Selex ES
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Smart Solutions

CITIES UTC
URBAN TRAFFIC CONTROL

Over recent decades urban traffic has continually increased, mainly due to private road-users who need to get from one part of a city to another. This requirement is incompatible with street networks which are sometimes complicated and generally unsuited to handling increasingly intense traffic flows.

Building new infrastructure would not be enough to solve this problem and improve conditions on urban road networks, since it is often hampered by economic and environmental constraints.

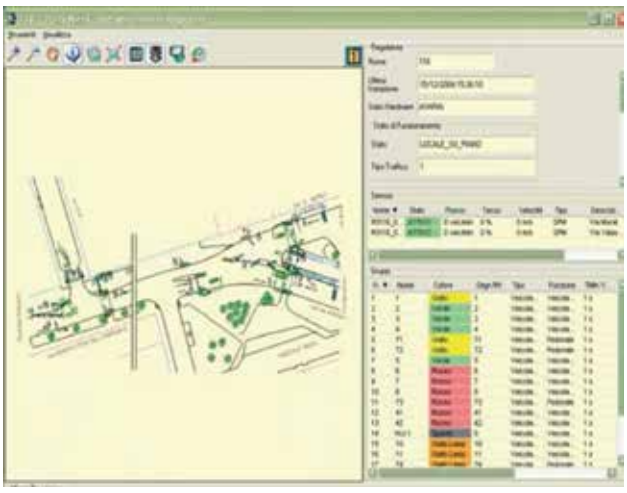
However, it would be appropriate to put in place a system for regulating and controlling traffic which simplifies and streamlines vehicle flows.

CITIESutc (urban traffic control), the system for regulating urban traffic-light networks produced by Selex ES, can make an effective contribution to smoothing out traffic- flows in cities since it coordinates installations centrally and schedules different traffic-light plans throughout the day.

ARCHITECTURE

The system has a distributed, flexible and robust architecture, with functions shared out between:

- A peripheral control unit (CITIESpmfu – peripheral multi-function unit), for operating traffic lights and regulators and local diagnostics
- A control centre, for monitoring and managing peripheral installations and the communication system.



PERIPHERAL CONTROL UNIT

The peripheral control unit is responsible for running the traffic-light installations and area regulators (also from different suppliers), making coordinated operations possible.

Plans can be selected and implemented using decision-making criteria which take into account the real- time traffic conditions in the monitored area: coordinated operations do not necessarily have to be arranged in advance but can change, adapting to the changing traffic conditions detected by a network of sensors. The peripheral system also has a level of micro-regulation which, using the traffic-light plan assigned by the centre, optimizes local conditions with small-scale measures at individual junctions (longer/shorter time on green, breaks, skipping a phase, etc.).

The peripheral unit constantly monitors all the installations: all the information is routed to the centre to be viewed, processed, archived and made available for management, planning or systems maintenance activities. The same unit can also be used to provide other services such as CITIESptl (preferential traffic light), the system for giving priority to public transport at traffic-light junctions, and CITIESvms (variable message system), the system for managing variable-message signs.

CONTROL CENTRE

The control centre operates, configures, checks and coordinates the traffic-regulating peripheral systems. Traffic-light plans can be selected depending on traffic data, calendars, time slots, customized patterns or manually by the operator. For every junction, the selection mechanism applies an optimised traffic-light plan for the traffic conditions at that time and coordinated with adjacent junctions, so as to create synchronised green waves according to the typical speed of vehicles in the monitored zone.

The safety criteria are worked out using an “intergreen” matrix which establishes the “conflicting” movements (i.e. those who cannot have the green light at the same time) and the necessary time interval between one green phase and the “conflicting” green phase. The control centre also collects and stores all useful information from the peripheral systems for planning and systems maintenance activities.

COMMAND LOGIC AND REGULATING PLANS

Regulating plans can be designed for traffic-light regulators with automatic “traffic-activated” settings, “timetable slot” settings or manual “operator”. settings, selected in order of priority to avoid conflicts. The timetable slot plan can be arranged in advance to regulate the duration of the cycles of green according to the anticipated traffic flow throughout the day, while during the night the “flashing amber” setting can be selected.

Timetable-slot regulation can also follow the calendar (weekdays, the run-ups to holidays and holidays). The “traffic-activated” settings mechanism automatically selects the optimal traffic-light plan for a specific area, on the basis of the traffic data being continuously transmitted by the sensors. The “timetable slot” settings have the advantage of automatically adjusting to changes in traffic flows.

TRAFFIC DATA COLLECTION AND VEHICLE CLASSIFICATION

Traffic data collected by the sensors is used both locally by the regulator for micro-regulation at an area level and centrally, where it is used to establish macro-regulation patterns. The sensor readings normally record the number of vehicles which pass the sensor in one minute, the rate (percentage of time a vehicle occupies the sensor) and the average speed of vehicles passing the sensor.

The system is able to also classify vehicles using an estimate of their length, calculated as L = T x V (where T is the time the vehicle occupies the loop and V is the vehicle’s speed, as measured by the loop). This data can be used for statistical analysis and to calibrate regulating plans accurately.

TRAFFIC ENGINEERING TOOLKIT

CITIESutc is designed to work in combination with traffic engineering toolkits such as those for the assisted design of traf fic-light plans and traffic scenario simulation and analysis.

For more information please email **infomarketing@selex-es.com**
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