Mission

Laboratory B3: Infrastructure and Traffic Management in Land Transport (Lab B3) focuses on modeling and optimization of transportation systems networks and traffic flow. It develops interfaces for the integration of Intelligent Transport Systems (ITS) and related processes in the field of traffic management of surface transport systems (including integration of related managing entities and stakeholders). More specifically, in the field of traffic management of surface transport systems, Lab B3 is involved with:

- Process modeling;
- Analysis, certification and processing of traffic and travel data;
- Traffic management and traffic control methods and technologies;
- Traffic Management systems for conventional, connected and autonomous vehicle flows;
- Integrated environments and simulation algorithms for circulation and communication of conventional, connected, autonomous and mixed vehicle flows;
- Design, management and maintenance of multimodal transport infrastructures and networks for averting the impacts of climate change (adaptation and prevention), related to severe weather events and physical catastrophes;
- Policies and Strategies for Transport systems adaptation to climate change.

History

Lab B3 is part of the Hellenic Institute of Transport (HIT) which is one of the five institutes of the Centre for Research and Technology Hellas (CERTH). CERTH was founded in 2000 and is one of the leading research centers in Greece, listed among the top-20 E.U. research institutions with the highest participation in competitive research grants. HIT is a highly recognized research body in the field of Transport. Since its establishment in 2000 it has been a leading research institution in Greece offering specialized basic and applied research and highly technical services in all fields of transport. CERTH-HIT is under the direction of Dr. Evangelos Bekiaris.

Lab B3 is part of HIT Department B: Infrastructure, Networks, Mobility and Logistics of HIT, which activities include all aspects of sustainable mobility research, with
emphasis on land transport networks and their traffic. Department B is under the direction of Dr. Georgia Aifadopoulou.

Since its foundation Lab B3 has participated in several national and international research and innovation projects with various key roles and responsibilities. A list of indicative projects is included below:

- **ITS Observatory** (Horizon 2020, 2015–2017): The project aimed at creating the first Pan-European ITS Observatory. Lab B3 as a project partner was responsible for the development of the Observatory, the definition of users’ needs—specifications—system architecture, the technical assessment and validation, the collection and analysis of data and information, the system evaluation methodology, the strategy for stakeholders, and dissemination activities.

- **Compass4D** (ICT PSP, 2013–2015): The project objective was to develop and deploy three C-ITS services, i.e. road hazard warning, red light violation warning and the energy efficient intersection, in 7 European cities. Among them pilot operations in the city of Thessaloniki (Greece) were coordinated by Lab B3 in cooperation with other local partners.

- **CAPITAL** (Horizon 2020, 2016–2019): The project designed, developed and executed a collaborative capacity-building program for practitioners in the public and private sector in the field of C-ITS. As a project partner Lab B3 was engaged with the development of an online deployment transferability handbook and educational and informational material for trainees and trainers, the organization of showcase events for end users and commercial operators, and the European and International Cooperation outreach for business and science.

- **C-MobILE** (Horizon 2020, 2017–2020): The project objective is the large-scale deployment of multiple C-ITS services in the urban road networks of 8 European cities. Lab B3 is the leader of the large-scale demonstration of the services Road Works Warning, Road Hazard Warning, GLOSA, In-Vehicle Signage, Flexible Infrastructure, Mode and Trip Time Advice, Warning System for Pedestrians, Probe Vehicle Data, Green Priority, Cooperative Traffic Light for Pedestrians, Emergency Vehicle Warning, Signal Violation Warning in the city of Thessaloniki (cmobile.imet.gr). The Lab B3 is also engaged with activities such as innovation.
management, cost-benefit analyses, business models, C-ITS systems architectures, software development, stakeholders’ involvement, impact assessment, and dissemination.

- **TransAID** (Horizon 2020, 2017–2020): The project focuses on the development of hierarchical traffic management schemes for mixed traffic (cooperative automated, automated, cooperative and conventional vehicles) along Transitions Areas of the road network. Lab B3 is the technical leader for the Modelling and Impact Assessment of Automated Vehicles and responsible for the definition of metrics and parameters, automated vehicles model requirements, and simulation of mixed traffic.

- **ACTIVAGE** (Horizon 2020, 2017–2020): The project objective is to build the first European IoT ecosystem across 9 Deployment Sites in seven European countries, in order to enable the large-scale deployment and operation of Active and Healthy Ageing IoT based solutions and services. Lab B3 takes part in this initiative with the development of a warning systems for drivers in the case of existence of elderly persons in pedestrian crossings.

- **WISE-ACT** (COST Action, 2017–2021): The main objective of the project is to investigate the wider impacts of Autonomous and Connected Transport, and to describe the best practice on how to evaluate them. Lab B3 is engaged in activities related to connected vehicles impact assessment, traffic simulation and analysis, and validation of pilot operations results.

- **CROCODILE 2** (Connecting Europe Facility, 2018): The project constitutes a co-operation between public authorities, road administrations and traffic information service providers of 15 European Member States committed to set up and operate a data exchange infrastructure based on DATEX II. Concerning the Greek side, Lab B3 is responsible for the design and development of the National Access Point (NAP) (nap.imet.gr).

- **Steer to Career DRV** (Erasmus+, 2018–2021): The project focuses on the development of curricula and professional learning programs to help companies prepare their professional drivers for a more diverse role within a company with the emergence of autonomous vehicles. Lab B3 is contributing in the development of curricula and learning programs, pathway and guidance documents.

- **Drive to The Future** (Horizon 2020, 2019–2022): The project aims to prepare drivers, travelers and vehicle operators to accept and use connected, cooperative and automated transport modes and also the industry to understand and meet the needs of these technologies. Lab B3 is involved in microscopic traffic flow modeling activities for connected and automated vehicles.

- **C-Roads Greece** (Connecting Europe Facility, 2019–2025): The C-Roads Platform (www.c-roads.eu) constitutes the instrument of the European Member States to deploy C-ITS. In the pilot of C-Roads Greece, which is coordinated by the Ministry of Infrastructure and Transport, Lab B3 is engaged with design and operational deployment of C-ITS technologies, as well as with their impact assessment and serves as the Greek representative in working groups related to impact assessment and digital infrastructures.

  Regarding research infrastructure and facilities, Lab B3 is actively engaged in the operation and maintenance of the Transport Observatory and Data Management Portal (HIT Portal) which is a web-based portal that provides Transport Data for Greece, Management of such data, and process services, supporting the Transport Research Community in Greece and abroad. Lab B3 in cooperation with other relevant laboratories of CERTH-HIT is exploiting data collected from a network of traffic detectors in the road network of Thessaloniki (cooperation with the city of Thessaloniki and the Region of Central Macedonia) which is comprised of approximately 45 roadside sensing devices, installed at selected intersections throughout the road network of the city, conventional traffic detectors, and floating car data of over 1200 taxis. Concerning C-ITS technologies, Lab B3 has developed both back-end (GeoMessaging Platform) and front-end (smartphone applications) solutions for the provision of C-ITS services to the users of the road network in Thessaloniki, currently extended to allow the use of C-ITS for traffic management purposes.

**Future Directions**

Lab B3 aims at keeping its successful track in the field of transport research in Greece and Europe, through active engagement in initiatives and actions related to emerging technologies and policies for road transport. Future research is focusing mainly on infrastructures and services to support connected and automated multimodal transport systems serving both the perspective of end-users and traffic managers/road operators. Towards this direction, the development of innovative solutions which support hybrid communications and interoperable interfaces between multiple actors is pursued. One of the goals of Lab B3 is to push further such accomplishments beyond the national and European levels and to achieve successful collaborations which could foster the establishment of sustainable business models and the market roll-out of research results. The dissemination of research results will be continued through the participation in major international conferences, as well as the organization of such events, the most important of which is the 23rd IEEE International Conference on Intelligent Transportation Systems (IEEE ITSC 2020), which will be held in Rhodes, Greece on September 20–23, 2020. More information can be found at www.ieee-itsc2020.org.