verify a license plate, including multiple image tools and keyboard shortcuts that optimize every single second of the manual validation process. Manual Image Revalidation feature available, based on the 4-eyes principle, to revalidate transactions before creating penalty transactions.
- Transaction Grouping: Configurable module to group transactions from non-compliant vehicles into a single record to reduce storage costs and ensure the highest system performance.
- Valuation: based on business rules, the valuation module can apply one, none or multiple rates to any location configured in the system to enter or pass through a defined configured zone.
- Transaction Viewer: Review each step of the lifecycle and all statuses through the end-to-end flow of a transaction.

Enforcement Back Office

The system can address the pain points cities face when a violator passes through a checkpoint. A powerful and flexible rules and workflow engine enables multiple action items to collect or enforce vehicles that do not meet defined criteria.

Main Modules and Features:

- CRM: a single module for managing all non-compliant LPN-based accounts, viewing the transactions, cases, registered payments (via self-service API channels or the system) and financial documents associated with the account.
- Enforcement: a flexible and powerful workflow engine capable of creating complex enforcement processes from simple actionable rules based on transaction status and information retrieved from other modules or 3rd party systems (e.g. vehicle owner information from the Vehicle Registration Agency, daily pass sales status from a city system, etc.). The Enforcement feature is also capable of applying additional fees and creating penalty fees.
- Financials module: to register the payment of daily passes within a configurable grace period and penalty fees, with multiple means of payment such as cash, credit/debit cards, etc.
- Case Management Module: to register general claims or transaction disputes via the Self-Service API or by a system operator via the CRM module.
- Self-Service API: Enables integration of self-service channels such as IVR, web or mobile app for penalty search and case management creation.
- Reporting capabilities

Features

- Flexible business and enforcement rules that allow cities to tailor the system to their specific needs
- Modular, productized solution that is highly mature and enables rapid, risk-free deployment
- Optimized TCO over the entire lifecycle
- Modern tech stack that enables cloud deployment and virtualization

Highlights

- Advance sensors, fixed ANPR video cameras including front and rear images
- Intelligent automatic number plate recognition capabilities/ANPR capabilities with unbeatable proven results with +98% of automation rate
- First-Class performance supporting +6.5 million transactions per day
- Ability to classify the compliance of the vehicles to enter the zone based on their emission levels
- Charging and enforcing capabilities for unregistered accounts
- Self-Service channels, such as IVR and Web, that enable end-users to search for and pay Violation Notices by their own
- Public/Private Cloud or On-Prem and Containerized solution that enables autoscaling to expand or reduce infrastructure resources as needed to deliver the most cost-effective solution

Selected Reference Projects

Sweden, Gothenburg: Congestion Charging





Traffic Demand Management

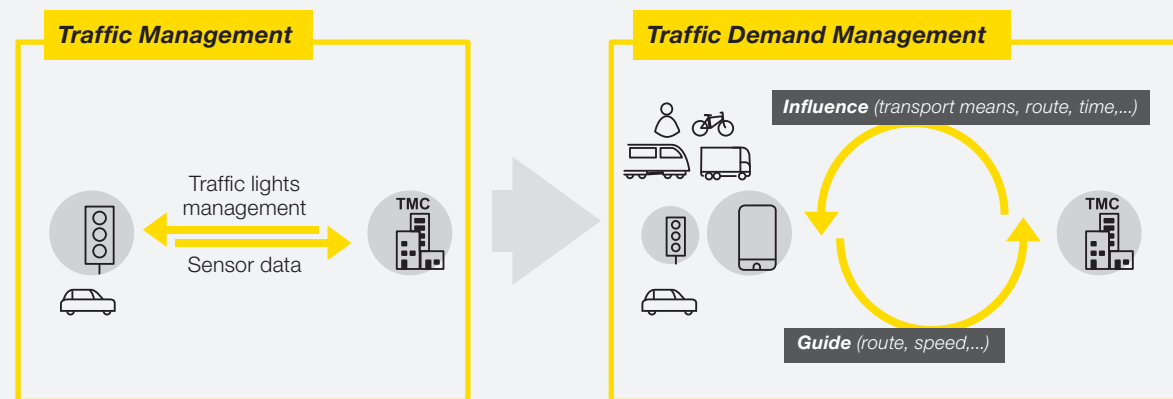
Current traffic management has a limit beyond which it is difficult to improve. To mitigate the effects of traffic, a new interaction between vehicles and road infrastructure is needed.

Traffic demand solutions go beyond current limitations and allow us to reach road users through various mobile technologies (mobile apps and in-vehicle units) to change their behavior and create a shared benefit for the community. In this way, we can manage everything from the demand at a sporting event to the speed of a bus.

From managing traffic to managing traffic demand, enabling mobility authorities to move from reactive management to proactive, multimodal management using a set of guidance tools (i.e., recommendations to drivers such as speed and route to take) and influence tools (i.e., shifting travel time or shifting to another sustainable mobility mode using incentives or flexible charging schemes).

By using connected devices (traffic lights, roadside units, etc.) and traffic data (from sensors, floating car data, etc.) in an orchestrated way, it allows to make predictions that are then used to send optimal suggestions to drivers. It even allows the creation and application of rules dictated by the city, which can be used to generate dynamic access restrictions to certain areas (due to events, schools, high pollution or other sensitive cases), contributing to a more efficient, safe, fair and sustainable mobility.

Finally, all this behavioral learning and collection of information on mobility demand can eventually be used automatically to improve the use of existing infrastructure.



Traffic Demand Applications

Driver Assistance

Enable transportation agencies to provide real-time recommendations to drivers, including recommended optimal speeds (GLOSA) and dwell times. It can also be expanded to support public transportation and active mobility options. This feature improves the user experience, reduces unnecessary stops, lowers fuel consumption and minimizes emissions.

Intelligent Traffic Routing

Use advanced traffic routing algorithms to intelligently distribute vehicles among available routes. This feature prevents congestion by suggesting congestion-free routes to drivers and taking into account traffic signal conditions (e.g., red lights) to provide the fastest routes. This results in improved traffic flow throughout the city compared to traditional „shortest-fastest“ routing.

Event and policy management

It enables the organization of major events by managing traffic in an optimal way to minimize the impact. It allows the city to select preferred routes to the event, organize parking, and even generate dynamic rules, providing citizens with an app that gives them all the tools they need to make the best decision.

Highlights

- Influencing road user behavior contributes to a greener and more sustainable environment.
- Increase operational efficiency and reduce costs through demand management.
- Improve transportation planning with an accurate, up-to-the-minute view of network congestion.

Selected Reference projects

Austria, Vienna: Traffic Management 2.0

Spain, Bilbao: Data Driven Traffic Management

A new way of understanding traffic

To discover more about Urban Traffic and Mobility Solutions and benefits, or to find out how Kapsch TrafficCom can help you realize your vision for improved traffic in your city visit our website or contact us today.



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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