

The Moscow Central Circle is waiting for an unmanned future

23.08.2021, Moscow

The MCC (Moscow Central Circle) – is one of the Moscow transport projects. It is integrated in Moscow metro network and in the railway system. In fact, it is considered to be the 14th surface metro line. At present, headway has already been reduced to 4 minutes, which is the limit for the existing infrastructure. Moscow authorities are working on the urban transport improvement, so that people can travel comfortably and quickly to their destination. One of the additional ways to reduce the interval between trains would be the unmanned traffic organization which will be launched on the MCC in the near future. As for now the system is being tested on a high-speed electric train – Lastochka.

According to the Pavel Popov the Deputy General Director of the JSC NIIAS: «The integration of the unmanned trains on the MCC will create a great bandwidth effect. When a driver controls a train, the variability of its motion and the accuracy of maintaining the desired speed are much greater than of the automatic control system. Basically, if it is necessary to maintain a minimum interval of the following train, for the driver it will be hard to do. There have been studies that have shown that the variation between the automatic system and the driver differs from each other. The variation in a system is 3-4 times smaller, that means that it is more accurately follows the traffic schedule and thanks to this, it is possible to reduce the intervals».

As noted by Popov, an electric train with the 3rd automation level on the IEC 62290, equipped with optical cameras with different focal distances, lidars and sensors that detect obstacles in poor lighting and visibility are currently being tested on the experimental circle in Scherbinka (a railway test site in Russia). All this allows train to start braking at a safe distance from the person, saving his life. Also, he mentioned that this day it is impossible to make a completely uncontrolled train from the operational point of view. Either way, there must be people who can control him.

Now all of the trains on the MCC are equipped with the 2nd level of automation, which allows to make independent braking and start traffic.

During the development of the 3rd level of automation, the obstacle detection unit installed on Russian unmanned trains, detects the barrier at a distance over 600 meters and classifies it as a human or third-party object using a neural system. Depending on the object actions on the tracks, the braking curve rebuilds, and the system decides by itself whether to initiate service or emergency braking. Mannequins are used during testing as



Moscow
Transport



Moscow
Metro

Contact center «Moskovskiy transport»
(Beeline, MegaFon, MTS)
+7 (495) 539-5454
transport.mos.ru, vk.com/transportmos,
mosmetro.ru

Service center «Moskovskiy transport»
Address: Staraya Basmannaya street 20, bld. 1,
1905 goda street 25.

adults, children or sitting on human paths. They are represented as adults, child and sitting mannequins on the track.

Currently the design documentation for the 4th level automated train is being developed and in parallel normative documents are being developed that will allow the launch of the unmanned traffic.

The MCC was launched in 2016 its length is 54 km, there are 31 station and 18 of them have interchanges to metro. Passenger traffic at the MCD and the MCC not only recovered from the pandemic but has also increased since 2019. In the first half of 2021, the MCC had 71 million passengers. A total of 242 pairs of trains Lastochka, and 211 pairs on weekends, run on MCC day.

The capacity of the electric train Lastochka - 1.500 passengers. At peak hours the electric train runs every 4 minutes and at non-peak hours - every 8.

Learn more information in the prepared film about the MCC (English subtitles):
https://www.youtube.com/watch?v=ty_eg8G1aDs



Moscow
Transport



Moscow
Metro

Contact center «Moskovskiy transport»
(Beeline, MegaFon, MTS)
+7 (495) 539-5454
transport.mos.ru, vk.com/transportmos,
mosmetro.ru



Service center «Moskovskiy transport»
Address: Staraya Basmannaya street 20, bld. 1,
1905 goda street 25.