PTV GROUP
the mind of movement

KRAKOW FOCUSSES ON ADAPTIVE CONTROL SYSTEMS BY PTV GROUP

In order to reduce traffic on the main transport arteries, the city of Krakow invested in adaptive control systems over a road network amounting to 19 kilometres. The results were outstanding: PTV Balance and PTV Epics were able to reduce the total waiting time for motorised private transport by 23 percent - thanks to intelligent models that can be easily configured in both control systems.

With a 53 percent increase in congestion during the morning rush hour and a 69 percent increase in the evening, the city of Krakow was at number 34 in the TomTom Traffic Index in 2014. 22 minutes were lost by every motorist due to traffic each day. That's according to a report by Deloitte and Tageo.pl. That’s according to a report by Deloitte and Tageo.pl. The situation on the road was no longer acceptable, so that the ministry started to look around for an adequate solution. The planners opted for a joint approach of the Partners GEVAS software GmbH, Munich (provider for traffic management systems, Global Traffic Systems Sp. z o.o. (responsibe for light-signal systems and communication) and PTV Group.

ADAPTIVE CONTROL WITH BALANCE AND EPICS

PTV Balance allows users to coordinate traffic lights across multiple intersections and activate green waves. The model-based network control optimises the signal programs every five minutes in response to current traffic flows. "PTV Balance uses a combination of traffic flow models in order to calculate delays, lengths of traffic jams and the number of stops," says Florian Weichenmeier, Manager Real-Time Signal Control at PTV Group.

Its macroscopic traffic model is fed with detector data, which it uses to analyse traffic densities on the individual sections and turn-offs, and to calculate different strategic framework signal plans. Its mesoscopic model then evaluates the control alternatives across multiple inter-

sections. This process also takes stochastic traffic variations and capacity conditions into account. A control model in

PTV Balance subsequently optimises the length of each green signal and the time offsets. "This results in a framework signal plan that determines fixed signal programs at each intersection for local control," explains Florian Weichenmeier. "Epics can then adapt its switching based on local detector data in order to provide local control, or can use the fixed-time control from Balance."

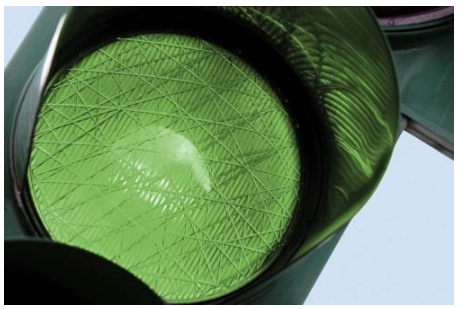
PTV Epics is a traffic-adaptive control instrument that was specially developed for single intersections and runs directly inside the control unit. The model-based process observes local conditions, calculates multiple control options in under a second, and applies the best alternative. "Epics also takes different modes of transport into account," says Florian Weichenmeier. "That's why Epics can prioritise public transport or pedestrians in signalling, for example, depending on the strategy of the local traffic managers."

OUTSTANDING RESULTS

PTV Balance and PTV Epics have been installed at 30 intersections in Krakow, allowing them to optimise four road sections in total. With a total length of approximately 19 kilometres, this covers the majority of the main traffic arteries leading into and out of the city. Public transport lines used by buses and trams also run across almost the entirety of this part of the network.

One of the sections runs along the Nowohucka road. While the volume of traffic in the main direction of travel remained consistently high throughout the day, traffic flows in the opposite direction always reduced by around 45 percent during the morning. The optimisation of the signal controls using PTV Balance and PTV Epics allowed travel times for motorised private transport in the main direction of travel to be reduced by 20 percent during the morning. And although this resulted in a slight increase in travel times in the opposite direction, the use of traffic-adaptive control systems allowed journey times to be reduced by 14 percent overall. It was even possible to achieve a reduction of 23 percent in the afternoon. This was an outstanding result.

The city of Krakow was also able to achieve positive results in terms of public transport prioritisation. The section along the Bronowicka road features separate lanes for public transport. This meant that each prioritisation of public transport had a direct impact on private traffic. By effectively balancing public transport prioritisation using PTV Epics, the travel time for public transport lines was reduced by an average of 10 percent. For private transport, this meant a 9 percent increase in travel times during the morning, but a 10 percent reduction in the afternoon.



PTV GROUP
Haid-und-Neu-Str. 15
D-76131 Karlsruhe
Germany
+49 (0) 721 96 51-300
info@vision.ptvgroup.com
vision-traffic.ptvgroup.com