Moscow Transport

MTCC

BUILDING A TRANSPORT SYSTEM OF THE FUTURE

THE TRAFFIC CONTROL CENTRE'S PERFORMANCE REPORT

2020

Moscow Transport

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Contents

INTRODUCTION BY THE HEAD OF THE TRAFFIC CONTROL CENTRE

This year, the Traffic Control Centre of the Moscow Government celebrates its 20th anniversary. Over these years, the Traffic Control Centre has evolved from a small department comprised of five employees to one of the world's largest traffic management systems. Large-scale infrastructure and IT projects have been developed and successfully implemented to make Moscow residents feel safer and more comfortable when moving around the city.

The capital's transport system received a huge development impetus in the past ten years under the leadership of Moscow Mayor Sergey Sobyanin. With the launch of major public transport projects (such as the MCC, MCDs, and the new Magistral route network), the street and road network has expanded and evolved. More than 1,000 km of new roads have been constructed, dedicated lanes for surface transport have been introduced and a cycling and pedestrian environment has been built. I can confidently say that all this has had a remarkable effect on traffic. For instance, the average speed on major routes has increased by 20% over ten years. At the same time, in 2019, the Moscow Metropolitan Area dropped out of the top 5 most congested cities in the ranking compiled by the Dutch company TomTom.

Innovations.

The Intelligent Transport System

The introduction of the Intelligent Transport System has led to a seismic change in the traffic situation thanks to smart traffic lights, a network of cameras and sensors that analyse and regulate traffic flows, as well as other IT solutions, which, for Moscow residents, often remain hidden from view. Today, about 3.2 million vehicles hit the capital's roads every day, creating a huge load on the street and road network. This is why seeking out and implementing innovative traffic management solutions that meet the growing mobility demands of Muscovites and visitors to the capital remain a key task for the Traffic Control Centre. Specifically, the Traffic Control Centre plans to upgrade the traffic light control system and roll out a smart intersection management system throughout the city. Overall, we set ourselves an ambitious goal to minimise the number of days with a road congestion score above 8 on a scale from 0 to 10.

Safety.

Vision Zero programme

Road safety and the preservation of human life are the key values that guide us. The approaches under the Swedish Vision Zero programme are used to reduce road fatalities in Moscow. The capital has already achieved and exceeded the targets set by Russian President Vladimir Putin: in 2019, there were 3.5 road fatalities per 100,000 people. This level of safety is comparable to New York (where the social risk is 2.6), Chicago (3.6) and Milan (4.0). The objective is to reduce the social risk to 3.3 by 2023, and to achieve an index of less than 1 fatality per 100,000 people by 2040. For this purpose, a new road accident prediction and prevention model will be developed and implemented, and strict control over taxi and car sharing safety will be established. Advances in unmanned technology, and the subsequent launch of autonomous transport in Moscow will improve road safety by minimising the human factor.

Environmental friendliness. Urban Health concept

The development agenda of the capital as a whole and its transport system in particular includes the environmental safety of Moscow and Muscovites along with physical safety. The COVID-19 pandemic that has affected the whole world has shown that respiratory diseases and a vulnerable immune system in general result from, among other factors, life in densely populated megacities. For several years now, the Traffic Control Centre has been implementing measures to reduce the amount of harm road vehicles cause to the environment and people. We are actively developing a pedestrian environment and infrastructure for green transport (bicycles and scooters), and are improving pedestrian accessibility of public transport stops. By 2023, Moscow Transport plans to create an infrastructure that facilitates the convenient use of electric transport.

Moscow is a megacity that continues to develop rapidly across all areas, which gives us the impetus for continuous improvement. Ahead of us lie new challenges and tasks to create a comfortable and safe environment for everyone.

Mikhail Kizlyk
Head of the Traffic Control Centre

2,343 lives
saved since 2010
as a result of measures
to reduce road fatalities

+20%
average daily
traffic speed vs 2010

MOSCOW'S TRANSPORT SYSTEM TODAY

AIR INFRASTRUCTURE

4 passenger airports
3 Aeroexpress routes for Moscow Transport Hub passengers

ROAD INFRASTRUCTURE

6,200 km – total length of roads

PEDESTRIAN INFRASTRUCTURE

410 streets, squares and public spaces modernised (361 km)
>800 navigation pylons on the streets

RAIL FRAMEWORK

Metro
244 stations
595 km of rail tracks

MCC
31 stations
54 km of rail tracks

MCD-1 and MCD-2
60 stations
132 km of rail tracks

Suburban rail transport
(within the city boundaries)
56 stations
1,979 km of rail tracks

SURFACE PUBLIC TRANSPORT

11,500 vehicles
1,050 routes
372 km of dedicated lanes
418 km of tram tracks
3,458 new passenger shelters

TAXI

141,000 taxis licenced to operate in Moscow and the Moscow Region
1,546 parking spaces in 450 parking lots specifically for taxis

CYCLING INFRASTRUCTURE

6,511 bicycles across 629 rental stations
895 km of bicycle paths and lanes (including dedicated lanes)
6,000 e-scooters
11,300 parking spaces for private bikes

CAR PARKING

85,600 paid parking spaces within the street and road network
21,100 parking spaces in at-grade car parks with lifting gates
14,300 parking spaces at park-and-ride facilities

WATERWAY INFRASTRUCTURE

80 km of the Moskva River flows through the city
220 km of riverside

CAR SHARING

30,000 vehicles
6 operators

Electronic Services

>35 million
TROIKA CARDS

5
MOBILE APPS

The Intelligent Transport System (ITS)

24/7
COMMAND CENTRE

180,000
CCTV CAMERAS

2,960
PHOTO AND VIDEO RECORDERS

>40,000
TRAFFIC LIGHTS CONNECTED TO THE SYSTEM

3,900
VEHICLE DETECTORS

177
INFORMATION DISPLAYS ON ROADS

100%
of vehicles and infrastructure facilities in Moscow are monitored by the ITS

For details on the ITS, see pages 22–35

Private transport accounts for 29%
8 million trips

Public transport accounts for 71%
20 million trips

28 million trips are made by passengers within the city every day

THE MOSCOW TRANSPORT HUB is the largest in the world and the first in Europe by passenger traffic

WHAT DOES THE TRAFFIC CONTROL CENTRE DO?

The Moscow Government's Traffic Control Centre is the City of Moscow's principal customer for the development and implementation of the traffic management strategy.

THE TRAFFIC CONTROL CENTRE'S MISSION

Develop a street and road network that enables traffic in the city to become as fast, comfortable and safe as possible for all participants – pedestrians, cyclists, urban transport passengers, and motorists.

TRAFFIC CONTROL CENTRE FUNCTIONS

Traffic control

Strategic planning of street and road infrastructure

1. Traffic control projects and traffic schemes: development
2. Urban planning: input into development
3. Design standards and requirements: input into development and revision
4. Introducing traffic control innovations: new technical means of traffic control and approaches to design
5. Collecting and processing requests/suggestions for traffic control changes

Operational planning of traffic control

1. 24/7 traffic monitoring and adjustment of traffic light timings
2. Temporary traffic diversions including road closures
3. Assistance in reporting a road accident and removing debris from roads

The construction and improvement of street and road infrastructure

1. Installation of road signs, safety barriers, base plates, poles, etc.
2. Installation of new passenger shelters at public transport stops
3. Installation of photo and video recorders
4. Installation of CCTV cameras

Technical means of traffic control comprise traffic lights, road signs, fences, road bumps, etc.

Traffic management – operational and strategic

The operation of a 24/7 command centre

1. The monitoring of, and prompt response to, the current traffic situation
2. Monitoring and analytics covering:
   - surface public transport operation
   - freight transport movement
   - the operation of taxis and shared cars
   - the operation of the public bicycle rental system.
3. Analysis of private car traffic

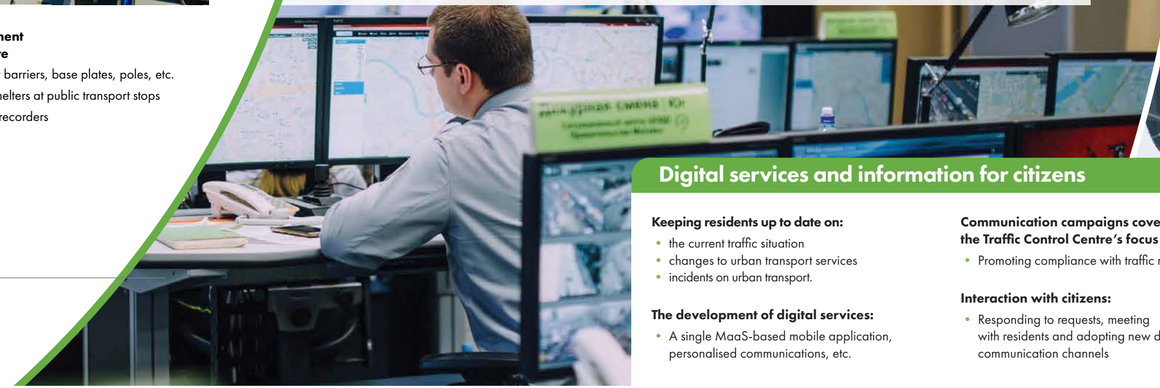
ITS – The Intelligent Transport System

The development of the Intelligent Transport System

1. The creation and development of an effective and innovative ITS for the city
2. The installation and maintenance of equipment, upgrading and supporting capabilities
3. The alignment of existing IT solutions

Operational and strategic analytics

1. Collecting, processing and analysing traffic data
2. Modelling passenger and transport flows
3. Commissioning expert reviews for projects, including traffic control, integrated traffic control systems, the construction and reconstruction of the street and road network
4. Preparing operational and strategic reports



Digital services and information for citizens

Keeping residents up to date on:

- the current traffic situation
- changes to urban transport services
- incidents on urban transport.

The development of digital services:

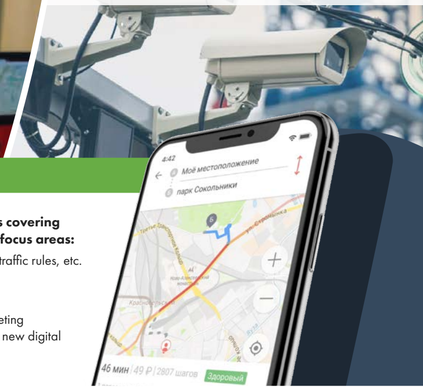
- A single MaaS-based mobile application, personalised communications, etc.

Communication campaigns covering the Traffic Control Centre's focus areas:

- Promoting compliance with traffic rules, etc.

Interaction with citizens:

- Responding to requests, meeting with residents and adopting new digital communication channels



Ensuring road safety

Enforcing violations of road traffic rules, rules for traffic on the water, and parking rules

1. Photo and video recording systems:
   - deciding on camera locations
   - acting as a customer.
2. The technical preparation of materials on administrative violations based on data from photo and video recording systems
3. Waterways and river transport monitoring

Ensuring road safety

1. Vision Zero – drafting and implementing a programme (analysing multiple factors that contribute to road accidents and eliminating their causes)

HISTORY OF THE TRAFFIC CONTROL CENTRE

1999
The Traffic Control Centre of the Moscow Government was established

2010
The Main Directorate for Traffic Safety was superseded by the Traffic Control Centre for changing traffic schemes and traffic light timings, building the technical means of traffic control, as well as preparing all design documentation for transport and road infrastructure facilities

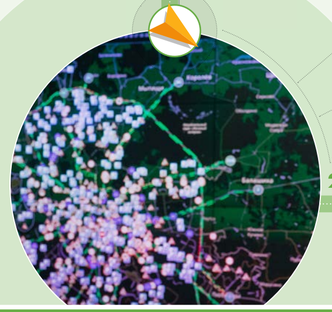
2011
The Intelligent Transport System development concept and key requirements were approved

2012
The first stationary photo and video recorders started operating in Moscow

2013
The Command Centre was set up at the Traffic Control Centre

- On-street paid parking was introduced
- Parking control system started operating
- Restrictions on the movement of freight transport within Moscow were introduced
- Truck weighing stations for freight vehicles started operating
- Public bicycle rental system was launched

2014
- 100% of Moscow's major routes are covered by the ITS
- A pilot freight framework was launched in the Eastern Administrative District
- Traffic information displays started operating
- The Mobile Command Centre was set up (a staff bus connected to the ITS)
- Portable photo and video recorders were introduced



2015
- A dynamic transport model of the Moscow Metropolitan Area was built at the Traffic Control Centre
- A coordinated traffic light control system was introduced
- Electric car infrastructure started to be developed
- Moscow car sharing system launched
- The Moscow Assistant mobile app was launched

2016
- Major efforts to reconstruct and improve the street and road network under the My Street programme were launched
- A freight framework was launched in the Northern and North-Eastern Administrative Districts
- Each district of Moscow has a dedicated traffic coordinator
  responsible for road signs, markings and pedestrian crossings.

2017
- Launch of the e-scooter rental system
- The Road Patrol service started operating
- Successfully organised transport services for the 2017 FIFA Confederations Cup
- Almost 2,000 photo and video recorders

2018
- Neural networks started to be implemented
- The new Bicycle Patrol service was launched
- Successfully provided transport services for the 2018 FIFA World Cup

2019
- The MaaS-based Moscow Transport mobile app was released
- Monitoring of the Moskva River launched
- The reconstruction and launch of the major transport hubs on Savelovskaya and Kievskaya Squares
- A working group for investigating, analysing and preventing road accidents was established

2020
9 months (actual)

- **450** smart intersections with priority passage for public transport
- **100 %** of Moscow (within the Moscow Ring Road) covered by the freight framework zone
- **+1,000** new bicycles across 119 rental stations
- **+6** new bicycle lanes

Plans
before the end of 2020

- Build up capabilities at the Traffic Control Centre's Command Centre to develop **Moscow waterways**
- **Neural networks:** roll out within the ITS, introduce on metro and surface transport
- Start implementing the 15-year development strategy of the **Integrated Traffic Control System**

BACKGROUND AND CHALLENGES

100 km
of roads have been constructed in Moscow every year since 2011...

1 New road infrastructure

2011 – September 2020

>1,000 km
OF NEW ROADS

>290
NEW BRIDGES, TUNNELS AND OVERPASSES

245
NEW OVER-GROUND AND UNDERGROUND PEDESTRIAN CROSSINGS

PwC, Quality of Living survey, 2018

Moscow is among the top 3 megacities in the world for road length growth rates, second only to Beijing, and ahead of New York, London and Hong Kong.

2 ... but the number of vehicles being registered within the Moscow transport hub outpaces even the record-breaking speed of road construction

Vehicles registered within the Moscow transport hub, mln vehicles

3 The disbalance between residential and employment areas in Moscow persists despite its polycentric development. Thus, commuting becomes an issue, with many residents travelling to work in another part of the city and back. This creates a huge, concentrated load on the transport system.

Distribution of residential and employment areas in Moscow by transport area

9%
OF THE MOSCOW POPULATION LIVES WITHIN THE BOUNDARIES OF THE THIRD RING ROAD

59%
OF JOBS ARE LOCATED WITHIN THE BOUNDARIES OF THE THIRD RING ROAD

~46%
OF VEHICLES ON MOSCOW'S STREET AND ROAD NETWORK COME FROM OTHER REGIONS

Interesting facts

55% of the world's population (4.2 billion people) currently lives in cities.

68% of the world's population (6.7 billion people, +60%) will live in cities by 2050.

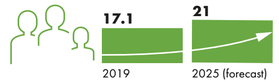
Source: the UN's Revision of World Urbanization Prospects

4 The Moscow Metropolitan Area is one of the largest metropolitan areas in the world and the largest in Europe

It is rapidly expanding and becoming more dense. As the metropolitan area expands, effective transport management becomes increasingly important.

Objective:
Ensure smart distribution of commuter flows

Population of the Moscow Metropolitan Area, mln people



The Moscow Metropolitan Area – Moscow and its suburbs within a 60–70 km radius: 13,600 sq km (area within two suburban zones)

5 In July 2012, a part of the Moscow Region became a district of Moscow

6 The amount of residential real estate commissioned annually reached an all-time high

MOSCOW'S FOOTPRINT HAS INCREASED
by 2.4 times
(2,600 sq km)

Objective:
Ensure new residential districts have transport accessibility, including connections between all other districts, without overloading the existing infrastructure

INCREASE IN THE AMOUNT OF COMMISSIONED RESIDENTIAL REAL ESTATE SINCE 2010
by 2.8 times
according to the Urban Planning Policy and Construction Department of Moscow

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3.1–3.2 MILLION VEHICLES

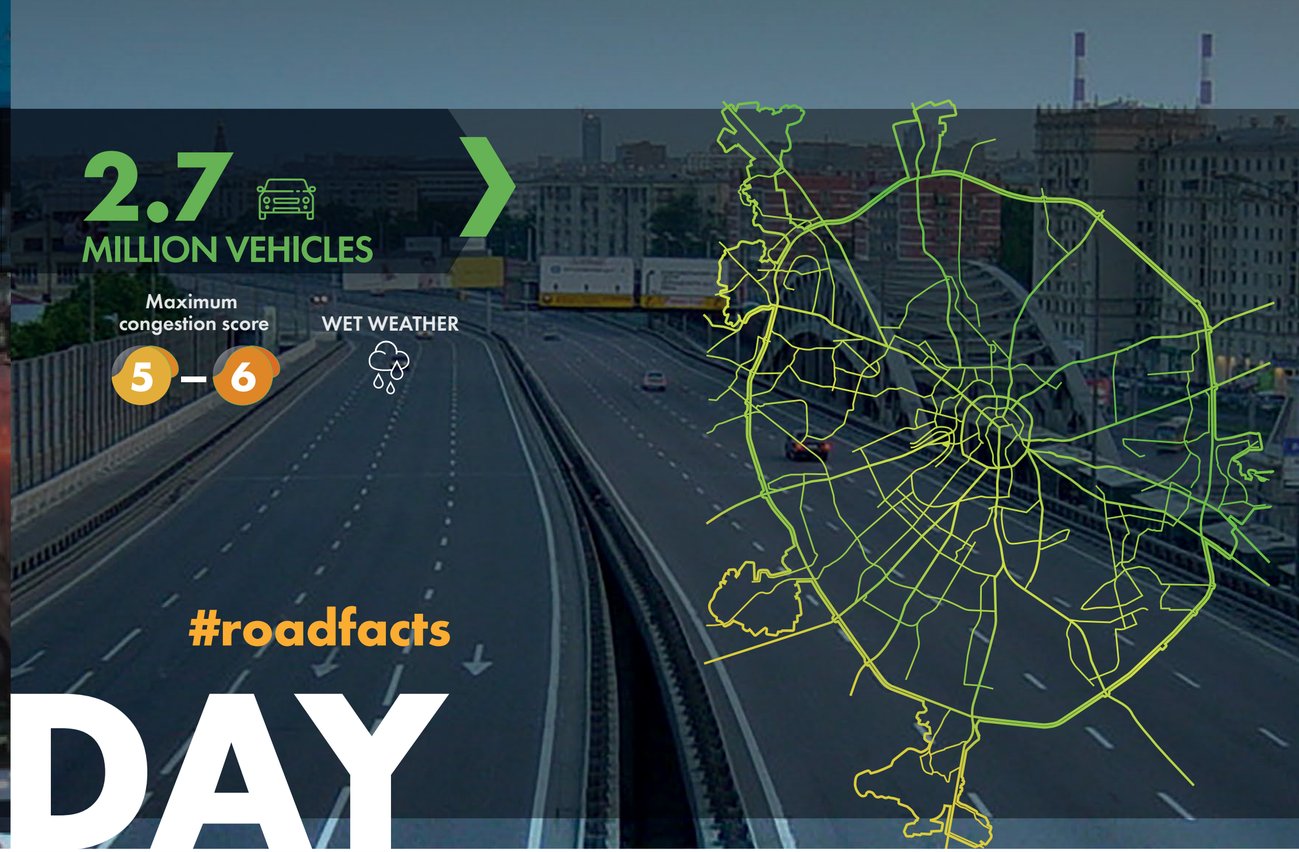
Maximum congestion score **8 – 9**

DRY WEATHER

Having

500,000

less vehicles on the roads has dramatically reduced congestion



2.7 MILLION VEHICLES

Maximum congestion score **5 – 6**

WET WEATHER

#roadfacts

WEEKDAY

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KEY IMPACTS
OF THE TRAFFIC CONTROL CENTRE

Traffic speed

Average speed of private vehicles along Moscow's key highways, km/h

2019 54
2010 45
+20%

TRAFFIC INDEX
TomTom, The Netherlands (2020)

2012 1st place (Moscow)
2019 6th place (Moscow and the Moscow Region)
down 5 places

Average number of unique trucks per day, '000

2019 240
2013 272
–12%

Average travel time from the Moscow Ring Road to the city centre, minutes

2019 56
2010 67
–16%

Punctuality and reliability of surface transport services using dedicated infrastructure, %

2019 97
2010 76
+28 p. p.

+20%
average speed of private vehicles along key highways of the city in 2019 vs 2010

Physical safety

Social risk[1]

2019 3.5
2010 6.6
–47%

Total road accidents, '000

2019 160
2010 609
4 times

Road injuries, people

2019 10,723
2010 13,592
–21%

Road fatalities, people

2019 433
2010 763
–42%

Road accidents

	2010	2019	
involving casualties	11,757	9,296	–21%
involving public transport	524	473	–10%
involving children (under 18)	993	865	–13%
involving pedestrians	4,734	3,293	–30%

Accident cluster sites

2019 226
2010 758
3.5 times

Car thefts

2019 2,458
2010 11,805
5 times

[1] Road fatalities per 100,000 residents.

SPEED

Traffic speed, convenience and safety, as well as the environmental situation in Moscow depend on the performance of the Traffic Control Centre.

SAFETY

Environmental safety

Share of Euro-4 and higher vehicles, %

2019 >65
2010 28
2.3 times

Emissions from road vehicles, million tonnes per year

2019 0.7
2010 1
–21%

2.1 times
lower average concentration of harmful substances in the air in 2019 vs 2010
NO_x nitrogen oxides
CO carbon

Pedestrian infrastructure relevance

Twice
AS OFTEN MUSCOVITES OPT TO WALK (5 TIMES MORE OFTEN IN SUMMER)

Moscow has become pedestrian friendly!

Cycling infrastructure relevance

2013 year of shared bike opening
0.07 MILLION RIDES DURING THE SEASON
2019
5 MILLION RIDES PER SEASON

70 times more rides on shared bikes in 2019 vs 2010

Public transport relevance

Share of people using public transport, %

2010 62
2019 70
+13 p. p.

INTERNATIONAL AND RUSSIAN RECOGNITION

Traffic congestion

TOMTOM www.tomtom.com The Netherlands

Traffic congestion in Moscow

1st place → 13th place (2012 → 2017)

25% LOWER TRAFFIC CONGESTION IN MOSCOW VS 2012

TomTom Traffic Index

Starting from 2017, TomTom has taken the Moscow Metropolitan Area (Moscow and the Moscow Region) as the study area.

Traffic congestion in Moscow and the Moscow Region

5th place → 6th place (2018 → 2019)

In 2019, the Moscow Metropolitan Area dropped out of the world's top 5 most congested cities and metropolitan areas, moving to 6th place.

Global leadership by rate of road construction

Moscow is among the top 3 megacities in the world by road length growth rates.

PWC, Quality of Living survey (2018)

www.pwc.ru

Beijing
Moscow
New York
London
Hong Kong

Global leadership by number of car sharing vehicles

No.1 globally by number of car sharing vehicles

АВТОСТАТ Autostat, Russia (2020)

www.autostat.ru

Moscow
Tokyo
Beijing
Shanghai

Moscow's ITS is the best solution for a smart city.

ЦИФРОВЫЕ ВЕРШИНЫ Digital Heights 2019 award, Russian Internet Week

www.digital-summit.ru

Global leadership by number of CCTV cameras

Moscow is among the world's top 5 cities by number of CCTV cameras.

BCG, Development of Comfortable Urban Environment in Moscow and Leading Cities Worldwide (2018)

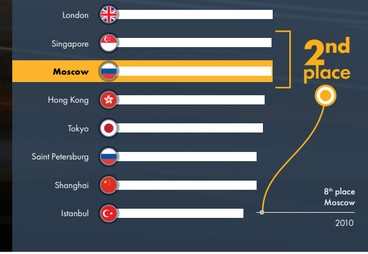
Beijing
Shanghai
London
Moscow
New York

Road safety and environment

www.indexmsu.ru Russia

Transport Development Index, Moscow State University (2020)

Among the world's largest megacities, Moscow tied for 2nd place with Singapore in the sub-index of road safety and the impact of transport on the environment in 2018 (8th place in 2010).



Space reorganisation

Sustainable Transport Award (2018)

Honourable mention for reorganising the city space and improving conditions for pedestrians

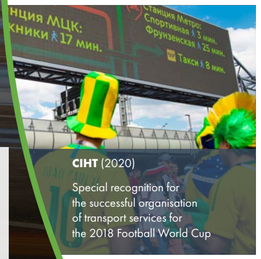
SUSTAINABLE TRANSPORT AWARD www.staward.org USA

Other achievements

Greenpeace (2019)

Greenpeace, the world's leading environmental organisation, considers the Moscow Government's efforts to introduce electric transport a breakthrough.

GREENPEACE www.greenpeace.ru



CIHT (2020)

Special recognition for the successful organisation of transport services for the 2018 Football World Cup

CIHT www.ciht.org.uk UK

Governmental Commission for Traffic Safety (2019)

www.government.ru Russia

No.1 in Russia for road safety

TOMTOM **TomTom** (2017)

www.tomtom.com The Netherlands

No.1 globally for smart parking space arrangement

McKinsey&Company **Elements of success: Urban transportation systems of 24 global cities** (2018)

www.mckinsey.com

No.6 globally for transport system development

Singapore · Greater Paris · Hong Kong · London · Madrid · **Moscow** · Chicago

The Moscow Assistant mobile app is ranked among the **top 12** most innovative global technological solutions to COVID-19 out of 704 projects.

StartupBlink (2020)

www.startupblink.com Israel

STRATEGY OF THE TRAFFIC CONTROL CENTRE

Key areas of the Moscow transport Strategy covered by the Traffic Control Centre

Affordable and comfortable public transport

New modes of mobility

Safe roads

VISION ZERO
is a road traffic safety project that aims to achieve zero road fatalities.

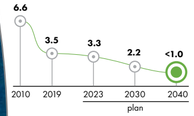
First passed by the Swedish parliament in 1997.

What has been achieved since 2010?

2 times
LOWER SOCIAL RISK RATE

For details, see page 36

Social risk, road fatalities per 100,000 residents



What will be achieved by 2040?

High-speed framework

New road accident prediction and prevention model

Autonomous transport

Taxi and car sharing safety control

Digital technologies

THE INTELLIGENT TRANSPORT SYSTEM

The ITS uses innovative developments to model transport systems and manage traffic flows.

100%
THE ITS COVERAGE IN MOSCOW

+20%
INCREASE IN AVERAGE SPEED ON THE CITY'S MAJOR ROUTES

Unlocking the full potential of the ITS:

- Update the centralised traffic light control system in a coordinated and adaptive mode
- Set up a system to carry out factor analysis and forecast road congestion
- Set up a system to estimate the number of vacant on-street parking spaces in real time
- Develop a system to prioritise urban transport
- Set up a system to monitor and manage emissions and noise

Plans for 2023–2040 include:

25%–37%
REDUCTION IN TRAVEL TIME DURING PEAK HOURS

down to 10 days per year
NUMBER OF DAYS WITH A ROAD CONGESTION SCORE OF 8+ ON A SCALE FROM 0 TO 10

Moscow will continue to introduce and develop innovative technologies to control and manage traffic, enforce traffic violations, carry out Traffic Rules and administrative tasks and improve the integrated urban mobility service.

Leading Vision Zero
participant cities

Preventive analysis of traffic accidents
based on historical data predicts the exact time and place of a potential accident and recommends the most optimal course of action to avoid it (route of patrol unit, transport service notification, signals to self-driving vehicles, warnings to other road users on the city's road information displays)

Selected case

Leading cities
in terms of ITS development

Selected cases

Vehicle-to-Everything (V2X), which envisages connectivity to other vehicles, transport infrastructure facilities, the ITS, pedestrians and buildings, i.e. anything that can affect traffic. The system is being developed alongside advanced autonomous vehicles.

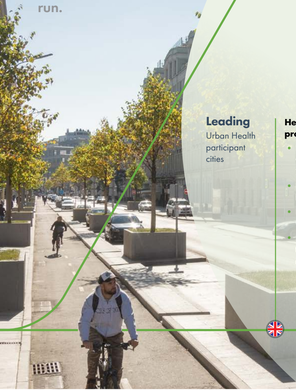
Virtual Singapore – a 3D city model.

Artificial intelligence and **5G-based** autonomous mobility

Connected Vehicle – intelligent sensors that detect hot-spots for sharp turns and abrupt stops.

Midtown in Motion – a traffic management system using E-ZPass technology (a system that connects vehicles with each other, infrastructure facilities and pedestrians).

In developing its transport system, Moscow follows the global URBAN HEALTH concept, which is based on prioritising health and an active and comfortable life when managing the way densely populated cities run.



Leading Urban Health participant cities

Healthy streets

What has been achieved since 2010?

66%
OF TRIPS ON PUBLIC TRANSPORT ARE MADE USING ECO-FRIENDLY VEHICLES

21%
(218,000 TONNES) LESS EMISSIONS FROM ROAD VEHICLES PER YEAR

Healthy Streets programme
- By 2041, all Londoners will move actively at least 20 minutes per day
- Introduction of new taxes for drivers
- By 2040, all new vehicles will be air pollution-free
- By 2050, the London transport system will generate no air pollution

What will be achieved by 2040?

- Development of the pedestrian environment
- Improvement of public transport stop accessibility
- Development of infrastructure for "green" last-mile transport – bicycles and scooters
- Development of infrastructure for electric cars
- Environmental restrictions on entry to Moscow

Paris Climat Action Plan: phase out diesel-powered mobility by 2024 and petrol-powered mobility by 2030

Crit'Air: progressive parking prices depending on the vehicle's environmental friendliness

Speed reduction in the streets (except major routes) to 30 km/h

Share of residents living within 20 minutes of the rail framework, %

Impact of the regulation (transport impact assessment)

Emissions from cars, '000 tonnes

PM – particulate matter (ultrafine particles)
NO_x – nitrogen oxides

Moscow's transport system of the future entails a minimisation of damage from road vehicles to people and the environment

Safe roads

VISION ZERO is a multi-national road traffic safety project that aims to achieve zero road fatalities.

First passed by the Swedish parliament in 1997.

What has been achieved since 2010?

2 times
LOWER SOCIAL RISK RATE

For details, see page 36

Social risk, road fatalities per 100,000 residents

Digital technologies

THE INTELLIGENT TRANSPORT SYSTEM

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100%
THE ITS COVERAGE IN MOSCOW

+20%
INCREASE IN AVERAGE SPEED ON THE CITY'S MAJOR ROUTES

For details, see pages 22–25

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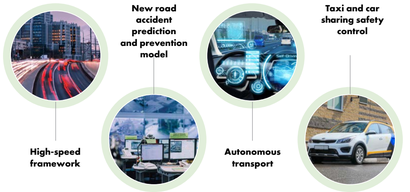
What will be achieved by 2040?



Unlocking the full potential of the ITS:
- Update the centralised traffic light control system in a coordinated and adaptive mode
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NUMBER OF DAYS WITH A ROAD CONGESTION SCORE OF 8+ ON A SCALE FROM 0 TO 10

Sources: open data: Land Transport Authority (www.lta.gov.sg), NYC Connected Vehicle Project (www.cvp.nyc/), Smart City Lab (www.smartcitylab.com), JREast (www.jreast.co.jp), Jelbi (www.jelbi.de/en/home/), www.london.gov.uk, cdn.paris.fr etc.

Interesting facts

The innovation of this approach

is that it does not require separate accident factors (e.g. speeding) or separate accident cluster sites (e.g. the Moscow Ring Road) to be processed individually. These factors are combined to give a broader picture (e.g. collision of vehicles on the Moscow Ring Road involving a combination of parameters such as speeding, cloudy weather, Friday, evening peak hours).

To help implement this, a digital tool will be developed to identify and propose measures to prevent similar accidents in the future, and to assess their potential effectiveness.

What has been achieved since 2019?

A single digital Mobility-as-a-Service (MaaS) ecosystem

MaaS technology combines all modes of transport and mobility in the city onto one digital platform to build a multimodal route from door to door, taking into account personal preferences and needs, with the fare paid at a single point of payment.

1.2 million
MOSCOW TRANSPORT APP DOWNLOADS

The maximum possible personalisation of the route and fare payment methods:
- One-click payment for the entire trip
- Traffic jams and road closures taken into account
- Useful related services and benefits
- Transport utilisation

What will be achieved by 2023?

Plans for 2023 include:

1.1 million
ACTIVE MOSCOW TRANSPORT APP USERS

THE CORE PURPOSE OF THIS SERVICE
is to create an application that will provide a level of flexibility, mobility and comfort of travel that exceeds the convenience of personal car ownership

Leading cities in terms of MaaS development

Zipster MaaS functionality comprises, among other things, seat booking and accident insurance

Suica – is a smart card that, along with transport fare payment, enables users to make purchases in stores, book hotels and settle bills in restaurants, etc.It can be used to cover anything the user may need throughout the day, from commuting between home and work to leisure and travel.

Jelbi app combines 12 modes of transport in one application, including booking shared cars, rides, or bikes

Movelt Moveit is a global aggregator covering 3,200 cities in 103 countries, available in 45 languages.

THE INTELLIGENT TRANSPORT SYSTEM

The development scenario for the Moscow ITS was approved in 2011. It was built on the experience of Singapore, Berlin and London; however, Moscow's street and road network and urban mobility have their own specifics. Therefore, solutions for other megacities could only be used in a limited way.

THE MOSCOW ITS is currently a 100% independent Russian development, fully customised to the capital's unique profile

HOW THE ITS OPERATES

1 Step — Big data collection

ITS equipment

ITS equipment collects big data about all transport, as well as traffic infrastructure and mobility in Moscow

- **180,000** CCTV CAMERAS
- **~3,000** PHOTO AND VIDEO RECORDERS
- **3,900** SENSORS
- **>40,000** TRAFFIC LIGHTS
- **177,000** INFORMATION DISPLAYS
- **>1,000** DIGITAL ROAD SIGNS

100% of Moscow is covered by the ITS

2 Step — Data storage and processing

ITS server

Data are stored and processed on the ITS server

The ITS is a database of city life that enables operational traffic management and strategic planning of the transport system's development

3 Step — Management and services

Software

ITS subsystems and electronic services for intelligent traffic management leverage big data.

- THE MAYOR'S AUTOMATED WORKSTATION
- DYNAMIC MODEL
- STATIC MODEL
- SURFACE TRANSPORT AND URBAN SERVICE OPERATION MONITORING SYSTEM
- PHOTO AND VIDEO RECORDING SYSTEM
- TRAFFIC LIGHT CONTROL SYSTEM
- etc.

For details, see pages 24–31

Command CENTRE 24/7

A single headquarters ensuring 24/7 monitoring and management of traffic in Moscow

For details, see pages 32–33

THE ITS OBJECTIVES

- Monitor traffic and respond to incidents on transport and at infrastructure facilities
- Coordinate the management of traffic flows
- Enforce traffic violations and boost road safety
- Monitor the operation of surface public transport and ensure it is prioritised over other transport
- Monitor urban services (utilities equipment, etc.)
- Inform traffic participants about the traffic situation and any diversions
- Regulate and develop the taxi, car-sharing and bicycle rental markets
- Forecast the ways the traffic situation will develop

3.2 million
UNIQUE VEHICLES ON THE CITY'S ROADS DAILY

6,200 km
LENGTH OF ROADS IN MOSCOW

28 million
RIDES PER DAY WITHIN MOSCOW

20 million on public transport

8 million on private transport

500 million
TELEMATICS DATA POINTS FROM THE ITS EQUIPMENT SHOWING THE NUMBER OF TRIPS PER DAY

99%
ITS EQUIPMENT OPERABILITY (70% IN 2014)

ПРЕМИЯ ЦИФРОВЫЕ ВЕРШИНЫ

THE MOSCOW ITS IS THE BEST SOLUTION FOR A SMART CITY (Digital Heights Awards 2019, Russian Internet Week)

STRUCTURE OF THE INTELLIGENT TRANSPORT SYSTEM

Moscow's Intelligent Transport System comprises software and hardware components that ensure the collection, processing, storage and update of data on mobility in the city.

Core ITS systems

>30
ITS systems
Each system is designed to address certain transport and city-wide issues.

DYNAMIC TRANSPORT MODEL

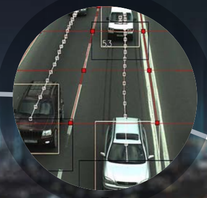
Monitors and tracks vehicle movements in real time. Enables effective control over the traffic situation in the city and prompt adjustment of traffic lights' operation mode.

For details, see pages 26–27

STATIC TRANSPORT MODEL

Shows existing transport and passenger flows in Moscow, including pedestrian routes. Enables changes in the transport network's operation to be predicted when new districts are built and new urban transport lines are launched.

INTEGRATED TRAFFIC CONTROL SYSTEM



A single data warehouse comprising traffic control projects and technical means of traffic control throughout Moscow. All information about traffic control in the city is collated on one digital platform. Currently, a strategy for the system's further development is being elaborated.

For details, see page 50

RIVER TRANSPORT MONITORING SYSTEM

Monitors Moscow waterways and all relevant facilities, identifies vessels, automatically detects speed violations and the rules of vessel mooring and lay-up. Capabilities:

- Recording relevant incidents for authorised agencies
- Generating a comprehensive picture of events on the waterways
- Analytical comparisons

SMART INTERSECTION SYSTEM

Smart adaptive traffic lights exchange data with sensors on surface urban transport and ensure priority passage for buses, electric buses and trams.

For details, see pages 30–31

>25 PB = The total volume of all internet data processed by Google in 2008

total volume
OF ITS DATA STORED

CCTV SYSTEM

The "eyes" watching over Moscow 24/7. All CCTV cameras are monitored in the Command Centre at the Traffic Control Centre, where the traffic situation across the entire city is monitored in real time.

PHOTO AND VIDEO RECORDING SYSTEM

A system that automatically records 55 types of traffic violations.

For details, see pages 38–41

SURFACE PUBLIC TRANSPORT AND SPECIAL SERVICE VEHICLES MONITORING SYSTEM

Monitors the operation of buses, electric buses, trams, taxis, shared cars and city service vehicles (housing and communal services equipment, etc.)

FACIAL RECOGNITION SYSTEM

Software rolled out to municipal photo and video recorders installed on public transport and transport infrastructure facilities. It takes a fraction of a second to recognise faces:

- of people wanted by police for offences or people on probation – to enable further actions by law-enforcement agencies
- to improve transport convenience – for example, to automate fare collection.

For details, see pages 84–85

TRAFFIC LIGHT CONTROL SYSTEM

Traffic lights can operate in three modes:

- **Local (basic)** – following a pre-programmed cycle
- **Coordinated** – traffic lights are interconnected to ensure a "green wave" (passage with minimum stops)
- **Adaptive** – traffic lights recognise the traffic situation and adjust accordingly based on the data received

Plans for the near future include introducing a centralised coordinated and adaptive traffic light control system

The Dynamic Transport Model

The dynamic transport model allows users to assess the current traffic situation (traffic speed/intensity), make short-term forecasts, inform residents and track traffic events (road accidents, road closures, repairs of sections of the road network, etc.).

The model combines data from the static traffic model based on the PTV Visum solution with real-time data.

GPS DATA

>100 million

TELEMATICS DATA POINTS PER DAY

DATA FROM

>4,000

VEHICLE DETECTORS

Using data from the Dynamic transport model

- Assessment of the current traffic situation – traffic speed and intensity
- Information for residents on the current traffic situation
- Analytical reporting
- Interactive visualisation of real-time data on the traffic situation

The dynamic transport model underpins **THE MOSCOW TRAFFIC SITUATION MONITORING MAP**

The traffic situation monitoring map was presented to the President of the Russian Federation Vladimir Putin on 14 March 2016 at the meeting of the State Council's Presidium on road safety in Russia.

Key Indicators

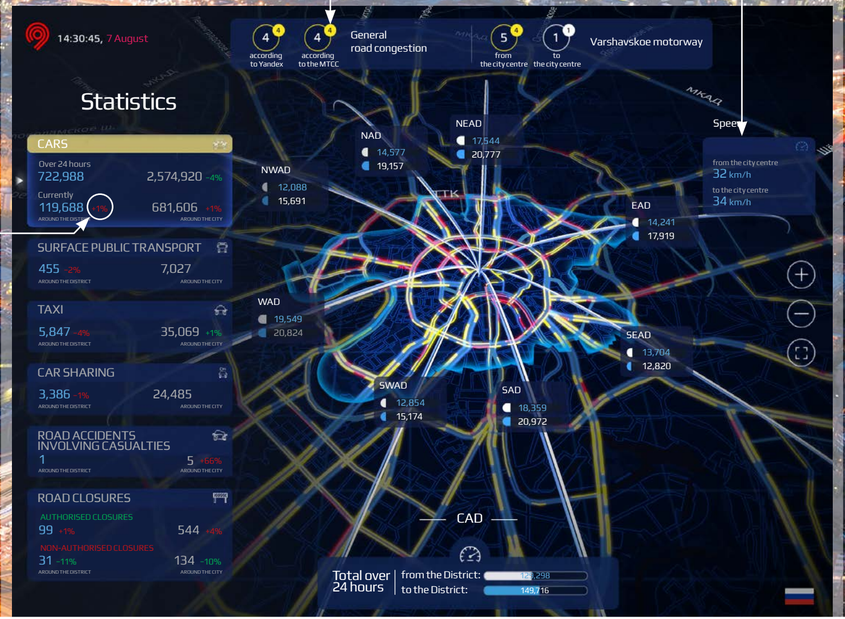
EACH INDICATOR IS COMPARED TO HISTORICAL DATA

For quantitative metrics, the variance between the current indicators and the previous given period is calculated

The data source is the ITS equipment installed on the street and road network, as well as the ITS subsystems

For traffic congestion points, the average score for the period is given in a small circle

The current traffic speed to and from the city centre



The Mayor's Automated Workstation

The Mayor's Automated Workstation is a single traffic situation monitoring system that operates on a 24/7 basis.

>40
DIFFERENT DATA SOURCES

300,000
ITEMS MONITORED

5,000
VIDEO SURVEILLANCE STREAMS

For who?

For the city administration

For what?

- **100%** online monitoring and control of city traffic
- **100%** reporting on the operation of public transport and road infrastructure
- **100%** reporting on the performance of urban services

What does it show?

Urban traffic

- **Traffic congestion:** unique vehicles on the city's roads, average speed, scoring, length of traffic jams
- **Traffic events:** road closures, accidents, emergencies, etc. (with details)
- **ITS equipment** (traffic lights, photo and video recorders and CCTV cameras, traffic detectors, traffic information displays, digital road signs, weather stations, etc.): locations, data, operability
- **Integrated traffic control system:** traffic control projects with technical means of traffic control throughout Moscow (planned)
- **Urban parking:** zones, cost, availability (planned)

Road safety

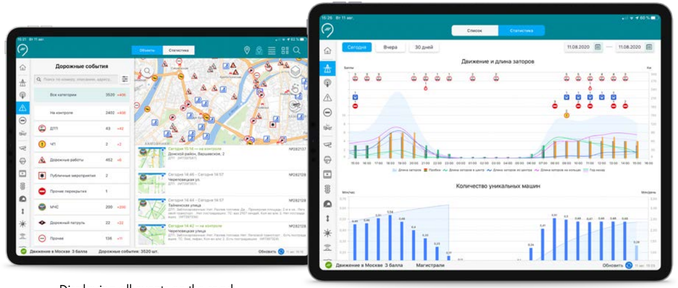
- **Road accidents:** statistics, locations, details
- **Photo and video recorders:** location, efficiency
- **Active accident centers:** locations, details (planned)

Monitoring of surface public transport operation

- Provision of vehicles (the number of vehicles)
- Registration cards for each vehicle
- Location data online
- Live bus arrivals on digital information displays
- Dedicated lanes for surface public transport (planned)

Monitoring the operation of rail transport

- Tracks
- Passenger traffic
- Intervals



Displaying all events on the road

Indicators of the traffic situation

Monitoring the operation of the public bicycle rental system

- Station map
- Usage statistics, sessions, display of free bikes and lanes adapted for Cycling (planned)

Monitoring of service vehicles

- Number of vehicles on the roads
- Location data online

Monitoring the operation of taxis and Car Sharing System

- The number of taxi and Car Sharing System on the roads and their tracks online
- Speed
- Vehicle registration card: information about the company, car, business permit, etc.

Monitoring the Moskva River

- Video surveillance of the River
- River transport monitoring (planned)

Monitoring freight transport movement

- Vehicle registration card: licence plate number, make, model, licence
- Location data online (planned)

Autonomous transport

- Location data online
- Speed
- Vehicle registration card

By zone

- Kremlin Ring
- Garden Ring
- Boulevard Ring
- 19 major routes
- Moscow Ring Road
- The Third Ring Road

The specified Analytics and data, both archived and current and projected, are available throughout Moscow as a whole and with in-depth analysis of key highways.

Analytics is used to make fundamental decisions on the development of the Moscow transport system.

By period

3 horizons

- future (forecasts)
- present (current state)
- past (archives)

Development plans

- **Customised widget:** personalisation
- **Critical event indicator:** warning before reaching a set threshold
- **New services:** MCC, MCDs, parking, river transport
- Key traffic events **digest** etc.
- **Rollout of the Integrated** Traffic Control system

Moscow Transport

MTCC

The Smart Intersection System

Launched in January 2020

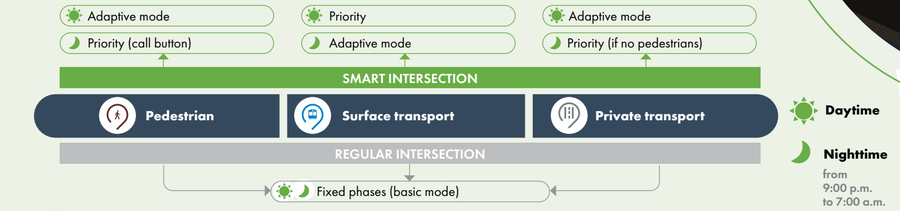
The Smart Intersection system uses inductive-loop detectors and is one of the world's most reliable and popular systems for traffic flow management.

Underground inductive-loop detectors identify public and private transport and help streamline the traffic at the nearest traffic lights.

THE SYSTEM'S BENEFITS

Positive impacts

- **Up to 25%** shorter waiting time for pedestrians at daytime
- The pedestrian has **100%** priority when getting off a tram
- The average public transport speed is **up 15%**
- Passenger traffic volumes with intelligent devices covering the whole route are increased by **up to 10%**
- The intersection's capacity is up **15%–20%**
- **20%–40%** – average reduction in waiting time at intersections thanks to the elimination of any unnecessary pedestrian phases (in all **up to 4 hours** saved during nighttime)



Drawbacks

- Longer waiting times encourage jaywalking
- The yellow-light mode is unsafe at night
- Failure to keep traffic moving at a steady pace
- Decrease in passenger traffic volumes
- Longer fleet turnaround times
- Idling during unnecessary phases
- Decrease in the intersection's capacity due to sub-optimal traffic light operation

Daytime

Nighttime from 9:00 p.m. to 7:00 a.m.

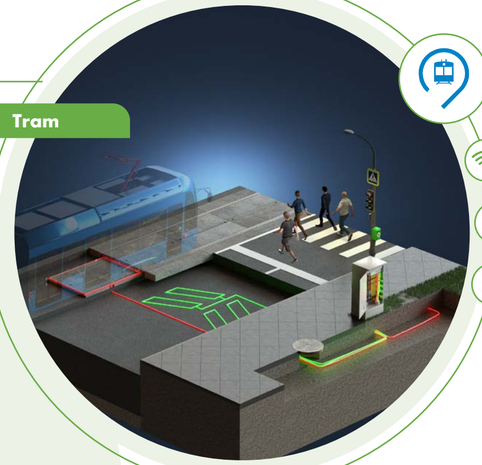
Adaptive mode means that traffic lights process real-time data about the current traffic situation on a given road segment and align the signals correspondingly to streamline traffic.

Reducing travel time for all traffic participants

>465 smart intersections

HOW A SMART INTERSECTION WORKS

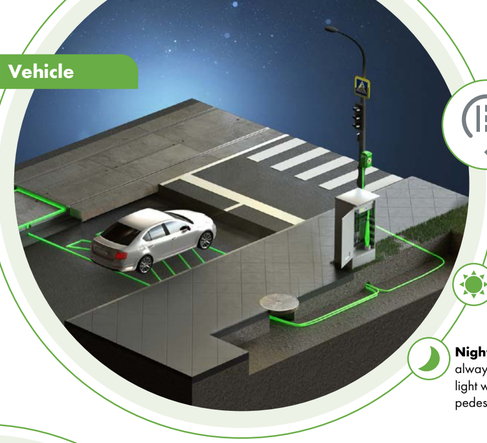
Tram



The tram approaches the intersection, the sensor identifies it as a tram

- The sensor exchanges data with the local adaptive control centre
- The tram is prioritised for a green light
- The green light ensures pedestrians' safety when getting on and off the tram

Vehicle



The vehicle approaches the intersection, the sensor identifies it as a vehicle

- **Daytime:** the green light operates in adaptive mode
- **Nighttime:** vehicles always have a green light when there are no pedestrians

Pedestrian

The pedestrian approaches the traffic lights and pushes the call button

- **Daytime:** the green light operates in adaptive mode
- **Nighttime:** the green light operates in priority mode

Inductive-loop detector:

99.9%

accuracy in vehicle type identification

Interesting fact

In the future, a neural network and machine vision will be used to determine the priority of travel at intersections and control the adaptively coordinated mode of operation of traffic lights.

Leading cities for Smart Intersections

Singapore · London · Sydney

SCATS (Sydney) – **a leading system**

42,000 intersections in **1,800** cities over **40** countries

Command Centre at the Traffic Control Centre

The Command Centre sources data from:

THE COMMAND CENTRE AT THE TRAFFIC CONTROL CENTRE

is a single headquarters ensuring 24/7 monitoring and management of traffic in Moscow in real time

WHAT DOES THE COMMAND CENTRE DO?

Gathers full information about the traffic situation in the city

Controls traffic

Informs road users about the traffic situation and optimal diversions

For details, see pages 66, 68–69

Monitors the condition of the street and road infrastructure: pavement, traffic lights, road signs, displays and other elements of traffic control and sends requests to relevant units to take remedial actions

Helps drivers on the road: in the event of an emergency, the Command Centre can send in the nearest Road Patrol crew or provide a mobile photo and video recorder

For details, see page 76

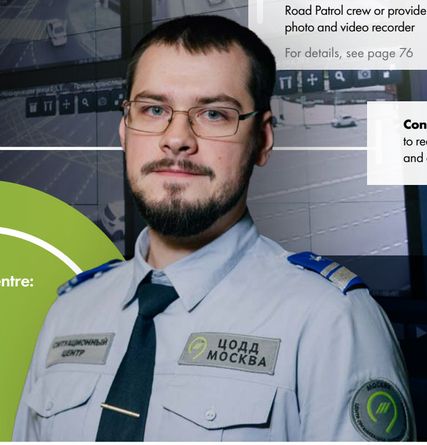
Controls traffic lights to redistribute traffic flows and eliminate traffic jams

Quickly gets in contact with the Main Directorate for Traffic Safety and other relevant authorities in the event of an emergency

The main screen at the Command Centre displays road network utilisation and all traffic monitoring data

On-duty operators at the Command Centre:

18 operators monitor the traffic situation 24/7



The Command Centre was set up in 2013 and currently has 80 employees. With the help of advanced technology, they are able to monitor the traffic of the whole megacity in real time.

The core of the Command Centre is the ITS server

25 PB
TOTAL STORAGE CAPACITY OF THE ITS SERVER

= the total volume OF ALL INTERNET DATA PROCESSED BY GOOGLE IN 2008

= **25,000 years** OF CONTINUOUS LISTENING TO MP3 MUSIC

= **1,300 years** OF CONTINUOUS FILM WATCHING

The Command Centre is scheduled for renovation by end-2022

For details, see page 86–87

Moscow Transport

MTCC

How Does the ITS Respond to Emergencies?

1

Accident

1 ITS equipment

The ITS equipment includes machine vision cameras, sensors and detectors that can recognise emergencies

2 ITS server

Neural networks identify slowdowns in traffic, traffic jams, road accidents and other emergencies and transmit the information to the Command Centre

3 The Command Centre

The Command Centre's on-duty operator receives a signal from the ITS server and takes action:

- Sends in a Road Patrol crew to help manage the incident
- Speaks to the Main Directorate for Traffic Safety (if necessary)

Driver information display shows information on traffic congestion

Digital road signs are signalled to reduce speed limits

Traffic lights change their operation mode to streamline traffic

Informing on the traffic congestion via media channels (radio, TV) and on the Traffic Control Centre's social media pages

2

Road closures

1 ITS server

The road closure parameters are entered into the static model, and the traffic situation is modelled automatically

2

Traffic lights automatically adjust their operation mode

Information displays and digital road signs indicate that a section of road is closed

The Road Patrol controls the traffic in place

The Moscow Transport mobile app takes account of closures and offers alternative routes

Major road closures are reported in advance **via Moscow Transport's social media pages, TV (Moscow 24) and radio channels (Moskva FM, Kommersant FM)**

Personalised updates via SMS: frequent users of the now closed road section receive a text message with landing links to alternative routes

ROAD SAFETY

Moscow has reached a record-high level of road safety

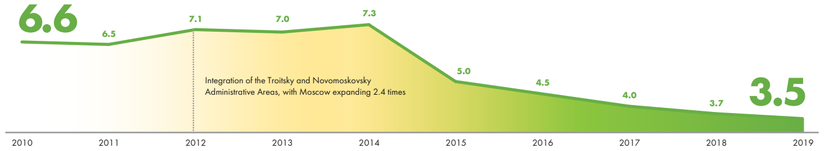
Despite heavy traffic and the growing number of vehicles, Moscow's accident rates have been steadily declining over the last nine years.

One-day snapshot of the street and road network of Moscow:

3.2 million UNIQUE VEHICLES

8 million TRIPS ON INDIVIDUAL TRANSPORT

Changes in social risk in Moscow, road fatalities per 100,000 residents



Social risk almost halved since 2010. The Russian President's instruction to achieve a social risk rate of 4.0 or below by 2024 has been COMPLETED AHEAD OF SCHEDULE.

Moscow is No. 1 in Russia for road safety

Executive Order of the Russian President No. 204 On National Goals and Strategic Objectives of the Russian Federation through to 2024, dated 7 May 2018:

"In developing a national project to build safe and effective roads, the Russian Government should proceed from the need to ensure the achievement of the following goals and targets by 2024 ... reduce the number of road accidents ... to a level not exceeding four persons per 100,000 residents (with the ambition to achieve zero road accidents by 2030)."

Social risk across Russia (2019), road fatalities per 100,000 residents

	Population, million people	Number of vehicles, million		Social risk
Moscow	12.5	4.7	8.0	3.50
The Moscow Region	7.4	3.3		11.03
Saint Petersburg	5.3	2.0		4.12
The Republic of Tatarstan	3.9	1.3		9.41
The Nizhny Novgorod Region	3.3	1.2		10.79

3.5
social risk rate in Moscow

Moscow is leading Russia by population and number of vehicles, while also being the country's safest region.

The social risk rate in Moscow is in line with those of other global capital cities

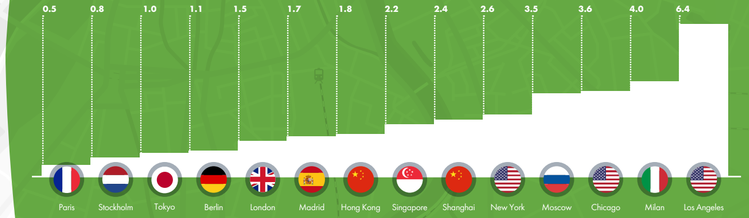


Photo and video recording system

Moscow operates an AI-based photo and video recording system.

AI processes traffic violations captured by cameras to support further administrative tickets punishable by a fine.

Overall, installing new recorders or changing recorder locations improves driving discipline and fosters more careful and prudent driving.

Objectives

- Monitoring traffic on a 24/7 basis
- Recording traffic violations

Impacts

up to 30%
fewer road accidents at recorder locations

Interesting facts

During the pandemic, photo and video recording systems tracked the cars of people who should have been isolating, as well as people who did not have digital permits to travel during lockdown.

For details, see page 91

Moscow is No. 1

in Russia by number of traffic violation types captured by photo and video recording systems

55
traffic violation types captured by the Moscow system

Top 3 MOST FREQUENT traffic violations

1. 
Speeding (2/3 of all tickets)

2. 
Using a transit-only lane

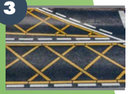
3. 
Failure to comply with markings

1.5 million potential violations captured daily

Top 3 NEW violations captured by the photo and video recording system

1. 
Failing to yield to a pedestrian

2. 
Reversing at a crossroads

3. 
Stopping in a yellow box junction at a red light

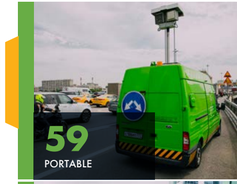
27.5 million traffic tickets issued in 2019 based on processed recorder data

Interesting facts

Road safety cameras have learned to identify passages through parking lots. In the nearest future they will be able to identify drivers with unfastened safety-belts, mobile phone use while driving and other traffic violations.

Moscow's photo and video recording system

2,960 recorders



The layout of photo and video cameras in the city is information open to citizens, it is posted on the Unified Transport Portal.

Moscow Transport MTCC

HOW THE PHOTO AND VIDEO RECORDING SYSTEM OPERATES

Artificial intelligence instead of manual labour

Phase 1 Recording of violations
and number plate recognition

Robot

100%
violations within the area covered by recorders

Photo and video recorders recognise and record offending vehicles.

Phase 2 Verification of violations

Robot

80% standard violations

20 recorders based on neural networks process data by checking the vehicle make and number plate against traffic police information.

Human

20% Sophisticated cases

An employee of the Traffic Control Centre checks whether the recorder correctly recognised the number plate, colour and make of the vehicle and analyses more sophisticated cases to identify whether a violation took place.

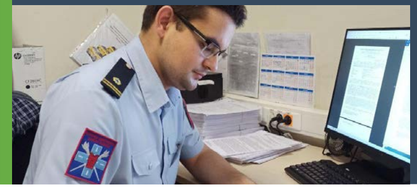
0.0032%
risk of system error

Phase 3 Drafting a ticket

All data coincide

Human

The checked photos are handed over to traffic police or the Moscow Administrative Road Inspectorate. They double-check the violation and issue an administrative ticket.



What is sophisticated cases?

Violations are considered "sophisticated" if there are a number of factors that rule out a violation: construction works, re-marking, completing a manoeuvre, etc.

Examples

- Running a red light
- Failure to comply with road signs and markings

The development outlook of the photo and video recording system until 2025

- Upgrading the camera fleet with next-gen recorders
- Increased capacity
- More complex neural networks
- A new pilot system for intercepting and searching launched in the Central

The Traffic system

Photo and video recorders monitor all traffic flows in Moscow on a 24/7 basis.

The system provides a full analysis of all vehicle movements within Moscow, which helps law enforcement authorities to quickly identify vehicles and/or persons wanted by the police: stolen vehicles, vehicles driven by criminals, vehicles failing to stop after an accident or illegal carriers.

80 million
VEHICLE TRIPS RECORDED PER DAY

5 times
FEWER CAR THEFTS SINCE 2010

Vision Zero

Moscow is committed to Vision Zero, a global concept identifying key mortality and accident drivers and implementing a wide range of initiatives to address them.

Key causes and factors of road accidents

Collision with a pedestrian outside pedestrian crossings

Breaching the rules for driving across pedestrian crossings

Trucks

Motorbikes

Traffic offences in residential areas

Driving while under the influence of alcohol

Speeding

443
ROAD FATALITIES IN MOSCOW IN 2019

Accident statistics – For details, see page 14

What do we do as part of our commitment to Vision Zero?

1. Analyse accident rates and improve the road safety performance of the Traffic Control Centre
2. Communication campaigns to promote compliance with traffic rules
3. Designing a safe road transport infrastructure

VISION ZERO INITIATIVES

Effective traffic control

TRAFFIC SCHEME REVISED ALONG
3,200 KM
OF MOSCOW'S STREET AND ROAD NETWORK (80%)

Safe geometry to reduce speeds and prevent chaotic parking

For details, see pages 48–51

Installing photo and video recorders

Up to 30%
FEWER ROAD ACCIDENTS AT RECORDER LOCATIONS

Photo and video recorders prevent speeding within accident cluster sites

For details, see pages 38–41

Data transmission to navigation services

A unique service in Russia

Information on roadworks and closures, accident site clusters and camera locations

Map of accident cluster sites | Map of road closures | Map of camera locations

Addressing accident cluster sites

3.5 TIMES
FEWER ACCIDENT CLUSTER SITES IN MOSCOW SINCE 2010

The Vision Zero team has been analysing severe road accidents and designing improvements since 2019

Team members

- Traffic Control Centre
- Mosgortrans
- Traffic police
- Association of Administrative and Technical Inspectorates (OATI)
- Prefectures of administrative districts
- Automobile Roads
- Department of Housing, Utilities and Amenities
- Department of Major Repairs and Construction

Roadworks

24/7
MONITORING OF THE STREET AND ROAD NETWORK CONDITION

100%
OF ROADS ARE IN GOOD CONDITION

Freight transport movement control

21%
FEWER ROAD ACCIDENTS INVOLVING TRUCKS

Freight framework, truck passes, truck weigh stations

For details, see page 70

The safety of children on roads

79 CHILDREN'S LIVES
SAVED SINCE 2010

The transmission of data on the location of children's facilities to navigation services, video lessons from the Moscow Government, road safety lessons at schools, etc.

Educating and raising awareness on road safety

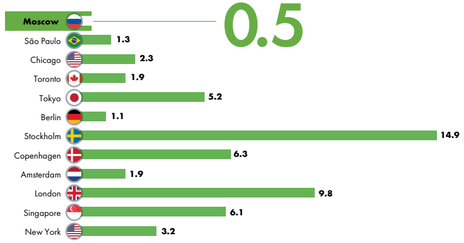
For details, see pages 46–47

SPEEDING IS THE MAIN CAUSE OF ROAD ACCIDENTS

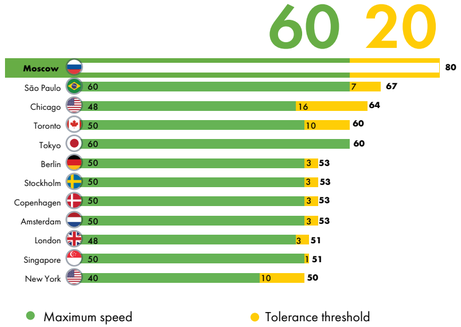
Moscow is among the cities with the highest speed limits and lowest fines globally. This results in high accident crash fatality rates.

Risk of road fatality for pedestrians, %

Minimum fine, RUB '000



Speed limit and tolerance threshold, km/h



What happens at high speeds?

Safer roads require:

A tolerance threshold reduction to **10** KM/H

Lower speed limits in the city centre

Increased penalty charges for breaking traffic rules

COMMUNICATION CAMPAIGNS – PROMOTING COMPLIANCE WITH TRAFFIC RULES

Social advertising

177
TEMPORARY TRAFFIC INFORMATION DISPLAYS

135
CITY BILLBOARDS IN A RANGE OF FORMATS

@codd_moscow
#CODDforsafety
#postaccident

Contests with a prize fund

Video lesson contest

415 LESSONS

8 WINNERS

24 PRIZES

7.2 MILLION RUB
IN CASH GRANTS AWARDED TO WINNERS

Watch the winning videos

All videos are posted on the Moscow Electronic School's website

Road safety lessons for schoolchildren

70
LESSONS PER YEAR

Lectures, celebrations, campaigns

3–5
EVENTS PER YEAR

Visits to the Command Centre

30
VISITS PER YEAR

Moscow Transport MTCC

TRAFFIC CONTROL

Traffic Control Design

Process participants

MTCC · Mosgortrans · Moscow Parking Administrator · The Main Directorate for Traffic Safety · Prefectures of administrative districts · Automobile Roads

2010–2020

TRAFFIC SCHEME REVISED ALONG
3,259 KM
OF MOSCOW'S STREET AND ROAD NETWORK
(50% OF THE ENTIRE STREET AND ROAD NETWORK INCLUDING TINAO, OR 80% WITHIN MOSCOW'S FORMER BOUNDARIES)

3,271
TRAFFIC CONTROL PROJECTS
TRAFFIC CONTROL PROJECTS DEVELOPED
FOR MOSCOW'S STREET AND ROAD NETWORK

>500
TRANSPORT SCHEMES DESIGNED FOR RECONSTRUCTION AND IMPROVEMENT PROGRAMMES

Based on traffic control projects and transport schemes

>370 KM
OF DEDICATED LANES ESTABLISHED

3,000
PEDESTRIAN CROSSINGS
BUILT OR UPGRADED
(20% OF ALL PEDESTRIAN CROSSINGS)

100%
PARKING SPACES REVAMPED
(123,000)

100%
OF MOSCOW DISTRICTS
(671 STREETS) WITHIN THE FREIGHT FRAMEWORK ZONE

>10 METRO STATIONS CLOSED WITH PRIORITY PASSAGE ARRANGED FOR RAIL REPLACEMENT SURFACE SERVICES

TEMPORARY TRAFFIC CONTROL SCHEMES DESIGNED
FOR **200** LARGE-SCALE ENTERTAINMENT EVENTS (INCLUDING THE 2017 FIFA CONFEDERATIONS CUP AND THE 2018 FOOTBALL WORLD CUP)

How is a traffic control project done?

Traffic situation analysis: gathering traffic and pedestrian flow data (using the ITS – cameras and detectors)

Development of solutions for traffic improvement

Mathematical modelling in the ITS's Statistical Model to verify that the selected solution is correct

Development and approval of traffic control projects

A dedicated traffic coordinator in your district

Each administrative district in Moscow has a dedicated traffic coordinator responsible for traffic control: road signs, markings, pedestrian crossings, parking spaces and traffic lights. The Traffic Control Centre's specialised unit, the Directorate of Traffic Control, employs more than 57 people. Meetings with residents at the Traffic Control Centre's office are held quarterly to discuss suggestions.

For information about the meetings and registration to attend, see the Getting in Touch section on pages 106–107

>50,000
TRAFFIC MANAGEMENT SUGGESTIONS FROM CITIZENS PROCESSED SINCE 2010

Marathon of Ideas (January 2020–March 2020)

The Marathon of Ideas project enabled any citizen to present their ideas to improve traffic and public transport via an electronic platform.

2,052 IDEAS SUBMITTED BY CITIZENS

100% REVIEWED

873 IDEAS (100 OF THEM STRATEGIC) WILL BE IMPLEMENTED BY END-2021

TOP 3 IDEAS SUBMITTED BY CITIZENS

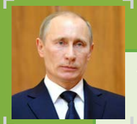
Access from Govorovo Metro Station to Meshchersky Les housing estate:
86 citizen requests
TIMEFRAME – UNTIL 2021

Keeping a "u-turn permitted" sign at Nametkina Street near Rodnoy Gorod housing estate:
55 citizen requests
TIMEFRAME – UNTIL 2020

Bicycle path on Lyusinovskaya Street:
11 citizen requests
TIMEFRAME – UNTIL 2021

The Integrated Traffic Control System and Maintenance of Technical Means of Traffic Control

The Integrated Traffic Control System is a single strategic approach to traffic control throughout Moscow



> Ensure that local governments develop the Integrated Traffic Control System in relevant municipal districts.
>
> **Vladimir Putin,**
> President of the Russian Federation

100%
of Moscow (excluding TiNAO) is covered by the ITS

The integrated traffic control system development strategy is currently being worked through for the next **15 years**

The Integrated Traffic Control System Automated Information System (AIS)

The Integrated Traffic Control System AIS is a single digital data warehouse comprising traffic control projects and technical means of traffic control throughout Moscow. All information on traffic control is stored on one digital platform. Currently, a strategy for the system's further development is being worked through.

Interesting facts

In 2020, the Traffic Control Centre started building a digital model of Moscow's transport and road infrastructure. The city's 3D model is the foundation for introducing autonomous transport and the Vehicle-to-Everything (V2X) system into daily life. The key objective now is to improve navigation quality and citizens' mobility experience.

Leading cities:

New York, Singapore, Shanghai

Examples of traffic control projects

Maintenance of Technical Means of Traffic Control

Technical means of traffic control comprise devices, structures and images used to control and manage traffic (road signs, hardscape elements, etc.)

402,000
ROAD SIGNS ACROSS MOSCOW

~60,000
ROAD SIGNS REPAIRED OR INSTALLED ANNUALLY

40 crews
SERVICE ROAD SIGNS EVERY DAY

~180,000
REQUESTS FOR ROAD SIGN REPAIRS PROCESSED EVERY DAY

24 hours
AVERAGE TURNAROUND TIME FOR ROAD SIGN REPAIRS

Communication channels:
- Written requests from citizens
- Our City portal
- Meetings with residents
- Directorate of Street and Road Network Construction and Operation
- Patrol department and other departments of the Traffic Control Centre, etc.

WHAT WE DO FOR MOSCOW RESIDENTS

Our guiding principles are safety and a comfortable environment for all Moscow residents

Moscow Transport MTCC

WHAT WE DO FOR MOSCOW RESIDENTS

For Pedestrians

I walk around the city

Traffic must be safe above all for the most vulnerable participants – pedestrians and cyclists.

A single navigation system

Each element is designed for a specific location.

Maps are oriented in the direction pedestrians are facing, like the maps for in-car navigators, which enables fast and intuitive navigation.

Street lights with sound and vibration modules

help visually impaired and hearing impaired pedestrians cross the road.

The pedestrian crossing button

reduces waiting times at an intersection on average by 20%. It is used either in places where people rarely cross the road, or at night.

Traffic management in residential areas

The Traffic Control Centre develops guidelines for traffic control in residential areas to prevent parking lots from replacing green spaces and children's playgrounds and to make residential areas safe for pedestrians.

Diagonal crossings

save time at intersections where the green light for pedestrians comes up in all directions at once.

20%

WAITING TIME AT TRAFFIC LIGHTS WITH PEDESTRIAN CROSSING BUTTONS AND AT DIAGONAL CROSSINGS

Changing street geometry

prevents drivers from speeding at a straight section and makes crossings safer for pedestrians.

New surface crossings

Locations are selected following the analysis of traffic flows, informal crossing points, accident statistics, and on-site observations. Thus, a pedestrian crossing can be established where it is most convenient for residents. Usually, it does not reduce the street capacity.

Pedestrian islands

improve mutual visibility for pedestrians and motorists and enable safe road crossing in two stages.

We design streets with the following in mind:

- Improving pedestrian connections
- Building a barrier-free environment for wheelchair users
- Installing new plants and street furniture

Sidewalk widening

is performed by redesigning the "excess" street and road network capacity – usually, in areas preceding bottlenecks.

Modernised streets

410 streets, major routes, squares, embankments and public spaces modernised since 2010

2 times more space for pedestrians

Twice as often

Muscovites opt to walk on Moscow's streets (five times as often in summer)

Moscow has become pedestrian friendly!

Honourable mention at the Sustainable Transport Award

for reorganising the city space and improving conditions for pedestrians (Washington, USA, 2018)

For Public Transport Passengers

I choose a route

The Moscow Transport mobile app

Builds multimodal routes that take into account all possible modes of transport, calculating travel time, the number of transfers, the total travel cost, and the arrival time – all in real time. The app also notifies the user of deviations and possible delays, offers information on nearby attractions, counts steps and calories, and allows the user to chat with fellow passengers, as well as many more features.

For details, see page 66

New passenger shelters

The Traffic Control Centre is responsible for updating information displays at passenger shelters with the latest surface transport arrival times.
When designing transport hubs, surface public transport stops are moved closer to metro and suburban railway stations to cut down transfer time between one mode of transport and another.

3,458
PASSENGER SHELTERS

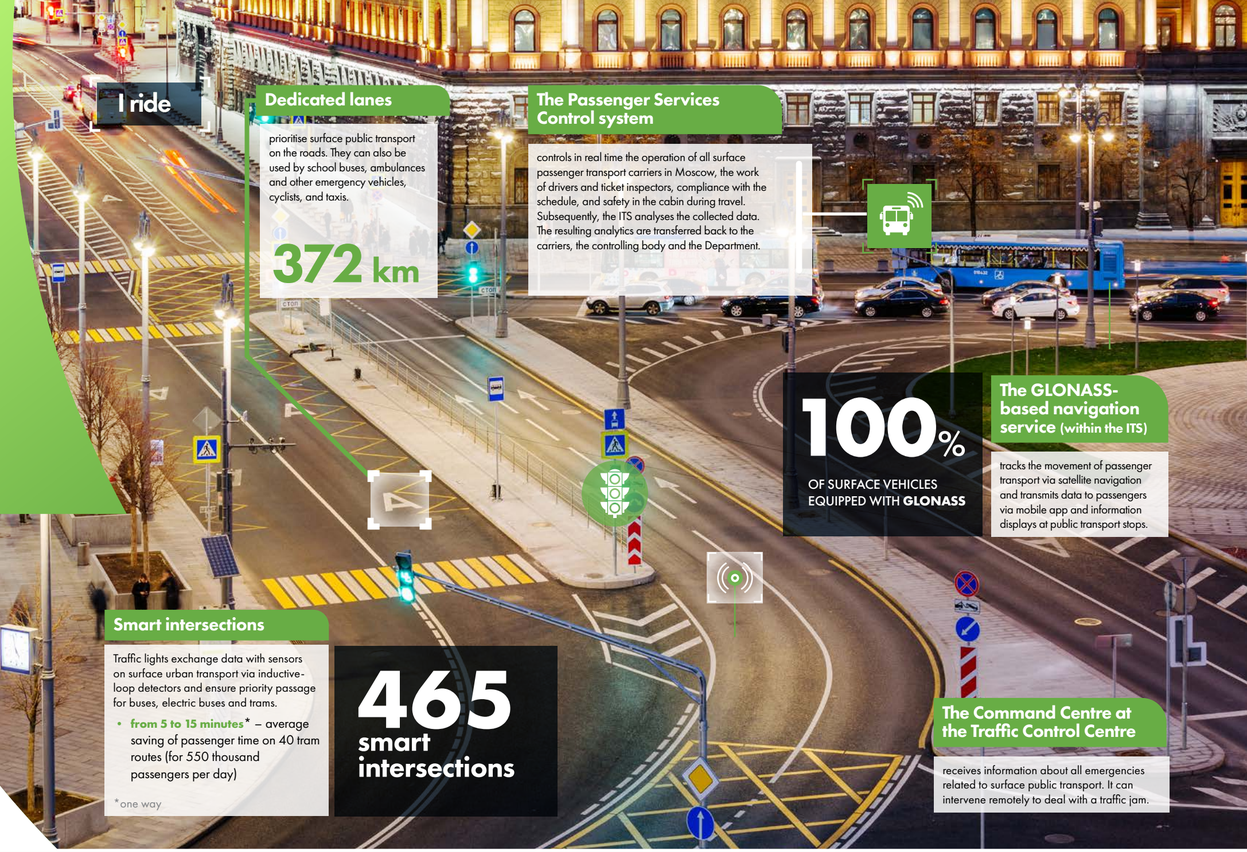
Drive-through passages for Magistral network routes

Due to the specifics of the Garden Ring, some routes could not cross it and buses had to turn around and go back. Drive-through passages are designed to enable buses to cross the Garden Ring.

6
DRIVE-THROUGH PASSAGES ESTABLISHED

for 14
ROUTES WITHIN THE MAGISTRAL NETWORK

2 to 10 minutes
OF PASSENGERS' TIME SAVED ON THE ROUTE



Dedicated lanes

prioritise surface public transport on the roads. They can also be used by school buses, ambulances and other emergency vehicles, cyclists, and taxis.

372 km

The Passenger Services Control system

controls in real time the operation of all surface passenger transport carriers in Moscow, the work of drivers and ticket inspectors, compliance with the schedule, and safety in the cabin during travel. Subsequently, the ITS analyses the collected data. The resulting analytics are transferred back to the carriers, the controlling body and the Department.

100%
OF SURFACE VEHICLES EQUIPPED WITH **GLONASS**

The GLONASS-based navigation service (within the ITS)

tracks the movement of passenger transport via satellite navigation and transmits data to passengers via mobile app and information displays at public transport stops.

Smart intersections

Traffic lights exchange data with sensors on surface urban transport via inductive-loop detectors and ensure priority passage for buses, electric buses and trams.

- **from 5 to 15 minutes*** – average saving of passenger time on 40 tram routes (for 550 thousand passengers per day)

*one way

465 smart intersections

The Command Centre at the Traffic Control Centre

receives information about all emergencies related to surface public transport. It can intervene remotely to deal with a traffic jam.

For Cyclists and Scooter Users

Cycling infrastructure

3.5 million
MOSCOW RESIDENTS USE BICYCLES
(27% OF THE POPULATION)

Traffic Control Centre Bicycle Patrol

reminds drivers that it is forbidden to park on bicycle paths and pavements.
In addition, patrol officers are trained in first aid, monitor road signs and traffic lights, give directions to people when they get lost and help cyclists with minor repairs.

For details, see page 77

Bicycle paths

A bicycle is the most convenient and safe mode of transport in Moscow. Bicycle paths are located in parks and protected areas, as well as along the Moscow streets. Bicycle paths can run within a district, between neighbouring districts, or connect suburbs with the city centre.

Cycle crossings

A special cycle crossing next to a pedestrian crossing offering improved road safety. Where there is no such crossing, cyclists must dismount before crossing (get off the bicycle and walk the bicycle next to you through the crosswalk).

895 km
OF BICYCLE PATHS AND LANES (INCLUDING DEDICATED LANES)

296 km
OF BICYCLE PATHS AND LANES
ON THE ROAD NETWORK AND IN PARKS

599 km
OF DEDICATED LANES
(ONE WAY)

Bicycle parking

designed to store private bikes near workplaces and housing estates.

2,200
BICYCLE PARKING FACILITIES

11,290
PARKING SPACES

1 INDOOR PARKING FACILITY (FILATOV LUG)
FOR LONG-STAY PARKING OF PRIVATE BIKES

Public bicycle rental system

6,511
BICYCLES
WITHIN THE RENTAL SYSTEM

629
BICYCLE RENTAL STATIONS

73
DISTRICTS COVERED
(50% OF ALL DISTRICTS)

5 million
RIDES PER SEASON IN 2019

Rental e-scooters

6,000
E-SCOOTERS

8,000
RIDES PER DAY
DURING THE SEASON

Bicycle rental

Velobike is Moscow's public bicycle rental service available 24/7 from April to October.

The Velobike mobile app will help you find the nearest available bike and plan your route.

Velobike app

Московский Транспорт ЦОДД

For Motorists

I drive

Road markings

Intelligent design and road marking system

No BOTTLENECKS

Improved visibility on roads

- LED strip lighting on traffic lights
- Internally-illuminated road signs
- Red outline for filter lights

Personalised communications

SMS and push notifications about traffic diversions and road closures on your route

Paid on-street parking

85,600 parking spaces, including 9,500 disabled spaces

Information display

displays speed limits, weather conditions, road utilisation and accidents. Information is updated every few minutes.

177 information displays

Adaptive traffic light

monitors traffic along the entire street. Turns on depending on traffic density.

Yellow box junctions

delineate congested junctions.

Rumble strip

alerts drivers to areas prone to road accidents, upcoming pedestrian and level crossings, steep hills.

Road sensor

detects speed, counts passing vehicles and exchanges data with the Command Centre for traffic monitoring and control.

In-car radio

On-duty operators at the Traffic Control Centre's Command Centre give traffic updates on Moskva FM and Kommersant FM.

Photo and video recorders detect

3.2–3.5 million

VEHICLES ON THE MOSCOW STREETS EACH DAY

No. 1 in the world

FOR SMART PARKING SPACE ARRANGEMENT

(Tom-Tom, The Netherlands, 2017)

For All Moscow Residents

Next-generation transport hubs

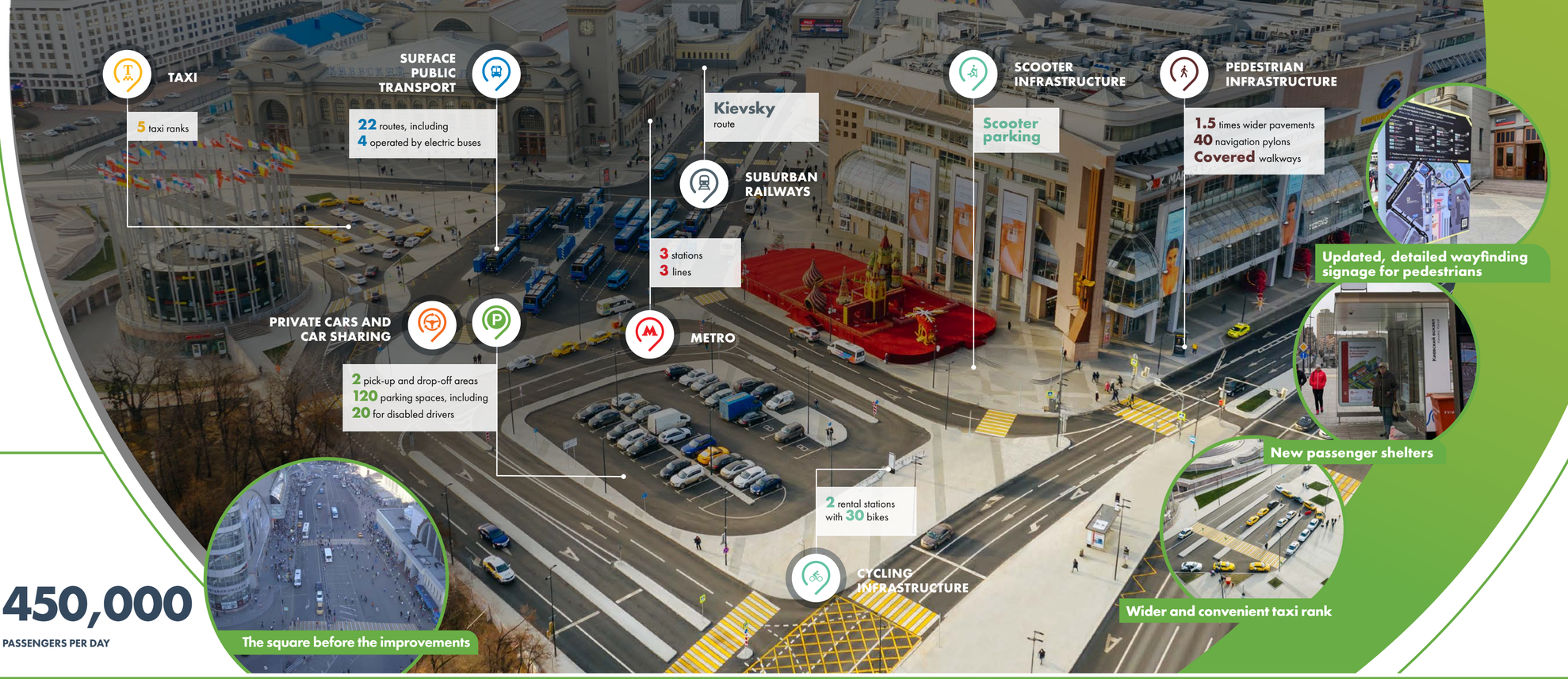
A new dimension of convenience for multimodal journeys:
ALL MODES OF TRANSPORT feature seamless infrastructure

Kievsky Railway Station Square

Since October 2019

A unique project implemented in 2019 took a comprehensive approach to 15 nearby streets to create a perfect minidistrict, accommodating the needs of pedestrians, public transport passengers and motorists. Speed limits in residential areas of the Dorogomilovo District were lowered to 40 km/h. Bolshaya Dorogomilovskaya, however, is a transit street and a traffic artery with dedicated lanes, parking facilities along relief roads, improved pedestrian infrastructure, convenient pedestrian crossings and islands.

450,000
PASSENGERS PER DAY



Updated, detailed wayfinding signage for pedestrians

New passenger shelters

Wider and convenient taxi rank

The square before the improvements

Savelovsky Railway Station Square

Since September 2019

Savelovsky Railway Station Square is a transport hub with passenger traffic coming from Savelovsky railway station, two metro lines (the Serpukhovsko-Timiryazevskaya and Big Circle lines), Moscow Central Diameters (MCD-1) and surface public transport. The creation of a new transport hub involved the reconstruction of Savelovsky Railway Station Square.

260,000

USERS PER DAY

The square before the improvements

PRIVATE CARS AND CAR SHARING

1 pick-up and drop-off area
21 parking spaces

TAXI

1 taxi rank

METRO

2 stations
2 lines

PEDESTRIAN INFRASTRUCTURE

1.5 times wider pavements
8 navigation pylons

SUBURBAN RAILWAYS

Kursky route
Savelovsky route
Belorussky route

SURFACE PUBLIC TRANSPORT

15 routes, including
3 operated by electric buses
1 night service

CYCLING INFRASTRUCTURE

1 rental station with **15** bikes

Pedestrian tunnel

New passenger shelters

Updated, detailed wayfinding signage for pedestrians

Moscow Transport | MTCC

Digital Services for Muscovites

The Traffic Control Centre develops and rolls out digital services to make getting around the city **FAST AND CONVENIENT**

- Suburban railways
- Taxi
- Car sharing
- Private car
- Bicycle rental
- Rental e-scooters
- Walking
- Water transport
- Cable car
- Metro
- MCC
- MCDs
- Surface public transport

Features:

- Support for visually impaired passengers
- Plans routes for passengers with reduced mobility
- "Green" routes (in 2021)

The Moscow Transport mobile app

Since December 2019

An integrated transport app for Moscow that combines all types of transport services on a MaaS (Mobility-as-a-Service) basis. It plans the optimal route from door to door considering all modes of transport, taking into account personal preferences and needs, travel time, passenger traffic and road congestion, with the fare paid at a single point of payment.

1.2 million
DOWNLOADS

>8 million
ROUTES PLANNED SINCE LAUNCH

AVAILABLE IN
6 languages
RU | EN | CN
SP | FR | DE

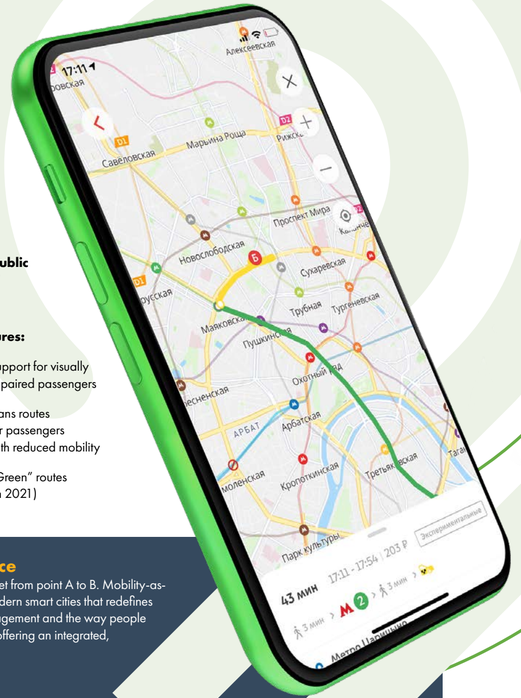
★★★★½ 4.4

★★★★½ 4.6

Mobility-as-a-Service

The app plans the best route to get from point A to B. Mobility-as-a-Service is a key element of modern smart cities that redefines transport and infrastructure management and the way people approach day-to-day travel by offering an integrated, improved mobility solution.

What can you do with the app TODAY?



- **Plan** the optimal route considering all modes of transport including traffic jams and overlaps
- **Calculate** travel time and total cost
- **Get** a free Shuttle bus ticket to the largest offices in Moscow (City Shuttle, SBER Shuttle)
- **Leave** feedback, **find out** news and information about transport service
- **Check** if a transport service offers a Wi-Fi connection and is barrier-free
- **Find out** your bus, electric bus or tram arrival time
- **Top up** your Troika card and other tickets online
- **Chat** with fellow passengers
- **Find** tourist attractions nearby
- **Find out** the flight schedule of intercity, international and suburban buses and buy a ticket

What will you be able to do with the app TOMORROW?

Plans until the end of 2021

- Single point of payment
- Transport utilisation
- Personalized notifications, etc.

How have mobile apps helped people during the COVID-19 pandemic?

For details, see page 94

★★★½☆ 3.2

★★★★☆ 3.8

The Moscow Assistant, a super service

It is not just a mobile app to enforce parking rules, but also a hardware and software system with three additional modes of operation:

Parking Inspectors (since 2016) – an app installed on parking inspectors' tablets to report violations

Citizen Feedback (since 2017) – more than 22,000 forms submitted

Stationary cameras (since 2018) – 260 cameras will be in operation by 2020 year-end

>1 million
DOWNLOADS

1.5 million
TICKETS ISSUED USING MOSCOW ASSISTANT WORTH 4 BILLION RUB.

The Moscow Assistant Mobile App

Since September 2015

A unique mobile app allowing residents to regulate public parking in Moscow. The app is fully automated, eliminating the possibility of fraud or user error.

- A world-first solution
- Has all the necessary certification for automation solutions

Which violations can be reported?

- Parking on a yellow line
- Parking beyond no stopping and no waiting signs
- Not paying for public parking
- Parking on a lawn
- Issues with bikes or rental stations (since June 2020)
- Parking on the pavement (cameras)

Each reported violation, completed task or achievement awards the user points that can be redeemed for parking, transport services, tickets to events and much more.

IN 2021, THE MOSCOW ASSISTANT SUPER SERVICE WILL BE INTRODUCED
across 16 regions
OF THE CENTRAL FEDERAL DISTRICT

Moscow Transport | MTCC | Safe transport

TAILORED COMMUNICATIONS

Since 2017

The Traffic Control Centre has partnered with the Safe Transport Innovation Centre to send targeted SMS and push notifications about changes to public transport services and the traffic situation to Muscovites based on their specific travel behaviours, profiles and triggers.

>250
CONDUCTED INFORMATION CAMPAIGNS

>300
DEVELOPED SPECIAL LANDING PAGES

>4.5 million
MUSCOVITES COVERED

How does the system work?

Transport user

Trigger for notification message

Selects target segment using big data analytics

Targeted, tailored SMS or push notification with a landing link

Messaging scenarios

Trigger:
Closure metro stations "Lermontovsky Prospekt", "Zhulebino" and "Kotelniki"

SMS with diversions

Passenger

Trigger:
Start of the motorcycle season

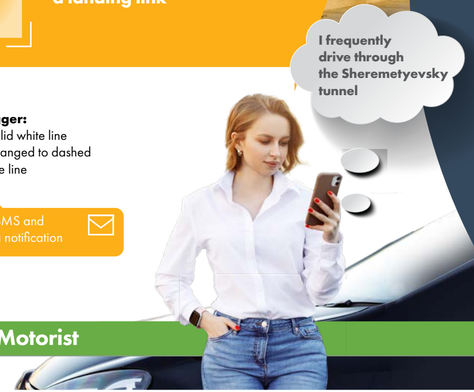
SMS with a reminder of the safety rules

Motorcyclist

Trigger:
A solid white line is changed to dashed white line

SMS and a notification

Motorist



Triggers for notification messages

Top 3 MOST COMMON triggers

1. **Changes to a passenger route**
   - Closure of a metro station
   - Surface transport route change
   - Road closures
2. **Alternative routes for passengers**
   - Faster
   - More convenient
   - Cheaper
3. **City events**
   - Meetings with local residents
   - Competitions
   - Moscow Transport Day

Top 3 BIGGEST triggers

1. An automated permit control system introduced during the COVID-19 pandemic
2. Transport services and traffic control in areas surrounding the 2018 Football World Cup venues
3. Traffic diversions for the May holidays and Victory Day Parade

1 million
NOTIFICATIONS

150,000
NOTIFICATIONS

300,000
NOTIFICATIONS

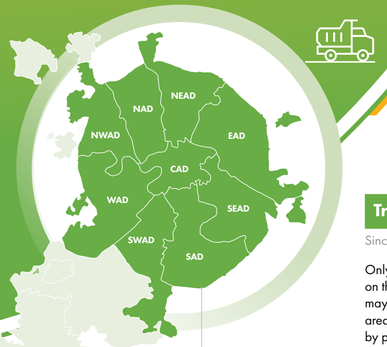
Мосгортранс ЦОДД

Environment

10% from enterprises

90% from vehicles

Emission sources in Moscow



The freight framework zone
September 2020

Freight transport movement control

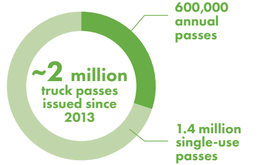
671 streets
ACROSS 9 DISTRICTS WITHIN THE FREIGHT FRAMEWORK ZONE

100%
OF MOSCOW WITHIN THE FREIGHT FRAMEWORK ZONE (THE MOSCOW RING ROAD)

Truck pass system

Since 2013

Only trucks listed on the Register of Valid Passes may operate in restricted areas. Rules are enforced by photo and video recorders, as well as law enforcement officers.



Freight framework

Since 2014

Restrictions:

- 24/7 prohibition from operating outside the freight framework
- Freight framework streets: trucks with a maximum permitted laden weight of over 2.5 tonnes may operate
- Residential areas: trucks may operate only to serve businesses or citizens within a residential district

12%
FEWER TRUCKS ON MOSCOW'S ROADS

93%
OF RESIDENTS SUPPORT THE FREIGHT FRAMEWORK

Truck weigh stations

47,000 VIOLATIONS IDENTIFIED

150,000 TRUCKS WEIGHED

Since 2013

An overweight truck presents a hazard to all road users and causes increased road damage. Therefore, the Traffic Control Centre and the staff of the State Motor Transport Central Administration of the Federal Transport Oversight Service operate weigh stations.

Prohibitions

- Trucks that **do not meet Euro 3 emissions standards** are prohibited from operating within and on the Third Ring Road
- Trucks that **do not meet Euro 2 emissions standards** are prohibited from operating within and on the Moscow Ring Road

Restrictions

- **From 06:00 to 22:00:** trucks with maximum laden weight of **over 12 tonnes** are prohibited from operating within the Moscow Ring Road
- **From 06:00 to 22:00:** trucks with maximum laden weight of **over 1 tonne** are prohibited from operating within the Third Ring Road

EMISSION REDUCTION INITIATIVES are a key focus area for the Traffic Control Centre

Improving and promoting public transport

Expanding the railway framework and dedicated lane network, improving service quality and the loyalty programme

66%
OF PUBLIC TRANSPORT TRIPS ARE MADE IN ENVIRONMENTALLY FRIENDLY PASSENGER VEHICLES

Paid parking

A global trend and a call to abandon the use of private cars in cities

123,000
PARKING SPACES AT URBAN PARKING FACILITIES (PAID ON-STREET PARKING LOTS, AT-GRADE PARKING LOTS WITH LIFTING GATES AND PARK-AND-RIDE FACILITIES)

Next-gen urban mobility models

Bicycle rental system
For details, see page 59

Rental e-scooters
For details, see page 59

Electric car sharing (**50** vehicles since its 2019 launch)

Improving pedestrian infrastructure

For details, see pages 54–55

Encouraging the use of electric vehicles

2013
Free parking

2019
230 charging stations across Moscow

No vehicle tax

2023 plan
1,200 charging stations across Moscow

5-fold
GROWTH IN THE NUMBER OF ELECTRIC VEHICLES SINCE 2015

Key objectives until 2023

Reducing transport emissions by:

- reducing the use of vehicles with poor emission standards
- encouraging the use of "green" transport for commuting

URBAN HEALTH

To reduce the negative impact of transport on the environment, Moscow follows the global trend in developing its transport system.

GREENPEACE

Greenpeace, the world's leading environmental organisation, considers the Moscow Government's efforts to introduce electric transport a breakthrough.

Moscow Transport

MTCC

1 ELECTRIC BUS =

0 annual emissions

57 CARS

- An electric bus can carry 85 passengers
- 1.5 car occupancy rate

782,000 tonnes of emissions from cars per year

"GREEN" TRANSPORT

Moscow Transport

MTCC

1 ELECTRIC BUS =

0 annual emissions

The **ELECTRIC BUS** is a next-gen form of public transport – comfortable, fast and safe. It helps cut road congestion and drastically reduce emissions in the city.

"GREEN" AND COMFORTABLE CITY FREE OF TRAFFIC JAMS

Assistance on the Roads

Traffic Control Centre Patrols

What does the Road Patrol do?

ROLES

- Help drivers in the event of road accidents and emergencies
- Tow disabled vehicles from the road to a safe spot
- Monitor the condition of the road, traffic lights and road signs
- Help fill in Europrotocol forms
- Monitor compliance with safety requirements during construction and maintenance works on roads and streets
- Manage traffic during mass gathering events
- Provide first aid or support in emergencies
- If necessary, direct traffic to manage traffic jams
- Complete any other tasks from the Command Centre

27 crews 24/7

Road Patrol – since 2017

What equipment do Road Patrol crews have?

The Tetris Challenge flash mob

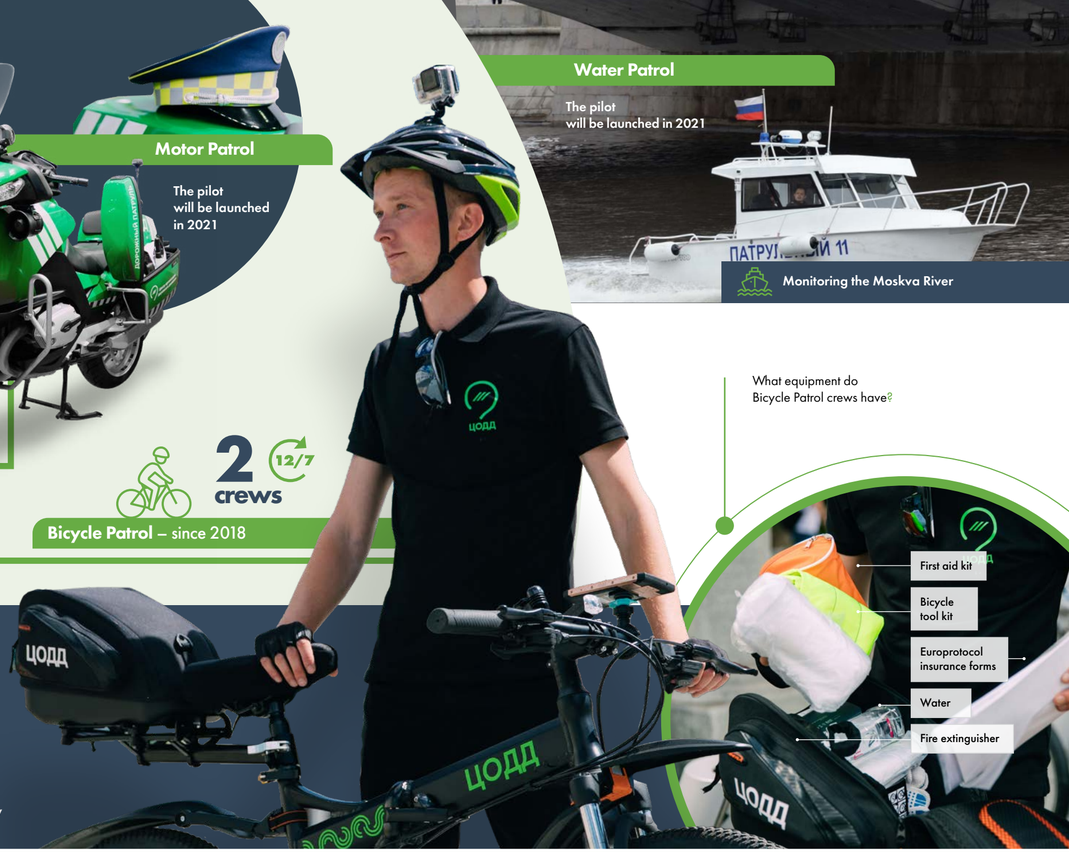
Motor Patrol

The pilot will be launched in 2021

2 crews 12/7

Bicycle Patrol – since 2018

- Monitor the condition of bicycle paths and racks
- Monitor gross and dangerous violations of parking rules with the Moscow Assistant app



Water Patrol

The pilot will be launched in 2021

Monitoring the Moskva River

What equipment do Bicycle Patrol crews have?

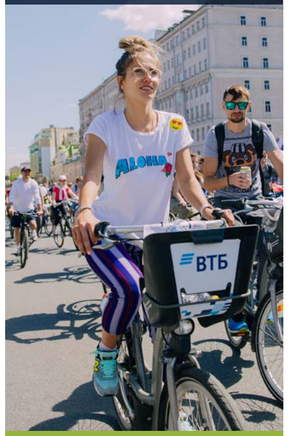
Traffic Control Centre Activities

Motorcycle parades

8 MOTORCYCLE PARADES
SINCE 2017

>35,000
PARTICIPANTS

Cycling festivals



30 CYCLING FESTIVALS
SINCE 2014

>400,000
PARTICIPANTS

The 2018 Football World Cup
in Moscow
Summer 2018

~1 HOUR
TO TRANSFER FANS FROM A STADIUM ON AVERAGE

THE LARGEST
INFORMATION DISPLAY IN EUROPE

2,7 MILLION
HAPPY FOOTBALL FANS

For details, see pages 92–93

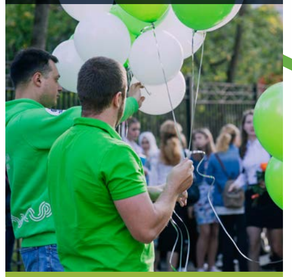
Safe Planet
a children's festival
in Sokolniki

>1,000
PARTICIPANTS
EACH YEAR

July 2019

A Guinness World Record: 2,700 people created the largest human image of a bicycle

Traffic safety awareness campaigns



BACK TO SCHOOL CAMPAIGN

CHILDREN'S MOBILE COMPLEX OF PHOTO AND VIDEO RECORDING

A SUPERHERO
AT THE PEDESTRIAN CROSSING

THE DANCING TRAFFIC LIGHT

SOYUZMULTFILM
MOBILE COMPLEX OF PHOTO AND VIDEO RECORDING

SEE AND BE SEEN CAMPAIGN

Video lesson contest
Road safety for all
December 2019

415 LESSONS

8 WINNERS

24 PRIZES

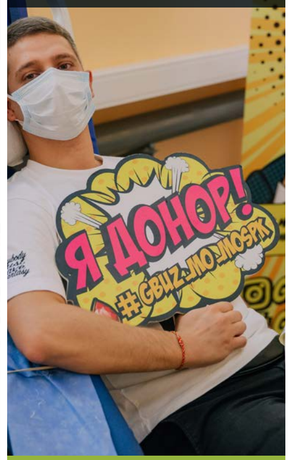
RUB **7.2** MILLION
IN CASH GRANTS AWARDED TO WINNERS

For details, see page 46

The Baikal Mile 2020
festival
December 2019

100 PARTICIPANTS
FROM AROUND THE WORLD, INCLUDING THE TRAFFIC CONTROL CENTRE'S TEAM

Donor Day
July 2020



63 TRAFFIC CONTROL CENTRE EMPLOYEES DONATED BLOOD

ADVANCED TECHNOLOGIES for Moscow Transport of the Future

2011 2012 2013 2014 2015 2016 2017 2020+

OUR ADVANCED TECHNOLOGIES OF THE FUTURE

- Big data analytics – fine-tuning of transport operations
- MaaS – a marketplace for transport services

For details, see the Digital Services for Muscovites section – page 66

- Biometrics – a new level of safety and service
- The ITS – unlocking the full potential, process automation and robotics
- Autonomous transport – the future is here

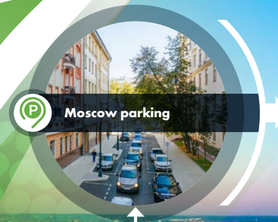
Big data analytics

The Traffic Control Centre has established partnerships to collect and analyse big data on urban mobility and the operation of the transport system of Moscow

Moscow Transport ensures the privacy of the data on its own system and its users' data, strictly adheres to applicable Russian laws and applies international standards for collecting, storing, protecting and processing data in its operations.

Big data analytics help improve the RELIABILITY, PUNCTUALITY, SAFETY and the level of SERVICE of the Moscow transport system and create a convenient infrastructure

Safe transport



Moscow parking

We help users check if there are vacant slots in a chosen parking lot

The service is being developed as part of the Moscow Transport mobile app

Big data

Parking sessions and coordinates

Surface transport

Big data

Data on vehicle location

We ensure that surface transport arrives on schedule and that the service quality is high

We do this by analysing:

- the number of vehicles on routes
- schedule performance
- estimated times of arrival
- the provision of replacement transport services when necessary (for example, in case of road or underground station closures).

The analytics for each route are submitted to carriers and controlling bodies to address weaknesses.

Cycling infrastructure

We open new bicycle and scooter rental stations, bicycle lanes and paths and parking lots for private bikes

We do this by analysing:

- the demand for bicycle rental services at each station
- popular cycling routes

Big data

Cycling sessions and coordinates

Big data

- **Location data**
- **Road accident statistics by factor**
- **Parking**

Big data

- **Location data**
- **Road accident statistics**
- **Taxi driver licences**

Car sharing

We improve car sharing safety and service quality

We do this by identifying:

- persistent traffic offenders
- spots where shared cars cause parking issues and a nuisance to local residents
- demand for car-sharing services.

We send the data to car-sharing operators and the controlling body to develop regulations (new parking terms for car sharing, the necessary and adequate size of the city's car-sharing fleet, etc.).

Taxi

We improve taxi safety

We do this by identifying:

- traffic offenders
- taxis operating under a third-party driver account (only the Traffic Control Centre can identify and handle such cases)
- taxis that do not comply with the single standard for Moscow taxis
- cases of overworking (>10 hours).

We send the data on each driver and taxi that violate the rules to taxi aggregators to block them in the system, and to the controlling body to take appropriate measures and develop regulations to support the further evolution of the taxi industry.

We improve the quality of passenger transport services

We do this by analysing:

- demand hotspots for taxi services; the analytics are used in planning spots for taxi ranks, pick-up and drop-off areas as well as surface transport routes.

We send the analytics to the controlling body to be used in planning spots for taxi ranks, pick-up and drop-off areas as well as surface transport routes.

BIOMETRICS – a New Level of Safety and Service on Public Transport

Today

Improving metro safety – measures taken since 2019

Metro CCTV with facial recognition sends photos to the server. Special algorithms extract biometric identifiers from the photos and compare them with the criminal database of law enforcement agencies. Then a signal is transmitted to the tablet of an Administration of Internal Affairs officer in the Moscow Metro who can detain the suspect.

~5,000
CAMERAS IN THE METRO

265
WANTED OFFENDERS DETAINED

100%
COVERAGE OF METRO STATIONS SINCE SEPTEMBER 2020

20 % less offences in the metro

Interesting facts

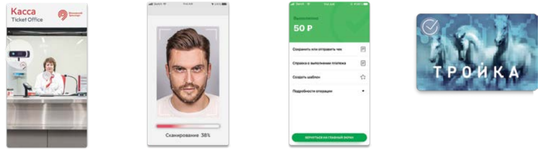
Going forward, the solution will also help find missing people, for example senior citizens or children who have gotten lost

In the near future

Instant payment and entry to the metro through the turnstiles

Fast travel card top up

1. Image taken by a ticket office camera
2. The photo is compared to the app's database
3. An online request is made to the passenger's bank
4. Travel card is topped up



Passing through a turnstile

1. Image taken by a turnstile camera
2. The photo is compared to the app's database
3. The turnstile opens
4. Payment is taken from the passenger's bank or Troika card

The facial recognition system was first successfully used in Moscow during the 2018 Football World Cup

1.89 million FANS

50 CAMERAS CONNECTED TO THE SYSTEM

<2 SECONDS IDENTIFICATION TIME

~100 WANTED OFFENDERS DETAINED

95.5%
ACCURACY OF FACIAL RECOGNITION FROM A VIDEO

Interesting facts

Zhengzhou

Facial recognition glasses can identify a person's name and address in 2–3 minutes.

The facial recognition system automatically searches for a match in the database.

Wuzhen

The Eye in the Sky facial recognition technology is used to detain criminals.

The ITS – unlocking the full potential, process automation and robotics

Renovation of the Command Centre

- Launch – **2021**
- Completion – **2022**

- **3x boost** of the ITS server's data management capacity
- **The world's most advanced** equipment
- **Automation and robotics,** including the implementation of neural networks
- **Enhanced functionalities** available with new equipment

Unlocking the full potential of the ITS by 2023 and further development to 2040

For details, see pages 18–21

AUTONOMOUS TRANSPORT – the Future Is Here

Driverless cars can already be seen on Moscow roads. Their spread in Moscow and across Russia is driven by technology improvement, cooperation with leading manufacturers at the city and national level, development of the legal framework and relevant urban infrastructure.

BENEFITS OF AUTONOMOUS TRANSPORT

Improved safety – elimination of the human factor that is the cause of over 70% of road accidents

Reduced traffic congestion (shorter travel time, better travel time predictability) – digital control, automatic distribution of flows along optimal routes

Financial accessibility – keeping fares unchanged by reducing carriers' HR expenses, despite the cost of buying autonomous vehicles

actual

planned

2018

- The Russian Government's resolution on the conditions permitting autonomous vehicles to operate for a test period is adopted
- The testing of Yandex driverless cars is launched in Moscow
- An agreement on the development and introduction of autonomous transport is signed between the Mayor of Moscow, Yandex, NAMI, GAZ Group, and KAMAZ

2019

- The partially automated Vityaz-Moscow tram is tested
- A driver fatigue monitoring system for bus and tow drivers is tested
- An agreement on cooperation in developing autonomous transport is signed between the Mayor of Moscow and Renault Russia

2020

- The Traffic Control Centre's driverless Mobile complex of photo and video recording is tested, certified and put into service (MosTransProekt)
- An unmanned vehicle was launched on the territory of the Pirogov Municipal Hospital No. 1 for the transport of dangerous goods

A vehicle that transmits data about itself and exchanges data with infrastructure and other road users

A recreation of Moscow's transport system (road signs, pedestrian crossings, traffic lights, roundabouts, as well as streets with different numbers of lanes, U-turns and exits)

2020–2023

- Develop a pilot to automate the MCC
- 5G network coverage
- Amend Customs Union regulations to enable these vehicles to be brought to market
- Adapt staff training programmes
- Develop an intellectual map of Moscow for driverless vehicles – a digital model of the street and road network (MosTransProekt, Traffic Control Centre)
- Test a connected car prototype
- Test a fully-fledged driverless tram prototype
- Launch a new testing ground for autonomous transport on the territory of the Dmitrov city circle (jointly with NAMI and Rosavtodor)

2024–2030

- Autonomous private and public transport to be used everywhere:
  - Metro
  - Suburban railways
  - Trams
  - Buses, electric buses
  - Private cars
  - Taxis
  - Trucks

Industry leaders (manufacturers)

Mercedes-Benz, DAIMLER, RENAULT NISSAN, PSA PEUGEOT CITROËN, General Motors, Volkswagen, BMW, TESLA, YUTONG, nauva, SCANIA, KAMAZ

Industry leaders (software developers)

MOBILEYE, Cognitive Technologies, Google, Yandex

Three development horizons for the emergence of autonomous transport

1. **Legal regulation:**
   - Create a regulatory framework to stimulate technology development – subsidies, tax benefits, etc.
   - Improve legislation governing the use of autonomous transport – develop standards, requirements, concepts.
2. **Urban infrastructure development:**
   - Create intellectual transport maps of Moscow
   - Upgrade metro and tram infrastructure
   - Improve mobile communication quality, set up a backup Wi-Fi network
   - Set up the infrastructure for electric vehicles
3. **Cooperation between Moscow Government and technology leaders** – collaboration, access to infrastructure (public roads and public transport infrastructure).

The world's first driverless Mobile complex of photo and video recording is operated by the Traffic Control Centre

Development and testing:

- MosTransProekt
- ROSDORNII
- MADI (institute)
- NAMI

Watch a video about the Traffic Control Centre's driverless Mobile complex of photo and video recording

- **Software:** Russian Institute of Radionavigation and Time
- **Creation of the digital map – a digital twin of the testing ground:** MosTransProekt
- **Fine-tuning and testing period:** November 2019–January 2020
- **Testing ground:** the NAMI Testing Centre
- **Launch:** in operation from February 2020, monitoring public parking lots in the Basmanny district (with an operator observing)

The Traffic Control Centre's driverless Mobile complex of photo and video recording is on the shortlist for the Winter City contest.

Driverless metro

OPERATES IN MORE THAN **25 countries**

Driverless metro technology works with longer intervals between trains than the average peak hour intervals on the Moscow metro.

Current status in Russia: Ural Locomotives produced a driverless Lastochka train; a pilot to automate the MCC is under development.

Copenhagen, Milan, Seoul, London, Paris, Singapore

Buses

TESTED IN MORE THAN **30 cities**

Current status in Russia: the SHUTTLE driverless bus is being developed by the NAMI Institute in cooperation with Yandex, testing is underway..

Berlin, Las Vegas, Tallinn, Bern, Paris, Helsinki

Cars

Current status in Russia: Yandex and StarLine are testing driverless cars in the city and on highways with an engineer observing. The Traffic Control Centre's driverless Mobile complex of photo and video recording successfully passed testing.

Boston, Pittsburgh, Miami, San Francisco, Phoenix, Singapore

Trucks

Current status in Russia: NTS has presented the first driverless truck. KAMAZ announced plans to launch production of driverless vehicles in 2025.

Tucson, Phoenix, El Paso

UNCONVENTIONAL CASES

Moscow During the COVID-19 Pandemic

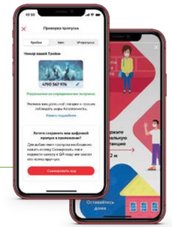
During the mandatory self-isolation amid the COVID-19 pandemic in April–June 2020, the Moscow Transport and Moscow Assistant apps proved a real help for Muscovites and the Moscow authorities in monitoring movements around the city and preventing the further spread of COVID-19 in Moscow.

MOBILE APPS

Moscow Transport

is a single digital assistant that Muscovites used to travel around the city during the pandemic.

1. **Check your digital permit**
2. **Receive a digital permit** (using the Troika card; licence plate or transport pass number that can be saved in your Wallet for quick access; or a point on a map)
3. Find out information on the schedule system for taking walks outside and **park crowdedness**
4. Find out information on the location of the nearest **pharmacies, stores or hospitals**
5. Quickly receive **helpful information** on COVID-19 (update on the situation in the city, new travel rules)
6. Find out **crowdedness of public transport** on your route



around 650,000
PERMIT CHECKS BY USERS IN TOTAL

over 15,000
CHECKS MADE OF PARK CROWDEDNESS

24/7
ONLINE CHAT

Top 2
BY **APPSTORE** AND **GOOGLE PLAY** RANKINGS FOR NAVIGATION

The Moscow Assistant

is used by the authorities to follow up compliance with the lockdown rules during the pandemic.

1. **Digital permits checked** by inspectors of Organizator Perevozok, the Moscow Administrative Road Inspectorate, JSC Central Exurban Passenger Company, traffic police and taxi drivers
2. Patients checked against the **KARANTIN** lockdown database
3. Schedule for **talking walks** outside
4. Evaluate **visitor intensity** in parks
5. Ability to report a **gathering**
6. Report a **taxi driver** if they do not wear a mask or gloves, or if they are sneezing

around 250,000
CHECKS PER DAY (INCLUDING 140,000 BY TAXI DRIVERS)

over 35,000
USERS PER DAY

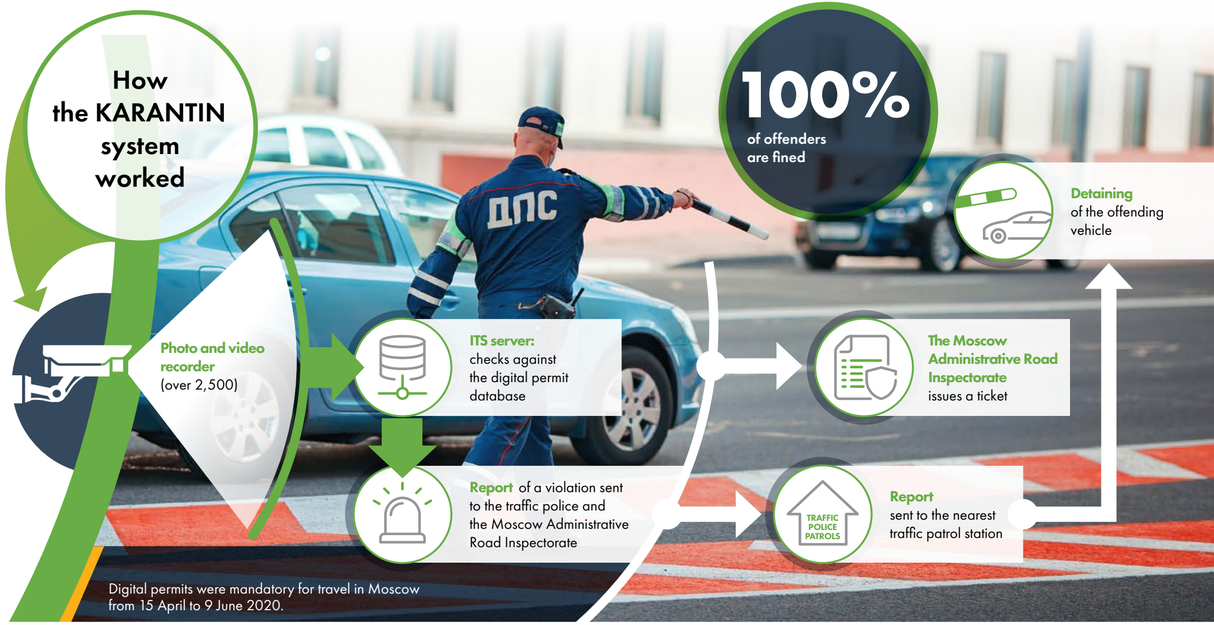
9 million
PERMIT CHECKS IN TOTAL

12th place out of 704
GLOBALLY FOR THE MOST USEFUL INNOVATIVE SOLUTIONS CREATED IN RESPONSE TO COVID-19,
3RD PLACE IN MOSCOW (CORONAVIRUS INNOVATION MAP AT CORONAVIRUS.STARTUPBLINK.COM, MAY 2020)

THE KARANTIN SYSTEM

During the COVID-19 pandemic, the Traffic Control Centre designed and launched an automated system leveraging over 2,500 photo and video recorders to report vehicles travelling without digital permits to law enforcement authorities in real time.

The system saved police time and resources and helped them to engage with people who violated the high-alert rules decreed by the Moscow Mayor and lockdown requirements.



Transport Services for the 2018 Football World Cup

"It was an incredible, amazing World Cup! These past couple of years I said that the 2018 World Cup would be the best of all time. Now I can say it again, convinced that this is the best world championship in history.

Gianni Infantino,
FIFA President

Eleven Russian cities hosted the 2018 Football World Cup over twelve stadiums.

The opening, semi-final and final matches were played at Luzhniki Stadium.

64 matches held, including 12 in Moscow

Spartak Stadium

45,000 SEATS
5 MATCHES
OVER **220,000** FANS VISITED THE STADIUM DURING THE MATCHES

Luzhniki Stadium

81,000 SEATS
7 MATCHES
OVER **546,000** FANS VISITED THE STADIUM DURING THE MATCHES

Fan Festival

25 DAYS
1.9 MILLION PEOPLE VISITED THE FAN FESTIVAL

The Traffic Control Centre:

1 Designed and deployed a special traffic control scheme for travelling

around to the World Cup stadiums (in partnership with MosTransProekt).

13 TRANSPORT SCHEMES DESIGNED

2 Set up a regional transport management centre

Based on the Command Centre of the Traffic Control Centre.

Operated 24/7 in a heightened mode **throughout the World Cup**, monitoring all trips and crowds of fans.

TWICE THAN WERE USUALLY INVOLVED

TWO TIMES FASTER RESPONSE TO EMERGENCIES

NO MAJOR INCIDENTS ON PUBLIC TRANSPORT

3 Ensured the availability of special-purpose equipment

- **Command bus** – a mobile command centre with access to all data from the intelligent management system, aggregating all information on movements within the city. A command centre for monitoring and managing the situation on the ground.
- **An information display** installed near the entry to Luzhniki Stadium was used by the Traffic Control Centre to display traffic management information and important emergency notices. Mobile information displays were also installed within one kilometre around the stadiums with information on road closures, the nearest public transport stops and metro stations. A total of 22 information displays were installed. All information was repeated in English.
- **Mobile biometric systems** were used at the Fan Festival.

5 × 20 metres EUROPE'S LARGEST DISPLAY

50 CAMERAS CONNECTED TO THE FACIAL RECOGNITION SYSTEM

<2 SECONDS TO IDENTIFY A PERSON FROM A VIDEO

~100 INDIVIDUALS RECOGNISED AND DETAINED BASED ON DATA FROM THE NATIONAL CRIMINAL DATABASE

4 Employees of the Traffic Control Centre took on extra responsibilities

- **Road Patrol**
  25 crews were actively involved in traffic management around the stadiums during matches and at fan attraction sites..
- **Youth Council of the Traffic Control Centre**
  18 volunteers helped **more than 15,000 fans** find their way to transport facilities.

Interesting facts

The World Cup and huge inflow of tourists into the city did not affect the traffic situation. The average traffic congestion score during the evening peak hours was 5 points, while the highest congestion score stood at 7 points, and was only registered three times during the World Cup.

Special recognition for the successful organisation of transport services for the 2018 Football World Cup (CIHT Awards 2020, UK)

CIHT AWARDS 2020 COMMENDED Transport Planning

~1 HOUR TIME REQUIRED TO CLEAR CONGESTION AROUND THE STADIUM – A RECORD FOR TRANSPORT ARRANGEMENTS AFTER MASS EVENTS

770,000 TOTAL NUMBER OF SPECTATORS AT ALL MATCHES AT LUZHNIKI AND SPARTAK STADIUMS

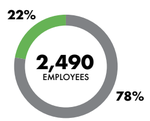
Safe transport

90% OF FANS USED MOSCOW TRANSPORT TO ARRIVE AT AND LEAVE STADIUMS AND WERE HAPPY WITH OUR TRANSPORT ARRANGEMENTS

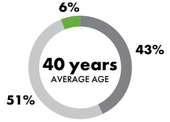
98% SATISFACTION AMONG FOREIGN FANS

OUR EMPLOYEES

Since 2010, the team of the Traffic Control Centre has considerably expanded the road infrastructure and created one of the world's largest intelligent transport systems for smart traffic management.

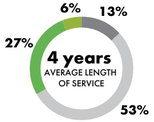


- Men
- Women



- Young people (under 35 years)
- From 35 years to the retirement age
- Working retirees

- Blue-collar employees
- Managers
- Specialists
- White-collar employees



- Below 1 year
- 1 to 5 years
- 5 to 10 years
- 10 to 20 years

1,379
employees (55%)
WITH HIGHER EDUCATION DEGREES

150
employees
HAVE BEEN WITH THE TRAFFIC CONTROL CENTRE OVER 10 YEARS

MARIA GRIGORIADIS,

Deputy Head of the Department of Automated Fixed Photo and Video Recording at the Directorate of Photo and Video Recording (5 years with the Traffic Control Centre)

My colleagues and partners from photo and video recording jokingly call me the Queen of Cameras. After 15 years of banking experience, I switched to a new field at the Traffic Control Centre, which has been historically 'reserved' for men. I know a lot about cameras, if not everything, and I have been continuously expanding my knowledge. I work in an awesome Team, and my colleagues value performance in priority areas, as do I. Road safety comes first, followed by public transport priority and then creating a friendly environment for all road users. This is what we are working towards every day."

SERGEY ZHURAVLEV,

Team Leader at the Road Patrol (4 years with the Traffic Control Centre)

I've been with the Road Patrol since it was created. When patrolling in Moscow, I monitor the condition of road infrastructure and can fix any issues on the spot myself. I help drivers in challenging situations, from simply providing them with information to helping them change wheels or offering any other assistance. Our vehicles are equipped so well that they help us address road situations quickly and effectively. I'm committed to help all motorists, ignoring no one."

ALESYA ORLOVA,

Mobile complex of photo and video recording driver, Vostok unit (4 years with the Traffic Control Centre)

When I heard about the vacancy at the Traffic Control Centre, my friends told me: 'A woman behind the wheel, come on, they aren't going to hire you!' But I had seven years driving experience by that time – quite a while. I was hired despite the common stereotype. The Traffic Control Centre turned out to be an awesome and friendly team of professionals. I believe I'm helping our big city to avoid the chaos of street parking, and I'm making our roads safer."

ILNUR SABIROV,

Directorate of Photo and Video Recording dispatcher (6 years with the Traffic Control Centre)

I joined the Traffic Control Centre six years ago to drive a vehicle with a mobile photo and video recorder. I used to drive along different routes and I always shared my ideas with the unit's head, like 'it's better to cut through this street here' or 'use this route because it's usually empty'. For me, it was an excellent experience that helps me today to build better routes for drivers and for the city."

OLESYA MAKAVEYEVA,

Patrol officer at the Road Patrol (3 years with the Traffic Control Centre)

Our job is about helping drivers on the roads. I've been with the Road Patrol for almost three years, and have never regretted it once. The more challenging the situation is, the quicker, smarter and more resourceful you need to be, and the quicker the working day goes by. I do the same work as my male teammates and can tackle any task assigned to me. My colleagues value and respect me and always support me in challenging situations."

ALEKSANDR BELOV,

Installer of steel and reinforced concrete structures for traffic control facilities (almost 8 years with the Traffic Control Centre)

What's the most important thing about my work? Signs! It's the driver's ABC. Every day I install signs on roads. It's usually windy out here, so the key thing is to make sure everything's fastened tight."

IVAN LAZAREV,

Driver of a vehicle with a portable photo and video recorder, Vostok unit (almost 16 years with the Traffic Control Centre)

I can deploy the system in ten minutes. I park my vehicle at places where a fixed camera can't be installed. My presence makes drivers slow down, leading to safer roads."

ALEKSANDR KHRISTOYEV,

Mobile complex of photo and video recording driver, Vostok unit (5 years with the Traffic Control Centre)

Over 10,000 vehicles are processed by my system every day. Over five years on this job, there are increasingly fewer offenders, with congestion declining. My job is extremely important for my fellow city residents."

ALEKSANDR DEGTYARYOV,

Chief On-Duty Operator at the Command Centre (15 years with the Traffic Control Centre)

"Keeping my finger on the pulse of a big city is so exciting. My job is like a real-life video game! I monitor the city on a huge screen. Over 100,000 cameras help me look into even the most remote corners of Moscow. At times, I handle dozens of road incidents and events over a day. Our Command Centre runs like clockwork."

ALEKSEY AKSININ,

Senior Shift Leader at a Truck Weigh Station (over 12 years with the Traffic Control Centre)

"Over my 12 years here, I've risen from a unit mechanic to Senior Shift Leader at the Weighing and Logistics Section. Over that period, I've weighed over 4,000 vehicles and issued over 2,000 scale tickets. We now also have the Freight Framework, an automated assistant. The freight framework makes the city cleaner, more user-friendly and above all, safer."

ZINAIDA LEVACHYOVA,

Head of two Moscow Transport service centres (4 years with the Traffic Control Centre)

"As soon as I heard about the launch of the service centres, I knew it was the thing for me! I like the idea that the two service centres have become one team and that anybody can come here and find a solution to their problems. My key priority is that people leave us with a smile on their face and their problems solved. Over my four years here, more than 1.2 million people have gotten in contact with the two service centres on various matters related to Moscow's transport. I am extremely proud that we are the fastest at getting problems sorted."

DMITRY CHUZHANOV,

Chief Specialist at the Directorate of Traffic Control (over 5 years with the Traffic Control Centre)

"I am responsible for the Eastern District. All traffic control projects in this District are my responsibility. I monitor every sign and marking there. I also meet local residents and representatives of district councils and prefectures to listen to their proposals and suggestions and make them a reality."

ALEKSEY SHUMILIN,

Leading Specialist (2nd grade) at the Section for Improving Traffic Light Management (almost 6 years with the Traffic Control Centre)

"My job is to make sure that all traffic lights in the east of Moscow work as smoothly and accurately as possible. I'm in charge of some 700 traffic lights! As far as I see it my key task and motivation is to make sure that Muscovites move around the city without a hitch."

MARIYA BROVARNIK,

Data Processing Technician at the Photo and Video Recording Data Processing Section (9 years with the Traffic Control Centre)

"After all these years with the Traffic Control Centre, I can pretty much figure out any make of car with my eyes closed (meaning "with ease" – editor's note)! I like to share my experience with new employees and thanks to our impressive teamwork there are increasingly fewer violations with every passing year."

DMITRY GORSHKOV,

Deputy Head of the Traffic Control Centre for the Intelligent Transport System (almost 7 years with the Traffic Control Centre)

"We communicate a lot with international and Russian IT developers and experts. We seek out the best innovations to improve smart traffic control in Moscow, testing and evaluating different systems and their applicability to the city. This is a continuous improvement process. We are absolutely confident that, if not for the ITS in its current form, it would be much harder to travel around Moscow."

ARTUR SHAKHBAZYAN,

Deputy Head at the Traffic Control Centre, Head for Vision Zero Programmes and Development of Pedestrian and Bicycle Infrastructure (over 5 years with the Traffic Control Centre)

"Our team has only one priority – people. How do they feel in big cities? Are they sufficiently protected by the urban environment? Have we minimised the threats to people's lives and health? Do they feel comfortable? We are constantly looking at the development journeys of the most comfortable and people-centered cities. We also strive to build a truly sustainable and resilient transport system that will always allow residents to choose a mode of transport to get to work, to theatre or to a meeting with friends, be it public transport, a private car, a bike or by foot."

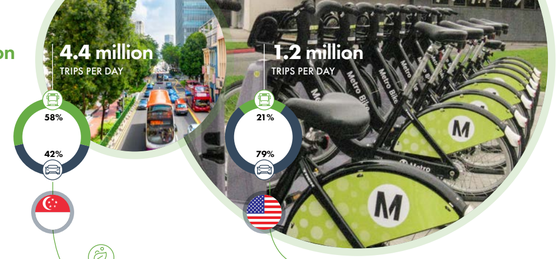
MOSCOW AND GLOBAL CITIES

Moscow Transport · MTCC

Daily passenger trips within the city

Private transport

Surface public transport



ALTERNATIVE FUEL

A SINGLE TRANSPORT APP

TRANSPORT STRATEGY AND MOBILITY

THE INTELLIGENT TRANSPORT SYSTEM AND ROAD SAFETY

MOSCOW

20 million TRIPS PER DAY

70% · 30%

Moscow Transport

Electricity

Population, mln people	12.6
Area, sq m	1,100
Density, people per sq m	4.8
Motorisation, vehicles per 1,000 people	298
Public transport development strategy	✓
On-street parking fee	RUB 40–380
Congestion charge	✗
Holistic approach to road safety	✓
Government regulation of surface transport	✓
Government regulation of taxi services	✓
Government support for car sharing	✓

NEW YORK

7.7 million TRIPS PER DAY

62% · 38%

myMTA

Electricity, biodiesel

Population, mln people	8.5
Area, sq m	1,213
Density, people per sq m	10.7
Motorisation, vehicles per 1,000 people	223
Public transport development strategy	✓
On-street parking fee	USD 1–4 (RUB 65–265)
Congestion charge	✗ Since 2021 Cars – RUB 770 Trucks – RUB 1,600 Tolls for bridges and tunnels – RUB 640–1 200
Holistic approach to road safety	✓
Government regulation of surface transport	✓
Government regulation of taxi services	✓
Government support for car sharing	✓

SINGAPORE

4.4 million TRIPS PER DAY

58% · 42%

Mytransport.sg

Electricity

Population, mln people	5.5
Area, sq m	718
Density, people per sq m	7.6
Motorisation, vehicles per 1,000 people	90
Public transport development strategy	✓
On-street parking fee	SGD 1,2–2,4 (RUB 58–115)
Congestion charge	✓ Range – RUB 20–275
Holistic approach to road safety	✓
Government regulation of surface transport	✓
Government regulation of taxi services	✓
Government support for car sharing	✓

LOS ANGELES

1.2 million TRIPS PER DAY

21% · 79%

Go Metro Los Angeles

Electricity, biodiesel, hydrogen

Population, mln people	4.0
Area, sq m	1,300
Density, people per sq m	3.1
Motorisation, vehicles per 1,000 people	410
Public transport development strategy	✓
On-street parking fee	USD 0,5–4 (RUB 35–280)
Congestion charge	✗
Holistic approach to road safety	✓
Government regulation of surface transport	✓
Government regulation of taxi services	✓
Government support for car sharing	✓

SHANGHAI

17.9 million TRIPS PER DAY

81% · 19%

Shanghai Transport

Electricity

Population, mln people	24.2
Area, sq m	6,300
Density, people per sq m	3.8
Motorisation, vehicles per 1,000 people	123
Public transport development strategy	✓
On-street parking fee	CNY 7–15 (RUB 63–135)
Congestion charge	✗
Holistic approach to road safety	✓
Government regulation of surface transport	✓
Government regulation of taxi services	✓
Government support for car sharing	✓

BERLIN

4.4 million TRIPS PER DAY

66% · 34%

VBB BVG

Electricity, hydrogen

Population, mln people	3.5
Area, sq m	891
Density, people per sq m	3.9
Motorisation, vehicles per 1,000 people	326
Public transport development strategy	✓
On-street parking fee	EUR 1–3 (RUB 70–210)
Congestion charge	✗
Holistic approach to road safety	✓
Government regulation of surface transport	✓
Government regulation of taxi services	✓
Government support for car sharing	✓

STOCKHOLM

0.8 million TRIPS PER DAY

71% · 29%

SL Public Transport

Biodiesel

Population, mln people	1.0
Area, sq m	188
Density, people per sq m	4.1
Motorisation, vehicles per 1,000 people	169
Public transport development strategy	✓
On-street parking fee	SEK 5–50 (RUB 35–350)
Congestion charge	✓ Vehicle – RUB 945
Holistic approach to road safety	✓
Government regulation of surface transport	✓
Government regulation of taxi services	✓
Government support for car sharing	Partially

AMSTERDAM

0.8 million TRIPS PER DAY

72% · 28%

GVBapp

Electricity

Population, mln people	0.9
Area, sq m	219
Density, people per sq m	4.0
Motorisation, vehicles per 1,000 people	278
Public transport development strategy	✓
On-street parking fee	EUR 1,5–7,5 (RUB 100–520)
Congestion charge	✗
Holistic approach to road safety	✓
Government regulation of surface transport	✓
Government regulation of taxi services	✓
Government support for car sharing	Partially

Active mobility

Bicycles

E-scooters

Car sharing

MOSCOW
3.5 million BICYCLE OWNERS (27% of the city's residents)
895 km BICYCLE PATHS (including dedicated lanes)

NEW YORK
2.1 million BICYCLE OWNERS (25% of the city's residents)
2,090 km BICYCLE PATHS

SINGAPORE
0.35 million BICYCLE OWNERS (6% of the city's residents)
440 km BICYCLE PATHS

LOS ANGELES
0.6 million BICYCLE OWNERS (15% of the city's residents)
900 km BICYCLE PATHS

SHANGHAI
10 million BICYCLE OWNERS (41% of the city's residents)
350 km BICYCLE PATHS

BERLIN
2.5 million BICYCLE OWNERS (77% of the city's residents)
630 km BICYCLE PATHS

STOCKHOLM
0.7 million BICYCLE OWNERS (72% of the city's residents)
760 km BICYCLE PATHS

AMSTERDAM
0.6 million BICYCLE OWNERS (67% of the city's residents)
767 km BICYCLE PATHS

Fines

VEHICLE VIOLATIONS

Drink-driving	Running a red light	Using a phone while driving	Not wearing a seatbelt	Failure to maintain single lane	Penalty points	Exceeding speed limits	Speed limit + tolerance threshold
RUB 30,000 + licence suspension from 1.5 to 2 years	RUB 1,000 RUB 5,000 for repeat offences	?	RUB 1,000	RUB 17,000	✕	>RUB 500	60 км/ч **+ 20 км/ч**
RUB 49,000 + licence suspension for 12 months	RUB 16,500	RUB 4,800 – 58,000	RUB 5,500 – 14,500	RUB 2,000	✓	>RUB 1,900	50 км/ч **+ 10 км/ч**
From RUB 175,000 to RUB 210,000 + licence suspension	RUB 5,000	RUB 9,000 RUB 171,000 for repeat offences	RUB 26,000	RUB 4,000	✓	>RUB 5,200	60 км/ч **+ 0 км/ч**
From 3 to 11 points Progressive penalty = % of income + % degree of intoxication	RUB 5,000	RUB 15,000 – 82,000	RUB 9,000 – 40,000	RUB 5,000	✓	>RUB 9,800	48 км/ч **+ 3 км/ч**
100–150% of income + detention	RUB 46,500	RUB 11,500	RUB 10,000	RUB 28,800	✓	N/A	N/A
Licence suspension + penalty + prison	RUB 20,000	RUB 10,000	RUB 10,000	RUB 20,000	✓	>RUB 14,900	50 км/ч **+ 3 км/ч**
Penalty = one-month net income • blood alcohol concentration	RUB 18,500	RUB 4,500	RUB 12,300 – 18,500	RUB 18,500	✓	>RUB 6,300	50 км/ч **+ 3 км/ч**

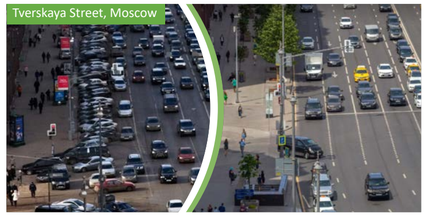
BICYCLE VIOLATIONS

Cycling drunk	Riding without a helmet	Using a phone while riding	Riding with earphones on	Parking violation	Riding in non-designated areas	Transporting more than one passenger	Violations of other traffic rules
RUB 1,000–1,500	✕	✕	✕	✕	RUB 1,000	RUB 800	RUB 800
RUB 94,000	✕	RUB 9,400	✕	✕	RUB 3,900	RUB 9,300	RUB 9,400
RUB 7,800	✕	RUB 4,300	✕	Bicycle removal	RUB 7,800	RUB 4,300	RUB 4,300
RUB 15,600	✕	RUB 10,500	✕	RUB 7,400	RUB 7,400	RUB 7,400	<RUB 7,400
RUB 460,000	✕	RUB 3,900	RUB 800	RUB 2,300	RUB 1,500	RUB 7,400	<RUB 3,900
RUB 621,000	RUB 1,000	RUB 34,000	RUB 34,000	RUB 2,000	RUB 6,900	RUB 13,800	RUB 2,000–34,000
✕	✕	✕	✕	✕	RUB 70–500	✕	RUB 70–500
RUB 17,000	RUB 1,400–1,700	RUB 28,000	RUB 700–3,500	RUB 6,900	RUB 13,800–17,000	RUB 6,900	RUB 13,800–34,500

FREQUENTLY ASKED QUESTIONS

Why do we need to widen sidewalks and create new pedestrian zones?

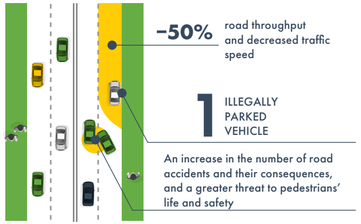
Pedestrians and cyclists have priority all over the world. Each of us is a pedestrian, but not everyone is a motorist.



BEFORE AFTER

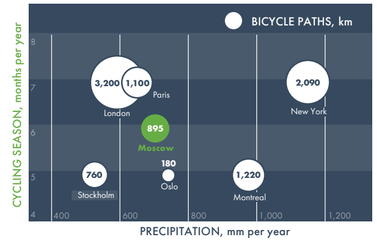
Why are cars taken to an impoundment lot for illegal parking?

Vehicle removal is a forced safeguard measure to protect 99.98% of law-abiding people from the 0.02% of gross offenders.



Why do we even need to build infrastructure for pedestrians and cyclists in our cold climate?

There are cities in the world where many more people ride bicycles than in Moscow, despite the fact that they have bad weather more frequently.



Why are private cars being squeezed out of Moscow?

The number of vehicles registered in Moscow grows each year. Currently there are already about 5 million cars. Moscow is the city with the most loyal measures for motorists in terms of restrictions on the use and ownership of a private car.

Does the Traffic Control Centre remove vehicles?

The Traffic Control Centre does not remove vehicles. The Moscow Parking Administrator deals with these issues.

The Moscow Parking website

Moscow Parking

Is the Traffic Control Centre introducing paid parking?

The Traffic Control Centre only plans parking spaces and records violations using 176 Mobile complexes of photo and video recording. The decisions to introduce parking fees are made by the Moscow Department for Transport and Road Infrastructure Development. The Moscow Parking Administrator issues fines for non-payment of parking fees and removes vehicles.

When can you drive in dedicated lanes for public transport?

Driving in dedicated lanes is allowed on weekends and holidays, but only if you can see road signs 5.4 "Fixed-Route Vehicle Lane" and 8.5.2 "Weekdays". Otherwise, driving in dedicated lanes is prohibited.

Why was parking prohibited here?

It is not always possible to arrange parking spaces where people want them.It depends on a number of factors:

- Street geometry;
- Dedicated lanes;
- Location of pedestrian crossings

etc.

Why is there a solid white line outside my house?

It is required to ensure traffic safety. We only paint dashed white line in places where it is safe to turn left or make a U-turn.

How do I call the Road Patrol?

You cannot call a Road Patrol crew. On-duty operators at the Traffic Control Centre's Command Centre record a road emergency using CCTV cameras and, if necessary, dispatch the nearest crew to the scene.

For more details on the operation of the Road Patrol, see page 76

What do cars with green stripes do?

They check cars are parked legally, including whether parking fees have been paid. A car with green stripes and #CODDhelps (#ЦОДДпоможет) lettering indicates to road users that the vehicle has all the equipment required to administer first aid to road users.

Who can I contact to have traffic light phasing changed, a sign installed or a traffic scheme modified?

Share your suggestions, complaints and questions on traffic lights, signs and road markings on the Unified Transport Portal of Moscow at **transport.mos.ru** and indicate the topic of interest.

You can also call Moscow Transport's contact centre.

Tel.: +7 495 539 5454

Mob.: 3210 (Beeline, MTS, MegaFon, Tele2)

Only in Russian

GETTING IN TOUCH

The Traffic Control Centre uses various communication channels to keep in touch with Moscow residents every day. Choose the one that is right for you.

I want...

... to watch an online guide

Learn about the Intelligent Transport System, why traffic jams happen, how traffic lights are controlled, and who and how monitors public transport and informs the drivers, from the comfort of your own home.

Allow us to guide you through the Command Centre at the Traffic Control Centre!

Information is available in Russian only.

... to follow the Traffic Control Centre on social media

Find us on all popular social media sites:
Information is available in Russian only.

Twitter

Instagram

VKontakte

YouTube
(Moscow Transport's channel)

... to visit the Traffic Control Centre

The Traffic Control Centre offers visits to the Command Centre for adults and children (Belorusskaya Metro Station, 11/1, 2nd Lesnoy Side Street). To visit you can:

- assemble a group and submit a free request, indicating the number of people (not more than 25) and the desired date and time of the visit to **press@gucodd.ru**
- join a drop-in tour. Available dates appear on our social media in advance.

A passport is required to visit.

You can register for a drop-in tour via the **Transport Saturdays section of the Moscow Schoolchildren Saturdays** education portal.
Registration opens seven days before the tour.

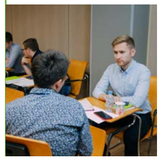
Information is available in Russian only.

... to meet a traffic coordinator

Traffic Control Centre traffic coordinators are responsible for traffic control: road signs, markings, priority passage, pedestrian crossings, parking spaces and traffic lights in your administrative district. They will help:

- install a road sign
- request a pedestrian crossing
- install and programme traffic lights
- amend a traffic scheme.

Meetings are held in the Traffic Control Centre's office each quarter on a district-by-district basis. Each participant can discuss their suggestions for their district with the coordinator in person.

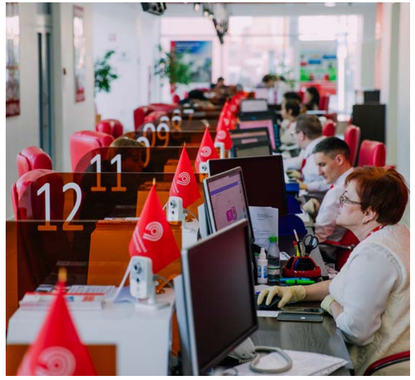


To find out the schedule of meetings with traffic coordinators, and keep up to date with the news on the Traffic Control Centre's social media:

... to learn more about the Traffic Control Centre

Details on Traffic Control Centre operations and the latest news are available on our website (Information is available in Russian only):

... to get advice or submit a request



Use the online Citizen Feedback form on the **Unified Transport Portal** to submit queries regarding the operation of Moscow Transport.

Visit one of the **Moscow Transport service centres** (from 08:00 to 20:00, seven days a week):

- 20 Staraya Basmannaya St., Bld. 1
- 25, 1905 Goda St.

Call **Moscow Transport's contact centre** to submit a request or get advice (24/7).

Call **+7 495 539 5454** from landline phones or **3210** from mobile phones (Beeline, MTS, MegaFon, Tele2)

Information is available in Russian only.

... to learn about the current traffic situation

The dynamic transport model is used to broadcast the current traffic situation on **Moscow 24**.

MOSKBA24

Also, on-duty operators at the Command Centre broadcast traffic updates on:

Moskva FM (92.0 FM)

MOSKBA FM 92.0

Kommersant FM (93.6 FM)

КоммерсантъFM

... to report a violation

Anyone can install the **Moscow Assistant** mobile app on their device to personally help bring order to the streets. Do not be afraid of making mistakes, the system is fully automated, and all materials are reviewed by professionals.

Road safety is in your hands!

For details, see page 67

Download the app:

... to work at the Traffic Control Centre

We are proud of our highly-qualified professional team. Visit the Vacancies page to join our team.

Information is available in Russian only.