



Yutrafic FUSION

A new era in traffic management and control.

YUNEX
TRAFFIC



FUSION is an entirely new adaptive traffic control and signal optimisation solution. Developed by Yunex Traffic, in collaboration with Transport for London (TfL), it represents a major advance in dynamic traffic control and a step change in approach, the first for decades.

The system delivers intelligent adaptive traffic control that is fit for the evolving challenges and opportunities that transport authorities face now - and into the future. FUSION contributes directly to the realisation of a city's aspirations, including the achievement of net zero targets, promoting active travel and improving air quality.

Taking adaptive control to the next level, FUSION is free from the constraints of existing systems and ageing code and has been designed to address today's challenges and embrace the latest technologies, data sources and the emerging interconnectivity of people, infrastructure, equipment and vehicles.

FUSION allows for all modes of transport to be detected, modelled and optimised. User specified, customisable optimisation criteria are used to deliver required transport policy outcomes.

With FUSION, Road and Transport Authorities can achieve improved optimisation of signals for all road users, including public transport, pedestrians and cyclists. FUSION considers all of today's road users - not just private vehicles.

This marks a key departure from traditional techniques, which focus solely on minimising vehicle delays and stops. And in addition to modal priority weightings, key routes can be weighted differently to ensure that core travel corridors are optimised as desired.

Rather than focusing on vehicular traffic and using traditional inductive loop detection, FUSION can also use richer multimodal data sources to optimise signalised junctions and pedestrian crossings.

These data sets will help change the underlying SCOOT® philosophy of minimising vehicle delay and stops, to FUSION's philosophy which is to optimise movements across your entire road network junctions based on all road users' needs.

Vehicles no longer need to be the priority, but pedestrians, cyclists, cars, goods vehicles and public transport vehicles can all now be optimised for and prioritised (as and when required) more appropriately.

FUSION: Real time Adaptive Traffic control

The new FUSION adaptive control algorithm has been designed to work with different Urban Traffic Control systems. Clearly defined interfaces will allow FUSION to be used in different markets, either as a cloud-hosted solution, or deployed on-premise.

FUSION has been designed to make use of richer, multimodal data sources to detect, model and optimise traffic control, and because vehicles are modelled separately and not aggregated, it has the ability to prioritise the passage of a single object in the network.

Continuously updated road user location data, including spatial data from connected vehicles, vehicle classifications and pedestrians or cyclist detections, can be incorporated into the network state model to obtain an even better understanding of the network and improve optimisation.

FUSION builds on well-established design and traffic engineering principles, providing further significant improvements and innovation. Significantly, the solution evaluates changes to the input or default plan based on targeted KPI driven changes, rather than focusing on the degree of saturation of vehicles only. This marks a step change in approach and positions FUSION as the optimisation tool of choice for cities with a diverse population of multimodal road users.

Rather than modelling individual network nodes and links to determine optimisation plans, FUSION adopts a network-wide view to provide a comprehensive picture of traffic conditions and predicted impact of actions on the entire network. This extensive module includes highly sophisticated modelling and forecasting techniques, such as demand forecasts, arrival profiles and turning proportions.

FUSION focuses on moving people across multiple modes, not just cars.





FUSION has been designed to incorporate AI approaches to aid and improve the traffic signal optimisation process.

- Dynamic prioritization for individual road user groups including pedestrians, cyclists and public transport
- Higher performance & reduced significantly vs. conventional adaptive control systems
- Lower cost of up to 30% due to reduced configuration and validation effort
- Increased safety and comfort with C-ITS use-cases
- Highly scalable to any size of network

FUSION has an advanced mesoscopic simulation methodology built into its algorithm to swiftly evaluate the impact of the adaptations considered within the optimisation process. For each optimisation call, this “digital twin” approach, performs multiple mesoscopic simulations to model all detected and forecast road users across the entire road network. This increases the possibilities for effective signal time adjustments, since many more options can be evaluated compared to existing control systems, such as SCOOT®.

The new system is highly modular and designed to be configurable according to the specific infrastructure installed and is not tied to any specific UTC system.

The Living Laboratory

Yunex Traffic and Transport for London are uniquely using a “Living Laboratory” to test, validate and optimise FUSION. This Living Laboratory consists of traffic intersections in London and allows newly developed features to be immediately verified directly by Yunex Traffic and TfL, ensuring a solid basis for continuous evolution and improvement of the system.

Key features at a glance

- KPI and policy driven optimisation
- Digital Twin models and optimises all road users across the entire road network
- Configurable modal and key route prioritisation
- Richer, multimodal data sources
- Exploits increasing interconnectivity of people, equipment and vehicles
- Embraces AI to aid learning and optimisation
- Highly modular and configurable
- Flexible deployment options; cloud or on-premise hosting
- Developed in partnership with Transport for London (with support from the University of Southampton)



Download our
Whitepaper about adaptive control for today's road users - real life deployments, real life learnings: from February to May 2023

Let's shape the future of mobility together!

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Yunex Traffic is a separately managed company of mundys SpA. It is a global leader in the field of intelligent traffic systems, offering the widest end-to-end portfolio of solutions for adaptive traffic control and management, highway and tunnel automation, as well as smart solutions for V2X and road user charging tolling. Yunex Traffic has 3100 employees from 58 nations and is active in over 40 countries worldwide. Its intelligent mobility solutions are currently being used in major cities across the world, including Dubai, London, Berlin, Bogota, and Miami. Yunex Traffic has successfully concentrated its efforts on mastering technologies in the three segments of hardware, software, and service, and is subsequently the only supplier who is capable of meeting all major regional standards in Europe, UK, Asia and America. Further information is available at: www.yunextraffic.com

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