



AS MEANS OF ENHANCING SAFETY
ON PASSENGER VEHICLES



A rapidly growing company with its own software **SKIF**, which has been developed using Java/JavaScript programming languages based on PostgreSQL data base management system characterised by powerful and reliable transaction, replication and GEO data processing mechanisms. An available simple open JSON API allows you to integrate with any external accounting and control systems quickly and easily.

In this presentation we would like to introduce a comprehensive ready-made monitoring/analysis/control/report/communication solution aimed at improving the level of public services, reducing the costs associated with maintaining a fleet of vehicles, supervising the observance of traffic rules by drivers and reducing the risk of road traffic casualty involving passenger vehicles.

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**FOR NOTES** 

## 1 TELEMEDICINE

TECHNOLOGY GIVES THE DRIVER A CHANCE TO OBTAIN MEDICAL CLEARANCE INDEPENDENTLY AND GET A PERMIT OBTAIN MEDICAL CLEARANCE INDEPENDENTLY AND GET A PERMIT FROM THE MEDICAL OFFICER

- TELEMEDICINE TERMINALS ARE INSTALLED AT THE VEHICLE

  FLEET PREMISES FOR REMOTE CERTIFICATION
- THE WORKER **GETS MEDICAL CLEARANCE INDEPENDENTLY,** BY FOLLOWING **THE INSTRUCTIONS** ON THE TERMINAL SCREEN
  - THE DATA OF THE MEDICAL CLEARANCE RESULTS ARE TRANSMITTED TO THE WORKING OFFICE OF THE MEDICAL OFFICER AND DISPLAYED IN SKIF
- ACCORDING TO THE REGISTERED HEALTH INDICATORS, THE MEDICAL OFFICER **EITHER PERMITS OR REJECTS** THE DRIVER
- THE RESULTS OF THE DECISION MADE ARE STORED AT **SKIF**,

  AND THE DRIVER GETS A PERMIT TO DRIVING THE VEHICLE ON HIS PERSONAL RFID-CARD



FOR TAKING THE TRIP

A touch-sensitive monoblock equipped with a video camera

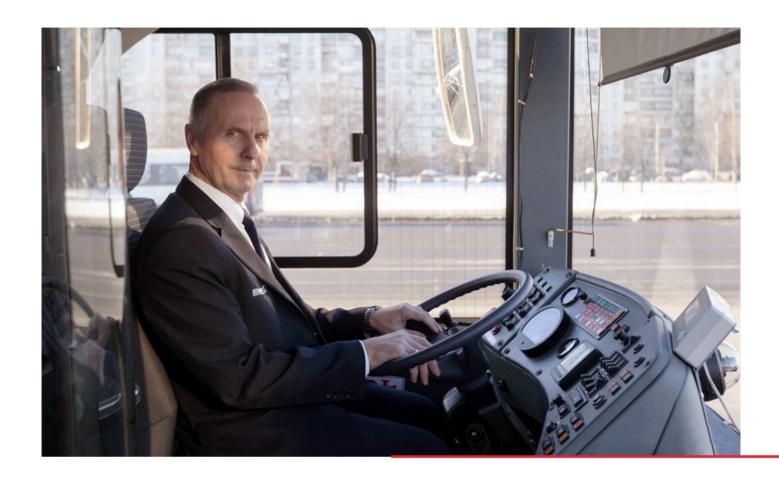
A printer for printing labels to be placed on the trip ticket

A pyrometer for taking the body temperature

A breath alcohol-testing device for measuring the alcohol level

A tonometer for taking the blood pressure and pulse





- AUTOMATED FILLING IN AND RECORD MAINTENANCE IN THE MEDICAL LOG
- REDUCING THE TIME REQUIRED FOR OBTAINING THE PRE-TRIP MEDICAL CLEARANCE
- DRIVERS' SELF-DISCIPLINE REGARDING PERSONAL HEALTH CARE INCREASES
- THE HUMAN FACTOR IS EXCLUDED WHEN MEASURING MEDI-CAL INDDICATORS
- THE SERVICE IS **PROVIDED ROUND THE CLOCK SEVEN DAYS A**WEEK
- THE MANAGER HAS QUICK REAL-TIME ACCESS TO THE DATA BASE
- A DATA BASE ON COMPLETED MEDICAL CHECKS IS CREATED FOR EVERY MANAGER

## RFID-BASED ACCESS TO CONTROL

## ALLOWS TO IDENTIFY THE DRIVER AND CONFIRM HIS PERMIT TO DRIVE THE VEHICLE

- THE DRIVER RECEIVES A UNIVERSAL PERMIT-CODE ON HIS RFID-CARD
- GETS ONTO HIS VEHICLE AND PLACES THE CARD ON THE RFID-READER
- AFTER THE DRIVER IS **IDENTIFIED** THE CAR ENGINE IS UN-LOCKED





## A RADIO FREQUENCY AERIAL ALLOWS TO **REGISTER**THE ENTRY/DEPARTURE TIME OF THE VEHICLES



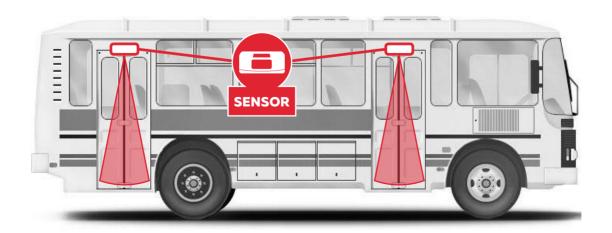
- A RFID AERIAL, ABLE TO RECOGNIZE EVERY VEHICLE OF THE PARK, IS INSTALLED AT THE CHECK-POINT OF THE BUS PARK PREMISES
- THE WIND SCREEN OF THE VEHICLE IS EQUIPPED WITH A RADIO FREQUENCY TAG CONTAINING A CHIP-STICKER
- DEPENDING ON THE SYSTEM SETTINGS, THE TAG MAY BE DETECTED FROM A DISTANCE OF UP TO 15 METERS
- ACCORDING TO THE RESULTS OF CHECKING THE ACCESS PERMIT,
  THE AUTO BARRIER OR GATE OPEN AUTOMATICALLY

# PASSENGER TRAFFIC

SPECIAL SENSORS INSTALLED IN THE DOORS AND ON THE SUSPENSION OF THE VEHICLE IDENTIFY THE PEAK LOAD HOURS



BY INSTALLING **SKIF** INTHE DOOR FRAME **SPECIAL PASSENGER**TRAFFIC SENSORS, ACTIVATED **AS EACH** PASSENGER PASSES
THROUGH THE DETECTION ZONE

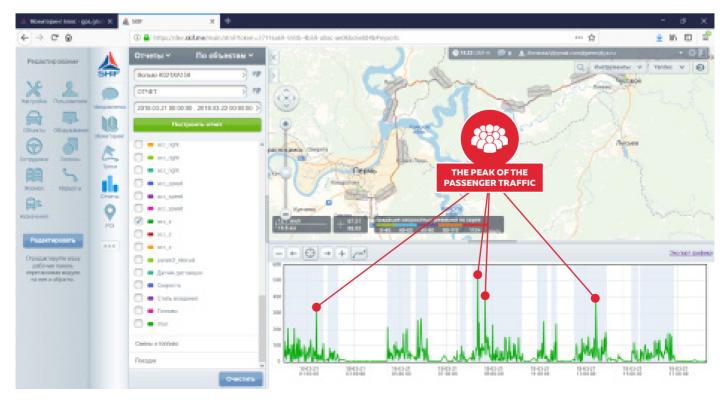




- THE SAME TASK IS BEING SOLVED BY MEANS OF INSTALLING

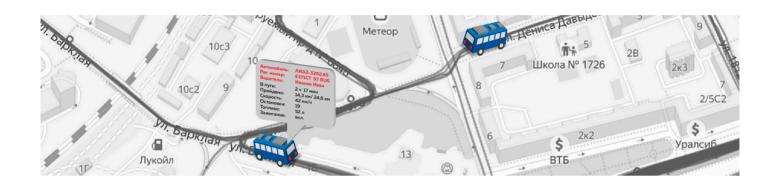
  SKIF WITHIN THE ELEMENTS OF BUS SUSPENSION A SYSTEM,
  WHICH INCLUDES A TRIP COMPUTER MODULE AND 2 SPECIAL
  SENSORS
- USING THESE SENSORS THE TRIP COMPUTER MODULE ANALYZES THE BURDEN OF THE SUSPENSION AND APPLYING A UNIQUE CALCULATION ALGORITHM CALCULATES THE BURDEN FOR EVERY SEPARATE AXIS AND ALSO THE NET WEIGHT OF THE LOAD, WHICH MAKES IT POSSIBLE TO DETECT THE PEAK LOAD HOURS OF PASSENGER TRAFFIC
- THE TRIP COMPUTER MODULE TRANSMITS THE LOAD WEIGHT

  DATA VIA A DIGITAL INTERFACE, WHICH MAKES IT POSSIBLE TO
  INTEGRATE IT INTO THE TRANSPORT MONITORING SOFTWARE
  AND TRANSMIT DATA IN REAL TIME MODE
- THUS, **WE MONITOR** THE VEHICLE FLEET OPERATION: WHERE FROM, WHERE TO AND HOW MUCH LOAD OR CARGO HAS BEEN TRANSPORTED





## THE MOBILE TERMINAL **PROVIDES AN OPPORTUNITY TO MONITOR THE LOCATION** OF THE VEHICLE AND SENSOR



- ▲ MOBILE TERMINAL INSTALLED IN THE VEHICLE RECEIVES
   ▶ SIGNALS FROM THE SATELLITE USING A GPS-RECEIVER, THOSE ARE GEOLOCATION SIGNALS (GPS/GLONASS)
- A TERMINAL EQUIPPED WITH A GSM/GPRS-RECEIVER,
  TRANSMITS DATA ON THE LOCATION AND THE READINGS
  RECEIVED FROM SENSORS INSTALLED ON THE VEHICLE TO
  THE SERVER VIA A GSM-DATA CHANNEL (GSM-SMS, GPRS)
- ON THE SERVER THE RECEIVED DATA ARE PROCESSED AND
   STORED, ACCESS TO THE SERVER OF THE MONITORING SYSTEM IS AVAILABLE VIA THE INTERNET





- MONITORING THE VEHICLE STATE, CONTROLLING ITS LOCATION AND MOVEMENT, AS WELL AS MILEAGE TRACKING TAKING INTO ACCOUNT THE TERRAIN RELIEF
- CONTROLLING THE FUEL CONSUMPTION AND LEVEL BY CONNECTING IMPULSE, ANALOG AND DIGITAL FUEL LEVEL SENSORS
- REMOTE CONTROL OF THE CONNECTED DEVICES AND SYSTEMS OF THE VEHICLE, FOR EXAMPLE, THE HOOTER, THE EXTERNAL REMOTE CONTROL ENGINE AND DOOR LOCK SYSTEMS, ETC.
- READING DATA OFF THE CAN-BUS OF THE VEHICLE;
   PROCESSING THIS DATA AND TRANSMITTING IT TO THE TELEMATICS SERVER
- DUAL SIM-CARD OPERATION
- OPERATION WITH A BUILT-IN BATTERY UP TO 4 HOURS SUPPORTS
- MicroSD-CARDS WITH MEMORY CAPACITY OF UP TO 32 GB, SUPPORTS A FLEXIBLY CUSTOMIZABLE FLEX PROTOCOL
- TO SAVE UP DOWNLOADING TRAFFIC AND THE EGTS PROTOCOL
- REMOTE UPLOAD OF DDD-FILES RECEIVED FROM ATOL, SHTRIKH, MERCURY, VDO CONTINENTAL TACHOGRAPHS
- THE FUNCTION OF AUTOINFORMER WITH SOUND FILE

  OUTLET VIA LINE ANALOGUE OUTPUT AND CONTROLLING
  THE DESTINATION INDICATOR DISPLAY
- OPERATING TIRE PRESSURE MONITORING SYSTEMS
- ▶ OPERATING THE DRIVER'S DISPLAY
- THE FUNCTION OF DETERMINING THE CURRENT LOCATION BY LBS DATA (BY THE LOCATION OF MOBILE OPERATOR TOWERS)

# TRAFFIC SCHEDULE

## THE INFORMATION DISPLAYS GIVE A CHANCE TO INFORM THE PASSENGERS OF THE TRANSPORT ARRIVAL TIME

DEPARTURE FOR PUBLIC TRANSPORT IS PROVIDED FOR BY AN INTERNAL SCHEDULE, WHICH IN SOME CASES IS NOT CONSISTENT WITH REALITY, THIS FACT CAUSES CERTAIN INCONVENIENCES IN TERMS OF ARRANGING THE PASSENGER TRANSPORTATION PROCESS

THE SCHEDULE OF ARRIVING AT THE BUS TERMINAL AND

- SKIF SYSTEM CAN PROVIDE NOTIFICATION ABOUT APPROXIMATELY ACCURATE TIME OF PUBLIC TRANSPORT ARRIVAL BY OUTPUTTING THIS INFORMATION ONTO THE LED DISPLAY, INSTALLED BY THE TRANSPORT TERMINAL PAVILION
- AND ALSO BY MEANS OF THE DISPLAYS, INSTALLED IN THE PASSENGER COMPARTMENT (WITH A VOICE-GUIDED SUPPORT OPTION) WITH RECORDED ANNOUNCEMENT FACILITY FOR PASSENGERS NOTIFICATION ON ARRIVING AT THE NEXT BUS TERMINAL

# BUSTERMINAL DISPLAY AND THE SKIF MONITORING SYSTEM THE ENTERPRISE SERVER AMODEMICOR COPYCOPAS STATIONOP THE OPERATOR





#### **ELECTRONIC DISPLAY**

A V-shaped colour version for halting points



#### **ELECTRONIC DISPLAY**

flat, coloured for halting points

DISPLAYS FOR PUBLICTRANSPORT AND FOR BUSTERMINALS AND HALTING POINTS ARE PART OF A VAST CITY NAVIGATION SYSTEM, THEY ARE A GREAT INFORMATIVE DEVICE FOR RESIDENTS AND GUESTS OF THE CITY WHICH HELPS TO KNOW OUR WAY AROUND IN THE TRAFFIC FLOW AND BOOSTS THE IMAGE OF THE REGION! —

LED displays are characterized by flawless operation in all environments. Information on the display can be rendered in static or dynamic mode: creeping line; scrolling; additional animation effects



#### **DISPLAY SET**

flat, colour ones for public transport

Print height and screen format can be adjusted.

Display operation implies automatic displaying of text information via automatic informative devices used on vehicle stock, provided the function and the RS-485 outlet for connection are available

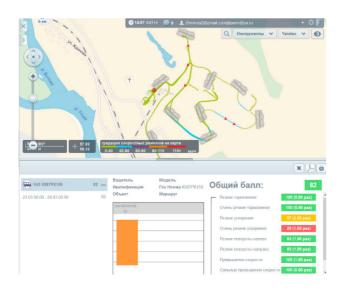
## The display set contains:

- wind screen; side;
- for the passenger compartment; rear

## DRIVING MANNER AND STYLE

- TO CONTROL THE SPEED OF THE VEHICLE TAKING INTO CONSIDERATION THE GNSS RECEIVER AND/OR CAN-BUS DATA
- TO CONTROL THE ENGINE RPM SPEED TAKING INTO CONSIDERATION THE TACHOMETER OR CAN-BUS DATA
- DRIVING QUALITY CONTROL (BASED ON ACCELERATION RATES RELATIVE TO THE LONGITUDINAL, TRANSVERSE AND VERTICAL AXES OF THE VEHICLE) ACCORDING TO THE GNSS RECEIVER AND ACCELEROMETER DATA

DRIVING QUALITY EVALUATION IS ACTUALLY THE NUMBER OF DEMERIT POINTS, RECEIVED IN A CERTAIN PERIOD OF TIME. THE FEWER DEMERIT POINTS WE GET, THE HIGHER IS OUR DRIVING QUALITY. DEMERIT POINTS ARE GIVEN FOR EACH TRIP, THEN SUMMED UP AND AVERAGED TAKING INTO CONSIDERATION THE TIME AND DISTANCE



#### **VIOLATION CRITERIA:**

**Acceleration** (analyzing the absolute values of positive acceleration)

**Deceleration** (analyzing the absolute values of negative acceleration)

**Overspeeding** (analyzing the overspeed values detected according to Gurtam maps)

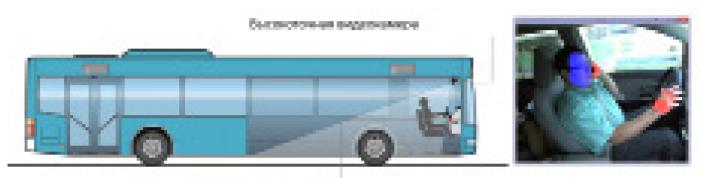
**Turning** (analyzing the absolute values of angular acceleration)

**Random** (analyzing the values of random violation parameters)





## THE VIDEO MODULE GIVES A CHANCE TO MONITOR THE FACTORS THAT DISTRACT THE DRIVER FROM THE ROAD SITUATION



Вости образвения поружурализм

A FIRMWARE MODULE OF VIDEO ANALYTICS CAN REGISTER THE BUS DRIVER TALKING OVER THE MOBILE PHONE, TALKING TO THE PASSENGERS AND SELLING BUS TICKETS WHEN THE BUS IS ON THE MOVE, INADEQUATE DRIVER'S BEHAVIOR, TAKING A MEAL ON THE MOVE, ETC.

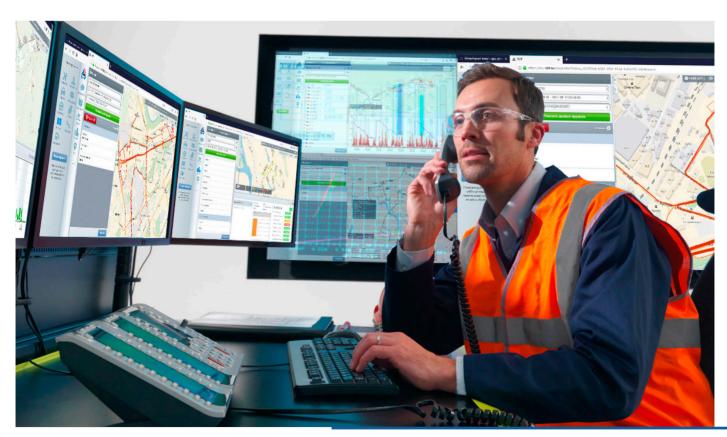


DO NOT DISTRACT THE DRIVER WHEN ON THE TRIP

## COMMUNICATION WITH THE DRIVER

IN ORDER TO ENHANCE SAFETY ON PASSENGER TRAFFIC WITHIN THE FRAMEWORK OF EMERGENCY COMMUNICATION WITH THE DISPATCHER THE SKIF MODULE PROVIDES AN OPPORTUNITY FOR THE DISPATCHER TO GIVE THE DRIVER PROMPT COMMANDS OR ELSE INFORM HIM OF THE CURRENT ROAD SITUATION, IT ALSO GIVES A CHANCE TO CALL THE OPERATIONAL SERVICES

THE PTT SWITCH IS DESIGNED FOR PRACTICING VOICE COMMUNICATION BETWEEN THE DISPATCHER AND THE DRIVER OF THE PUBLIC TRANSPORTATION VEHICLE ON BOARD OF WHICH THE MONITORING SYSTEM TERMINAL IS INSTALLED



# 1 EMERGENCY BUTTON



THE EMERGENCY BUTTON GIVES A CHANCE TO PROMPTLY INFORM

ABOUT AN EXTREME SITUATION



- IN AN URGENT CASE WHEN IT IS NECESSARY **TO COMMUNI- CATE THE INFORMATION ON THE LOCATION** OF THE MONITORED OBJECT PERFORMING PASSENGER TRANSPORTATION,
  THE DRIVER JUST **PRESSES THE EMERGENCY BUTTON**
- AUTOMATICALLY A MULTIFUNCTIONAL CALL BACK IS TRANS-MITTED TO THE DISPATCHER'S PANEL AND DIRECTLY TO THE EMERGENCY CONTROL CENTER OF SEVERAL SECURITY SER-VICES, THUS PROVIDING DIRECT COMMUNICATION
- FIRST OF ALL, IT GIVES AN UNDERSTANDING THAT THE PASSENGERS ARE UNDER PROTECTION AND THEY CAN BE SURE
  THAT IN CASE OF NON-STANDARD SITUATION ALL THE NECESSARY ASSISTANCE WILL BE PROVIDED

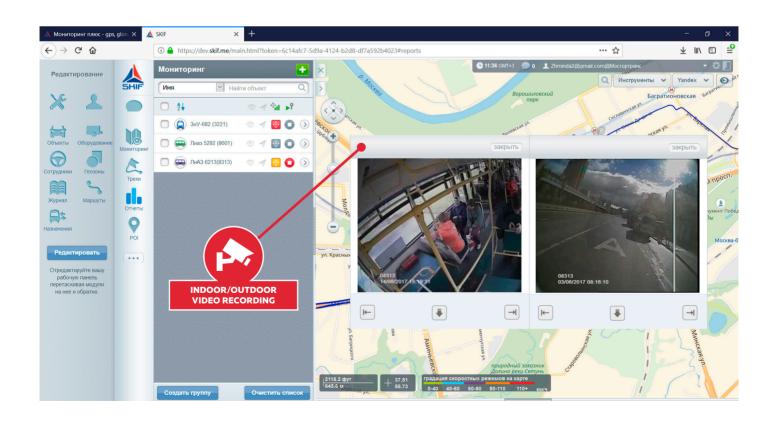


# THIS TECHNOLOGY ENABLES TO **BE INSTANTLY** INFORMED OF **EXTREME SITUATIONS** WITHOUT THE NECESSITY TO WITHDRAW **THE BLACK BOX RECORDER**

ETER INSTALLED IN THE TERMINAL IS ACTIVATED, ARE TRANSMITTED TO THE SKIF SERVER SKIF IN THE FORMAT OF PHOTOS/VIDEOS CONTAINING A RECORD OF EVENTS BEFORE AND
AFTER THE EXTREME SITUATION OCCURRED WITH A PRESET
TIME INTERVAL

PHOTOS/VIDEO TRACKS, RECEIVED WHEN THE ACCELEROM-

THIS TECHNOLOGY EXCLUDES THE NECESSITY TO WITHDRAW
FROM THE VEHICLE THE SO-CALLED BLACK BOX RECORDER
AND ENABLES TO OBTAIN A READY VIDEO RECORDING WITH
EXHAUSTIVE INFORMATION REGARDING THE EVENT OF INTEREST







PHOTO/VIDEO-CAMERA colour, domed for the passenger compartment of the vehicle



PHOTO/VIDEO-CAMERA colour, vandal-proof for the vehicle body



**DASHBOARD CAMERA** network, small-size

- DASHBOARD CAMERA
- ×2 PHOTO/VIDEO-CAMERAS FOR THE PASSENGER COMPART-MENT OF THE VEHICLE
- > x2 PHOTO/VIDEO-CAMERAS FOR THE BODY OF THE VEHICLE



## THE TECHNOLOGY ENABLES TO INFORM THE PASSENGERS ABOUT THE AIR TEMPERATURE INSIDE AND OUTSIDE THE VEHICLE



- AN OPPORTUNITY TO MONITOR THE AIR TEMPERATURE IN THE COMPARTMENT OF THE VEHICLE, HAS A FAVOURABLE EFFECT ON THE PASSENGERS STATE AND IS AN INDICATOR OF THE HIGH LEVEL OF SERVICE PROVED BY THE TRANSPORT OPERATOR
- THERE IS A POSSIBILITY TO COLLECT DETAILED CLIMATIC DATA
  ON THE ENVIRONMENTAL CONDITIONS FROM THE SENSORS
  INSTALLED ON THE BUS BODY, AND TO PERFORM MONITORING
  IN REAL TIME

# 1REPORTS GE



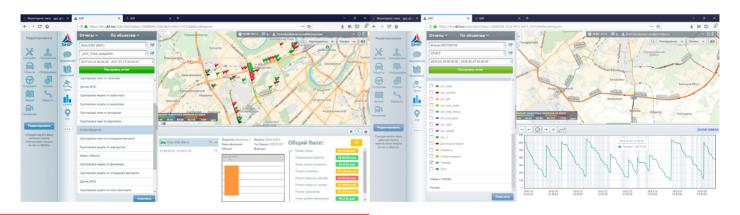
## THIS PROGRAM ALLOWS TO EDIT TEMPLATES IN COMPLIANCE —— WITH THE USER'S REQUIREMENTS ON THE SET CRITERIA

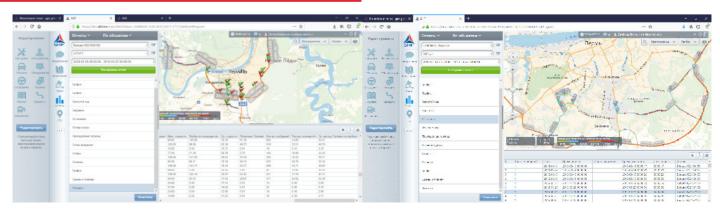
Reports are created on the basis of the edited templates, which makes it possible to develop a report format that satisfies the user's requirements best.

Most tabular reports in the program system are related to retrieving from the object's history time intervals, corresponding to certain criteria. This category of reports include travel reports, reports on parkings, stops, refueling, draining, on visited/passed by geozones, trip tickets in kilometers, trip tickets in engine hours/hectares, en-

gine hours, on communication failure, digital sensors, etc. For such reports additional filtering parameters are provided, which specify the conditions for information output onto the table.

The user can **receive reports** from the satellite monitoring system on a regular basis **without entering the program**; he just has **to create an appropriate task**.







#### **УТВЕРЖДАЮ**

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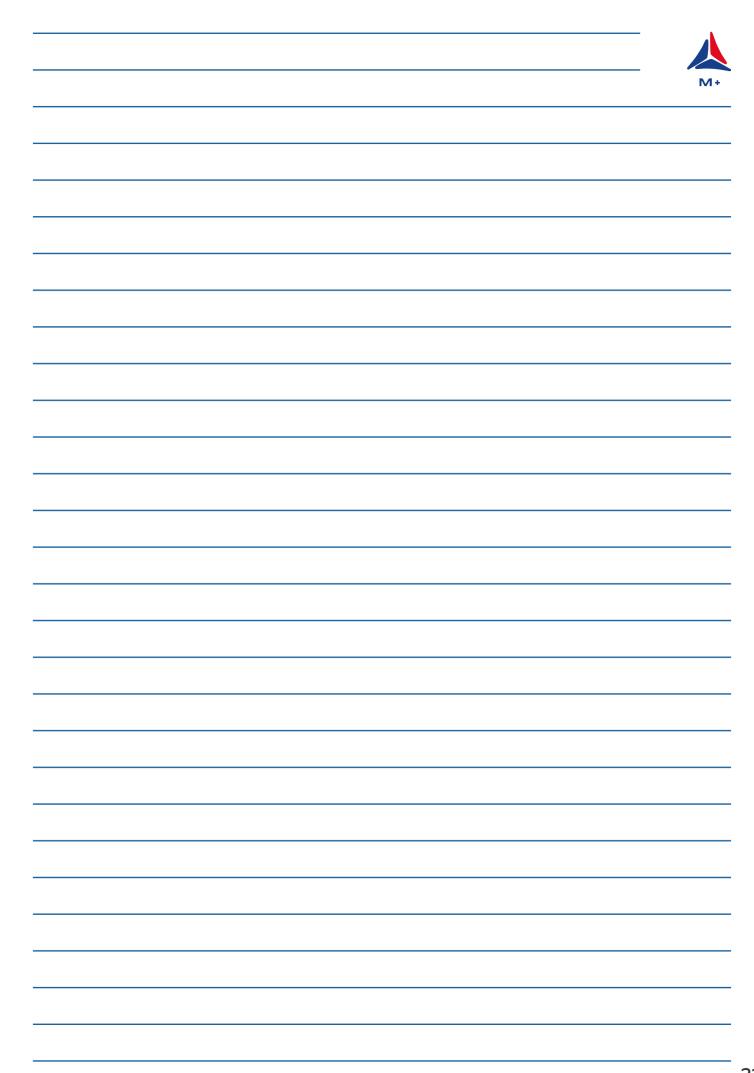
«Пилотпый проект по тестированию

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