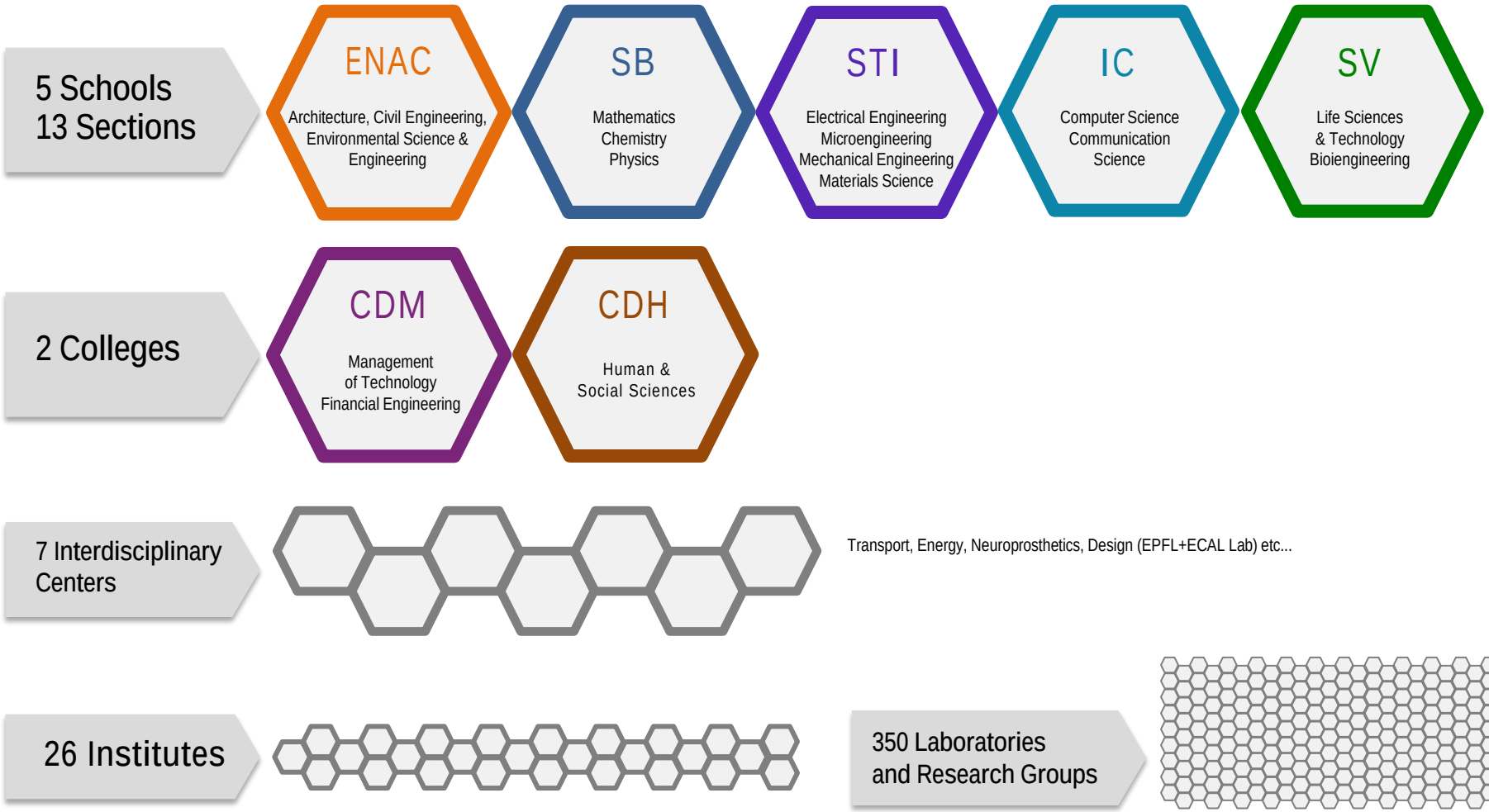
Ecole Polytechnique Fédérale de Lausanne
EPFL

Transportation Center

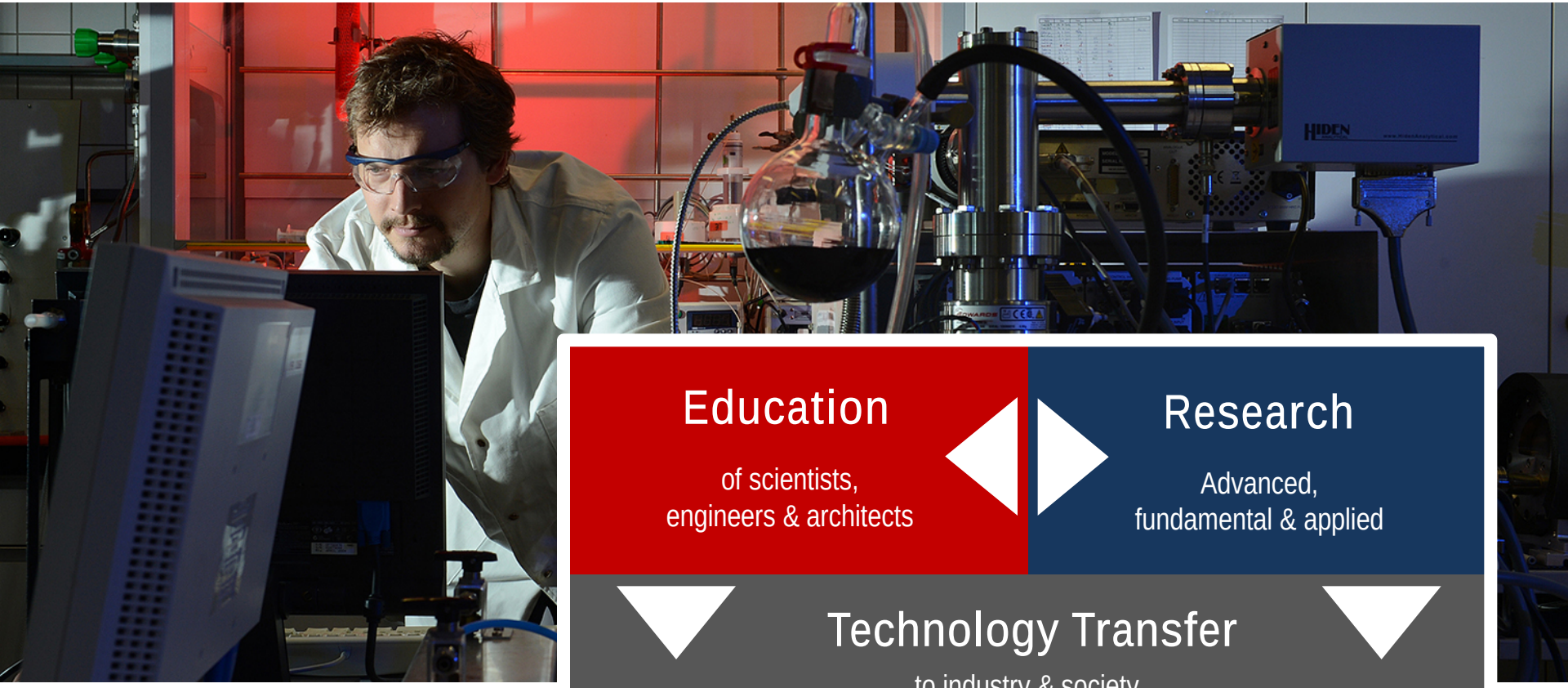
GEOsummit 9.6.2016
Bern

Simone Amorosi,
Jordan Holweger

EPFL: 13 Study Programmes, 350 Research Labs



EPFL's three missions according to the Federal Act



Education

of scientists, engineers & architects

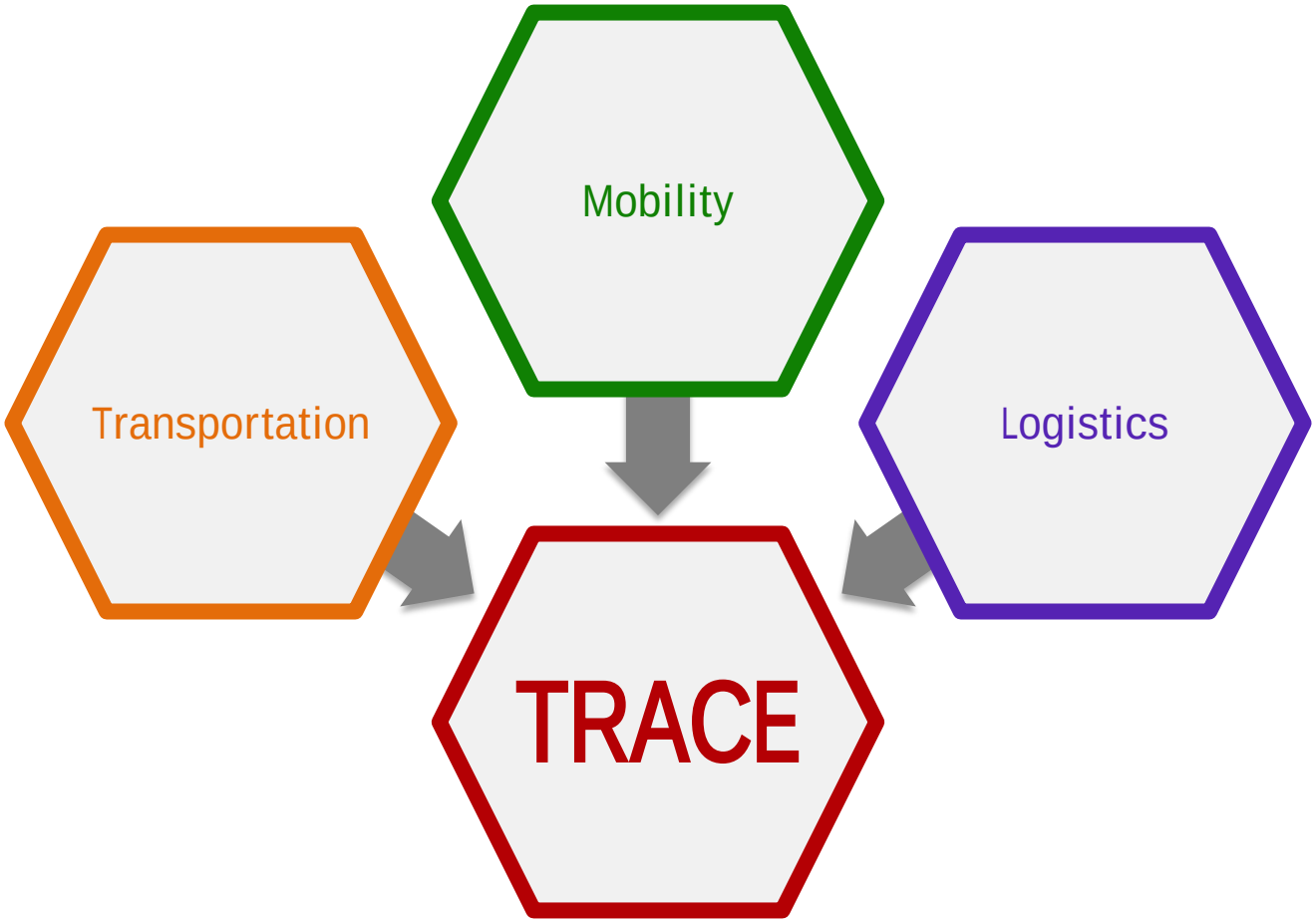
Research

Advanced, fundamental & applied

Technology Transfer

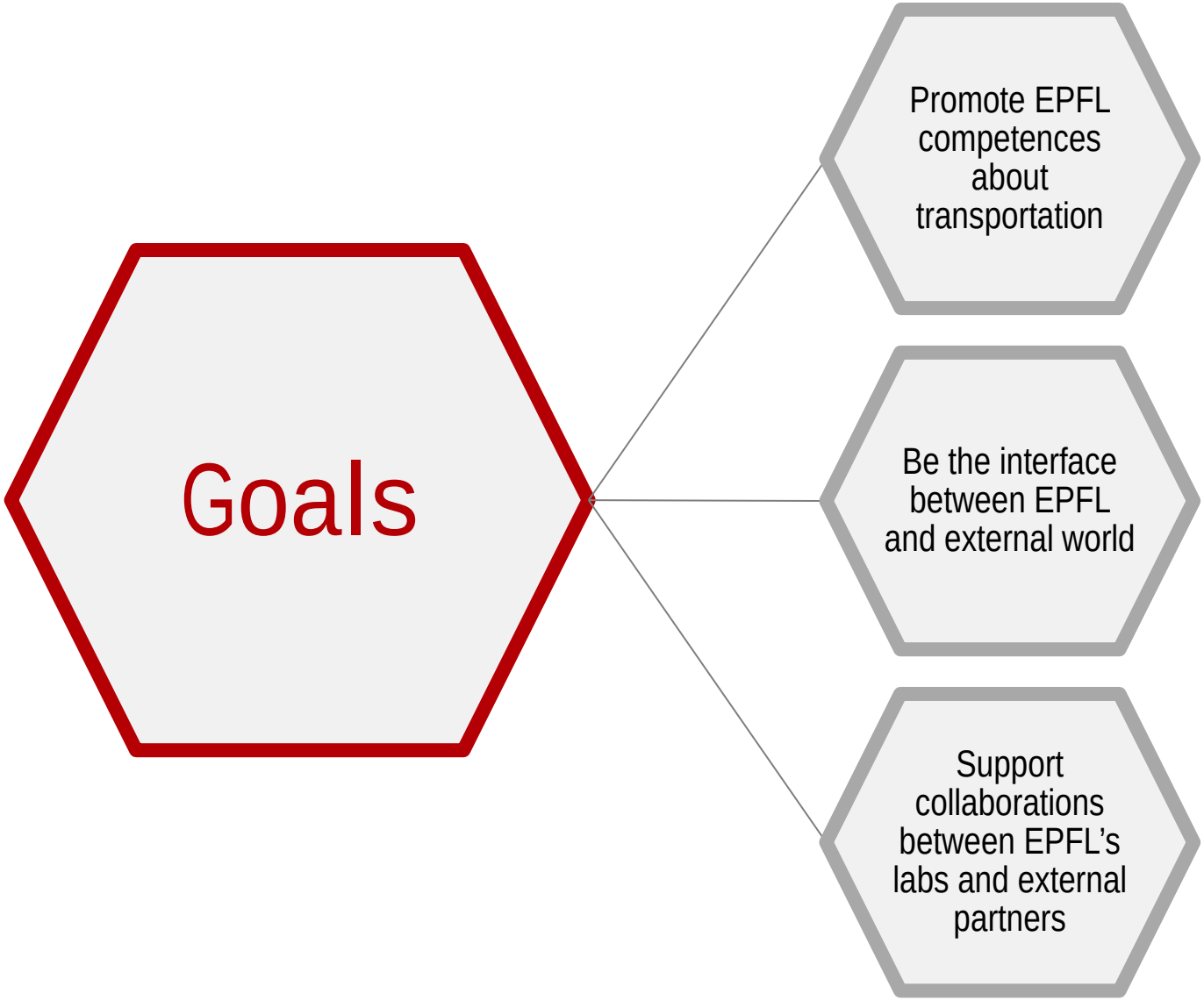
to industry & society

TRACE – Fields of Expertise

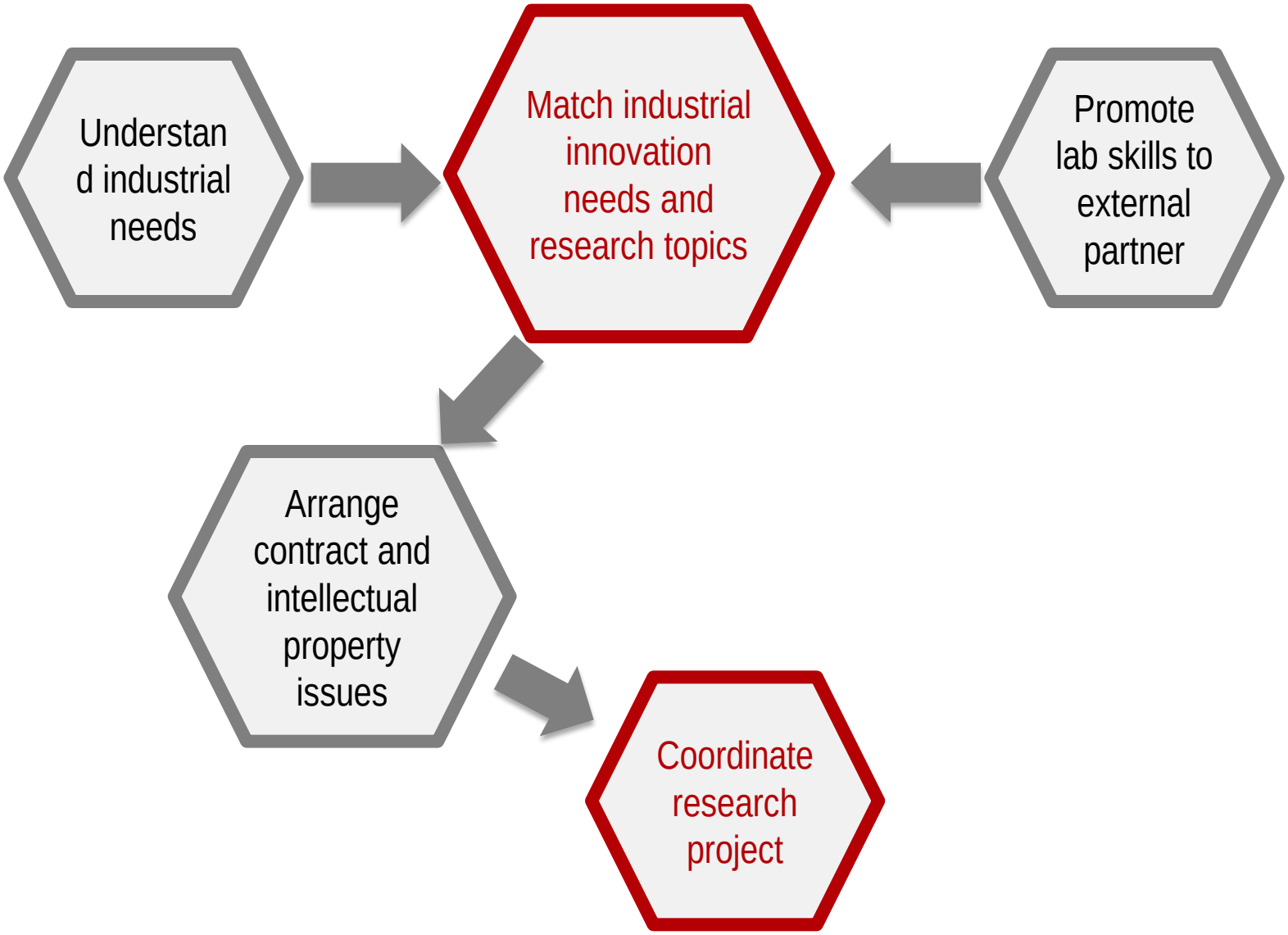


TRACE – Transportation Center

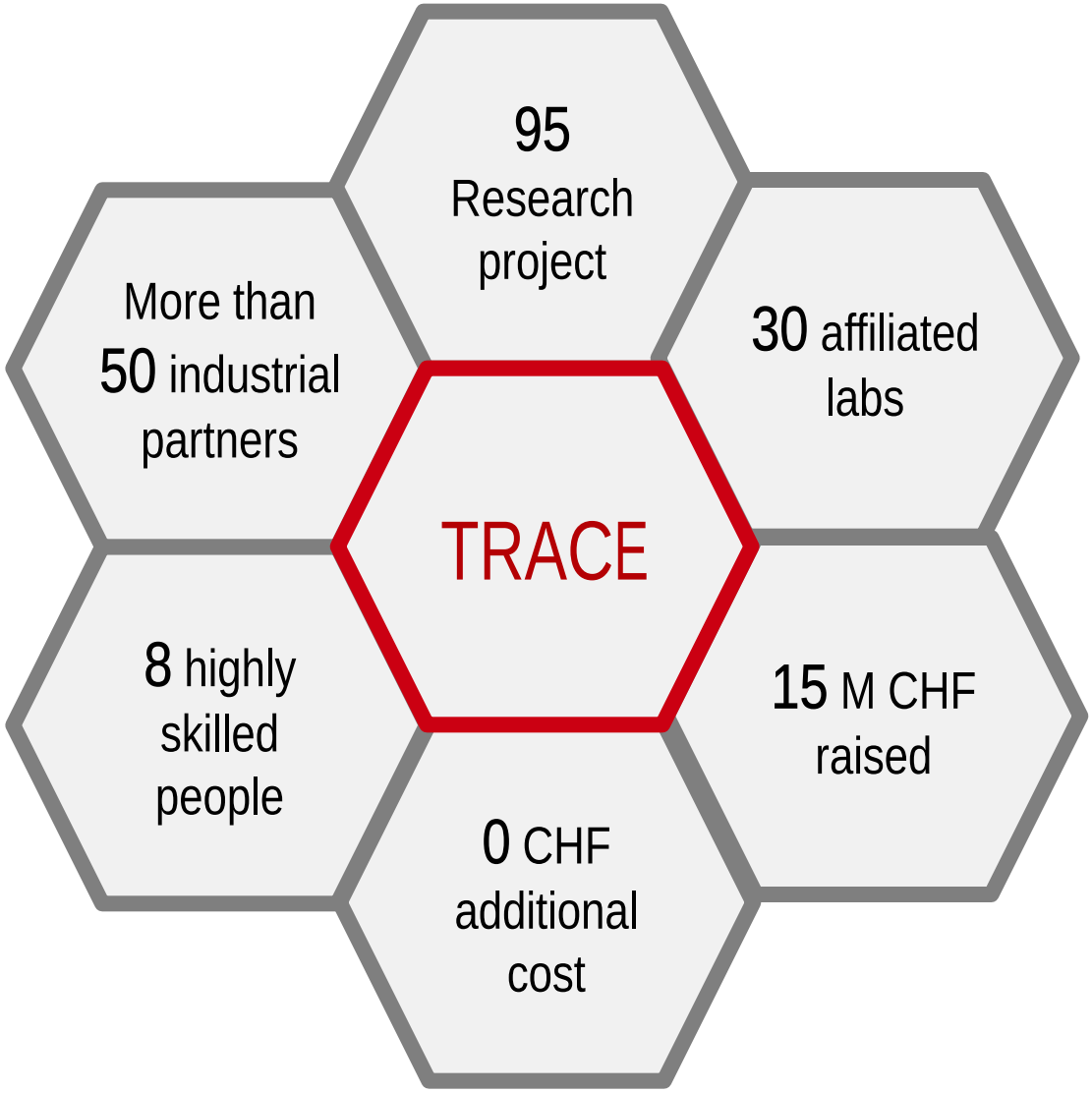
TRACE – Goals


Goals
Promote EPFL competences about transportation
Be the interface between EPFL and external world
Support collaborations between EPFL's labs and external partners

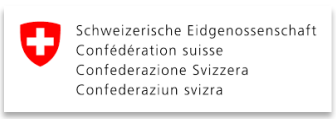
TRACE -Activities

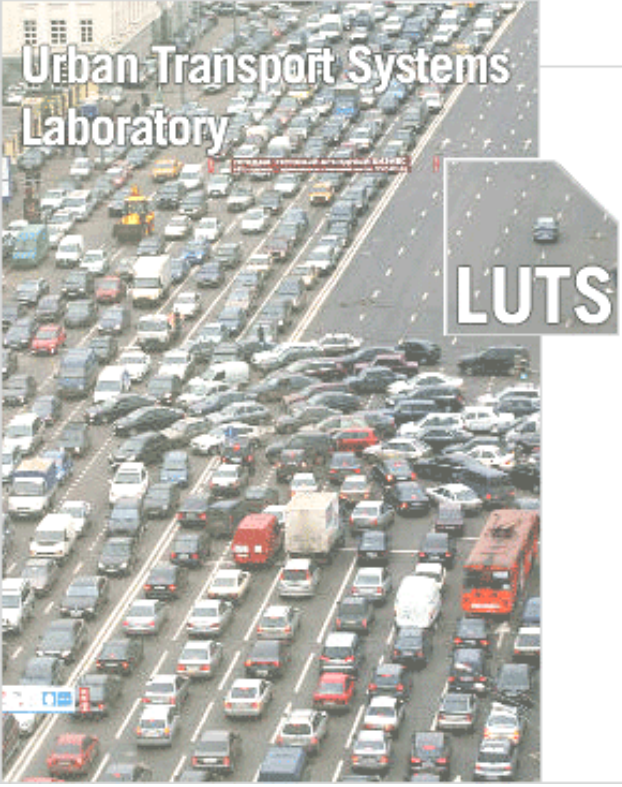


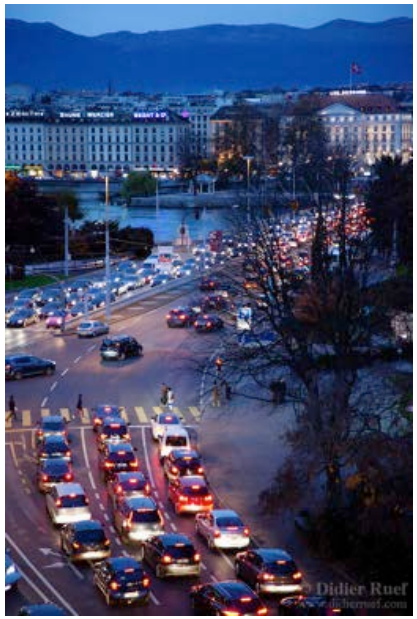
TRACE - Key Numbers



TRACE – Key Partners







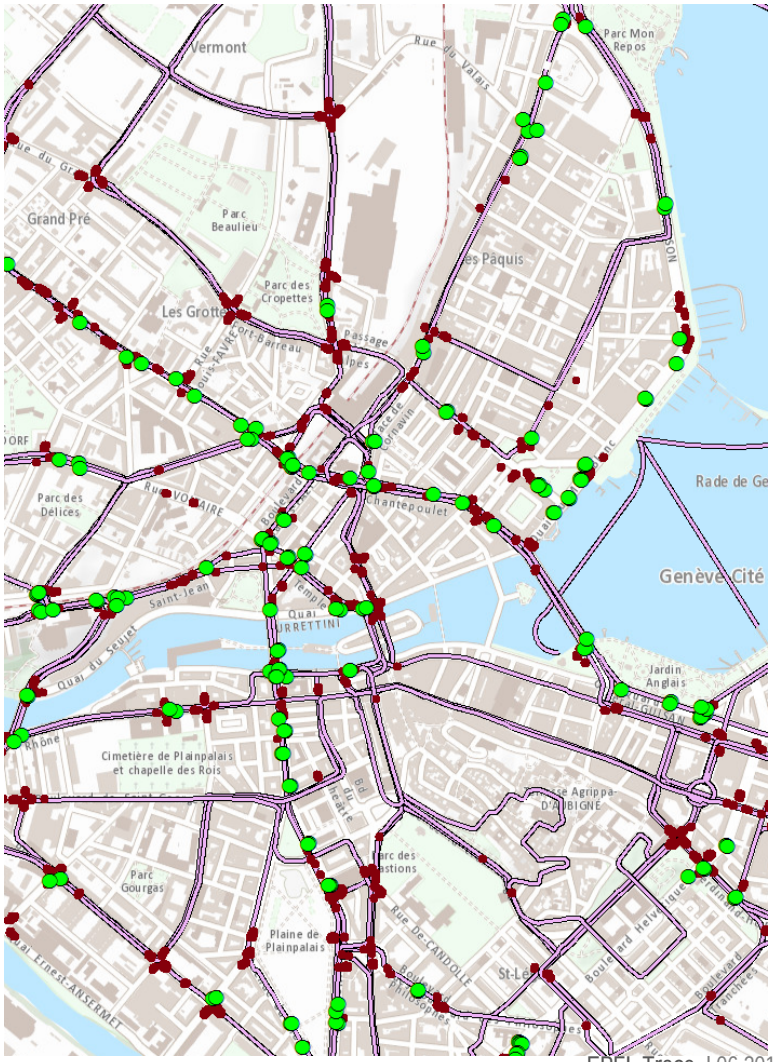
Designing efficient multi-modal traffic management schemes for the city of Geneva

Prof. Nikolas Geroliminis
Urban Transport Systems Laboratory

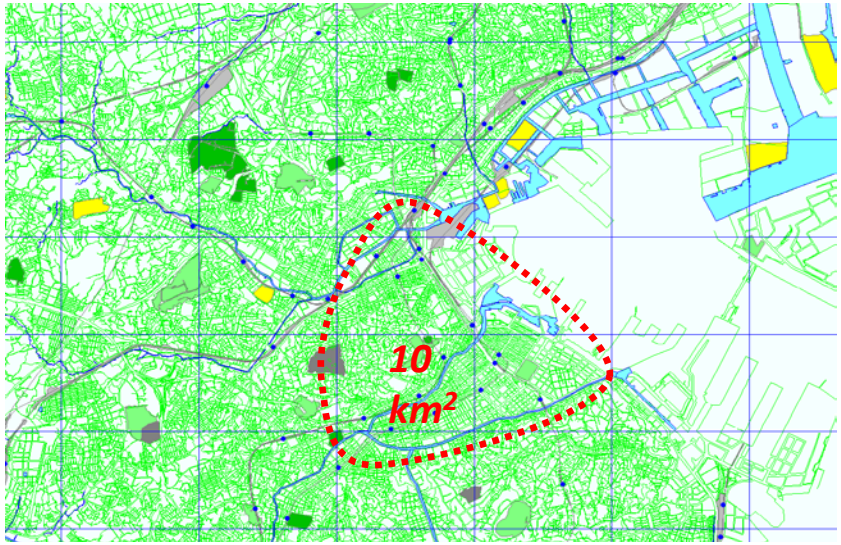
EPFL team: R. Lamotte, R. Meyer, N. Zheng, T. Kouvelas

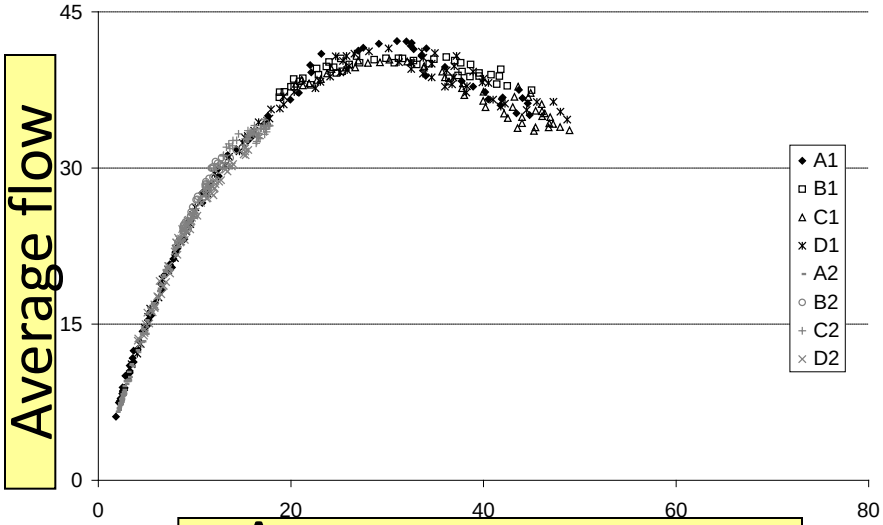
POTENTIAL IMPACT/OBJECTIVES

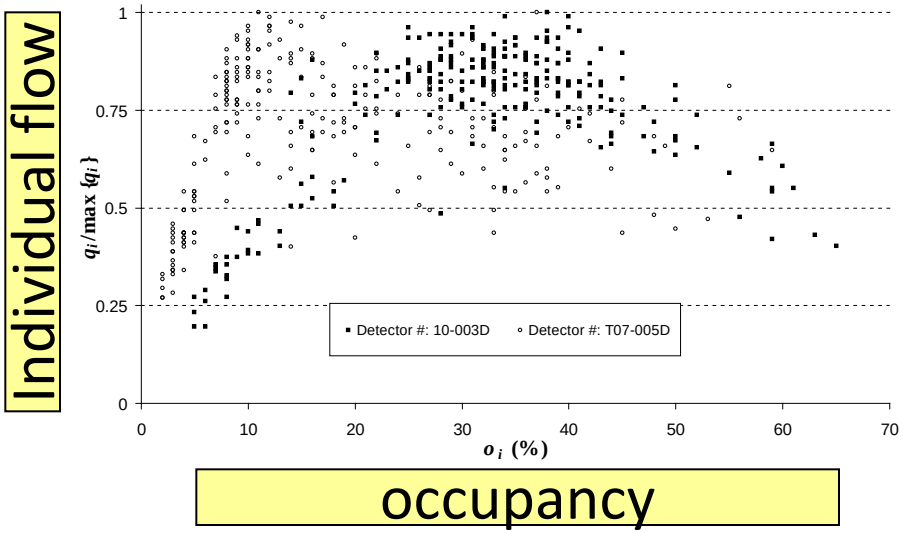
- Understand network behavior
  - Data analysis from loop detectors and bus GPS
  - Identify zones of congestion along time
- Define a new traffic management system
  - Design traffic signal strategy
  - Prepare the city for implementation
  - Identify additional useful sensor
- Final goal: Improve mobility of cars and public transport



MFD Empirical results







- Fixed sensors

  500 detectors (Occupancy and Counts per 5min)

- Mobile sensors

  140 taxis with GPS

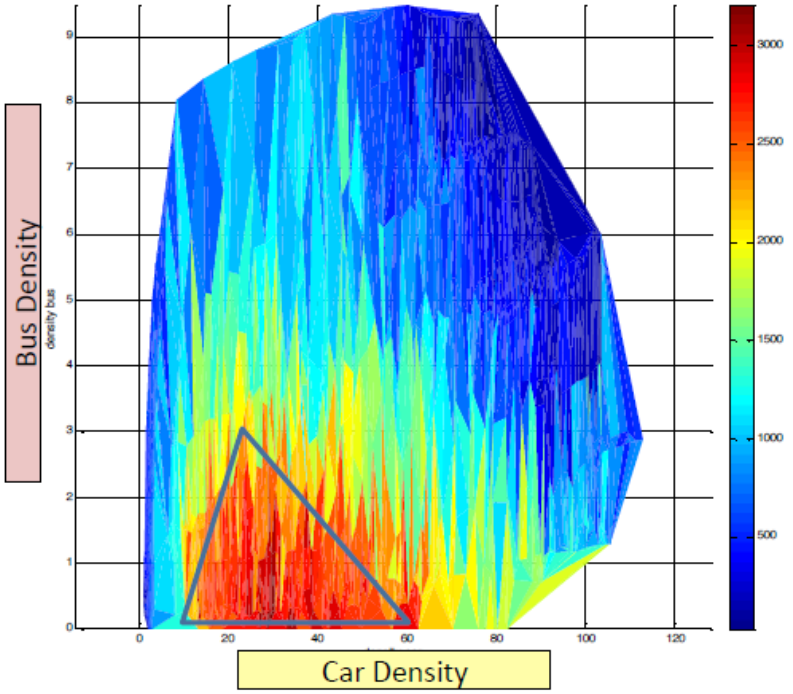
  – Time and position (stops, hazard lights etc)

- Geometric data

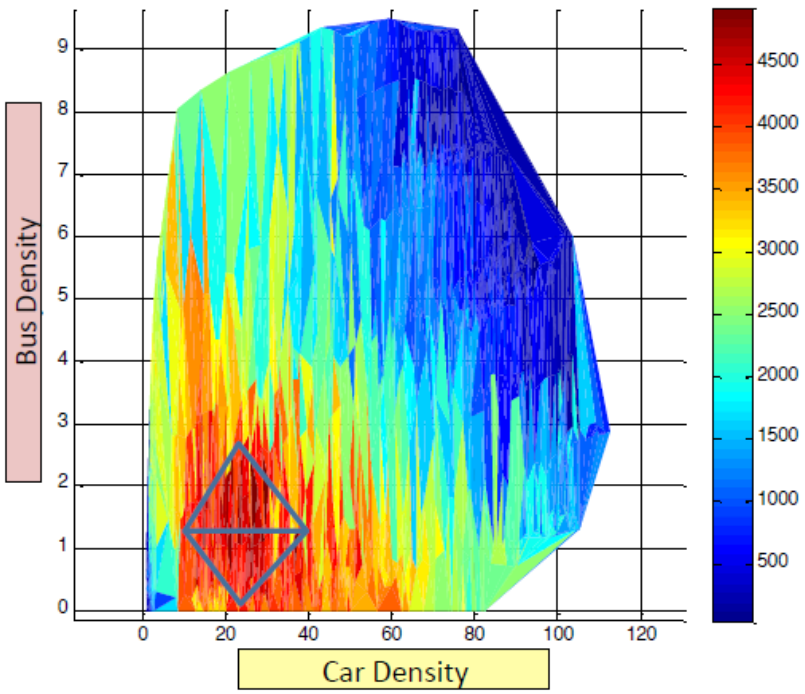
  (detector locations, link lengths, control, etc.)

Geroliminis and Daganzo (2008) – Tr. Res. Part B

Multi-Modal MFD



VEHICULAR FLOW



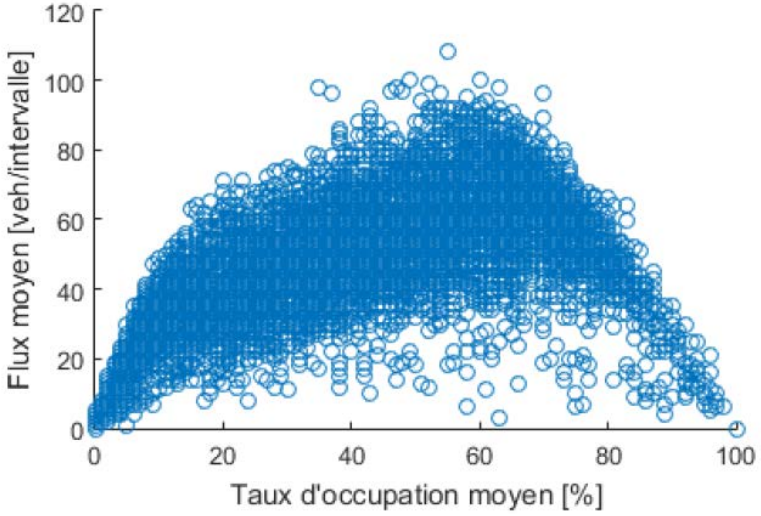
PASSENGER FLOW

Simulated data – Downtown SF

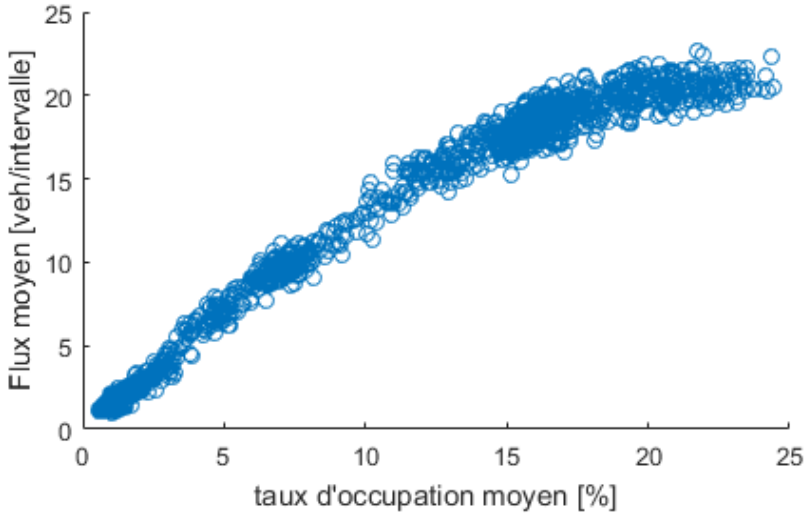
Geroliminis et al. (2014) Trans. Res. Part C

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

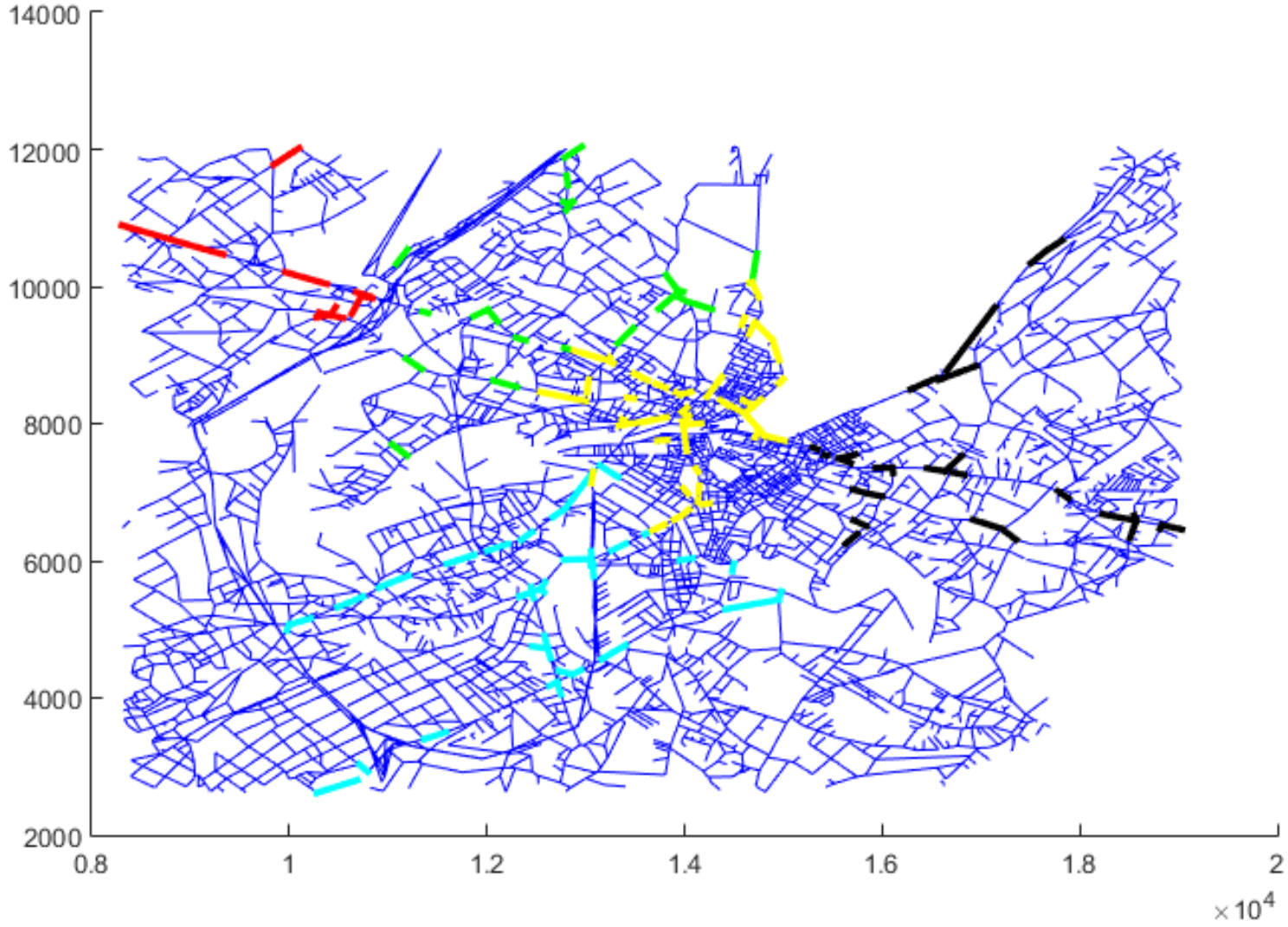


0 (single detector)

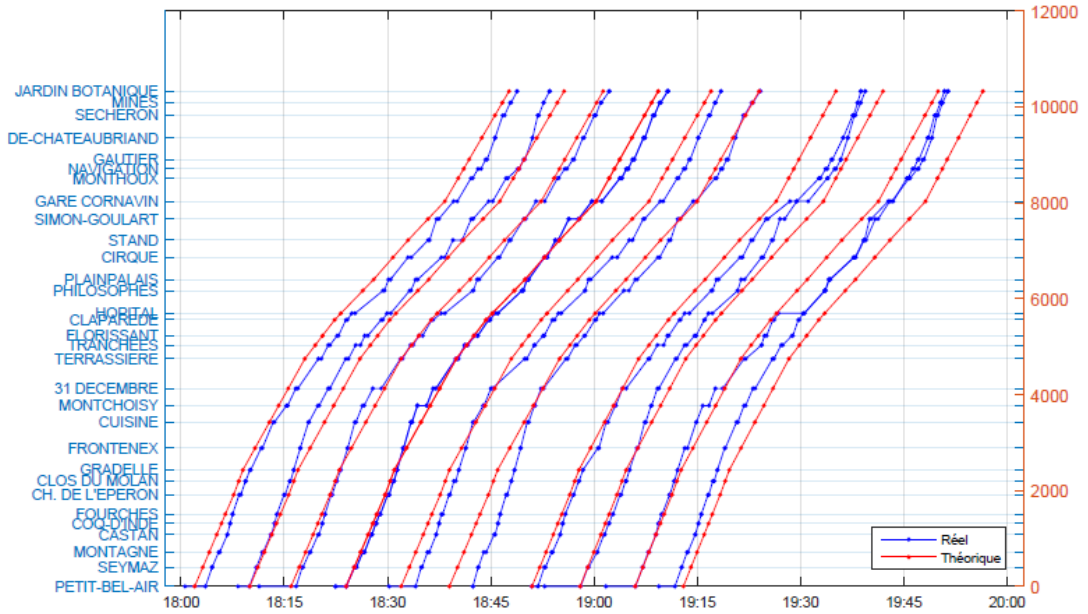
[some compromise] Radius considered

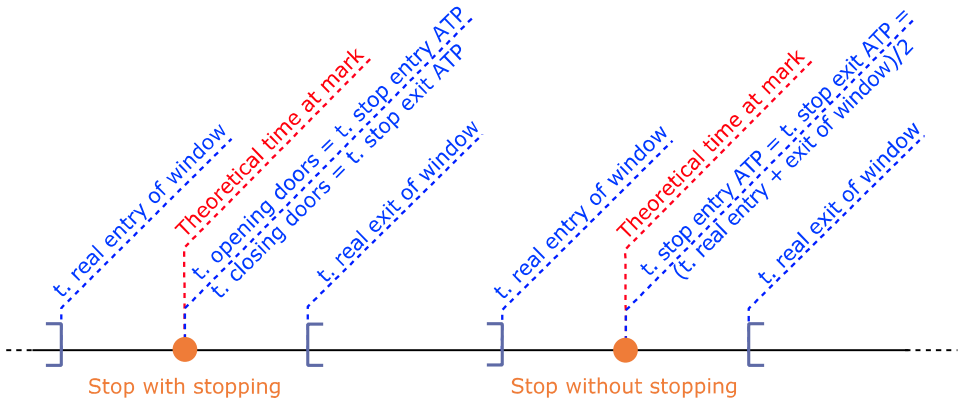
Canton of Geneva

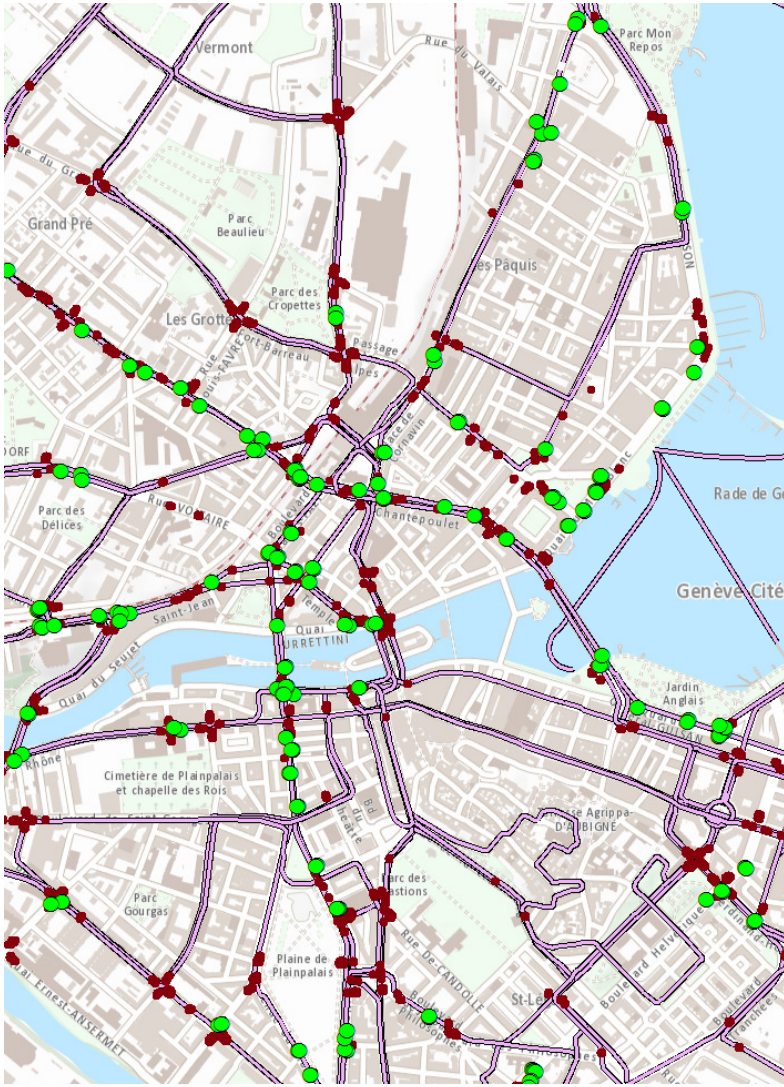
Defining zones for control (under progress)



Data presentation

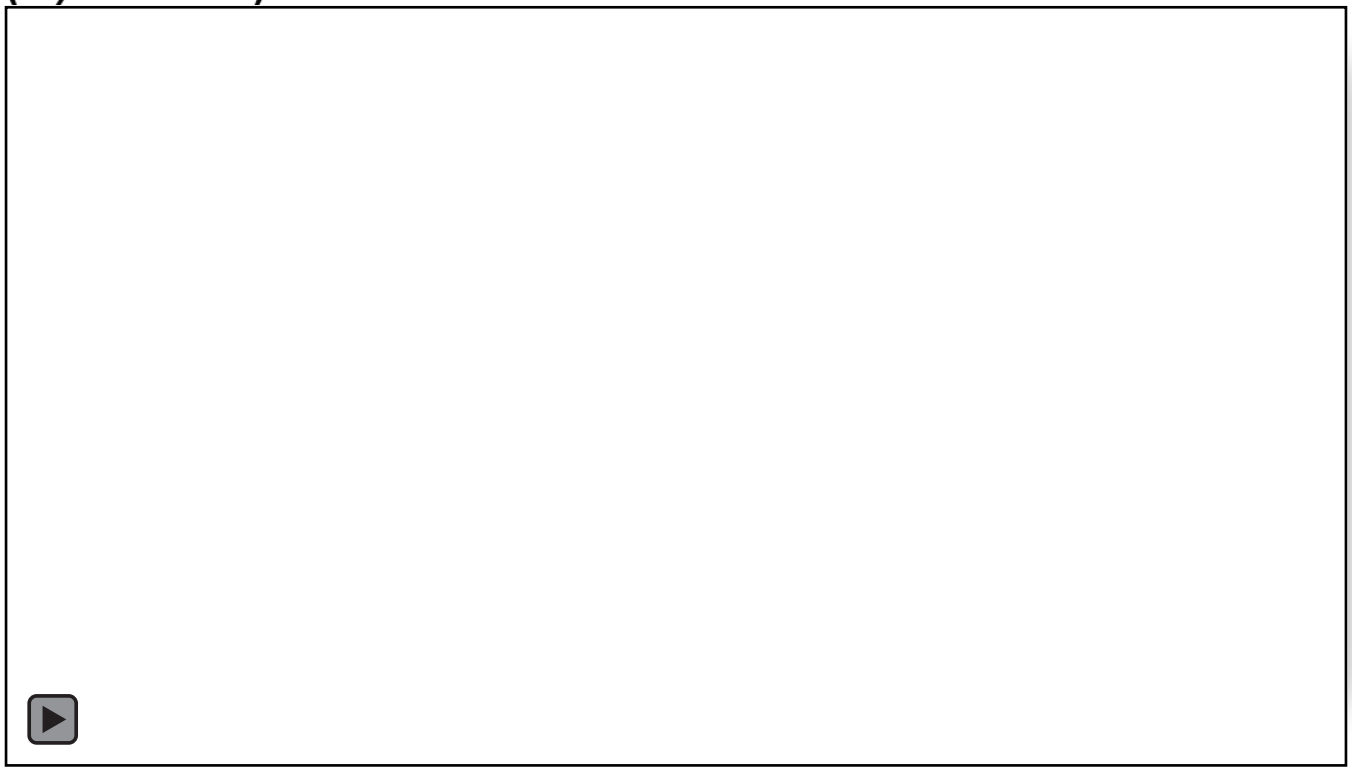






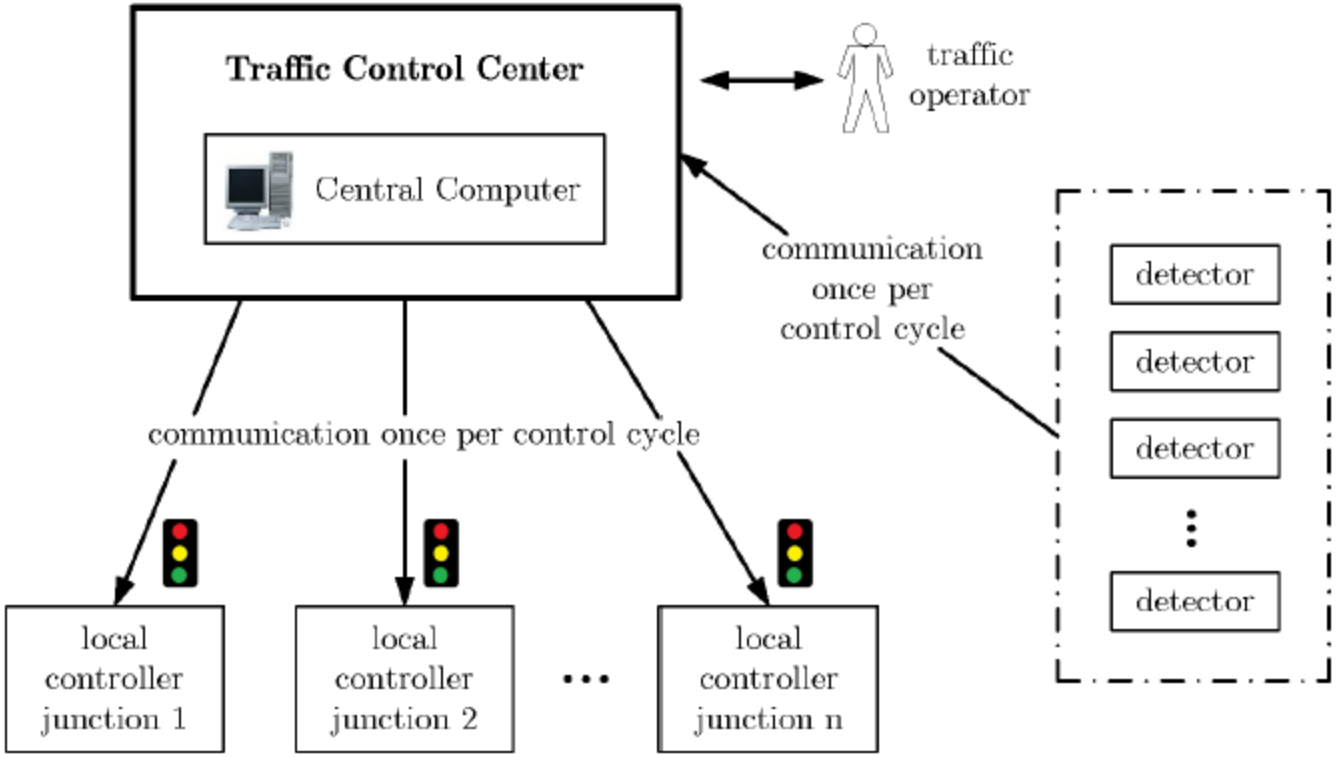
Monitoring bus performance

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



=> Potentially a good way to measure congestion…

Control architecture



Missing a link?