

Digital Transformation of Public Transport

2023

Background



Urban transit service providers give much prominence to safety and convenience of travel, accessibility of transport in all areas for both local residents and tourists.

They introduce **alternative payment methods**, solutions to ensure **travel safety**, **mobility of passengers and carriers**, **alignment of workflows**. Today they implement hardware based on innovative technologies, for instance, the **ITxPT concept**.

Digital solutions help to manage public transport based on real-time and accurate data, offer passengers new services and simplify the service for tourists.



ITxPT

INFORMATION TECHNOLOGY
for PUBLIC TRANSPORT

IBA
GROUP

Services offered to carriers and urban transit service providers



Consulting and Design

We develop an approach based on customer data, taking into account our experience.

We create and formalize business processes in order to take measures for their implementation.

We coordinate the actions of all participants based on the generated analytical materials.

Implementation

We develop software for the customer's business processes or adjust ready-made IT solutions : traffic control, passenger notification, fare payments, etc. The software accelerates company digitalization, helps improve processes and increase their efficiency .

Support

We support the deployed solutions: we refine the functionality, address issues, advise the customer's employees on the use of the software. We are already working with customers from Belarus, Kazakhstan, Moldova, Ukraine .

Business challenges we can address

Ticket sales and fare payment control



Traffic control



IBA ISP

Transport Systems Analytics

Maintenance and repairs



Passenger service



T-Pay

Information Guide

Help Desk

Chat bots



Equipment

IBA AVM / IBA AFC Ecosystem:
validators,
driver data station,
passenger traffic sensors,
two-way voice communication
with the driver.



Ticket sales and fare payment control: public transport fare collection system IBA AFC



Passengers apply **travel and bank cards to validators** and pay for travel.

One-use tickets are punched by passengers in electronic ticket punches.

Time, date, route and vehicle numbers are printed on tickets.

Result. Service providers reduce the costs of manufacturing and selling ticket products, optimize existing and introduce differentiated tariffs, increase revenue collection and return on transportation, and reduce payroll costs.



Ticket sales and fare payment control: tapXphone



tapXphone

Instead of POS-terminals, fare collectors use smartphones with NFC. By combining tapXphone with a travel card platform, an operator may quickly and efficiently implement contactless payment for public transport.

Result. The transport operator saves on infrastructure maintenance and does not depend on vendors/manufacturers.



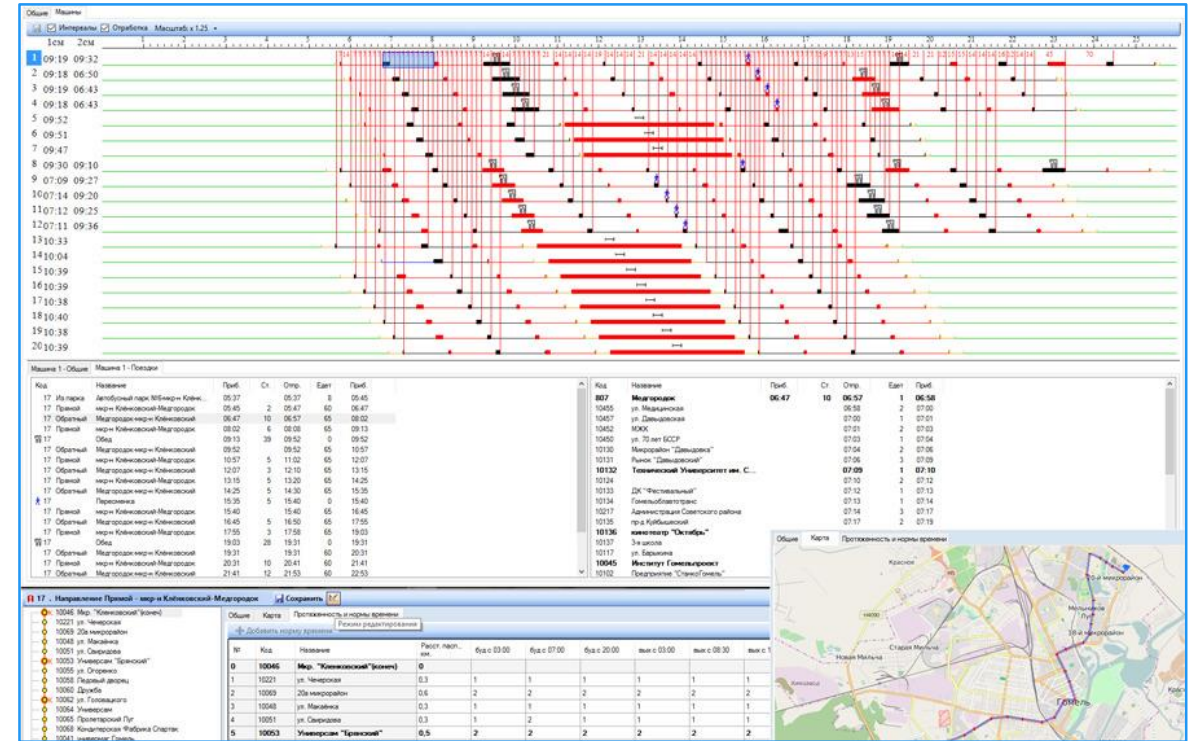
Traffic control:

automated traffic control system for passenger transport IBA AVM



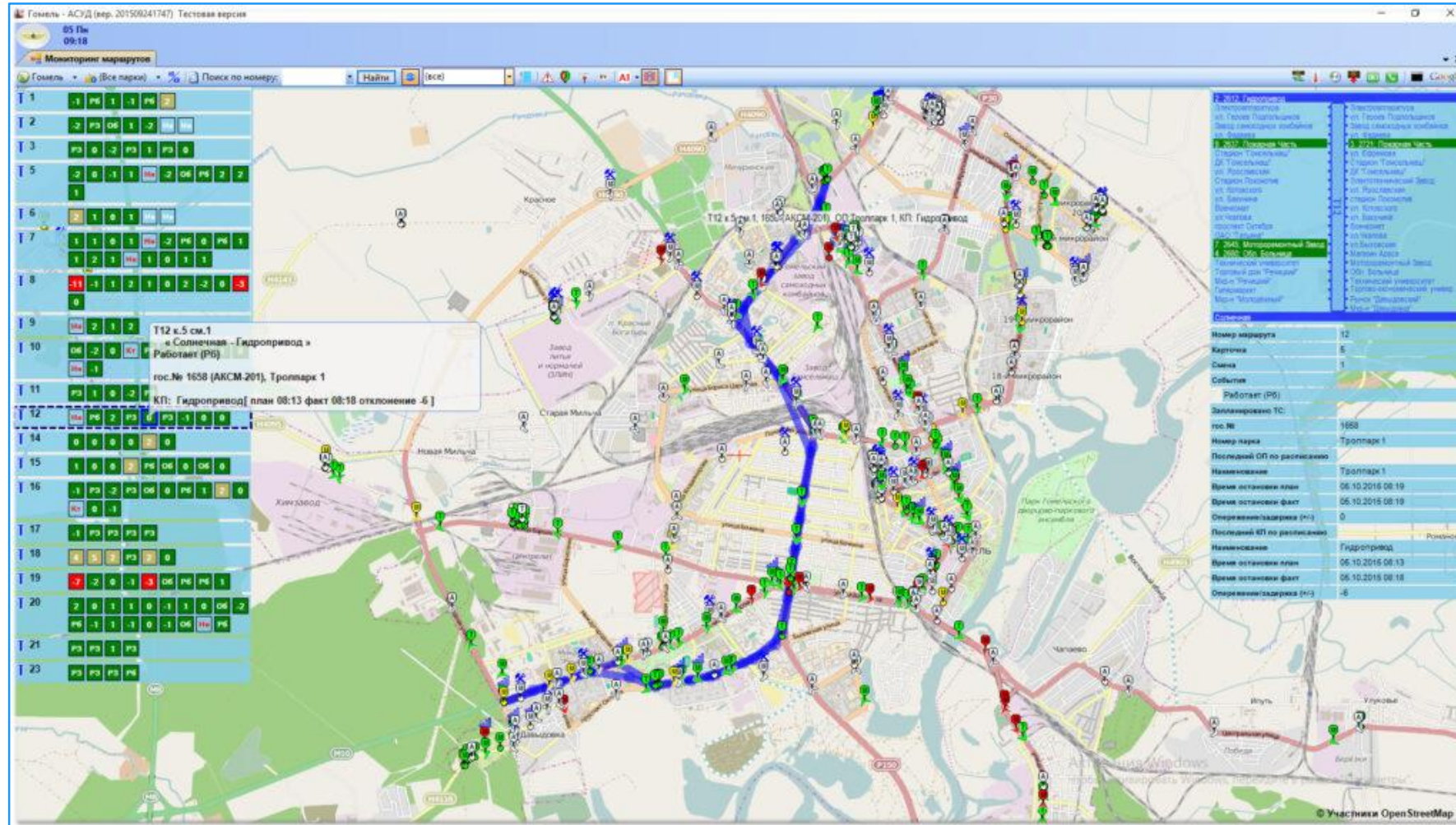
Operators and carriers are able to plan routes, track traffic and make changes to routes in real time, monitor route adherence.

Result. IBA AVM improves the quality of passenger transport management, streamlines the control of transport management systems. It helps to analyze data and generate reports on work actually completed.



Traffic control:

automated traffic control system for passenger transport IBA AVM



Traffic control:

IBA AVM. Additional systems

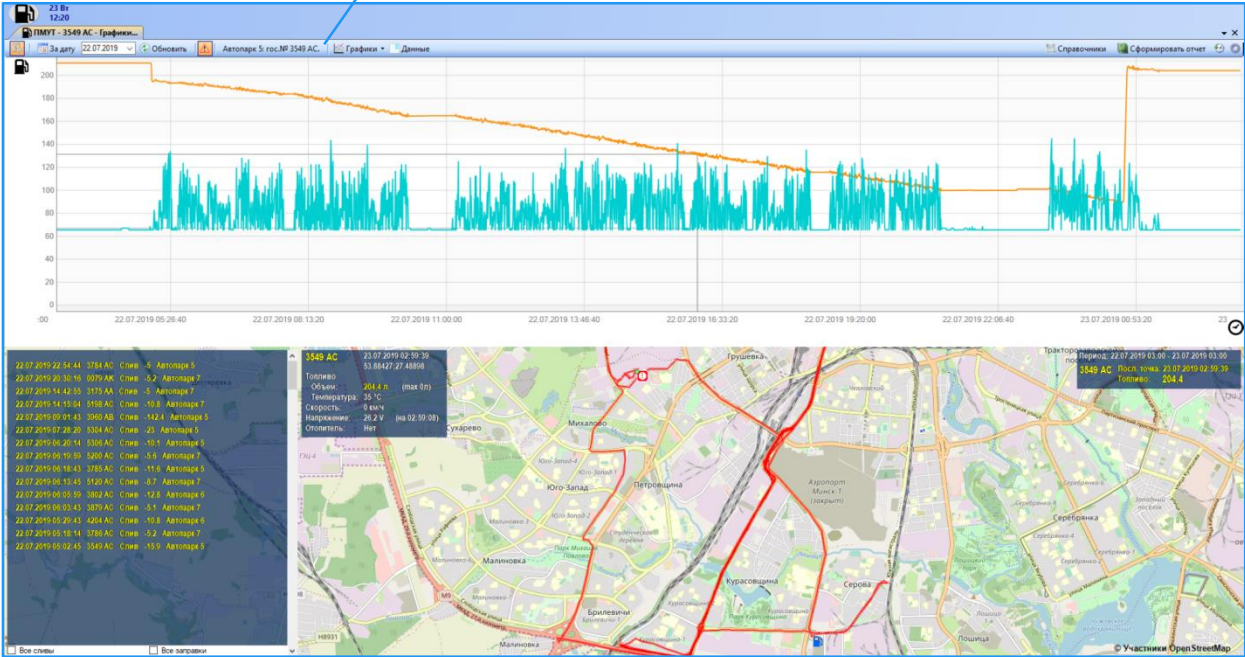


Fuel metering: fuel draining and location

Fuel metering, speed control, leakage current control, interior heater control, interior and cabin temperature control systems, etc.

The systems help optimize fuel consumption, determine dishonest employees, monitor the speed of movement on routes, the climate in the cabin, etc.

Result. Companies may improve control of all transportation processes and reduce their costs.



Минсктранс ПМУТ (модули IBA AVM вер. 202002071720)

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1 из 1 100% Найти Далее

Заправки топлива
по машине "4366 AA"
за период с 10.03.2020 03:00:00 по 16.03.2020 03:00:00

Гос. №	Гар. №	Марка	ФИО водителя	Таб. №	Дата	Период времени, ч:мин:с		Заправка по ДУТ, л	Заправка по отчету РУП "Белоруснефть" Минскавтозаправка" и данным АС Фиггиса, л	Отклонение заправки по ДУТ от заправки по отчету, менее/более (+/-), л	Отклонение заправки по ДУТ от заправки по отчету, приведенное к объему бака ТС (+/-), %	Местоположение
						Нач.	Кон.					
4366 AA	40614	МАЗ-103 065	Луцкевич А.В.	68731	10.03.2020	19:43:00	19:48:00	41.3	60	-18.7	-8.4	53.8846 27.5628
4366 AA	40614	МАЗ-103 065	Луцкевич А.В.	68731	12.03.2020	19:11:00	19:15:00	49.8	55	-5.2	-2.3	53.8339 27.6032
4366 AA	40614	МАЗ-103 065			15.03.2020	15:23:00	15:27:00	60.1	70	-9.9	-4.5	53.8339 27.6034
ИТОГО								151.2	185	-33.8	-5.1	

Входные параметры:
Запрошенный период: с 10.03.2020 03:00:00 по 16.03.2020 03:00:00

распечатано 18.03.2020 14:31 стр.1 из 1

Records of underfilling at gas stations

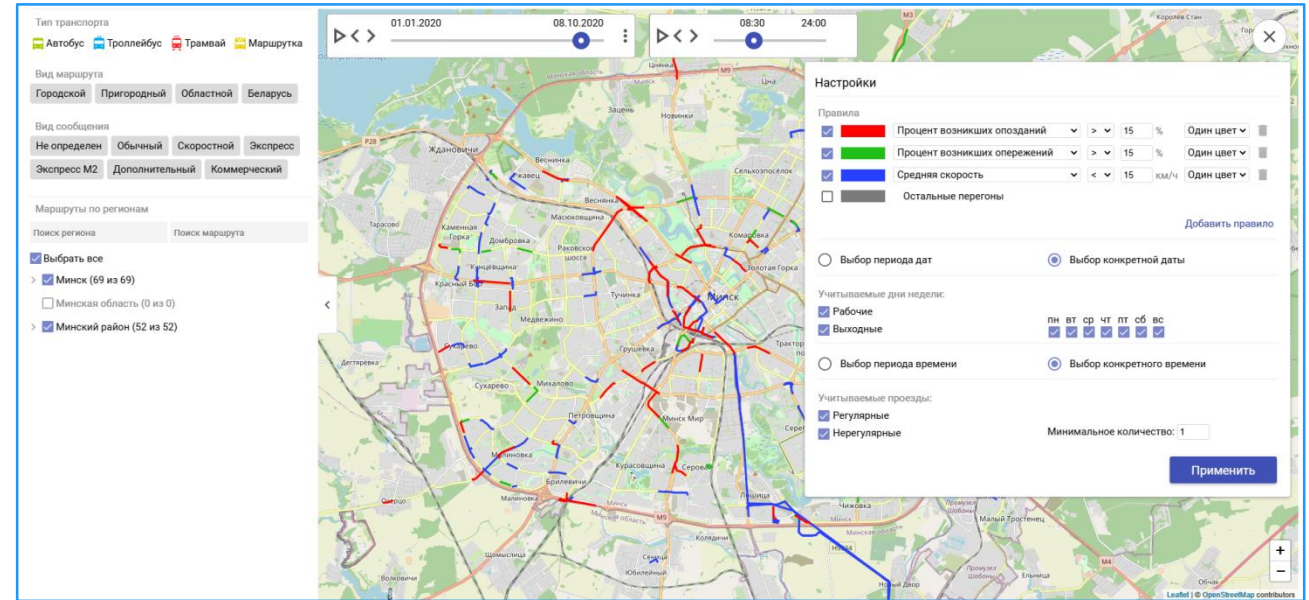
Traffic control: transport network analytics



The system helps to search for and analyze issues related to the road and transport infrastructure of the city, for example, traffic ahead or behind schedule, low and high speed.

Result. Municipal services responsible for the operation and development of road and transport infrastructure receive a full-fledged tool that helps to identify and eliminate problems in the city, monitor the implementation of measures to improve the quality of transport infrastructure.

Using the tool will improve and speed up the urban development.



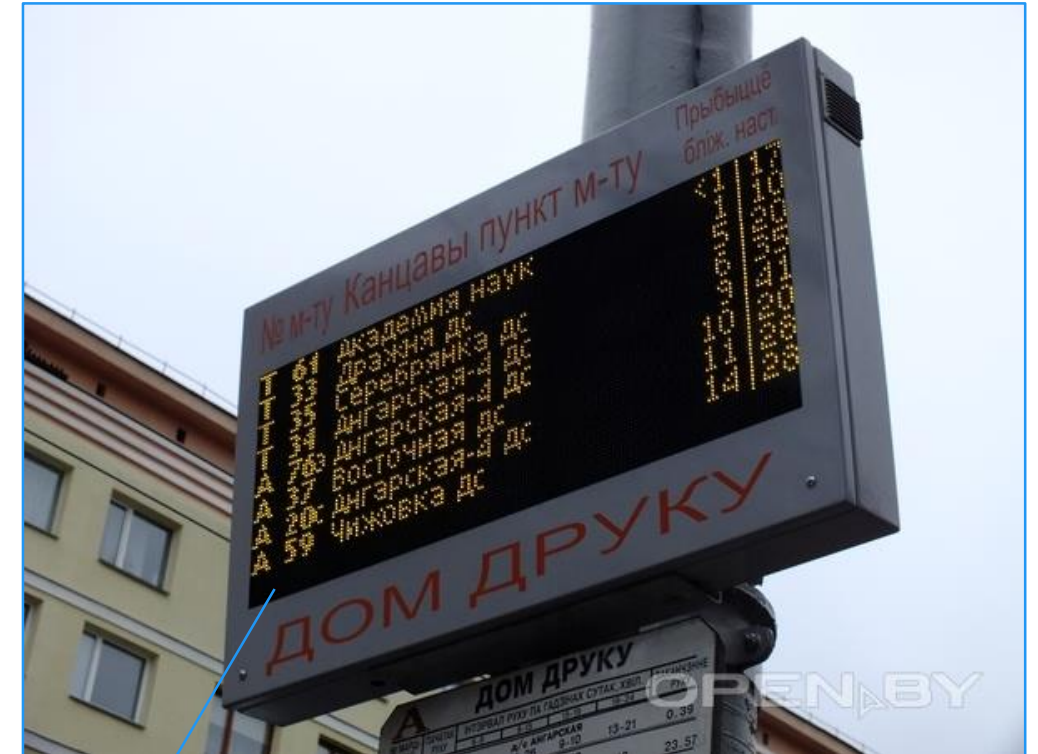
Traffic control:

passenger information system IBA ISP



The system displays moving vehicles on the map, the time of arrival at the stop, the schedule of the selected route, and also helps passengers to build a route.

Result. IBA ISP offers passengers a convenient service that simplifies city travel planning.



Example of a display board
at a bus stop in Minsk (about 450 installed)

Information service for passengers: TransportBY mobile application

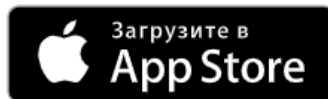
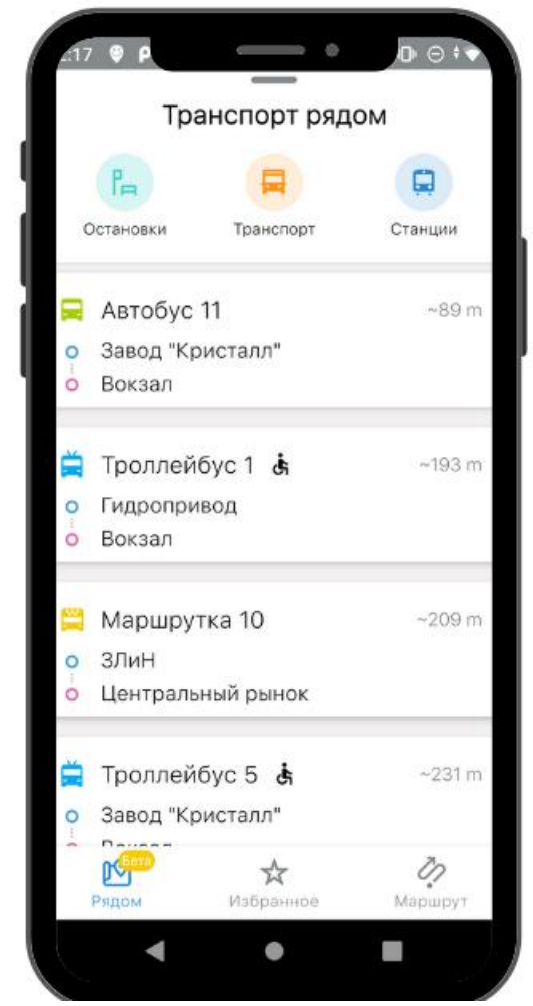
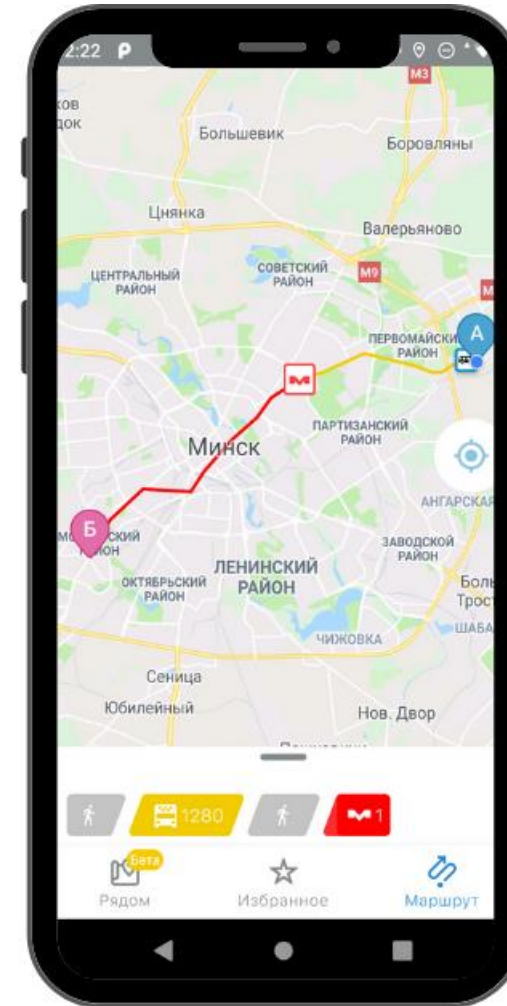


The app provides passengers with information about where public transport is now, how soon it will arrive at the stop, and where it can go. The arrival time and the location of the transport are estimated online, so if the run is delayed, the information is immediately displayed in the application.

TransportBY also builds routes to the destination, taking into account the selected modes of public transport.

An individual carrier is connected to the system, so we work with both large and small settlements.

Bus, trolleybus, tram and route taxi available.



Fare payment service for passengers:

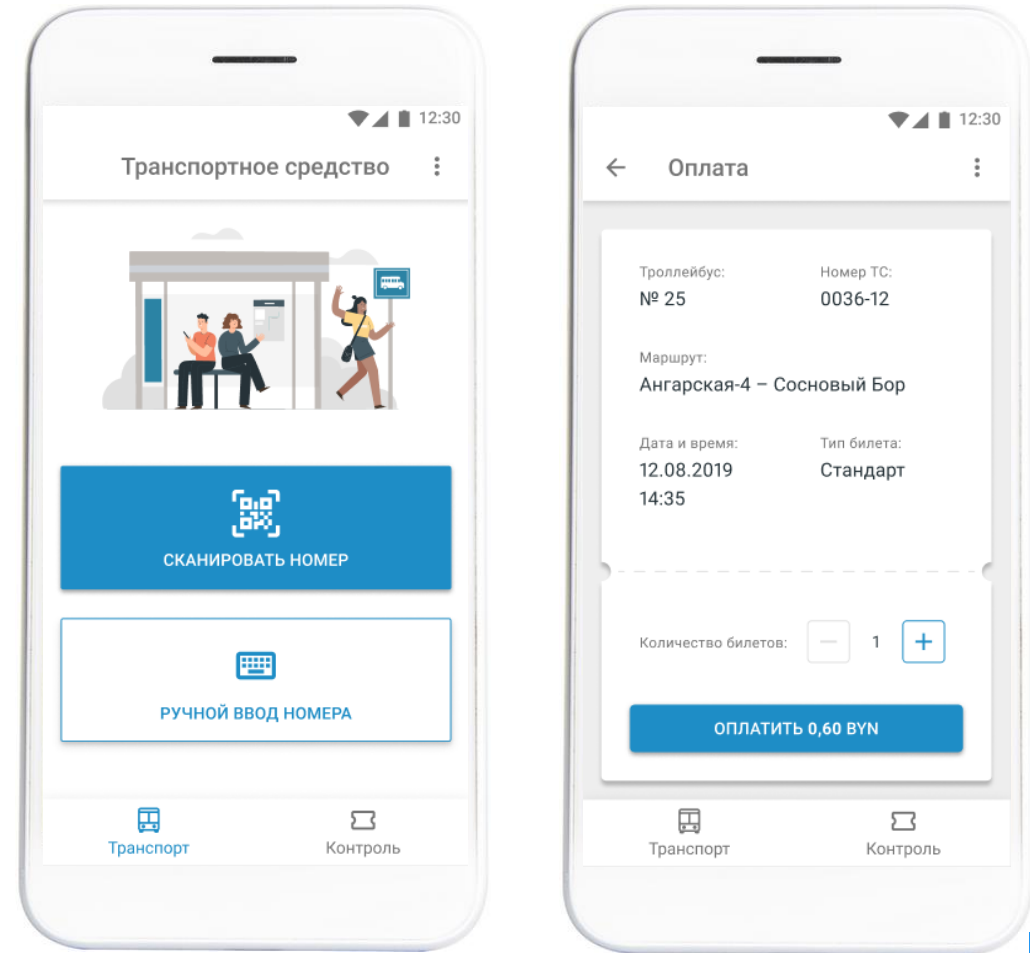
T-Pay mobile application



The vehicle is equipped with plates with a QR code. The code contains the vehicle number. Passengers log in the system, scan the QR code and pay their fare. Several tickets may be purchased at a time.

The T-Pay system establishes the fare for each route. Carriers may enter their own fares for their routes. Information about all routes and carriers is taken from the IBA AVM dispatching system.

The solution allows logging in as a fare collector, ticket inspector or passenger.



Maintenance and repairs



Maintenance and repair of vehicles based on SAP PM and an MRO solution powered by Industry 4.0 technologies:

SAP Asset Intelligence Network, SAP Predictive Maintenance and Service, SAP Asset Strategy and Performance Management, SAP Digital Twin for Structural Dynamics.

Solutions automate scheduled types of repairs and maintenance of passenger transport, help monitor the condition and maintenance of equipment, prepare repair programs, keep track of the movement of parts, assemblies and monitor the implementation of MRO.

Predictive diagnostics collects and processes data from sensors. The program is learning from this data and simulates failures of traction rolling stock units. In the future, the system will help to switch to on-condition maintenance.



Help desk:

chatbot for call center



The solution recognizes customer requests in natural language and helps to find out the necessary help information, for example, the train schedule on a specific day.

Result. The chatbot reduces the workload of operators of the Call Center and increases the speed of answering typical questions from passengers.



Proprietary equipment

Public transport fare validators

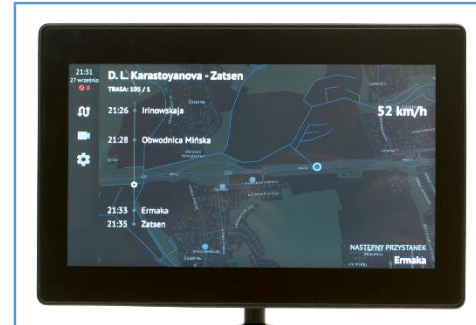
Validators are developed and manufactured in Belarus from scratch, they have received a certificate from the Mastercard international payment system. The devices have confirmed compliance with Terminal Quality Management (TQM) requirements. Validators are installed in Minsk and are also exported.

Driver station

The device is developed based on the ITxPT concept. The ITxPT Association develops and provides standardized technical specifications with open interfaces that guarantee the interaction of on-board and auxiliary information systems in public transport.

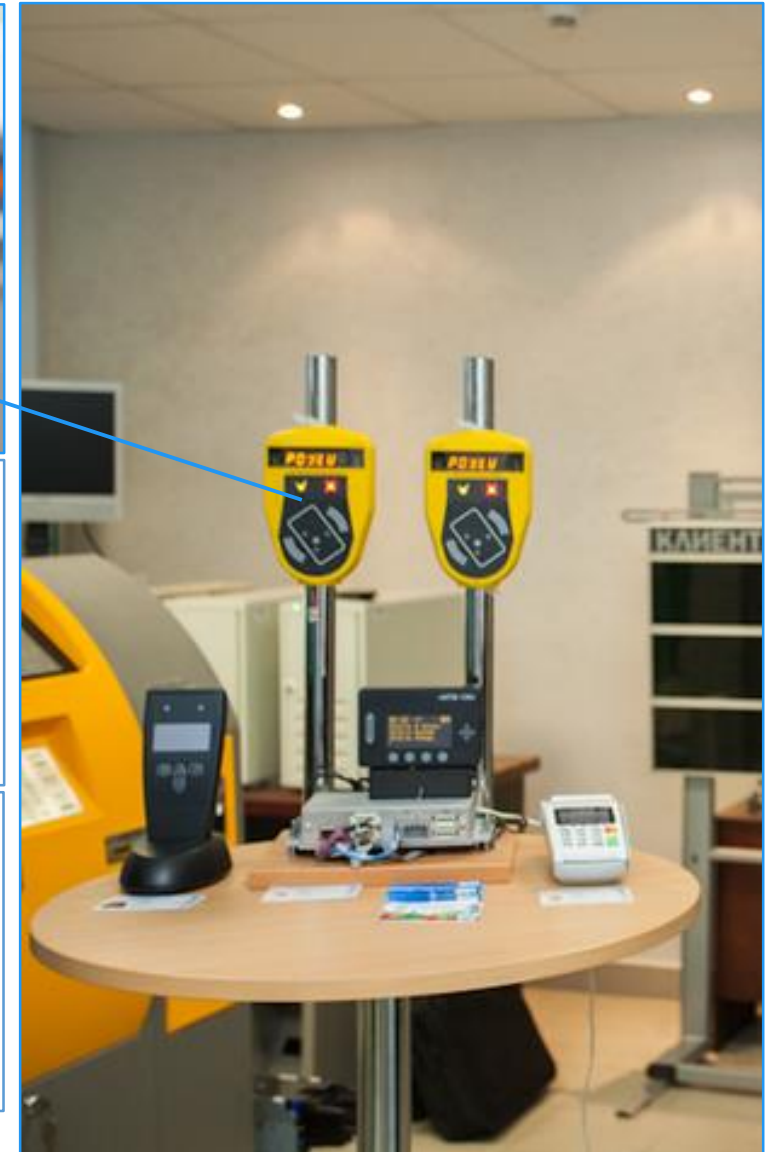
The driver's station displays a list of stops, the time of arrival at them, running behind or ahead of schedule.

Validator for travel card



Driver terminal

IBA AVM / IBA AFC Ecosystem



Services offered to carriers and urban transit service providers?



Asset Management

We design SAP-based asset management systems, MRO solutions for passenger transport companies, and deploy IBM Maximo.

Development of analytics, planning and budgeting systems

We develop financial and resource management systems, information and analytical systems for making management decisions based on SAP ERP, SAP BI, SAP S/4HANA.

Mobile and web development

We develop mobile, web and desktop applications, thanks to which passengers can buy tickets and monitor public transport online, build convenient routes and accurately plan trips.

Implementation of Industry 4.0 technologies

We introduce technologies of the Internet of Things, RPA, computer vision and machine learning, contactless fare payment, predictive diagnostics, predictive analytics at passenger transport companies.



Why IBA Group?

IBA Group projects for transport companies



View projects



IBA Group projects for transport companies



1/ Minsktrans increased the number of paid trips

The company increased the share of non-cash payments and advances for travel, reduced costs due to a decrease in the number of fare collectors. Passengers received more flexible fares and began to use contactless fare payment technologies. IBA AFC has been operating in Minsk since 2014 for 2500+ vehicles.

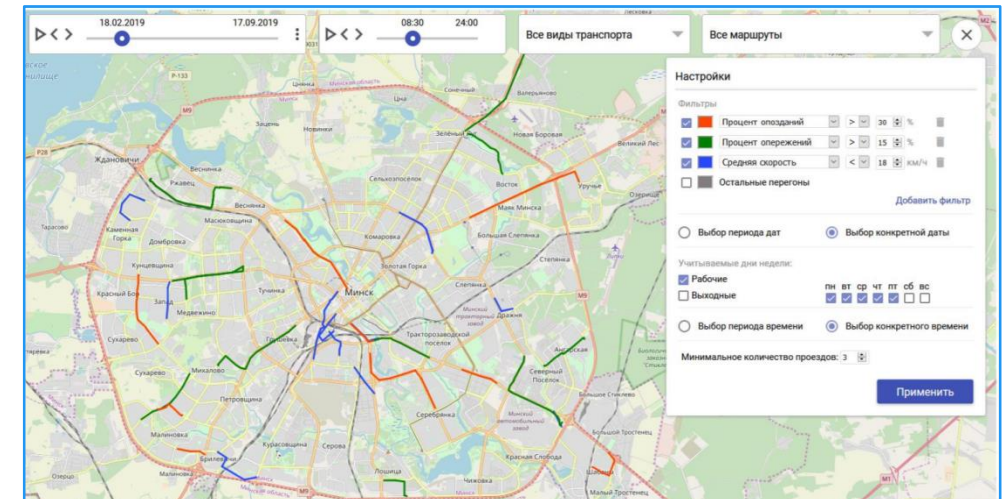


2/ Minsktrans introduced distance-based fares and increased passenger satisfaction

The customer has deployed a system for 200 buses of the suburb of Minsk and 6 trains of city lines.

3/ Operators and carriers in Belarus have streamlined vehicle dispatching

IBA AVM simplified building and adjustment of routes, helped to optimize the traffic schedule, and improved the quality of transport services. The system is installed on 6200+ vehicles.



IBA Group projects for transport companies



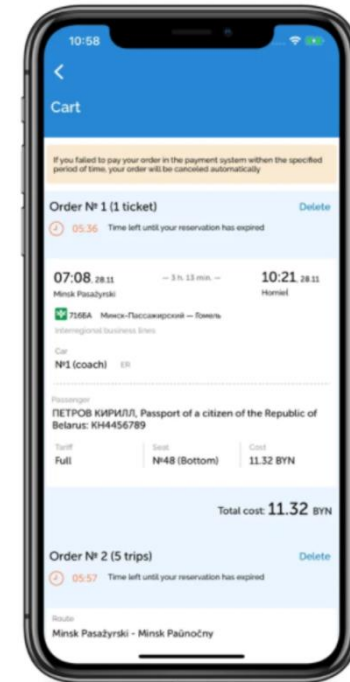
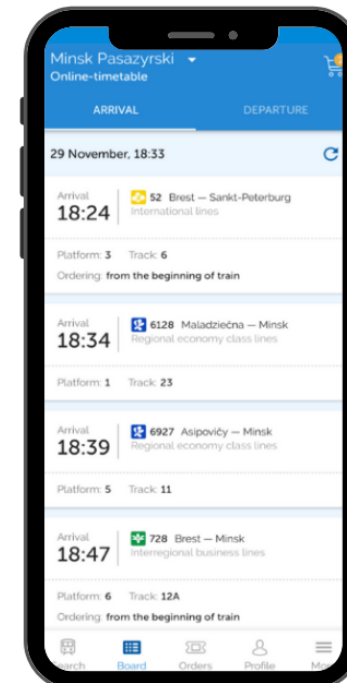
4/ IBA Group has implemented a new IT integration platform for the Belarusian Railway

The integration platform for the sale of Belarusian Railway travel tickets was put into operation in one year. The mobile application and the new website support Russian, Belarusian and English. The website is mobile-friendly. Belarusian Railway partners who sell tickets can connect to the system via API.

The new version of the IT platform became the basis for the creation of a mobile application (powered by Android and iOS) and the "Passenger Services" section on the website of the Belarusian Railway.

5/ Passengers of the Belarusian Railway can now find out the train schedule and buy tickets in the mobile application

The mobile application runs on Android and iOS. In the first month after launching the application, the platform recorded at least one million requests every day. Currently, 2,000 tickets are sold daily through the mobile application.



IBA Group projects for transport companies



6/ Belarusian Railway accelerated management decisions

The system has accelerated the preparation and approval of documents, eliminated duplication, simplified the follow-up actions and the speed of decision-making.

7/ The railway company reduced costs and accelerated maintenance and repair

The solution accelerated the execution of requests for equipment maintenance and repair. Employees remotely enter information into the SAP EM system about an item that needs repair or maintenance. The application may run in online and offline modes and synchronize information when connected to the Internet.





_5 Facts about IBA Group

- _1 30+ years in IT business
- _2 2 700+ IT and business professionals
- _3 20+ companies in 15 countries of the world, headquarters:
Prague, Czech Republic
- _4 Partner of leading global IT service providers
- _5 Developer of proprietary solutions and products