

Miovision Surtrac

Real-Time Adaptive Traffic Control

Using Artificial Intelligence to Transform Urban Mobility

Surtrac is a patented, artificial intelligence-based adaptive traffic signal control system that optimizes traffic flows in real-time based on actual traffic conditions. It was created in the Robotics Institute at Carnegie Mellon University as part of the Traffic21 research initiative and has since been deployed in cities like Pittsburgh, Portland, and Boston, and towns outside of Philadelphia, Toronto, among others.



1 Real-time Response to Actual Traffic

Surtrac optimizes traffic signal performance second-by-second based on actual traffic on the road, not just historical averages.

2 Multi-modal Optimization

With advanced sensing, Surtrac can integrate vehicle, pedestrian, bus, and bicycle traffic flows automatically or according to pre-specified priorities.

3 Optimized for Complex Grids, Not Just Corridors

While Surtrac is capable of handling suburban corridors with a single dominant flow, it really shines when optimizing more complex grid networks with multiple competing flows that change throughout the day.

4 Decentralized and Inherently Scalable

Surtrac is decentralized and scalable to networks of any size and shape and can be deployed incrementally as budgets allow.

5 Communicates with Connected Travelers

Surtrac was designed with the future in mind – with connected and autonomous vehicle capabilities built-in.

Why Miovision Surtrac?

Unlike other adaptive systems that optimize splits, cycles, and offsets in a conventional way, Surtrac treats traffic optimization as a decentralized scheduling problem with network coordination.

This means that each individual intersection can create its own optimized plan, while still communicating with its neighboring intersections to dynamically create coordination as broader traffic patterns demand – all in real-time, on a second-by-second basis. This allows Surtrac to work in all types of traffic environments ranging from suburban arterials with a single, dominant flow of fairly predictable traffic, to extremely chaotic and challenging grid systems often found in urban areas where queuing, conflicting demands, and multi-modal traffic are commonplace.



How does Surtrac work?

Surtrac gets real-time, multi-modal traffic information from detectors at the intersection and uses these data to build a model of the actual travelers approaching the intersection and where they are headed.

Surtrac optimizes over this model second-by-second using its artificial intelligence scheduling technology to build a plan of how best to move travelers through the intersection as actual traffic evolves.

Based on this plan, Surtrac communicates projected traffic flows to neighboring intersections so they can optimize over a longer planning horizon and create real-time coordination of traffic flows through the road network.

Surtrac then sends commands to the traffic signal controller at the intersection to control phase durations in real-time.

Surtrac can also communicate with connected travelers, including connected vehicles, pedestrians, transit, as well as other systems (e.g., central traffic management systems, dashboards, smartphones, etc.), while the powerful configuration system ensures operators get the most out of their investment—whether the solution is being used for actuation, measurement and ATSPMs, or for adaptive signal control.

Benefits of Surtrac

In addition to reducing the direct and indirect costs of traffic congestion, Surtrac can help:

- Improve mobility within a city – especially as population, tourism, and economic activity increases – making a city more liveable for its residents and attractive to businesses and tourists
- Drive value from other smart city and IoT investments – Surtrac is generally agnostic to the type of sensors it uses and improves its optimization planning as more information from IoT sensors becomes available
- Prepare a city for the future – Surtrac is designed with forward-looking functionality that allows for CAV (connected/autonomous vehicle) and V2X (vehicle-to-everything) communication supporting the evolution of multi-modal mobility trends within urban areas



For more information, visit mivision.com, email us at hello@mivision.com, or call us NA Toll-free at 1-855-360-7752

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