

LABORATORY FOR TRANSPORT SYSTEMS AND MOBILITY

DEPT. DIATI - POLITECNICO DI TORINO

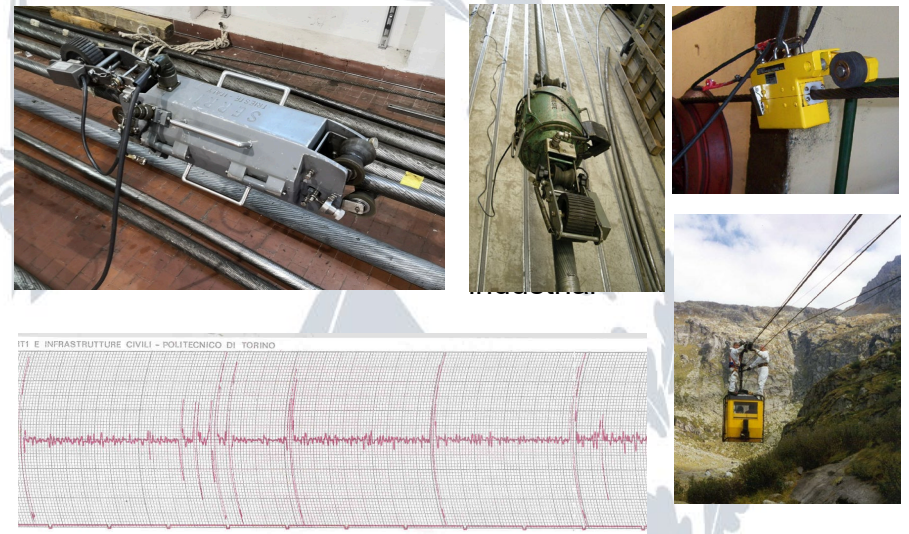
The Transport area in the Department DIATI of the Politecnico di Torino has at its disposal a *Laboratory* – both indoors and outdoors, with fixed and mobile placing - where activities related to *research, measures, demonstrations for students* and *tests* for public and private companies are carried out; such activities are related to the subjects taught at the Degree and Master of Science courses in Mechanical Engineering, Civil Engineering, Management Engineering and Land Planning.

Within such activities, the staff and the instruments are mainly devoted to:

- A. tests on *ropes* operating on rope installations (*ropeways*), both on-ground and aerial;
- B. *traffic data* collection and analyses concerning vehicles – both on road and operating on fixed installations – for passengers and freight;
- C. *intelligent transport systems* (ITS) concerning both *freight transport and passengers mobility* (simulation, education and training);
- D. *surveys and analyses* for the transport planning and scheduling of transportation systems

Within the Laboratory of Transports, tests are carried out either in a continuous way or occasionally. The activities funded by *conventions, tests for external companies* and *researches* are mainly:

- A. **electromagnetic or magneto-inductive tests on steel wire ropes**, which consist in non-destructive controls applied on ropes installed on ropeways, submitted to magnetic fields; these tests are carried out using apposite detectors, crossed through by operating ropes and which allow reveal the variation in the magnetic flow deriving from defects in wires, strands or in the configuration of the ropes themselves; the laboratory Technician (Mr. C. Giannitti) owns the certification of the CICIPND (Italian Center of Certification for the Non-destructive tests and processes) and related card (method MIT level 2 – n. 64/F2/C of the 10/05/2011 with extension until 02/12/2026) for expert staff in non-destructive controls on steel wire ropes used for material handling, passengers and freight transport and tenso-structures. The instruments are certified by the competent Ministry.



- B. **Collection of data concerning traffic and movement of the vehicles**, which can be made with various kinds of sensors, studied for different applications. Typical parameters that can be outlined are the testing and accumulation time, the peak periods for traffic, the headways or time slots between two subsequent passages, classes of distance, the speed and related classes, the lengths of vehicles and related classes, the axial and total loads of vehicles, accelerations and positions. The typical exams are finalised to simple traffic counting, the measurements of traffic flows, the **energy consumption**, **road safety**, verification of the dangerous intersections or crossings, statistical analyses, estimation of energy use and environmental analysis in road traffic, rail and rope transport.



- C. “ITS” (**Intelligent Transport Systems**) integrate telecommunications, electronics and information technologies - in short, ‘telematics’ - with transport engineering in order to plan, design, operate, maintain and manage transport systems. This integration aims to improve **safety**, **security**, **quality** and **efficiency** of the transport systems for passengers and freight, optimising the use of natural resources and respecting the environment. To achieve such aims, ITS require procedures, systems and devices to allow the collection, communication, analysis and distribution of information and data among moving subjects, the transport infrastructure and information technology applications. [ITS-EduNet, 2009 and IET ITS journal web site]. The verification and quantification of the gained results can be carried out through the **simulation of transport systems and traffic** and **simulators** for road, rail, intermodal transports, as well as for metros and those in mountain areas – available at the Department. The education is nowadays carried on also through advanced and multimedia instruments for e-learning.

