EPFL: 13 Study Programmes, 350 Research Labs

- **5 Schools, 13 Sections**
  - ENAC: Architecture, Civil Engineering, Environmental Science & Engineering
  - SB: Mathematics, Chemistry, Physics
  - STI: Electrical Engineering, Microengineering, Mechanical Engineering, Materials Science
  - IC: Computer Science, Communication Science
  - SV: Life Sciences & Technology, Bioengineering

- **2 Colleges**
  - CDM: Management of Technology, Financial Engineering
  - CDH: Human & Social Sciences

- **7 Interdisciplinary Centers**
  - Transport, Energy, Neuroprosthetics, Design (EPFL+ECAL Lab) etc...

- **26 Institutes**
  - 350 Laboratories and Research Groups
EPFL’s three missions according to the Federal Act

Overview

Missions

Education
of scientists, engineers & architects

Research
Advanced, fundamental & applied

Technology Transfer
to industry & society
TRACE – Fields of Expertise

- Mobility
- Transportation
- Logistics

TRACE – Transportation Center
TRACE – Goals

**Goals**

- Promote EPFL competences about transportation
- Be the interface between EPFL and external world
- Support collaborations between EPFL’s labs and external partners
TRACE - Activities

- Understand industrial needs
- Match industrial innovation needs and research topics
- Coordinate research project
- Arrange contract and intellectual property issues
- Promote lab skills to external partner
TRACE - Key Numbers

- 95 Research project
- 30 affiliated labs
- 15 M CHF raised
- 0 CHF additional cost
- 8 highly skilled people
- More than 50 industrial partners
Designing efficient multi-modal traffic management schemes for the city of Geneva

Prof. Nikolas Geroliminis
Urban Transport Systems Laboratory

EPFL team: R. Lamotte, R. Meyer, N. Zheng, T. Kouvelas
POTENTIAL IMPACT/OBJECTIVES

• Understand network behavior
  – Data analysis from loop detectors and bus GPS
  – Identify zones of congestion along time

• Define a new traffic management system
  – Design traffic signal strategy
  – Prepare the city for implementation
  – Identify additional useful sensor

• Final goal: Improve mobility of cars and public transport
MFD Empirical results

- Fixed sensors
  500 detectors (Occupancy and Counts per 5min)
- Mobile sensors
  140 taxis with GPS
    - Time and position (stops, hazard lights etc)
- Geometric data
  (detector locations, link lengths, control, etc.)

0.25 0.5 0.75 1

Multi-Modal MFD

VEHICULAR FLOW

PasSenger flow

Simulated data – Downtown SF

Geroliminis et al. (2014) Trans. Res. Part C
MFD: Choosing the good scale

- Very scattered
- Does not capture all the determinants of flow
- Clear hypercongestion

- Low scatter
- Large heterogeneity inside
- Hypercongestion is hidden

0
(some compromise)
Radius considered

Canton of Geneva
Defining zones for control (under progress)
Data presentation
Monitoring bus performance

- Congestion analysis: representation of the relative speed \( \frac{v}{v_{\downarrow 90}} \) as a function of time

=> Potentially a good way to measure congestion...
Control architecture
Missing a link?