

Porto – Our living Lab for Future Cities

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Porto

Midsized European city
Multi-modal transportation system
Fiber-optical Internet backbone
Entrepreneurial tradition
41km² of *Real Life*



Universidade do Porto

- Founded in 1911
- 14 different schools
- ~31,000 students
- ~2,300 professors
- 70 research institutes





U.PORTO

urban-scale sensors wireless comm. mobile platforms cloud services



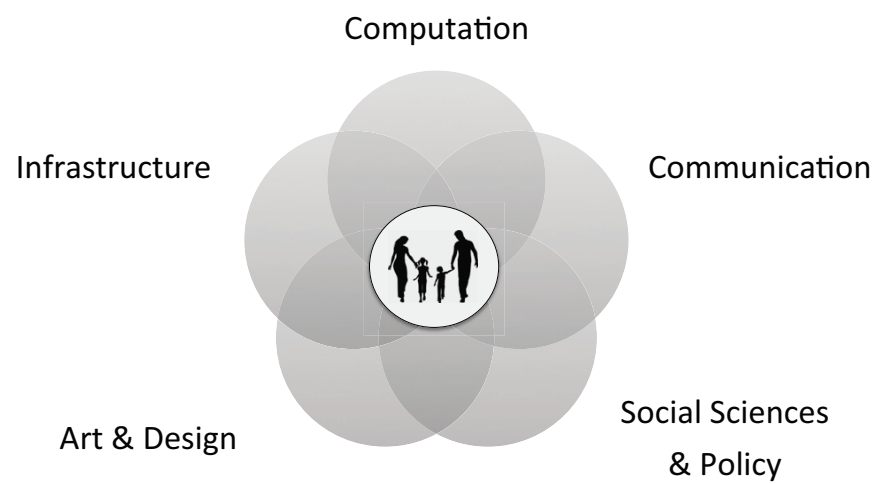
FUTURE
CITIES
PROJECT
.EU

Porto Living Lab

an ecosystem for the future

sustainability mobility urban planning ICT wellbeing

1. Form inter-disciplinary teams



2. Build world-class testbeds for urban-scale experiments



VANET - Vehicular Ad-hoc
Networking Test-bed

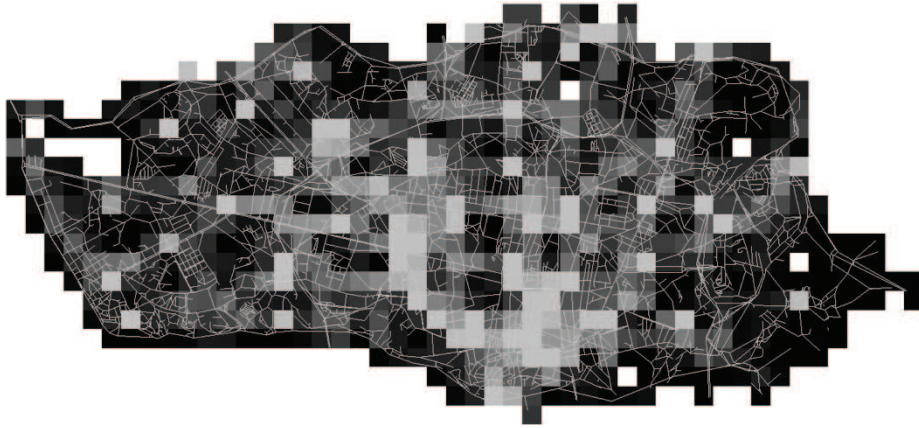
SenseMyCity – Crowdsensing Test-bed

Urban Sense - Hybrid Sensor Networking Test-bed

3. Work closely with end users from day one



4. Share data sets



5. Work with Industry Partners

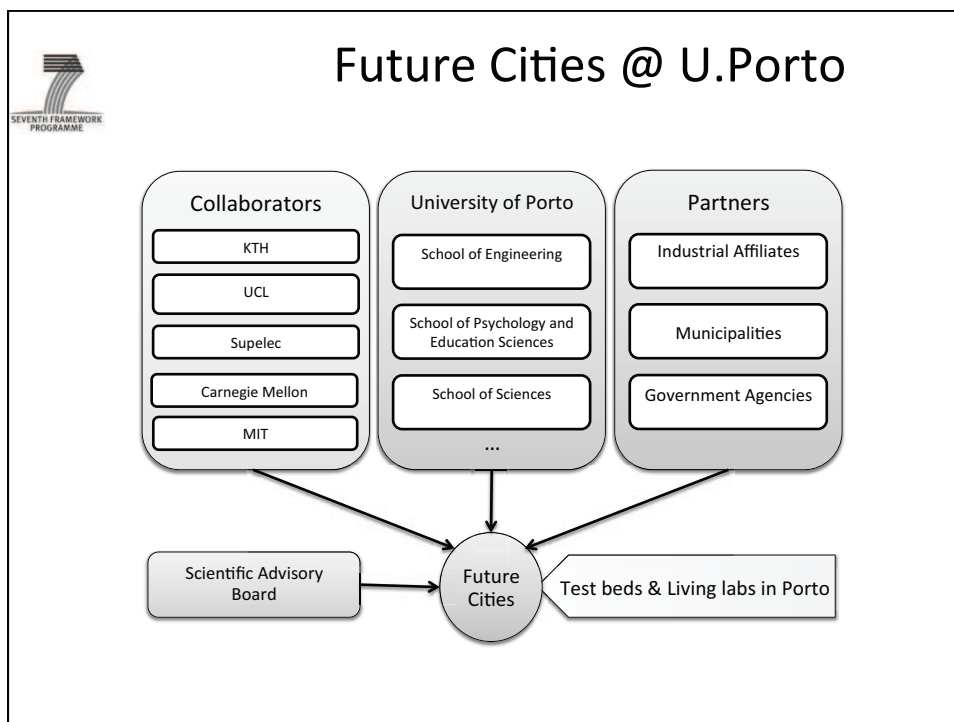
Companies

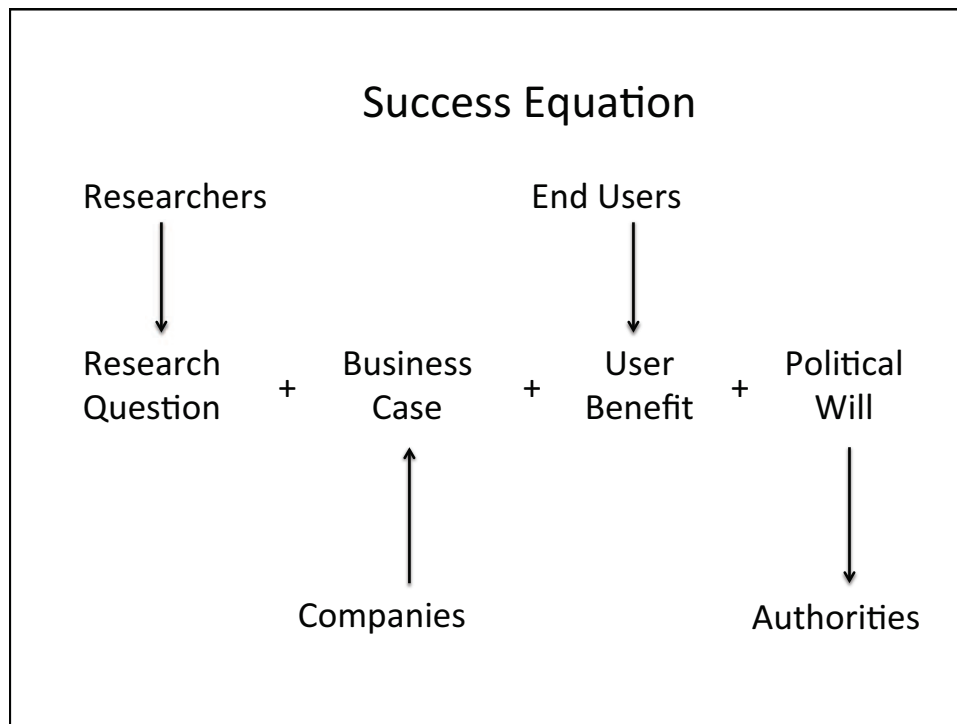


Institutional Support



6. Bring the results out to the world.







VANET

Harbour Testbed









Transportes Sardão testbed: 18 nodes (18 on, 0 unk, 0 off, 0 inop)





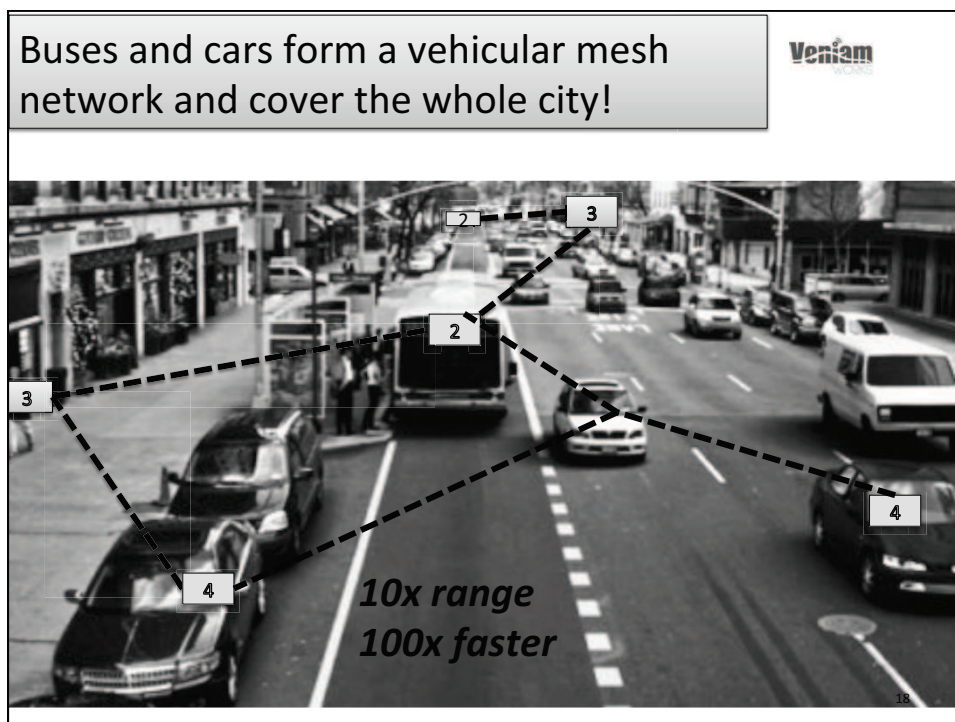
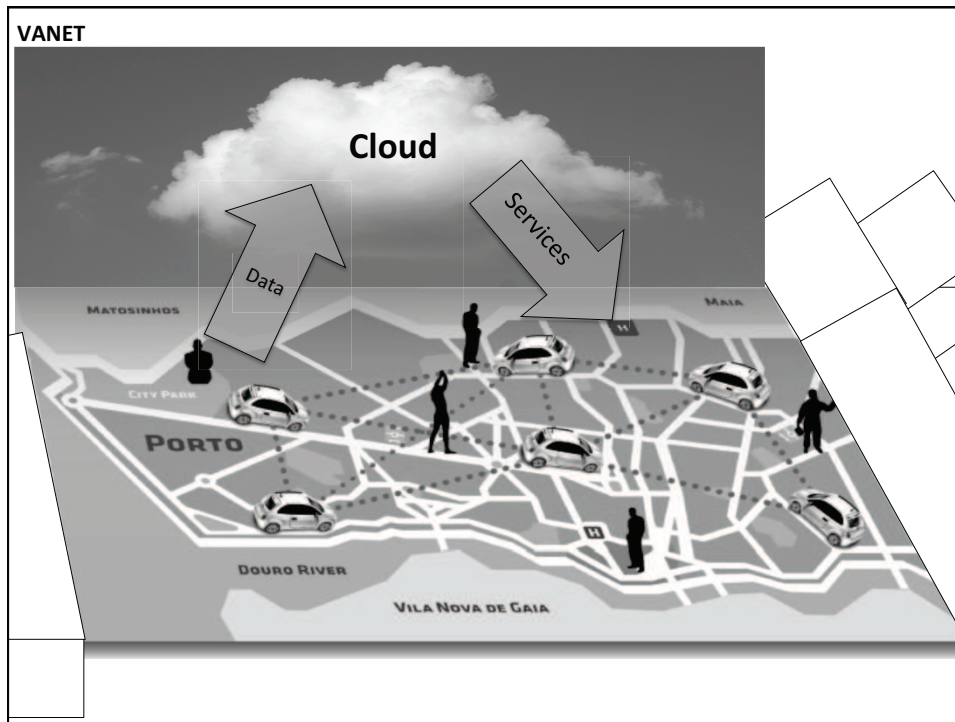
VANET testbed #2

Connected Vehicles

- Experimental testbed deployed in Porto, Portugal
- 465 taxi cabs with GPS computers
- 3G connection to the central
- 470 buses with GPS
- IEEE 802.11p connection vehicle2vehicle and vehicle2roadAP



VANET

Vehicular network coverage simulation

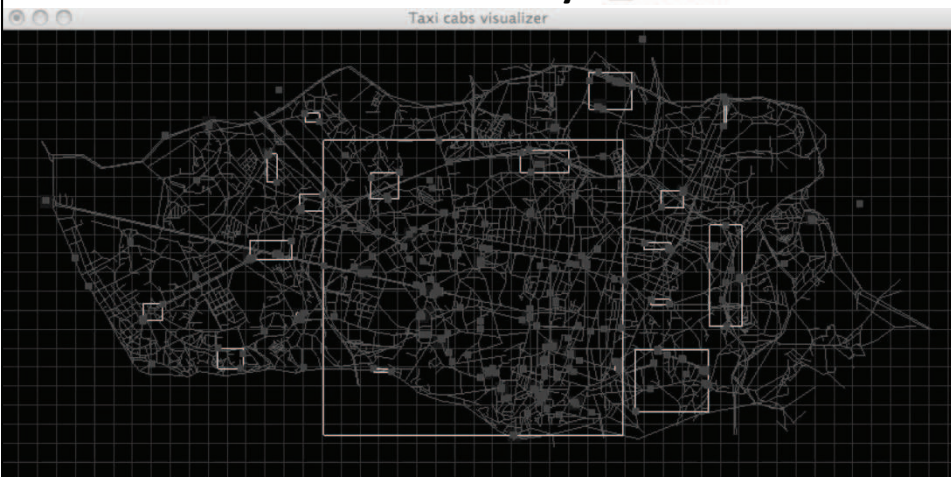


VANET

Buses real connectivity

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telecomunicações

universidade do oporto



VANET

1000s of WiFi hotspots!

- Porto: 40,000 ZON@FON hotspots
- UK: 4.5m BT wifi hotspots



VANET

WiFi coverage

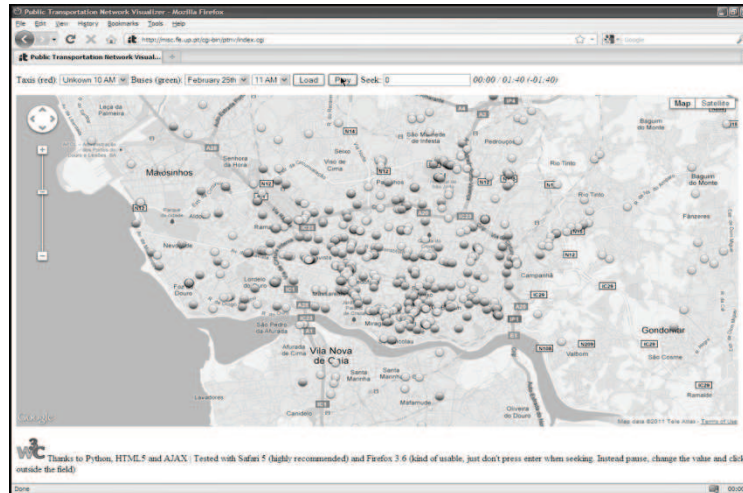


VANET

Bus+Taxi connectivity

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telecomunicaçõesVeniam
WORKS

universidade de aveiro



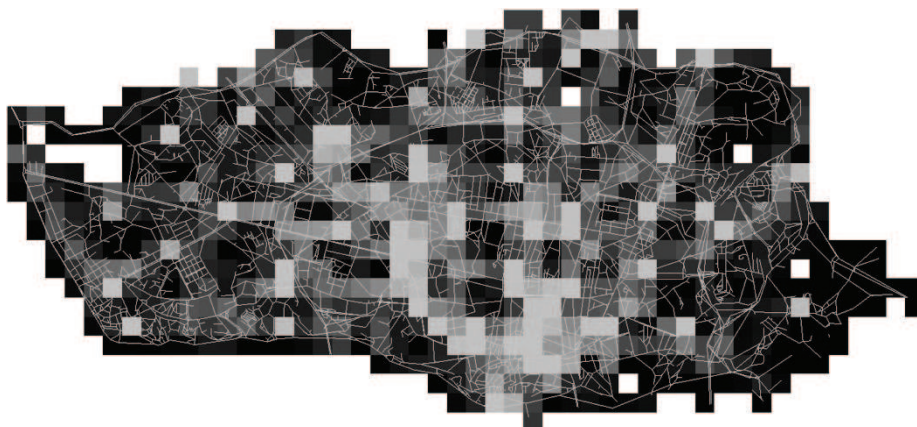
VANET

Latency trials

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30 mins of sampling with taxis and buses



SenseMyCity

Vital Driver (MISC)

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IEETA

instituto de engenharia electrónica e telemática de aveiro

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Teenager steers school bus to safety after driver has heart attack

A quick-thinking seventh grader steered a school bus to safety after the driver was stricken with a heart attack in the state of Washington.



SenseMyCity

Vital Driver (MISC)



Fig. 2. Smart t-shirt used to register ECG and monitor heart rate. Electrodes are only felt during the initial minutes, after which the garment becomes

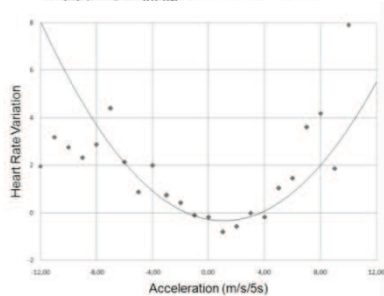


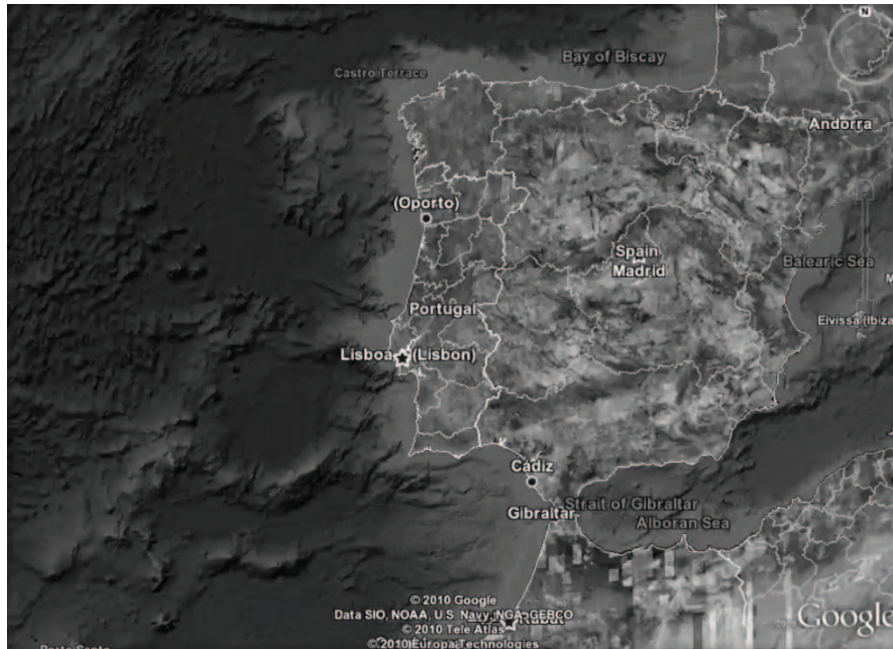
Fig. 5. Average heart rate increase caused by different vehicle accelerations



Fig. 3. Overview of a trip over Freixo Bridge. Hot colors represent higher values of heart rate while light colors represent lower values. [15]

In: IEEE ITS 2011

SenseMyCity



SenseMyCity

MISC/Vital Driver

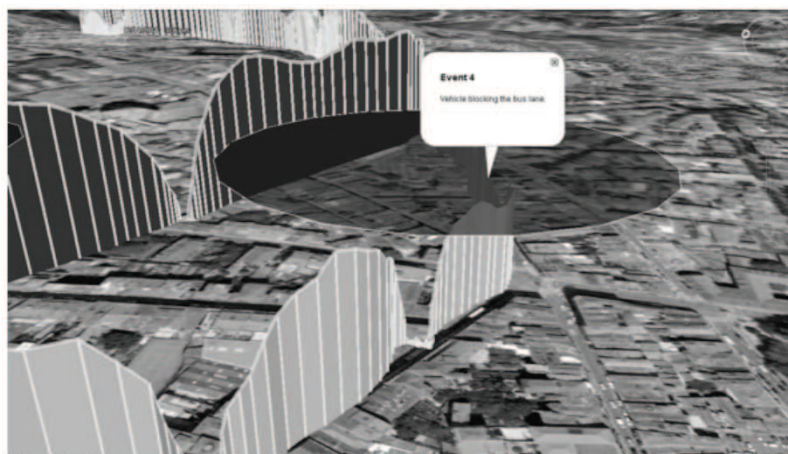


Figure 6 - Close-up of a stress event in Google Earth. The height of the traces represents bus speed.

SenceMyCity

Vital
Responder

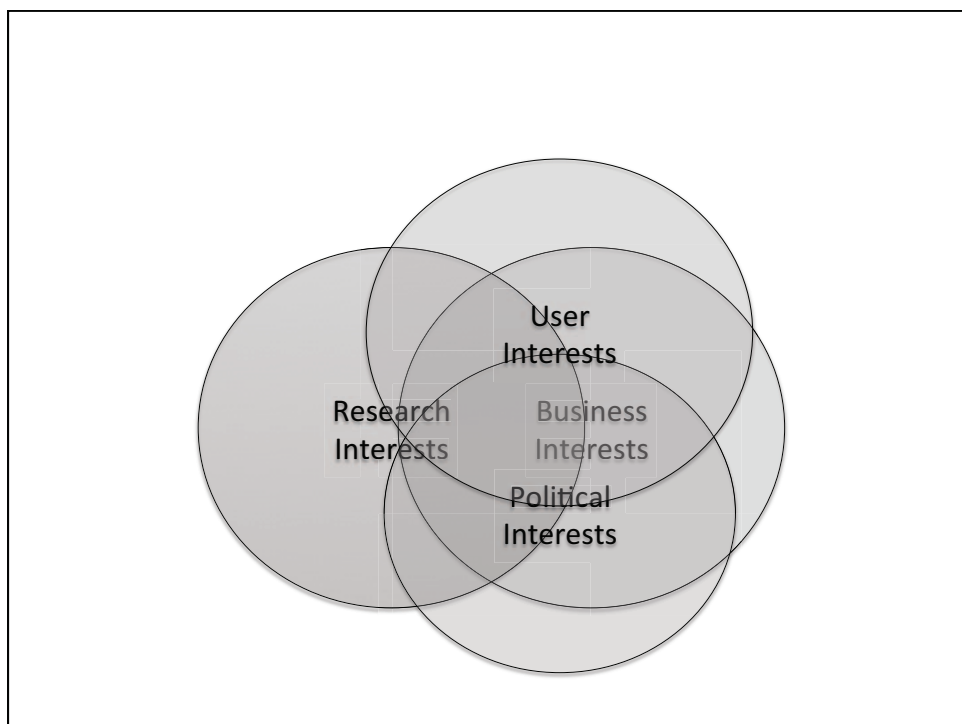
 Instituto de telecomunicações
Carnegie Mellon | PORTUGAL

 universidade de aveiro



13:47

SEGURANÇA DOS BOMBEIROS
2 universidades desenvolvem t-shirt que permite monitorizar sinais vitais no terreno



Porto – *Our Living Lab for Future Cities*



2. Build world-class testbeds for urban-scale experiments

