OPEN JOINT STOCK COMPANY “AGAT – CONTROL SYSTEMS” –
MANAGING COMPANY OF “GEOINFORMATION CONTROL SYSTEMS” HOLDING

“AGAT” AUTOMATED TRAFFIC CONTROL SYSTEM (“AGAT” ATCS)

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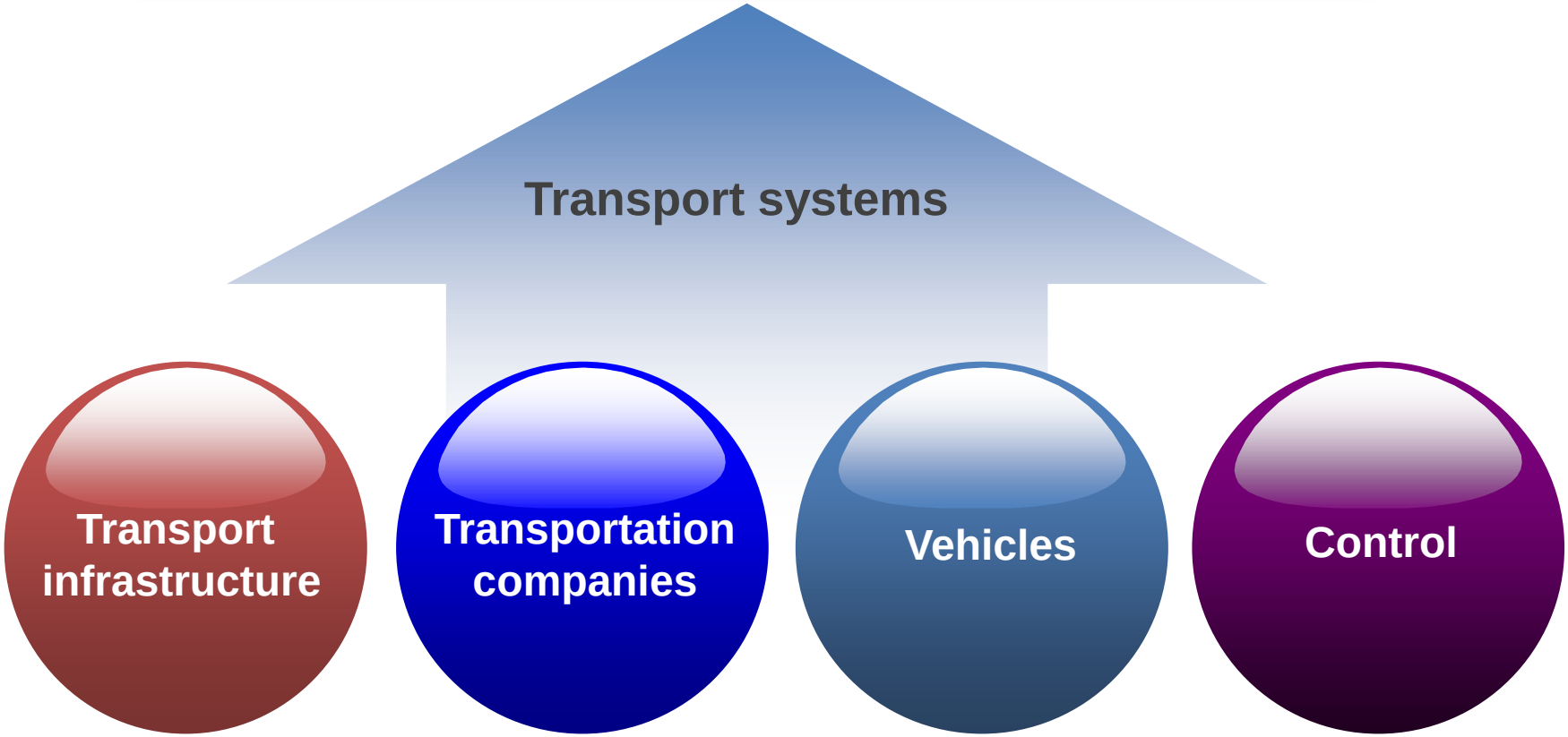
“AGAT” ATCS

“AGAT” ATCS is designed for efficient management and redistribution of traffic flows by means of intelligent control of light signals and electronic information boards. The system enhances employment of the existing transport infrastructure, reduces negative effects of the transport system overloads for citizens and environment, and ensures reasonable and efficient investment into the city infrastructure.

Maximum satisfaction of transport requirements at minimum costs



AGAT CONTROL SYSTEMS

AGAT "ATCS" – PRINCIPLES OF IMPLEMENTATION

Openness

- Use of standard communication tools, protocols, application interfaces.

Integratability

- The possibility to connect any new equipment is not limited.

Scaling

- The system may be easily scaled from single objects to hundreds and thousands of peripheral equipment.

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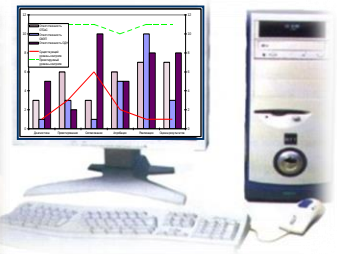
“AGAT” ATCS - APPLICATION

AGAT “ATCS” provides

1. Control of light signals according to the preset control technology.

2. Interaction with any system road controllers via wire lines, cellular lines (GSM, GPRS), and fiber-optic communication lines.

3. Collection, processing, storage and visualization of telemetry data regarding the traffic flow parameters, as well as information about operation modes and condition of peripheral equipment.



4. Supply of current information to traffic participants.

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“AGAT” ATCS PROVIDES:

1

ADAPTIVE CONTROL

of road traffic according to the measured (or calculated on the basis of the measurement data) traffic flow parameters:

- Local adaptive control
- System adaptive control

2

MONITORING OF TRAFFIC SITUATION

3

REMOTE MAINTENANCE AND TROUBLE-SHOOTING

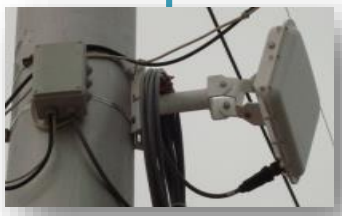
AGAT CONTROL SYSTEMS

“AGAT” ATCS INCLUDES:

HARDWARE AND SOFTWARE COMPLEX OF THE MAIN CONTROL CENTER (MCC)

CHANNELIZING EQUIPMENT

PERIPHERAL DEVICES



AGAT CONTROL SYSTEMS

THE COMPLEX OF HARDWARE-SOFTWARE TOOLS PROVIDES CONTROL IN THE FOLLOWING MODES:

1. Centralized – control from the hardware and software complex of MCC;
2. Decentralized – control from the zonal center controller (ZCC) or centered road controller at the highway-road network;
3. Local – control from the road controller.

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SWITCHING BETWEEN THE MODES IS PERFORMED:

- Automatically according to the preset control technique;
- According to the traffic management engineer's regulations.

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CHANNELIZING EQUIPMENT

1. Zone controller (KZTs-M1)

2. Cellular modems

3. Adapter module (MC-5) for GSM/GPRS link

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PERIPHERAL EQUIPMENT CONNECTED TO “AGAT” ATCS

1. **System road controllers** manufactured in Belarus, Russia, the Ukraine and other former USSR countries, and connected via wire-lines or cellular lines.

2. **Transport detector** (inductive, radar, infra-red and video detectors).

3. **Information boards for road traffic participants** (information about weather conditions, open and closed roads and runways, speed limits, alerts, security suggestions, etc.)

4. Recommended speed indicators and variable message signs.

5. Preliminary information boards for pedestrians.

Call panels for pedestrians.

6. Traffic lights and preliminary information boards for drivers.

AGAT CONTROL SYSTEMS

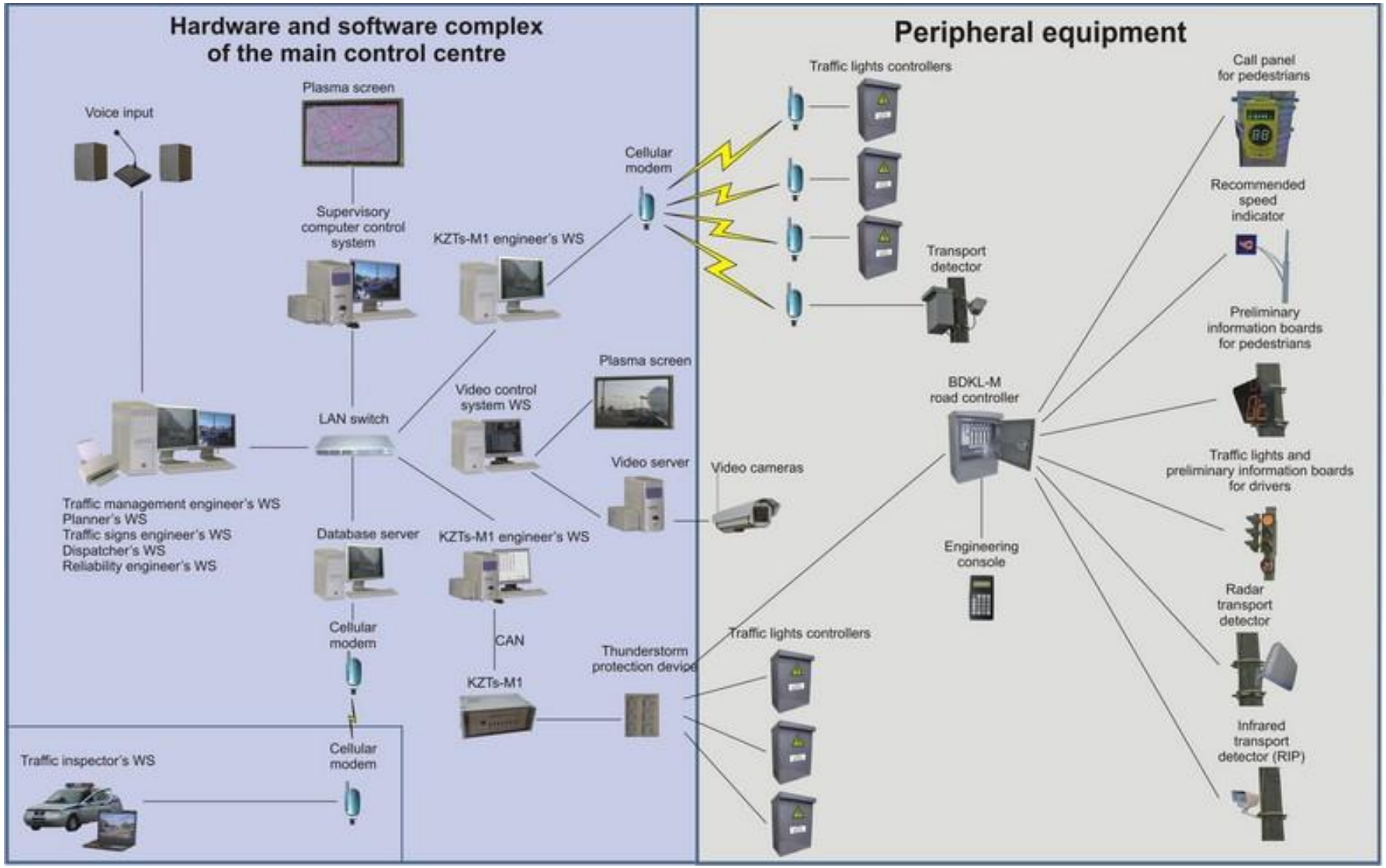
MCC CONTROL PROVIDES IMPLEMENTATION OF THE FOLLOWING TASKS:

- Generation of the system information base and mailing of its fragments that provide implementation of the required control technology for the ATCS elements (ZCCs and road controllers).

- Control of light signals according to the received fragment of the system information base and implemented control algorithms.
- Generation of statistical information of the following types:
  - report generation of the system operation;
  - traffic information;
  - operation modes and condition of the equipment.
- Display of current and statistical information at display facilities:
  - in the form of inquiries and reports (upon request);
  - mandatory (place-oriented);
  - development and dislocation of the object.

AGAT CONTROL SYSTEMS

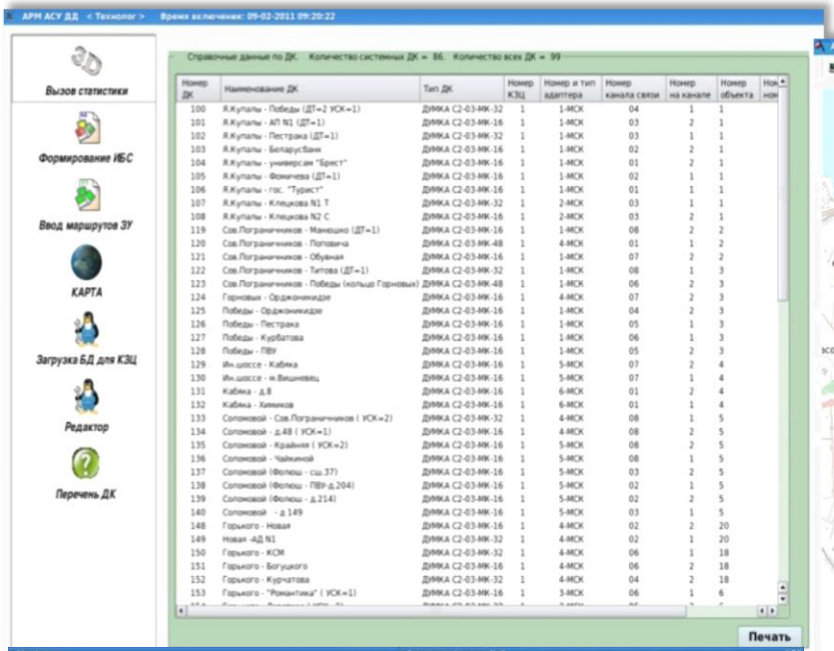
HARDWARE AND SOFTWARE COMPLEX OF THE MAIN CONTROL CENTER - STRUCTURE

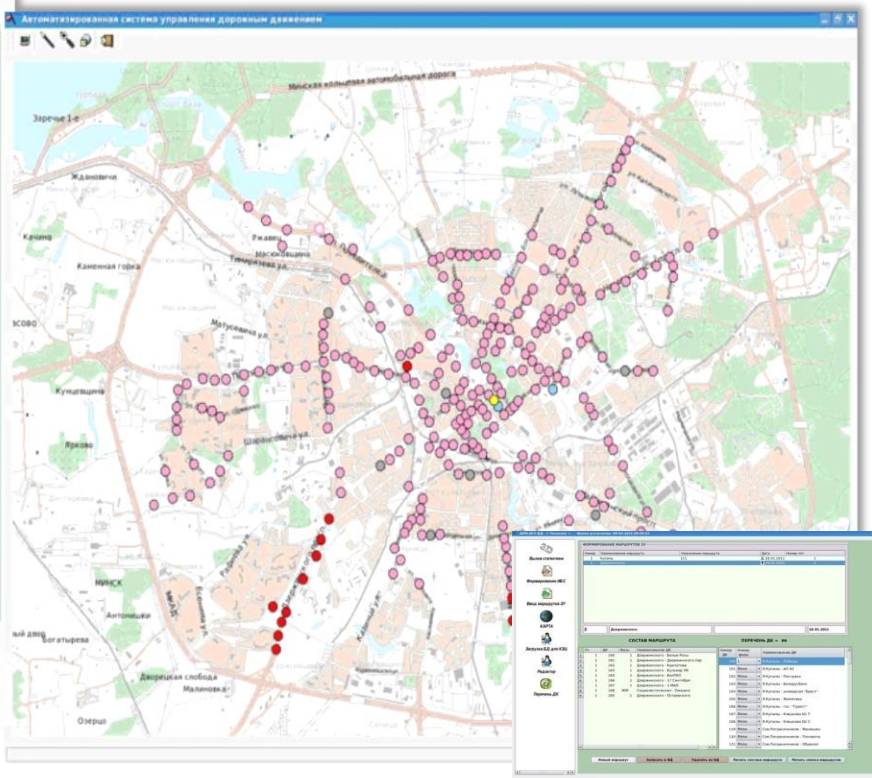


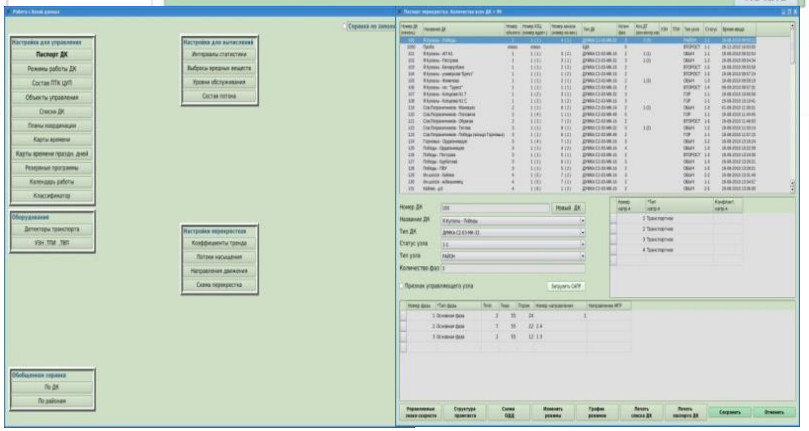
AGAT CONTROL SYSTEMS

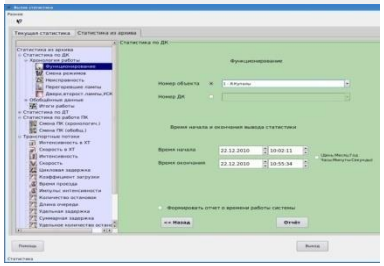
HARDWARE AND SOFTWARE COMPLEX OF THE MAIN CONTROL CENTER - STRUCTURE

PLANNER'S WORKSTATION









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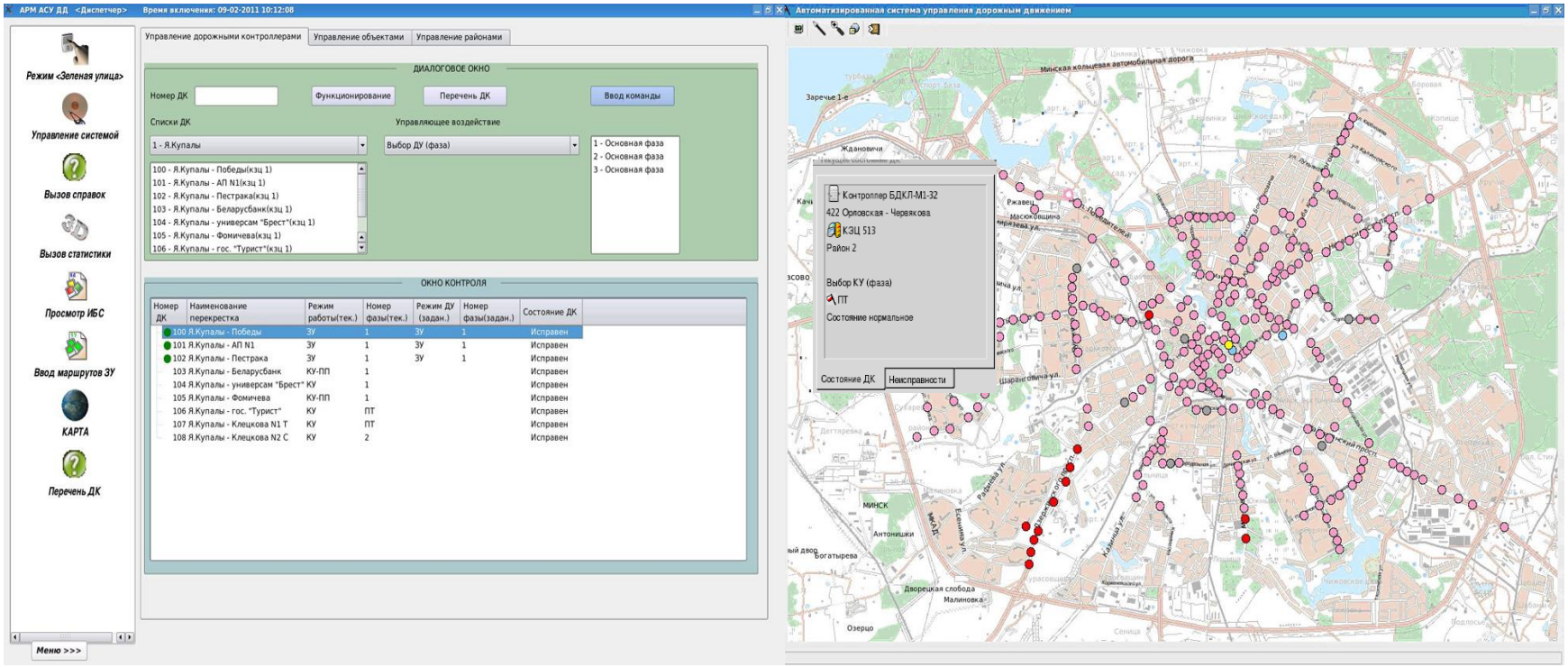
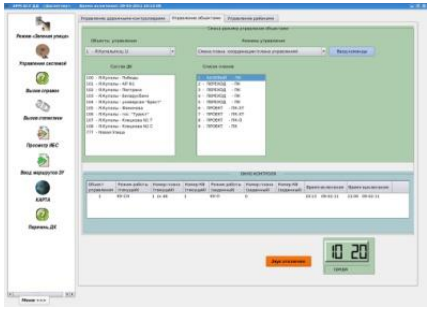
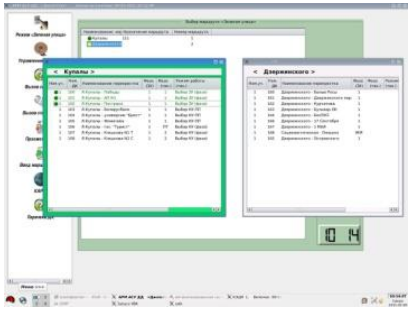
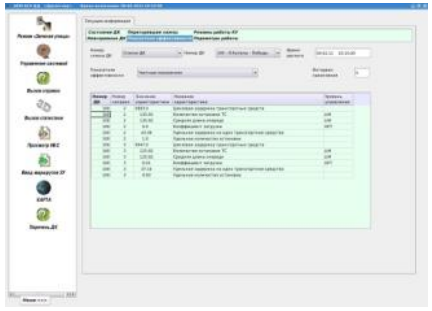
HARDWARE AND SOFTWARE COMPLEX OF THE MAIN CONTROL CENTER - STRUCTURE

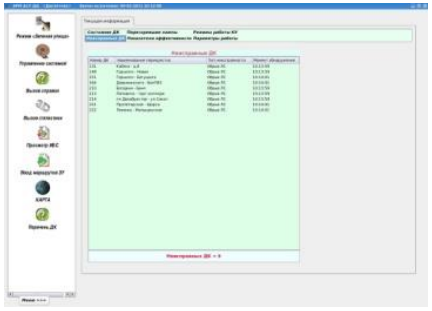
TRAFFIC MANAGEMENT ENGINEER'S WORKSTATION











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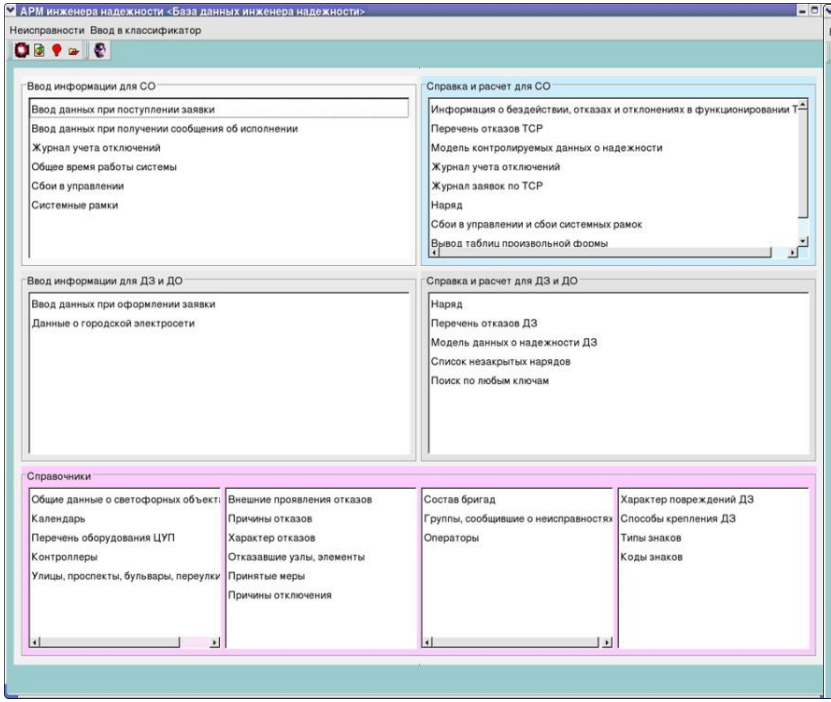
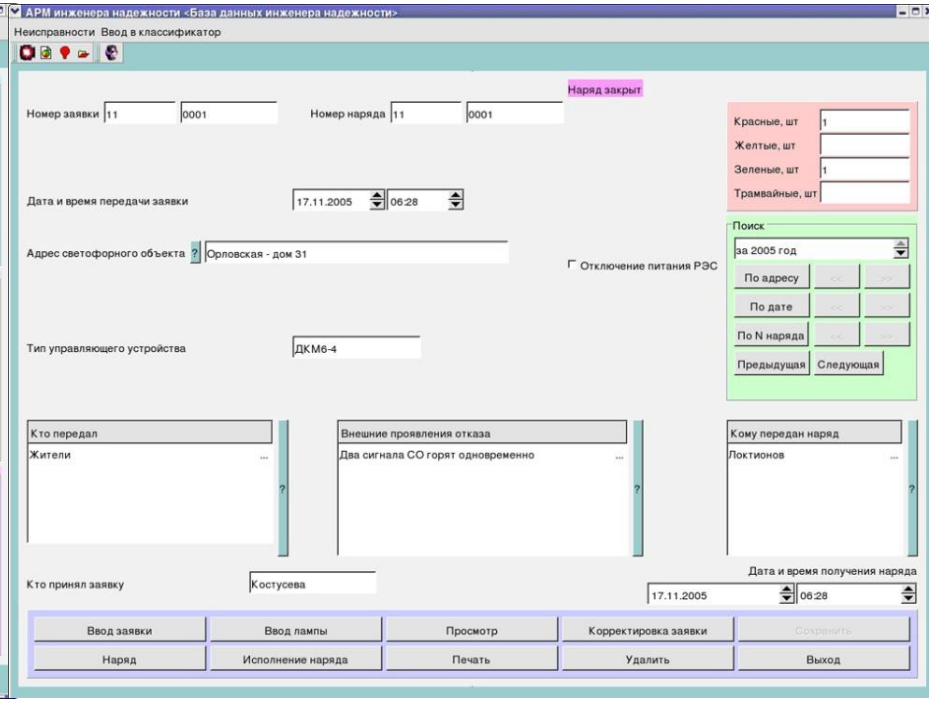
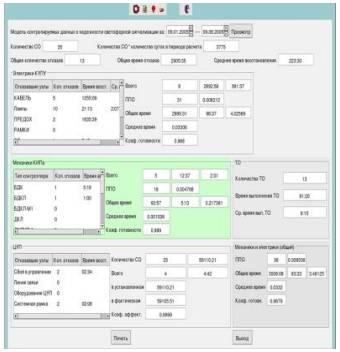
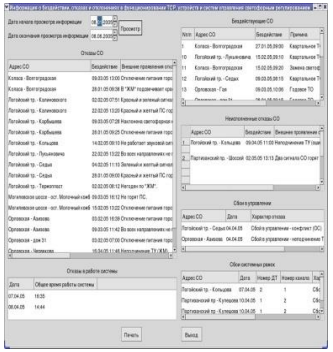
HARDWARE AND SOFTWARE COMPLEX OF THE MAIN CONTROL CENTER - STRUCTURE

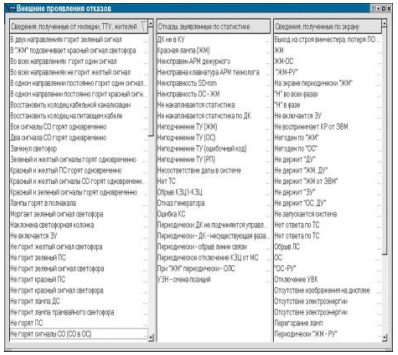
DISPATCHER'S WORKSTATION / RELIABILITY ENGINEER'S WORKSTATION

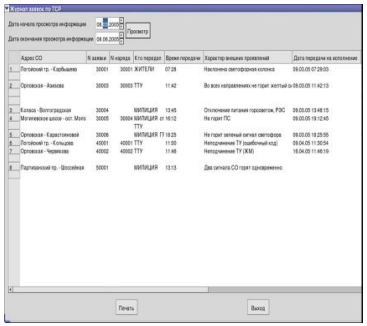












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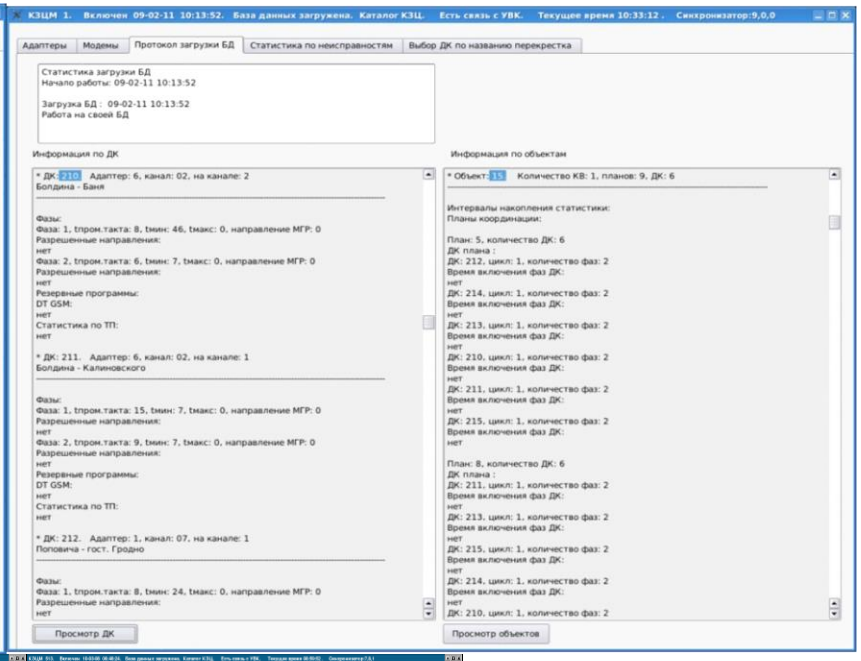
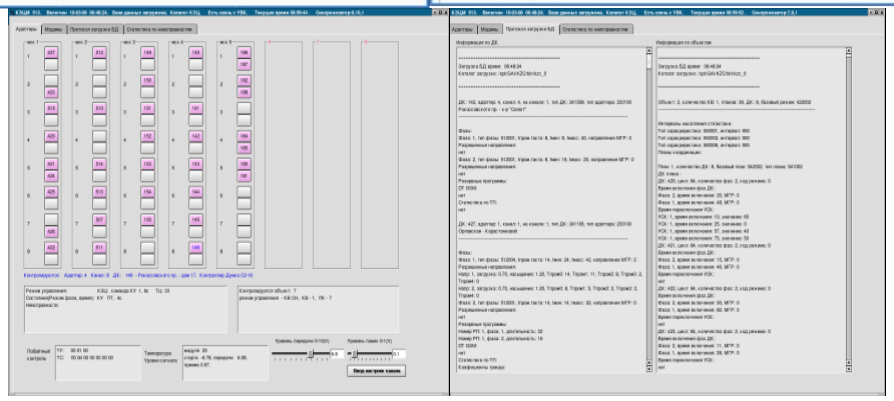
HARDWARE AND SOFTWARE COMPLEX OF THE MAIN CONTROL CENTER - STRUCTURE

ZONE CONTROLLER (KZTS-M1) ENGINEER'S WORKSTATION





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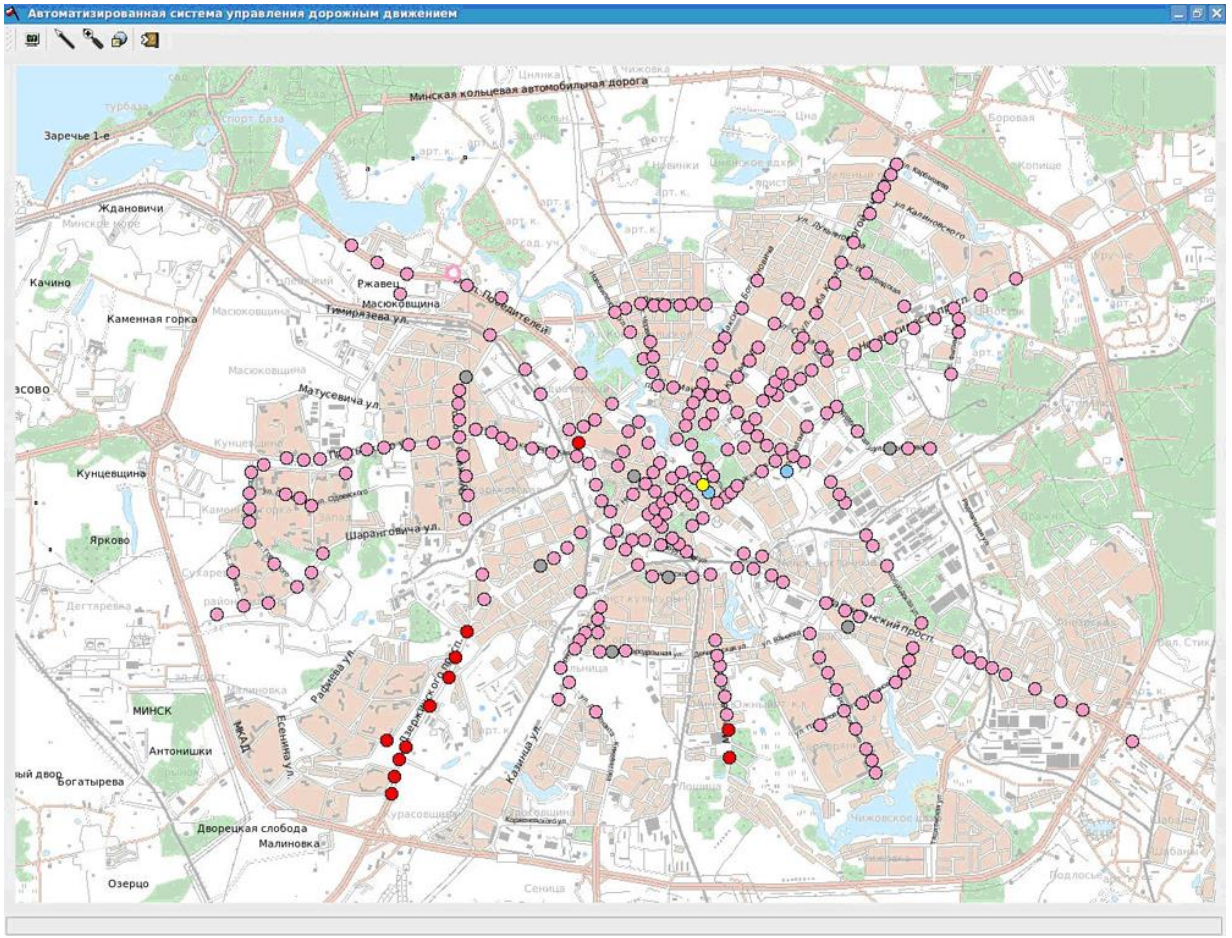
HARDWARE AND SOFTWARE COMPLEX OF THE MAIN CONTROL CENTER - STRUCTURE

CONTROLLING COMPUTER SYSTEM

The controlling computer system is designed for statistical processing of information, display of current status information on the map and information exchange between the system elements.



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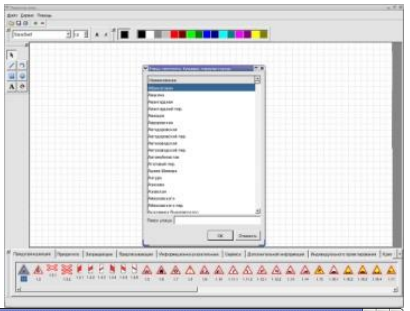
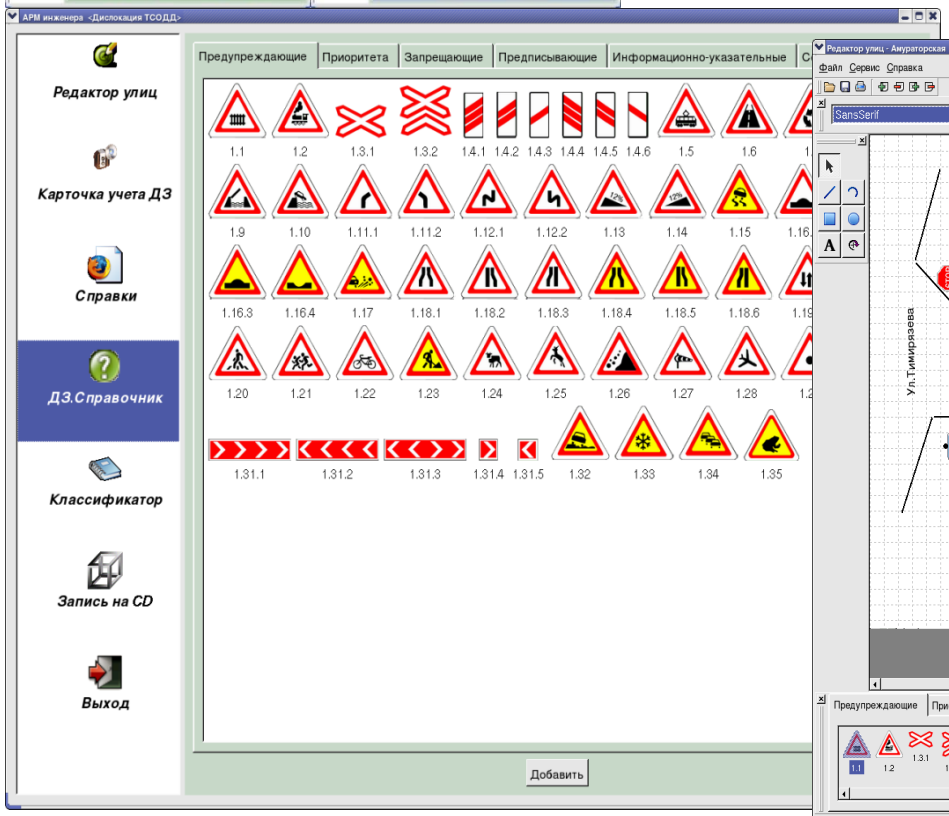
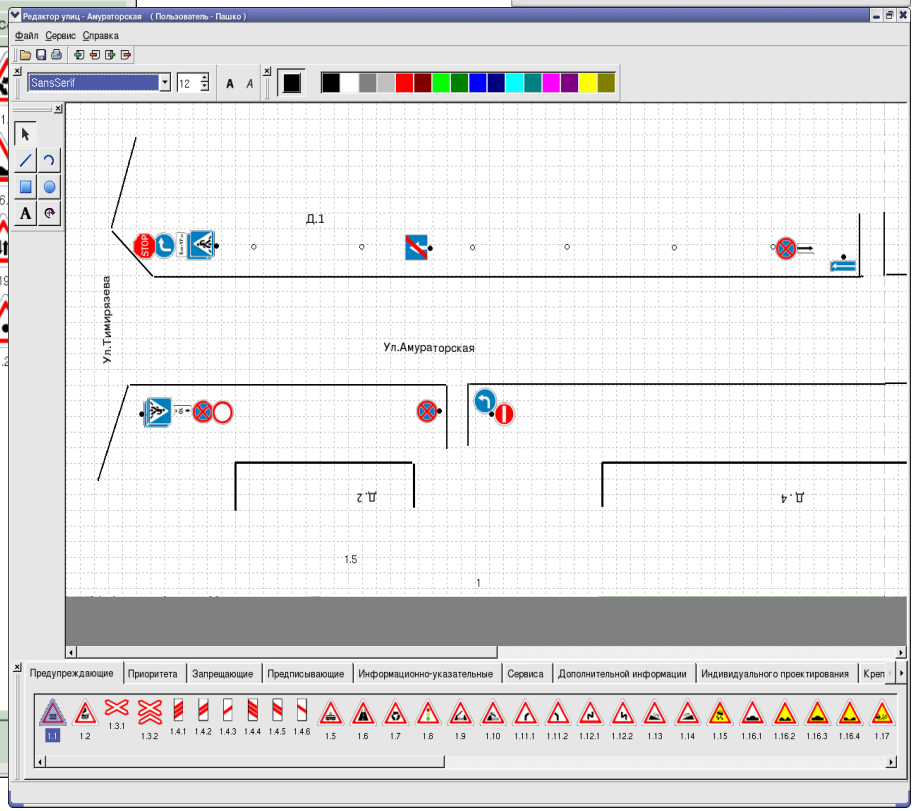
HARDWARE AND SOFTWARE COMPLEX OF THE MAIN CONTROL CENTER - STRUCTURE

TRAFFIC SIGNS WORKSTATION



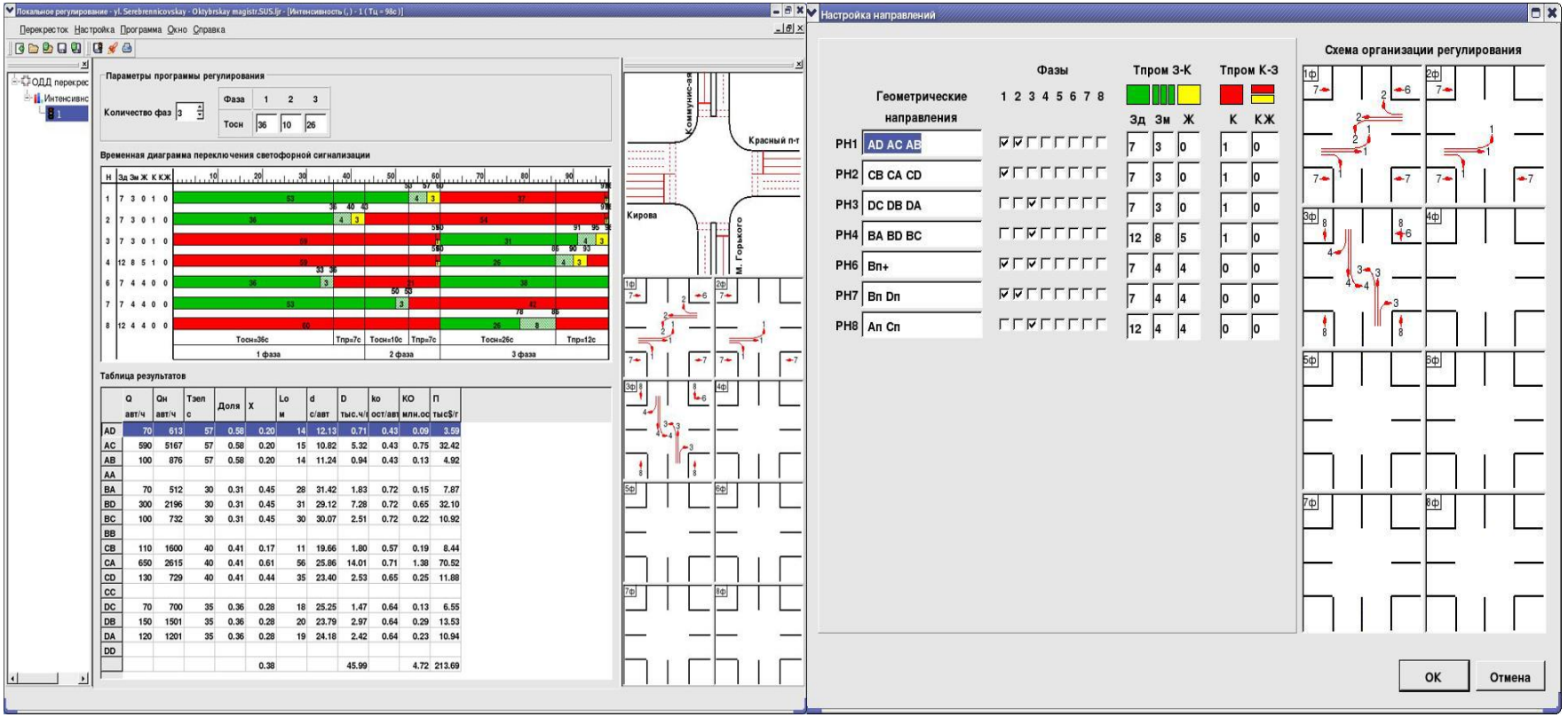




AGAT CONTROL SYSTEMS

COMPUTER-AIDED DESIGN SYSTEM FOR TRAFFIC PARAMETERS

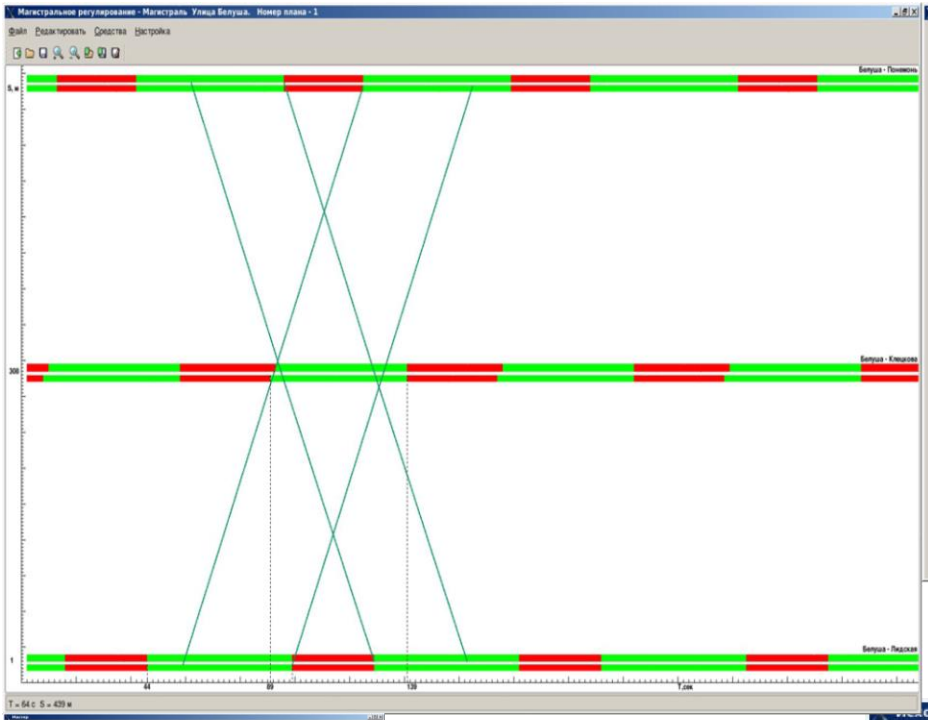
LOCAL CONTROL ALGORITHM

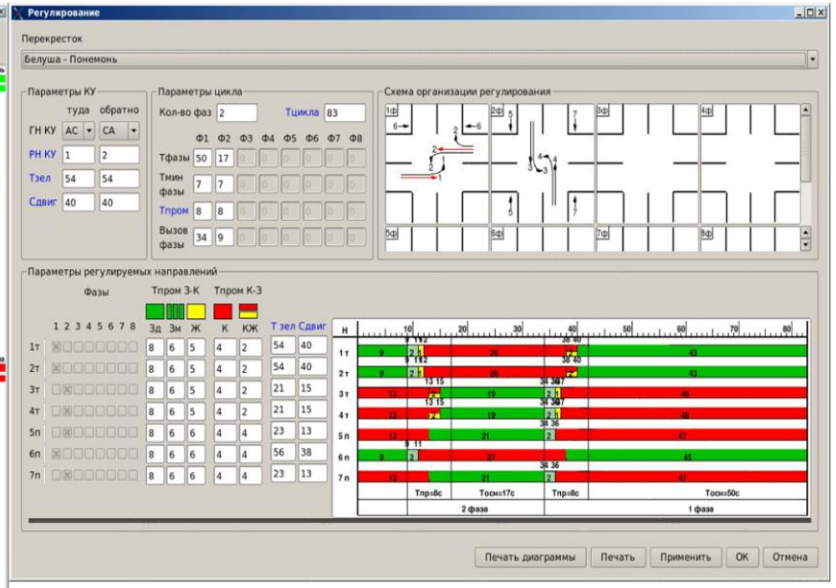


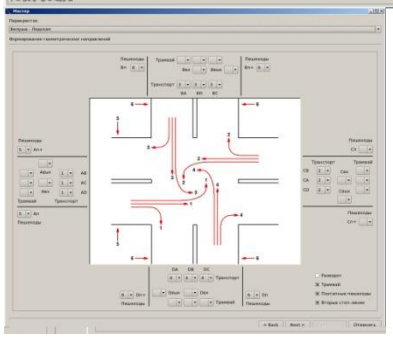
AGAT CONTROL SYSTEMS

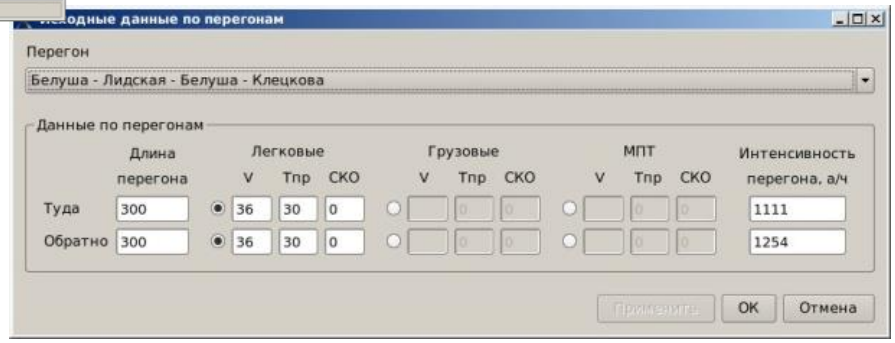
COMPUTER-AIDED DESIGN SYSTEM FOR TRAFFIC PARAMETERS

COORDINATED CONTROL ALGORITHM





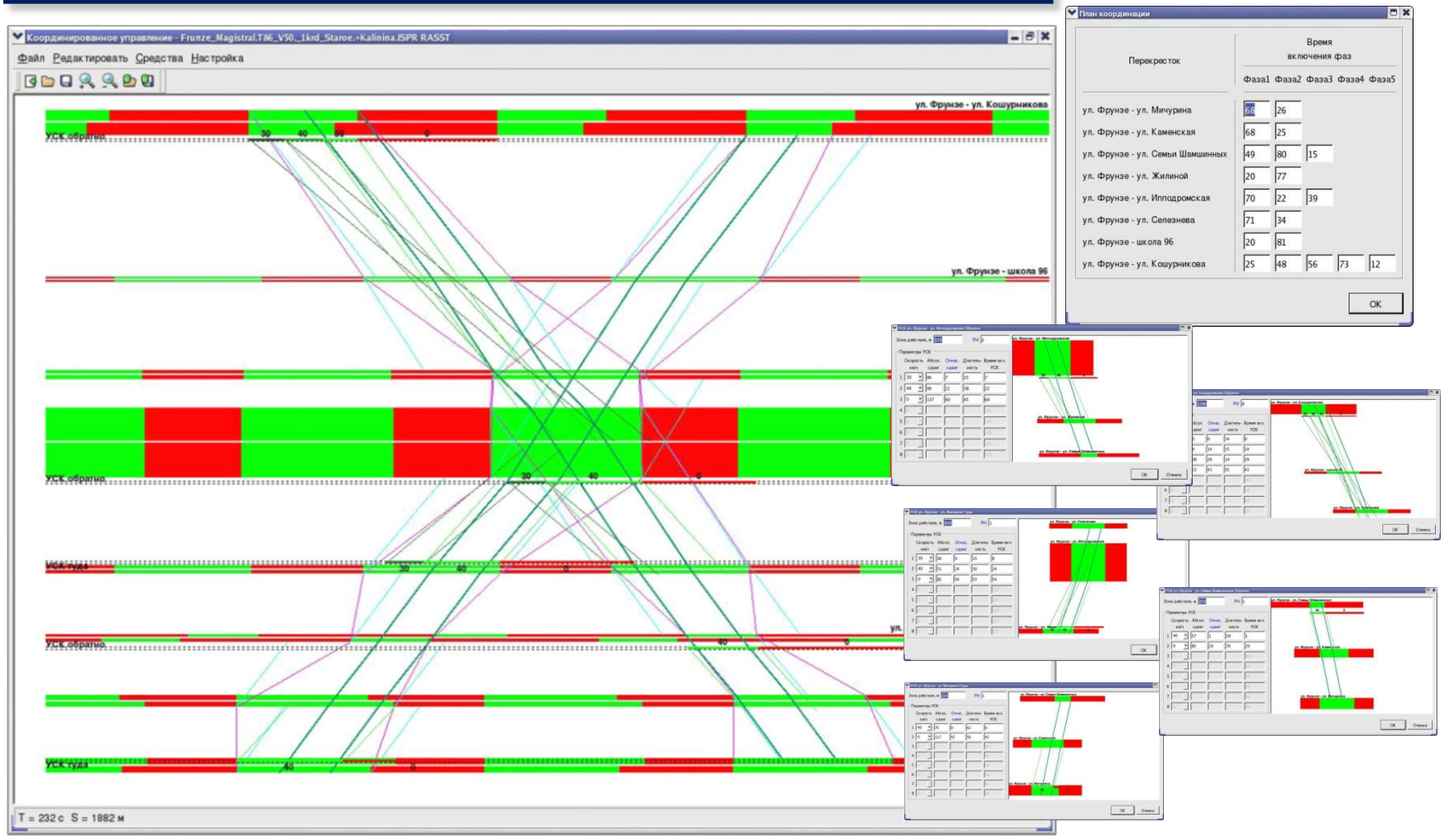




AGAT CONTROL SYSTEMS

COMPUTER-AIDED DESIGN SYSTEM FOR TRAFFIC PARAMETERS

THOROUGHFARE CONTROL ALGORITHM



ATCS SOFTWARE

The software operates under Linux RedHat OS

Oracle DBMS is used for data storage

AGAT CONTROL SYSTEMS

SUPPLEMENTARY CONTROL ALGORITHMS

- Coordination of light signals with real-time shift optimization (calculation of shifts according to traffic flow conditions).
- Coordination of light signals with speed control at sections.
- Control of traffic flow with the coordination plans being selected according to control efficiency factors: traffic capacity, queue length, overall losses.
- Network coordination of light signals.
- “Green street” management.
- Local flexible management with regard to traffic flow intensity, queue length, overall losses, with phase length and control cycle calculation.

AGAT CONTROL SYSTEMS

“AGAT” ATCS PROVIDES:

ENHANCED TRAFFIC CONTROL EFFICIENCY, INCLUDING:

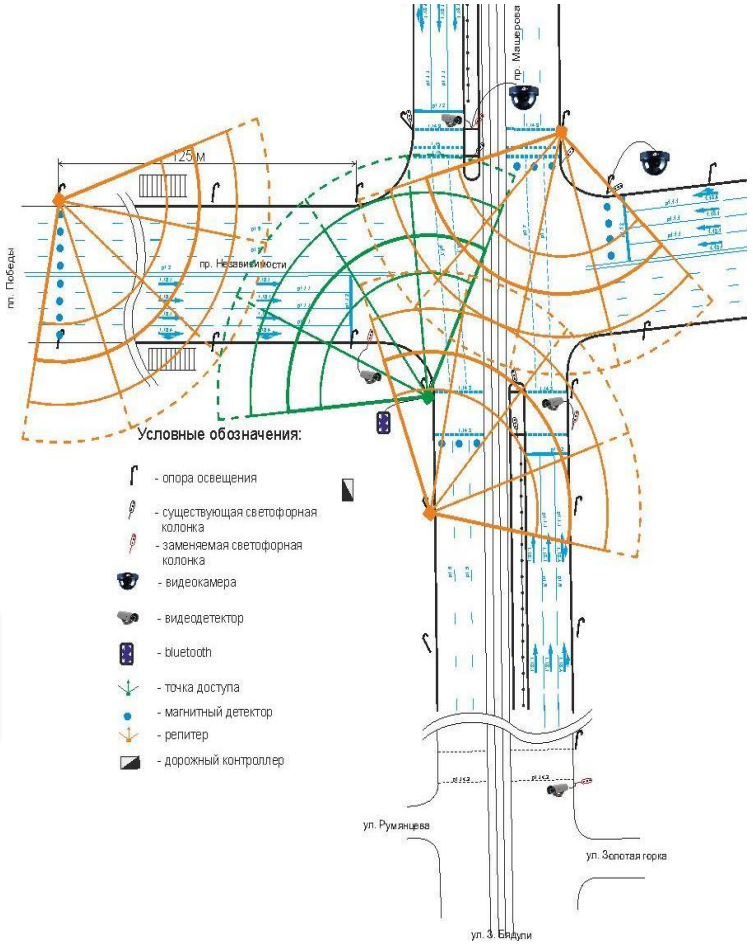
- increased efficiency of the road network;
- decreased number of delays at crossroads (by 20-25%);
- reduced petrol and lubricant consumption (by 5-15%);
- reduced atmospheric pollution (reduction of exhaust of carbon dioxide, hydrocarbon, nitric oxide and other harmful substances by 5-10%).

INCREASED ROAD SAFETY

REDUCED TIME IN TRAVEL (BY 10-15%)

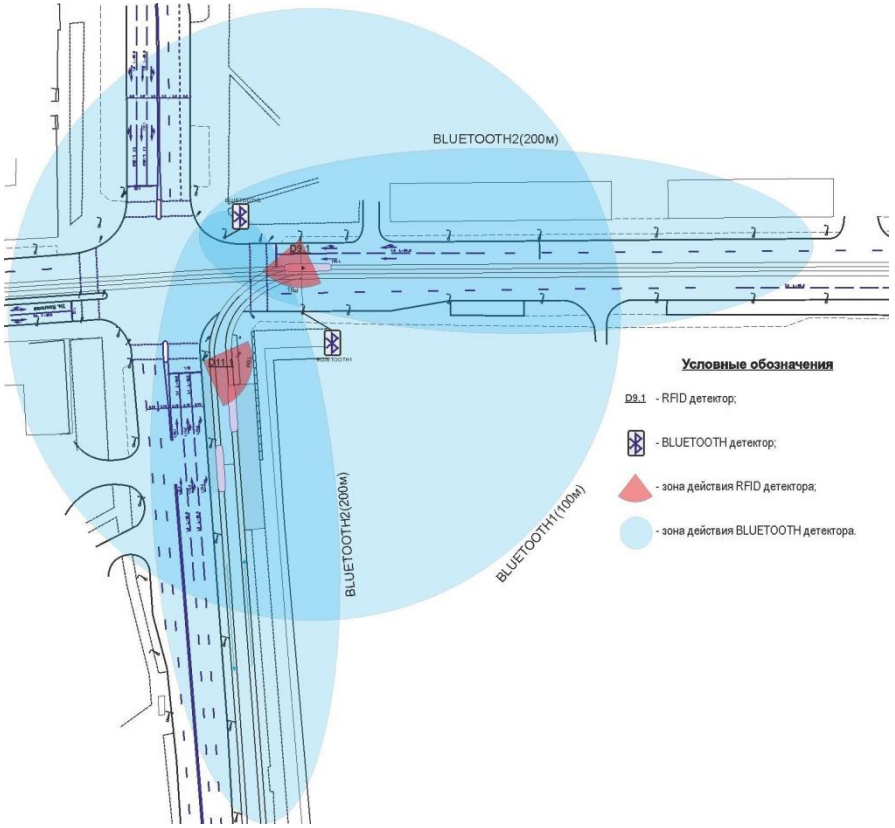
TRAFFIC VIDEO DETECTION SUBSYSTEM ENABLES:

- Road traffic control and law enforcement by means of automatic video detection of road traffic parameters and transfer of the data to the ATCS.
- Reduced traffic losses through more efficient operation of major ATCS algorithms.
- Prompt response to emergencies, incidents and road accidents in the city street and road network.
- Application of additional control algorithms:
  - Adaptive control algorithms;
  - Anti-jamming algorithms.
- Increased traffic speed.
- Reduced accident risk.



INTERACTION OF ATCS WITH THE PASSENGER TRANSPORT CONTROL SYSTEM (SUBSYSTEM FOR PRIORITY PASSAGE OF PUBLIC TRANSPORT) ENABLES:

- Detection and identification of public transport using RFID technology.
- Increased speed of public transport due to reduced queuing time and stops.
- Reduced number and time of schedule delays.
- Reduced number of conflicts at signal-controlled intersections.



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LIST OF WORKS RELATED TO ATCS

1. Inspection of road traffic parameters.
2. Development and coordination of traffic management project (or concept).
3. Manufacturing of the hardware supplied by OJSC “AGAT – Control Systems – Managing Company of Geoinformation Control Systems Holding”, Minsk, Belarus.

AGAT CONTROL SYSTEMS

LIST OF WORKS RELATED TO ATCS

4

Equipment assembly, software installation

Base-line configuration:

- OS Linux licensed operating system;
- Oracle licensed database management system;
- NOD32 antivirus tools;
- Traffic management engineer's WS;
- Planner's WS;
- KZTs-M1 engineer's WS;
- Database server;
- Controlling computer system.

Additional workstations:

- Dispatcher's WS;
- Reliability engineer's WS;
- Traffic signs WS;
- Remote WS;
- Traffic parameters CAD system.

AGAT CONTROL SYSTEMS

LIST OF WORKS RELATED TO ATCS

5. Installation and setting-up of light signals equipment.
6. Development of the system information base, updating of documents.
7. Commissioning works, personnel training, putting the system into trial operation.
8. Participating in trial operating of the system (1 month).
9. Delivering the turnkey project to the Customer, putting the system into commercial operation.

AGAT CONTROL SYSTEMS

IMPLEMENTATION OF ATCS IN THE CITIES:

Minsk (Belarus)

- Putting the ATCS into operation with 250 light signals connected to the system.
- ATCS development with 300 light signals connected to the system.
- Implementation of the hardware and software complex of the main control centre of the modernized ATCS.

Kaliningrad (Russia)

- Commissioning of ATCS with 16 light signals connected to the system.

Novosibirsk (Russia)

- Implementation of ATCS with 75 light signals connected.
- Development of ATCS with 100 light signals connected.
- Development of ATCS with 150 light signals connected.
- System commissioning.

Baranovichi (Belarus)

- Implementation of ATCS with 11 light signals connected to the system.

Grodno (Belarus)

- Implementation of ATCS with 90 light signals connected via wire-lines.
- Implementation of ATCS with 90 light signals connected via wireless lines.