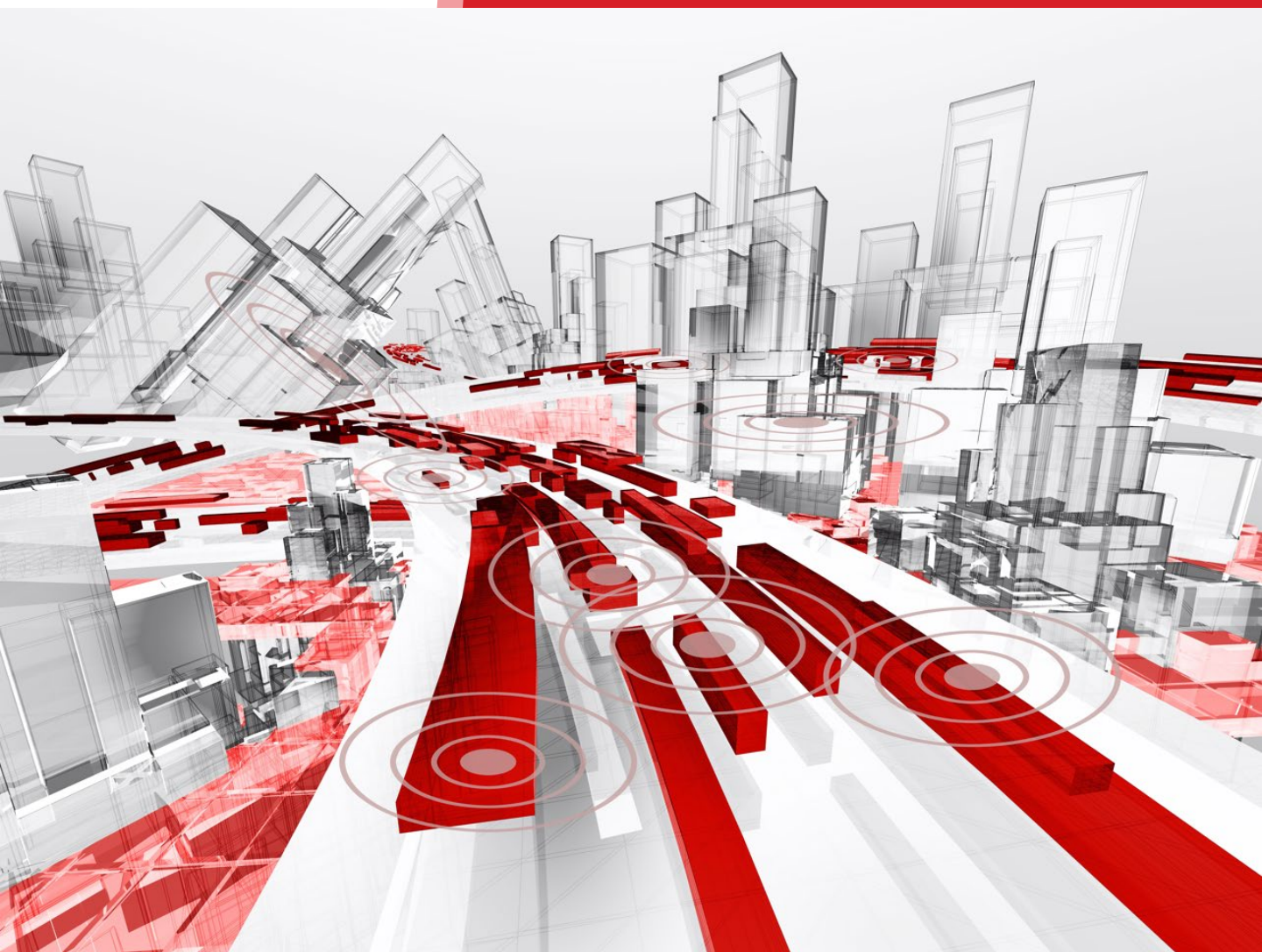




Austrian Light Vehicle Proving Region for Automated Driving

Company Overview



Supported by:

 Federal Ministry
Republic of Austria
Climate Action, Environment,
Energy, Mobility,
Innovation and Technology





We test the future of mobility.

From a global perspective, the transformation of mobility has long since begun. Digitization, automation and, as a consequence, autonomous vehicles will be part of our future and fundamentally change the human basic need of being able to move from A to B.

ALP.Lab supports the development and validation of future mobility technology by providing advanced testing solutions.

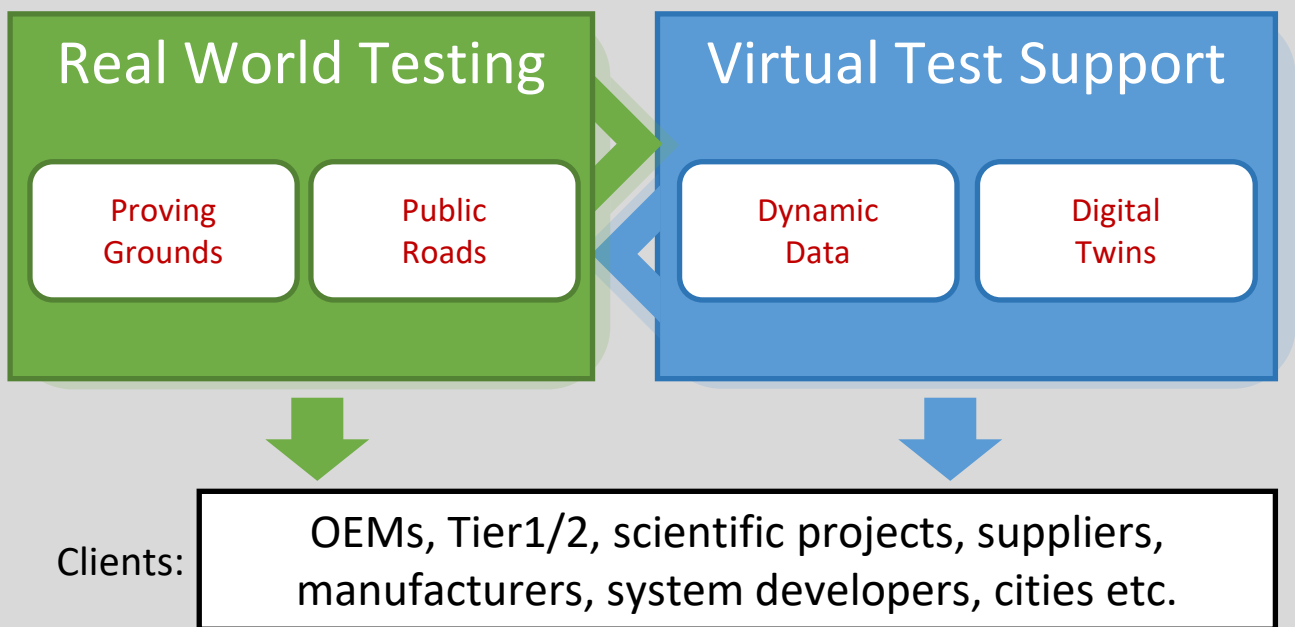


DI Gerhard Greiner und Dr. Jost Bernasch
Geschäftsführung ALP.Lab



The Austrian Light Vehicle Proving Region for Automated Driving

ALP.Lab is the one-stop shop for testing of automated driving functions and whole vehicles. In addition to real and virtual test possibilities for automated driving functions and entire vehicles (incl. Euro NCAP tests), ALP.Lab offers comprehensive solutions for mobility developers, traffic planners and research institutions. E.g. object-based real-time traffic monitoring for the evaluation of traffic safety, test possibilities for infrastructure- and vehicle-based information systems (C-ITS) as well as a marketplace for data, tools and services in the field of CCAM (Cooperative, Connected and Automated Mobility).



Founded in 2017, ALP.Lab operates from its headquarters in Graz, Austria. Our ADAS/AD testing team is located with direct connection to a proving ground at the test center in Hofkirchen, Austria. The shareholder structure consists of the automotive industry partners AVL List GmbH and MAGNA STEYR vehicle technology AG & Co KG as well as the scientific partners JOANNEUM RESEARCH Forschungsgesellschaft mbH, Graz University of Technology and VIRTUAL VEHICLE Research GmbH.



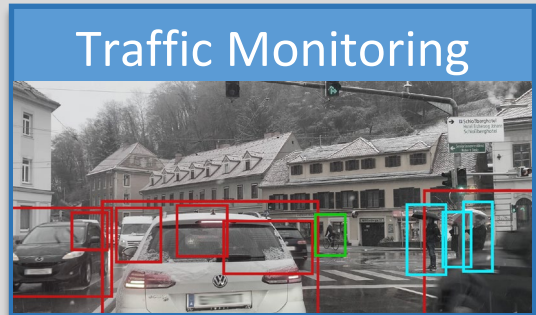
Real World Testing

Virtual Test Support

Euro NCAP Tests



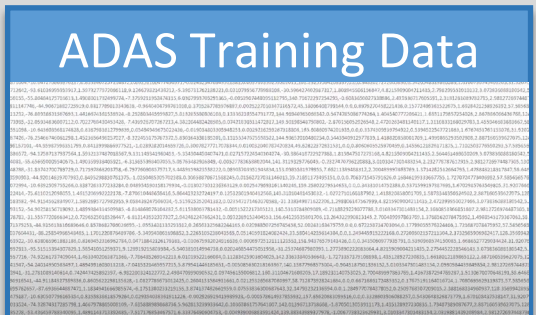
Traffic Monitoring



ADAS/AD Tests



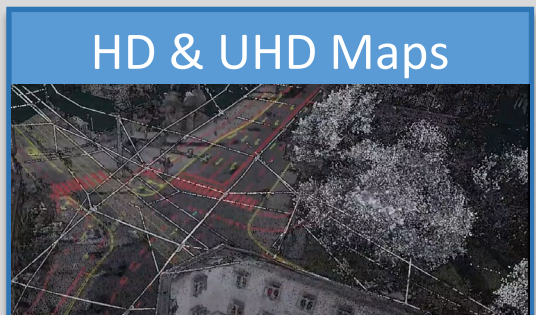
ADAS Training Data



Public Road Tests



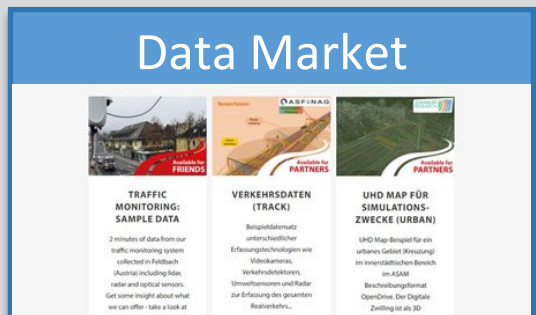
HD & UHD Maps



CCAM Tests



Data Market



ALP.Lab as Euro NCAP Test Laboratory

Anyone who pays attention to vehicle safety when buying a car is bound to be familiar with them: Euro NCAP's five-star ratings. The more stars a car has collected in tests, the safer it is.

Since 2022, Austria has also been a member of Euro NCAP and is setting up its own Euro NCAP test laboratory called "Safety Labs Austria" - with decisive advantages for vehicle developers, end customers and the entire field of vehicle safety.

Tests from the field of active safety are carried out by ALP.Lab. For this purpose, an exclusive cooperation was established with DSD - Dr. Steffan Datentechnik, which built Austria's first Euro NCAP-compliant test track in Upper Austria. Driving assistance systems, e.g. emergency braking, distance and lane keeping systems, are tested here. These systems help to prevent accidents from the outset and play a key role in determining whether a vehicle is rated as particularly safe.



The SLA cooperation partners are each independent institutions and provide their services independently. They jointly use the label "Safety Labs Austria" when conducting Euro NCAP vehicle tests.



From driving assistance to automation

Advanced driver assistance systems (ADAS) can be found in every new vehicle. These include features such as lane departure warning, brake assist, blind spot display, adaptive cruise control and parking assist. They represent the gradual transition from assisted to fully automated driving and are constantly being developed further.

ALP.Lab supports vehicle manufacturers (OEMs) and suppliers (TIERs) as a competent test partner. With our extensive test equipment and the many years of experience of our testing team, we offer our services at Proving Grounds throughout Central Europe.

We perform tests on closed proving grounds in Central Europe at attractive prices, even in Alpine and Mediterranean areas with/without snow and in tunnels.

- Test preparation and execution
- Rental, provision and usage of test equipment
- Equipment preparation and calibration
- Programming of trajectories for test vehicles and self-driving testing platforms
- Evaluation and validation of the results
- Logging the vehicle's behavior with modern logging solutions



Performing tests on public roads

Following the legal possibilities, we organize and perform test drives of autonomous driving systems on highways and in rural and urban areas.

- Full project management incl. support with the administrative procedure
- Highly qualified testing team
- Well equipped car fleet (production vehicles and research prototypes)
- Vehicle tracking using mobile or infrastructure-based sensors
- Use of the unique – and road legal – hardware-in-the-loop-platform “SPiDER”

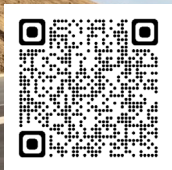
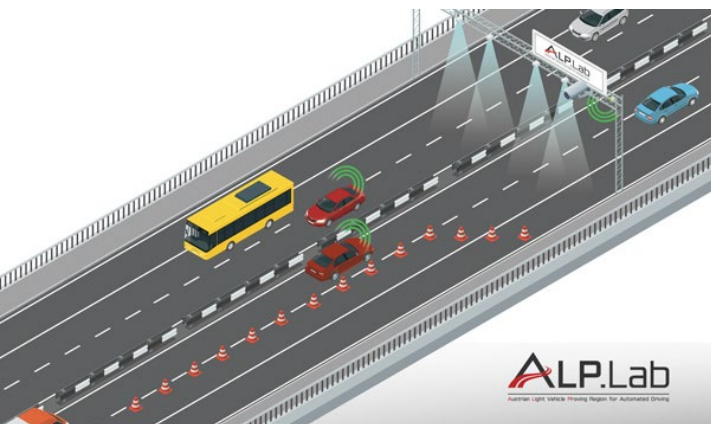


Connected, Cooperative and Automated Mobility (CCAM)

ALP.Lab offers its customers the opportunity to use cooperative intelligent transport systems for tests on selected road sections within the test region.

Due to our close cooperation with ASFINAG, the Austrian road operator for motorways and highways, as well as the city of Graz, we can offer interesting testing opportunities for C-ITS technologies in urban areas and on public highways. (RSUs available for receiving and sending C-ITS G5 messages.)

As part of the funded project TORUS, ALP.Lab is leading the construction and operation of a city bus of vehicle class M2 as a test vehicle for automated driving functions with L3. The bus will be road-legal, barrier-free, automated, open-system and battery-electric. Pre-tests can already be carried out with the SPIDER hardware-in-the-loop platform, which has the same system software as the finished bus.



**Autonomous, flexible
and up to 50 km/h fast.**



TORUS – Austria’s largest Autonomous City-Bus

Technologies for automated driving are developing rapidly - also and especially in public transport. Both, manufacturers and research projects, are constantly working on new innovations that need to be extensively tested and evaluated. For such tasks, "test vehicles" are needed, i.e. vehicles with which prototypical solutions can be tested.

The open-system technology of the ALP.Lab TORUS city bus is designed precisely for this purpose, because it can be easily expanded - uniquely on the market - to include additional components. The sensors installed, software used, etc. can be flexibly expanded and individually adapted for each test case.

Austria's largest automated passenger bus (6.9 meters) is based on a series-production vehicle from the manufacturer eVersum and is being automated as part of the TORUS project together with VIRTUAL VEHICLE.

Model	Mk II - 400
Dimensions	
Length Width Height [m]	6.90 2.30 3.15
Curb weight Permissible Gross Vehicle Weight [t]	7.5 14.00
Turing radius without rear-wheel steering [m]	9.40
Entry height in parking position [m]	0.25 - 0.30
Drive train & Performance	
Norm speed [km/h] and gradeability (%)	80
Nominal voltage [V]	650
Battery capacity [kWh]	42 - 126 59 - 177
On-board charging	22 kW/h on-board
Range-extender	optional
Suspension system	Air suspension
Brake system	ECE 2-circuit + recuperation
Body & Equipment	
Passenger capacity, standing [pax @ 75 kg/person]	54
Seating capacity	various (up to 14)
Door type	e plug-sliding
Floor configuration	low-floor
Wheelchair ramp	manual or automatic
Infotainment	all options available



Traffic monitoring for cities and regions

Municipalities ask, we provide the answers: How many cars, bicycles or trucks cross the intersection, when and how? Does this result in dangerous situations, e.g. for pedestrians?

ALP.Lab answers questions like these thanks to traffic monitoring with object-based sensors. For example, to monitor a street before and after a reconstruction for the purpose of traffic calming. This gives road planners an objective basis for making a solid decision about which reconstruction to undertake and if it has worked as planned.

The monitoring results are statistically processed and made available via a user-friendly online dashboard.

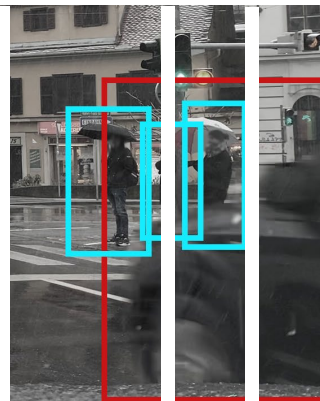


Training data for autonomous vehicles

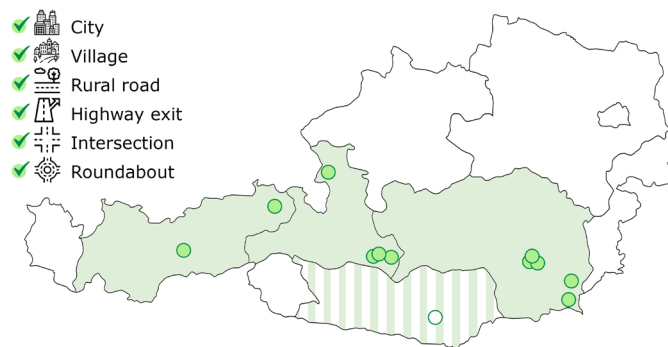
Two autonomous vehicles meet. One says to the other: You know that situation where a cyclist passes a pedestrian in front of you?

What sounds like the start of a humorous conversation is actually a real-life test scenario. Autonomous driving systems - and autonomous vehicles in the future - must experience dealing with critical traffic situations.

ALP.Lab has implemented an innovative approach with international sensor manufacturers to accelerate the collection of such training data and make it more sustainable. Instead of fleets of vehicles traveling millions of miles, sensors are mounted directly at intersections and other critical road areas. In this way, vehicles passing by anyway are recorded anonymously - around the clock. This data is also extremely helpful for traffic planners in cities and villages. All together we collect millions of km of trajectories every year.



ALP.Lab operates
traffic monitoring
systems all over
Austria.



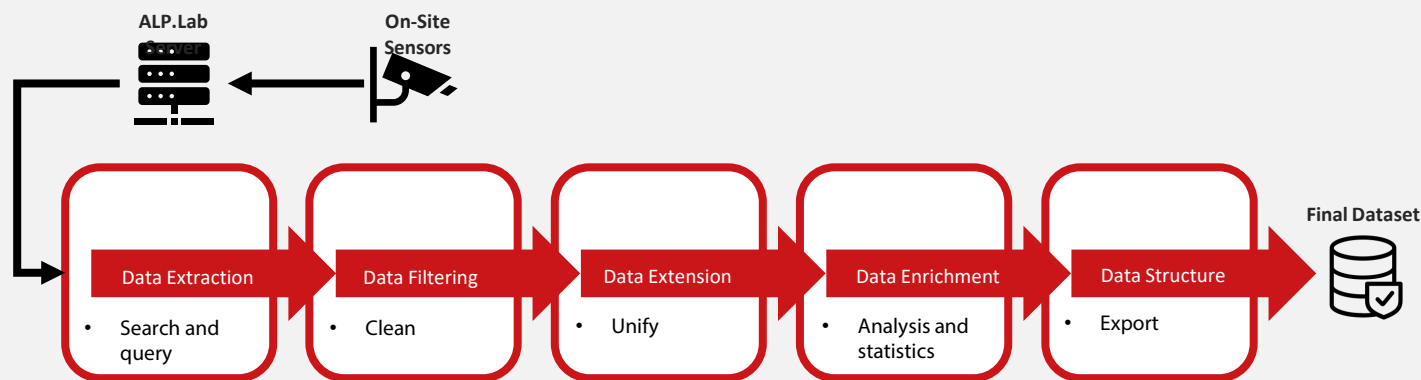
Post-processing of traffic monitoring data

Due to professional post-processing ALP.Lab not only provides millions of km of real-life traffic monitoring data, but this data can also be used in simulation right away.

The key facts in terms of our post-processing service:

- Detection and preparation of real traffic scenarios.
- Criticality analysis
- High-frequency/high-accuracy and comprehensive classification
- Customized data sets for easy implementation in simulation tools

Post processing

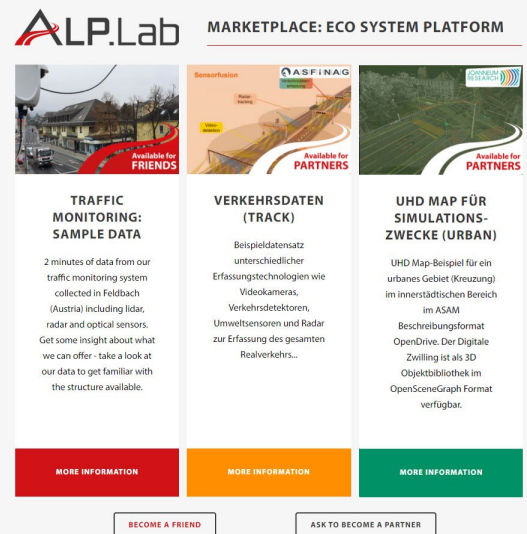


Key-Facts:

- Recognition and preparation of real traffic scenarios
- Criticality analysis
- High frequency/high accuracy and comprehensive classification
- Tailored data sets for easy implementation in simulation tools or follow-on applications

Eco System Platform

Transportation planners, researchers and technology developers depend on mobility data. To accelerate the development of new solutions in the field of automated mobility, a platform has been created that brings together relevant data from a wide range of providers and makes it more valuable. If you want to develop new, sustainable solutions in the field of automated mobility, you need one thing: data. How do road users behave? What do modern sensors perceive and how does this perception change with different environmental influences?



ALP.Lab MARKETPLACE: ECO SYSTEM PLATFORM

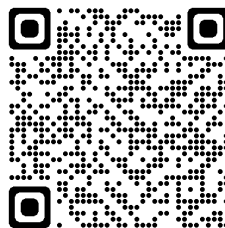
TRAFFIC MONITORING: SAMPLE DATA	VERKEHRSDATEN (TRACK)	UHD MAP FÜR SIMULATIONS-ZWECKE (URBAN)
2 minutes of data from our traffic monitoring system collected in Feldbach (Austria) including lidar, radar and optical sensors. Get some insight about what we can offer - take a look at our data to get familiar with the structure available.	Beispieldatensatz unterschiedlicher Erfassungstechnologien wie Videokameras, Verkehrsdetektoren, Umweltsensoren und Radar zur Erfassung des gesamten Realverkehrs...	UHD Map-Beispiel für ein urbanes Gebiet (Kreuzung) im innerstädtischen Bereich im ASAM Beschreibungsformat OpenDrive. Der Digitale Zwilling ist als 3D Objektbibliothek im OpenSceneGraph Format verfügbar.
MORE INFORMATION	MORE INFORMATION	MORE INFORMATION
BECOME A FRIEND		ASK TO BECOME A PARTNER

Much of this data already exists, but it is not always easy to find it in the appropriate quality. To support traffic planners, researchers and technology developers in their search, a platform has now been created for the first time in Austria that brings together relevant data from a wide range of providers.

On the EcoSystem platform initiated by ALP.Lab, the entire ecosystem "Automated Mobility" is to be mapped step by step - from universities and research institutes to vehicle manufacturers and suppliers to public and non-profit providers of mobility-relevant data. It is precisely this networking that is important so that Austria can make a strong contribution to the global development market of future mobility.

Content partners ASFINAG and Joanneum Research have been on board since the beginning - other partners (e.g. AAI) will follow shortly. Already available are, for example, traffic data, environmental data, video event data of traffic monitoring, object lists and trajectories, dynamic display or event data of traffic control, C-ITS messages as well as examples of UHD maps as digital twins.

<https://www.alp-lab.at/plattform>



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