"TOWARDS VEHICLE AUTOMATION IN THE FRAMEWORK OF SMART CITIES"
Missions of EPFL

- **Education**: of scientists, engineers & architects
- **Research**: Advanced, fundamental & applied
- **Technology Transfer**: to industry & society
Role of the Transportation Center

Aim: Promote EPFL scientific competences in the external world for all issues related to transportation and mobility.

Understand innovation needs from external partners

Understand EPFL lab research skills

The Transportation Center creates the connection

Arrange contract & IP issues

Coordinate research projects
Mobility analysis in Sion (Switzerland)

- Better understand the complexity of mode choice which is determined by elements linked to lifestyle such as values and activities.
- Identify the opportunities for modal shift from cars towards public transport, bicycles, walking.
- Evaluate the motivations of inhabitants that determine their choices of transportation modes.
- Discuss several operational paths, of urban planning, pricing or communication.

Lab: CEAT led by Prof. Vincent Kaufmann
Demand prediction in the car industry

- Predict the future demand for electric vehicles in Switzerland.
- Include soft determinants, such as beliefs and attitudes in car choice modeling.
- Identify target-groups for electric vehicles within the Swiss population.
- Identify the best pricing strategy and analyze the “willingness-to-pay” for associated services.
- Possibility to apply this study to automated vehicles

Lab: TRANSP-OR led by Prof. Michel Bierlaire
Transportation research projects

Air-rail physical intermodality

- Development of an innovative solution to adapt the transportation system on demand
- Conception of wagon-capsules able to transport freight, passengers of fuel.
- Allow capsules to move on rails before being hanged beneath a flying wing.
- Transhipping management thanks to automated carriages transfer.

Labs: TRANSP-OR, ICOM, LIV and other mechanical labs
Transportation research projects

Cooperative transport systems

- Develop adaptive driving assistances (platooning, collision avoidance, etc.) to improve mobility, increase security and decrease pollution.
- Adapt the level of assistance according to the driving context.
- Develop a multi-vehicle realistic simulator able to evaluate the design of smart vehicles.
- Develop and test a co-operative technology supporting fully automated driving.

Lab: DISAL led by Prof. Alcherio Martinoli

Technology

System
Transportation research projects

Multi-modal traffic management

- Analyze and evaluate the level of performance of the current traffic management strategy in different parts of the city of Geneva.
- Investigate the feasibility of “smart traffic management schemes” to decrease congestion for all modes of transport.
- Develop the methodological tools to answer all of the above.

Lab: LUTS led by Prof Nikolas Geroliminis
Vehicle fleet management

- Develop fleet management algorithms for planning and operation of autonomous vehicles.
- Enable real time operation, provide cost and risk minimal solutions.
- Integrate the fleet of autonomous vehicle to the existing public transport system of cities.
- Full-scale test in Sion from June 2016 to prepare their commercialization

Partners: EPFL (LUTS and Best Mile Spin-Off) and Post Bus
Transportation research projects

Drones

- Develop advanced “Detection & Tracking” and collision-avoidance algorithms for unmanned aircrafts.
- Integrate these algorithms in a realistic simulation framework.
- Perform tests with unmanned aerial vehicles in real indoor and outdoor conditions.

Labs: CVLAB, DISAL, REACT, Flyability, Sensefly

Honeywell

Technology
Develop computer-vision techniques for on-board pedestrian detection and tracking.

- Improve the robustness of pedestrian tracking systems by complementing them with mathematical models of pedestrian behavior.
- Predict the future trajectories of pedestrians surrounding the vehicles in order to assess risks of collision.

**Automated pedestrian detection**

**Labs:** LTS5, TRANSP-OR
Transportation research projects

Logistics systems

- Exploit the Internet metaphor and propose a sustainable breakthrough solution to logistics problems.
- Simulate the added values of multimodal mutualized logistics for the transport of FMCG in France.
- Conceptualize and simulate a new generation of intelligent rail-road hub.

Lab: TRANSP-OR led by Prof. Michel Bierlaire
Thank you for your attention