
Press release

Brno, 5th May 2020

Testing of autonomous vehicles support in the Czech Republic

The Transport Research Centre (CDV) in cooperation with the Ministry of Transport and the State Transport Infrastructure Fund has created the Catalogue of the autonomous vehicles testing areas in public roads which is to contribute to creating an attractive environment for development, research, and the testing of autonomous and automated vehicles in the Czech Republic.

Currently, autonomous vehicles are one of the main technological innovations, with the potential to positively affect society, in particular through increased road safety and improvement of transport in general. The support of autonomous mobility, therefore largely testifies the level and development of individual countries. The Czech Republic has been active in this field for a long time and contributes to the development of the sector on many levels. “Most recently thanks to the National Catalogue of the autonomous vehicles testing areas in common traffic,” adds Veronika Valentová, Director of Division of Traffic Engineering, Road Safety and Strategies, The Transport Research Centre (CDV).

The Catalogue released on the 4th May 2020 at <https://testovacioblasti.autonomne.cz/> is through its form and scope world-unique tool, which significantly simplifies the work of developers, technicians, software engineers, and other professionals active in autonomous vehicles industry by providing detailed information about specific sections of the Czech public road network. “Thanks to this, there will be possible to view sections of the Catalogue virtually before real testing takes place. It means a road test can be realized as effectively as possible with the knowledge of all conditions related to the transport infrastructure,” explains Ms. Valentová. The Catalogue is prepared in Czech and English that enables its wider use and makes the Czech Republic more attractive within the international environment.

What areas does it include?

The Catalogue of the autonomous vehicles testing areas is made up of two areas. The length of each is more than 500 km, so altogether is more than 2000 km in both directions. The first area located in the Bohemia region includes cities such as Prague, Mladá Boleslav, or Ústí nad Labem. The second area spreads in Moravia and Silesia, whereas the route leads through Brno, Zlín or Kroměříž. Areas are segmented into individual sections. Altogether there are 3 434 sections.

It will significantly simplify and reduce the cost of testing in real operations

The Catalogue takes the form of a web application that contains a database of sections based on the needs of autonomous vehicles. It allows easy filtering of sections by using predefined packages which take into account the type of testing and search through a personalized selection of custom parameters. The selection can also be made from the interactive map directly. Based on the selected parameters, a user will see a list of all sections that meet the specified criteria. Then all these sections can be viewed in detail.

There is also video footage taken during a drive-through of all sections, a moving map showing the exact location, an attribute timeline with a list of main infrastructure elements and last but not least a list of all relevant information such as coverage of different sections of wireless networks, elevation, accident index, and other data affecting testing. “Users of the Catalogue thus receive a very useful tool that will significantly simplify and reduce the cost of testing in real operation,” says Marek Vanžura, co-author of the application from The Transport Research Centre (CDV).

Access is free of charge

Access to the application is free of charge to anyone after previous registration. The only condition for using the Catalogue is to provide feedback on the quality of the information presented through pre-set forms. The feedback in the form of own suggestions for possible improvements, additions, or extensions is also welcome.

Methodical instructions included

In addition to the web application of the Catalogue, the project also contains related documents. At first *Methodology for section selection* serves as a guide for future possible expansion of the database with new sections. The second *Proposal for maintenance and service conditions for test sections and sectors* provides instructions on how to work with sections included in the Catalogue to maintain usefulness for testing autonomous vehicles, and the third *Framework for operational safety measures* represents a manual for ensuring safe test and test operation on sections of the Catalogue.

Who participated in the project?

The project was initiated by the Ministry of Transport, financed by the State Fund for Transport Infrastructure. The Transport Research Centre (CDV) participated in the project in cooperation with O2 Czech Republic, TÜV SÜD Czech, Roboauto, and Czech Technical University in Prague.

Map preview with both areas for section selection

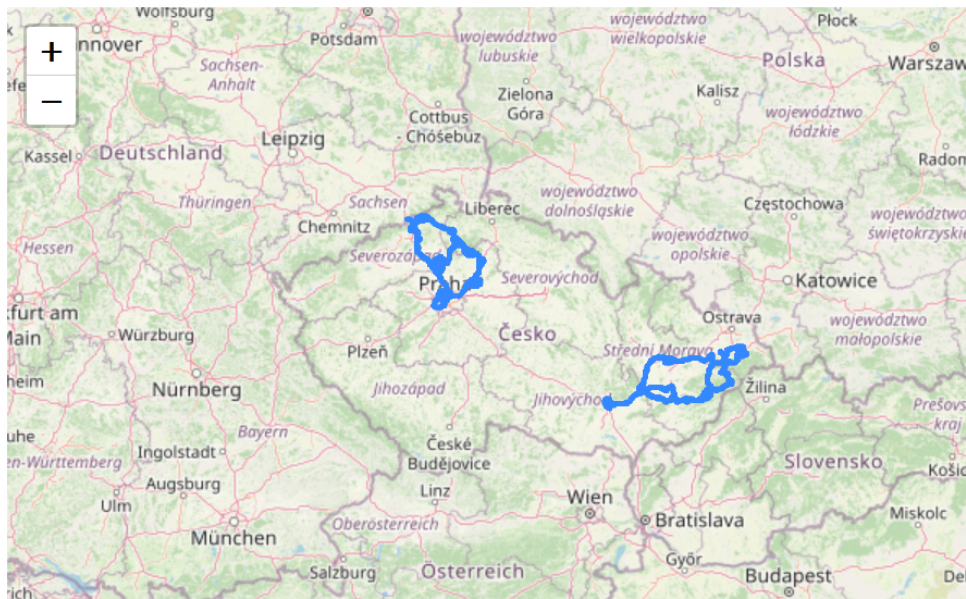


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[Home](#) >> Area selection

Area selection

Select area for display



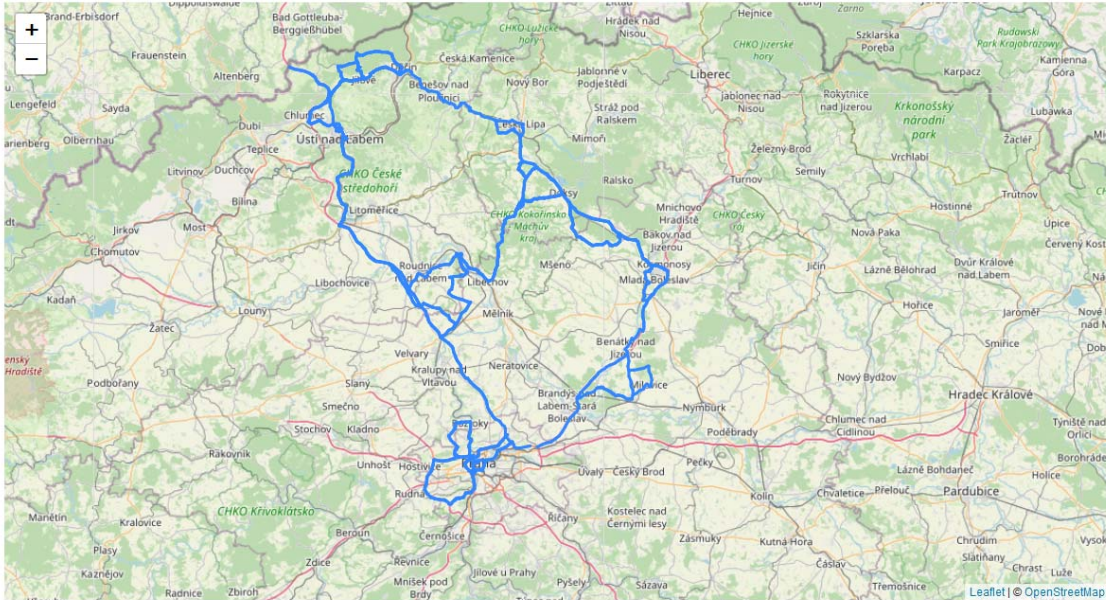
The area of Bohemia

>> Area selection

Area selection



Select area for display



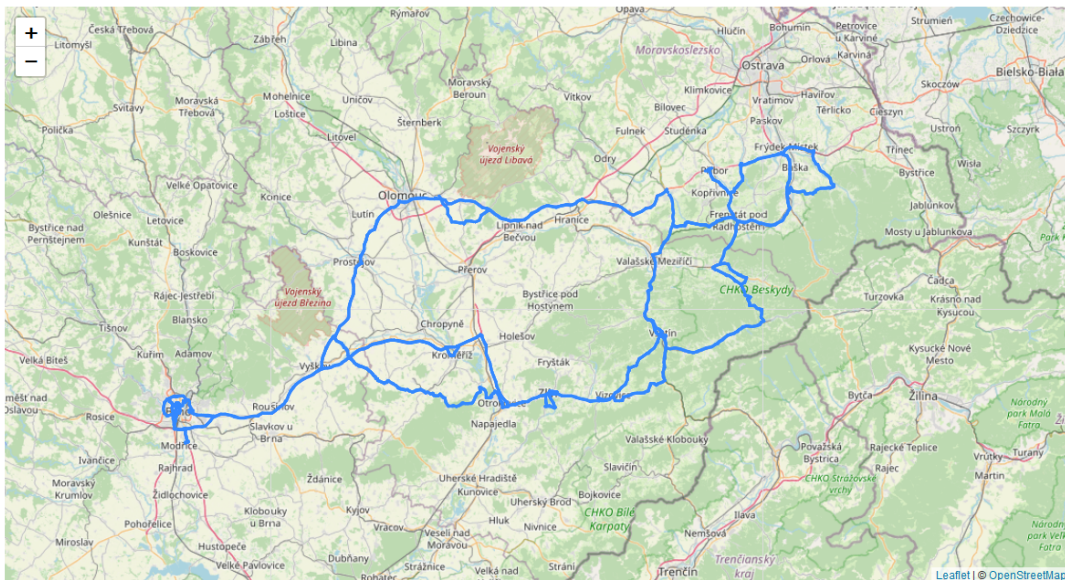
The area of Moravia and Silesia

>> Area selection

Area selection



Select area for display



The preview of the page with a selection of predefined packages:

[Home](#) >> Package selection

Package selection ?

We have prepared these six packages in order to make your orientation in the vast number of parameters easier.

Sensors

Sensors collect data from the environment, they often provide raw data which might contain errors. A vehicle needs to deal with faulty inputs (sun glare, phantom reflections of lidar signals caused by shiny surfaces). A sensorics layer is responsible for the communication with hardware and for the pre-processing of input data.

Road signing density per 1 km

0 108

[Use the package Sensors for search](#)

Localization

This layer is dependent on a preferred and selected approach to autonomous driving. The first approach assumes precise maps based on sensory data (mostly from Lidar) created during rides through particular location. A vehicle then identifies its own position and knows its proper position on this map (this approach is used by Waymo). The second approach assumes a combination of GNSS and standard maps with detection of lanes for localization of the position on the road (this approach is used by Tesla).

Rural area

[Use the package Localization for search](#)

Collision avoidance

This layer is responsible for quick reactions to unexpected events – avoid collisions. This layer is partly separated from the others, its purpose is to rapidly detect potential collisions and to re-route a vehicle in order to prevent a collision. A challenge is to prevent this layer from acting in inappropriate situations, such as during overtaking.

Perception

In this layer, a processing of sensor data and creation of virtual model of the vehicle's surrounding, so-called local map, is being made. A data fusion and object detection is also done in this layer. Among challenges in this area belong a proper detection and following overlapping objects or objects that might be underpassed, ie. signs and bridges.

Lanes number

[Use the package Perception for search](#)

Planning

A planner projects a route to a local map, including the speed which a vehicle should follow. This layer presupposes complete detection of objects in a local map. A planner should expect some extrapolation and uncertainty of future movements of objects. It should also take into account all traffic rules and physical limitations of a vehicle (braking, acceleration, possibility of skidding, road condition etc.).

Road

[Use the package Planning for search](#)

Vehicle control

The input is a planned route, an actual position, and a vehicle condition. This layer then calculates from these inputs the right vehicle setting and control signals needed for following and maintaining an intended route. Possible challenges are caused by uneven surfaces, such as potholes and slippery road, that might cause discrepancies between actual behavior of a vehicle and predictions made by

The preview of the page with the detail of a specific section:

[Home](#) >> [Select section](#) >> Section detail

Detail of section 11104

Not rated yet

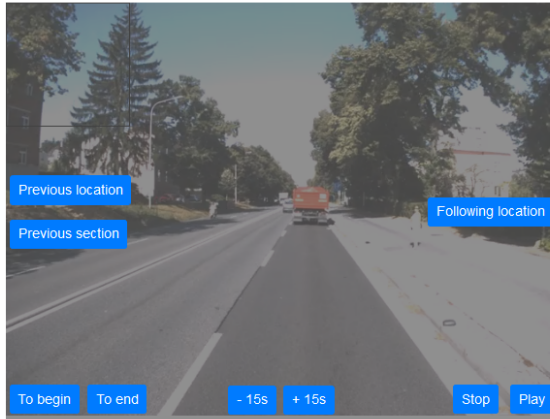


Export of section detail

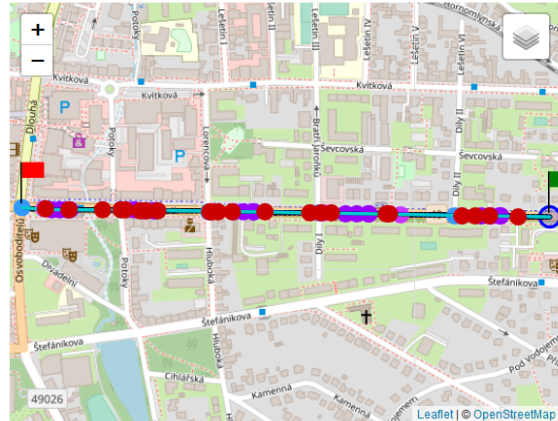
Fasten video



Video



Map



Event timeline

▼ Segment events	
Road surroundings (oko)	
+	
Crash barrier (svo)	
+	
Road surface (pko)	
+	
Road marking (vdz)	

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