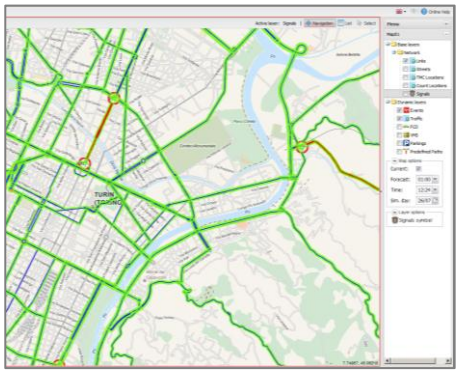
PTV OPTIMA
the mind of movement

„I LIKE THE ROBUSTNESS AND EFFICIENCY PTV OPTIMA IS DELIVERING RELIABLE INFORMATION.“

Covering an area of 25,000 square kilometres, Piedmont is, after Sicily, Italy's second largest region: its provinces are intersected by more than 34,000 kilometres of main road. The company responsible for managing traffic and providing mobility information in this region is 5T, a public company owned by the Piedmont Region, the City and the Province of Turin. Since autumn 2013 the company's traffic managers have been using PTV Optima to assist them in this task: a tool which enables dynamic traffic prediction.

Tecnologie Telematiche Trasporti Traffico Torino

PTV Optima combines the tried-and-tested offline transport modelling method with real-time data and algorithms. This process is based on a transport model created in PTV Visum which shows each "typical day" (e.g. working days or weekends) for the selected transport area. It models transport services and travel demand using demand matrices. Dynamic traffic assignment is used to calculate the time-related traffic volume and turning movements in networks based on travel demand. This is where online data comes into play. In PTV Optima, the data is used in real time in order to adjust capacity, speed and volume from PTV Visum's base model to the current local flow and road conditions. The simulation of PTV Optima includes the network structure, traffic flow dynamics and the route choice behaviour of road users, covers the traffic situation for routes without detectors and predicts the impacts also of unforeseen incidents. "PTV Optima is the solution which best meets our requirements", says Dr Fabrizio Arneodo, ITS Design & Development Manager at 5T.



PTV Optima allows traffic managers to monitor real-time traffic and provides an overview of all existing traffic events.

PROJECT OVERVIEW

- Project name: Regional Traffic Supervision Centre of Piedmont
- Purchaser: 5Tsrl, Piedmont, Italy
- PTV Group's role: Main contractor
- Project volume: 584,000 EUR
- Implementation period: 2011 - 2013

DYNAMIC NOT STATIC

Alongside Floating Car Data (FCD), approximately 1,400 induction loop stations as well as 200 stationary sensors, such as infrared and radar, are currently implemented in Piedmont, delivering new measurement data relating to real-time traffic patterns at 5-minute intervals. "This allows us to observe roughly one half of 76,000 arcs of our Transportation Graph. The other, much larger section of our routes is covered by PTV Optima", explains Fabrizio Arneodo. A solid base for traffic management.

Being able to predict traffic behaviour is key to ensuring the traffic management team can dynamically control traffic. PTV Optima can give an up to 60-minute forecast on the development of traffic. "Here we have opted to use a rolling approach", says Fabrizio Arneodo. "That means that we simulate a 60-minute time frame which is then automatically recalculated every five minutes." This allows 5T to see what effects the volume of traffic, speed and disruptions have on the various sections of road.

MAKING A DIFFERENCE EVERY DAY

At 5T the system is generally put into action for two main applications. The first is when the traffic manager receives information from the relevant police authority regarding a traffic incident. An 'incident' could be an accident or even a group of demonstrators on the road. "His job is to apply this information to a specific scenario and to respond with appropriate traffic measures", explains Fabrizio Arneodo. This could involve, for example, opening extra lanes, putting changeable message signs in place or passing information on to road users via text message, the company's website, mobile applications or the radio.

The second application makes use of an automated feature. If pre-defined thresholds are exceeded - because actual traffic behaviour differs greatly from normal patterns - the system will send a warning to the traffic manager. This can, for example, be due to the weather. "As we are situated next to the Alps, there are a lot of tunnels in this region which we have to close in winter during adverse weather conditions", explains Fabrizio Arneodo. "Closing the tunnels leads to unusual congestion patterns in the traffic network. The system recognises this change automatically and suggests an intervention strategy to the traffic manager."

A RELIABLE AID

At 5T intervention strategies are developed offline by traffic engineers before being applied to the PTV Optima online environment where they are assessed, compared and weighted using real-time traffic data. The engineers then share their results with the traffic managers based at the traffic management centre. They are the ones responsible for turning scenarios developed by the team into operative measures. PTV Optima aids managers in this task by making it possible to quickly return traffic to normal levels within the road network. "I like the robustness and efficiency PTV Optima is delivering reliable information", says Fabrizio Arneodo. "PTV Optima is an extremely sophisticated system, but it features a straightforward interface that has been developed and designed with the user in mind, making it simple for anyone to use." ■

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