# Naturalistic cycling study in French cities

Basis for relevant and accepted countermeasures

**ERGO-CENTRE**
Conseil Formation Recherche en Ergonomie

**IFSTTAR**

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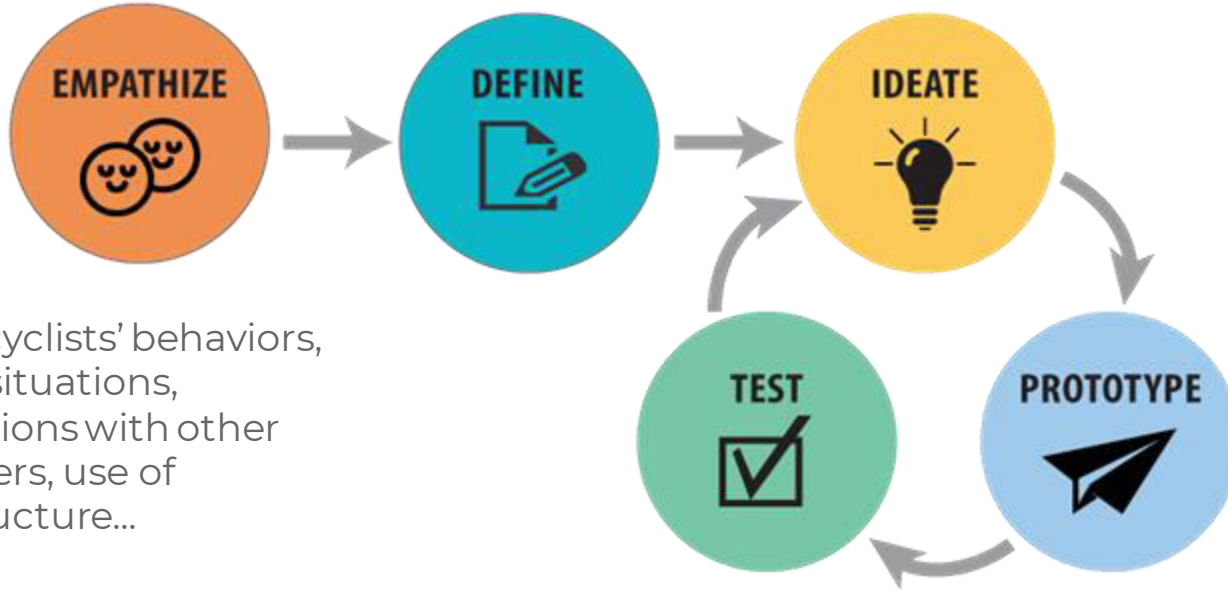
Dublin, 06/27/2019

## Challenge

The best way to prepare
the cycling city of 2030
is to investigate what cyclists do
in the real world in 2020

# Human centred approach

Users are asked to conceptualize a heap of thoughts and to suspend judgment. It takes the form of focus group based on the field study results.



Actual cyclists' behaviors, critical situations, interactions with other road users, use of infrastructure...

Testing is a part of an iterative process that gives testers feedback.. The reason for testing is to realize what works and what doesn't, and afterward emphasize it.

# What do we know about cyclists' critical situations?

**Accidents**

**Nearmisses, behaviors, interactions, cognitive processes**
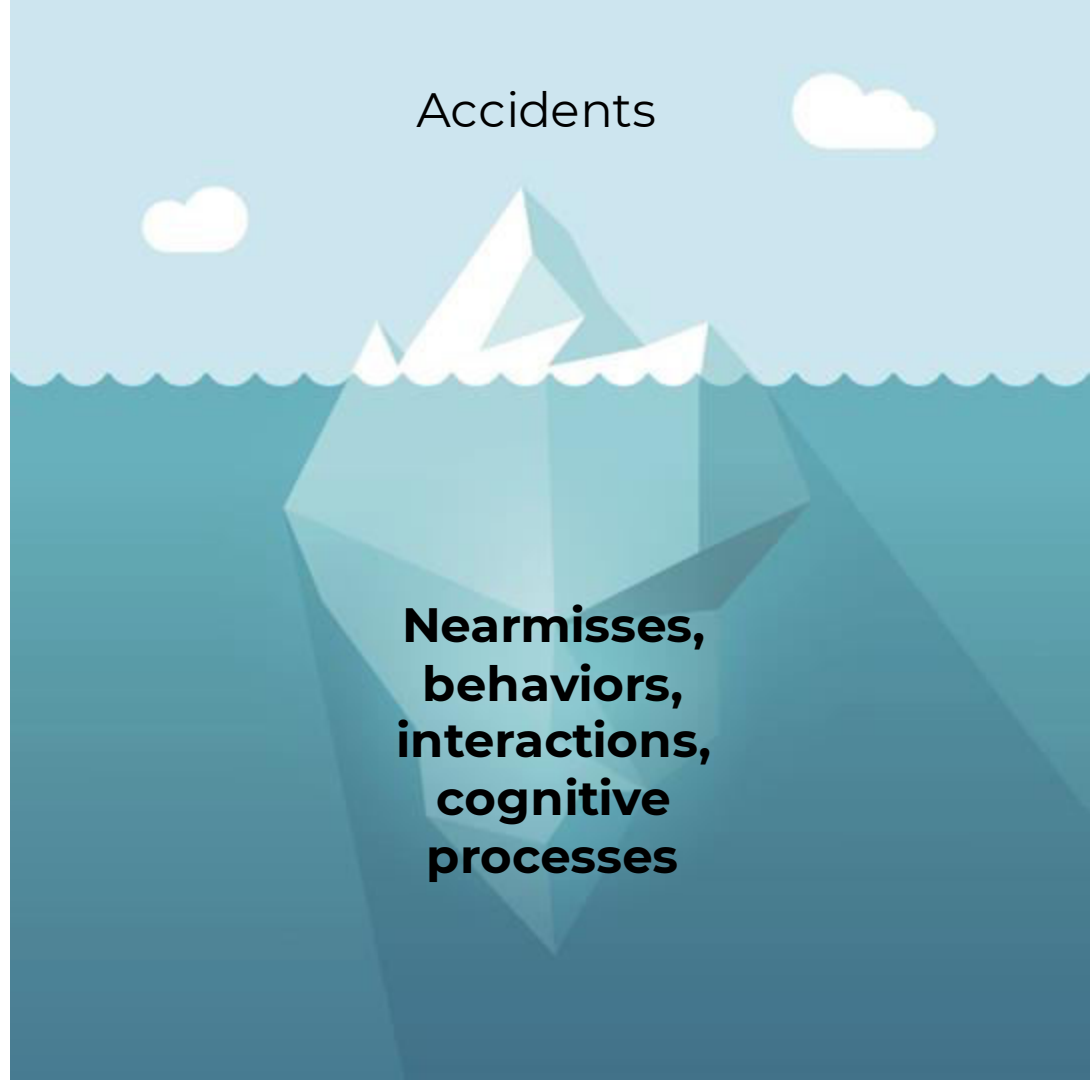
# What are naturalistic cyclists studies?

Open roads in real world

Daily and usual journeys

Longitudinal study

Behaviors AND cognitive processes
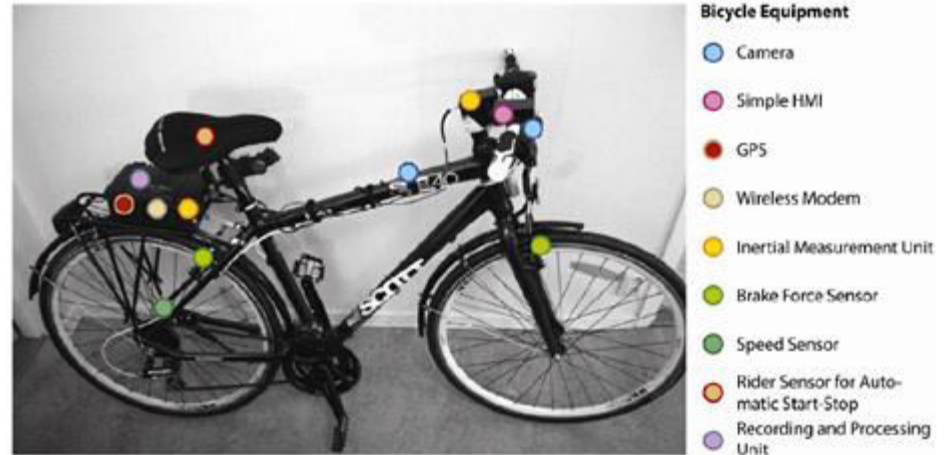

User experience

Design
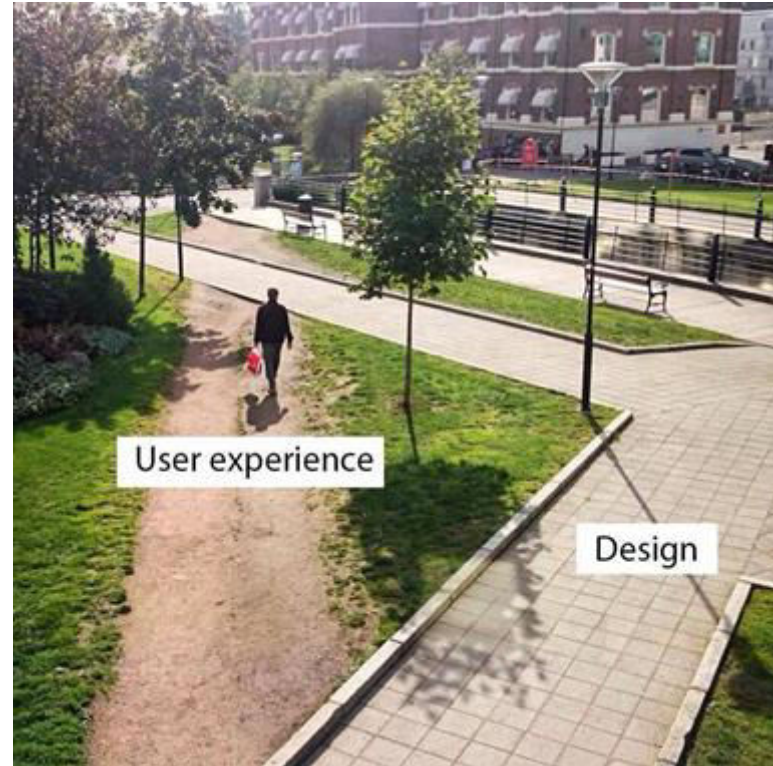
# Existing Naturalistic Cycling Studies

Naturalistic studies on cyclists' behaviors are very scarce.

Interesting pilot studies in EU, US and Australia:
- Dozza et al., 2012
- Gustafsson and Archer, 2012
- Johnson et al., 2013

No NCS conducted in France.



**Bicycle Equipment**
- Camera
- Simple HMI
- GPS
- Wireless Modem
- Inertial Measurement Unit
- Brake Force Sensor
- Speed Sensor
- Rider Sensor for Automatic Start-Stop
- Recording and Processing Unit

Bicycle equipment in Dozza et al. (2012)

# Our experience in naturalistic studies



15 years experience in naturalistic riding studies at IFSTTAR: PTW instrumentation in sensors and cameras

Systematically combined with interviews

Experimented and validated in EU projects, mainly on 2-wheelers (2BESAFE, SAFERIDER...)



Espié, S., Boubezoul, A., Aupetit, S., & Bouaziz, S. (2013). Data collection and processing tools for naturalistic study of powered two-wheelers users' behaviours. *Accident Analysis and Prevention, 58, 330-339.*

# The example of a current project

**Goals**
Understanding what cyclists do in the real world and the critical situations they face during cycling journeys in Paris and Lyon, in order to design relevant solutions.

**Partners**
IFSTTAR - French Institute of Transport & Safety Research
ERGO-CENTRE - Ergonomic studies in transportation
The French GOT
The city of Paris

**Duration**
2019-2020

**Procedure at a glance**

**75** cyclists
**50** in Paris & **25** in Lyon
**75%** of men
Mean age: **35** y/o

Each cyclist followed during **1** month
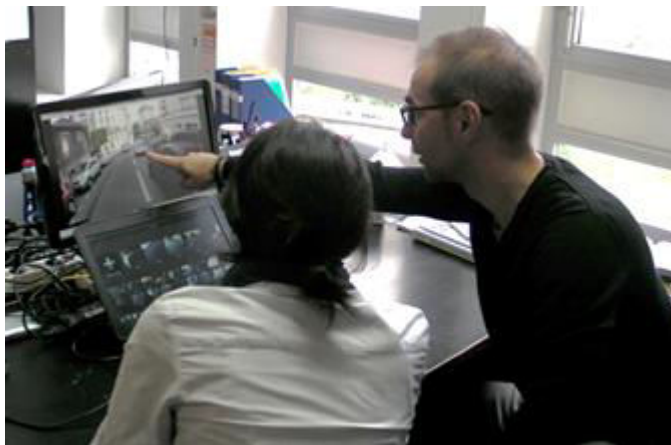**All** the cycling trips recorded
**3** sessions of 25 cyclists
**3** ergonomists in parallel

# Data collection

**3200** trips recorded
**15 000** hours recorded

**100** completed diaries
**1 000** risky situations

**375** interviews

# Data processing
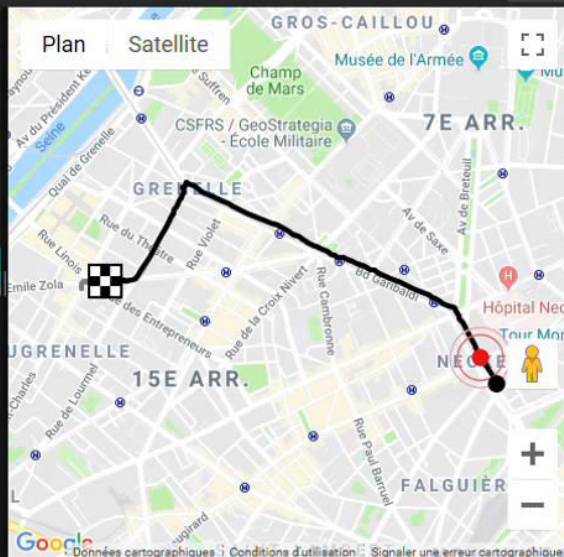
# Expected results // Use and profiles

In-depth understanding of journeys, distance travelled, use of facilities, and itineraries

Identification of user profiles and motivations for cycling

> **Helping public policies in the promotion of cycling, ITS, and soft modes of transport in cities, thanks to scientific field studies**

# Expected results // Critical situations

Map of critical situations faced by cyclists
in their everyday trips

Identification of the severity and the frequency of
these critical situations

Comparison with existing database on cyclists'
accidents in urban contexts

**> Improve existing solutions and risk
management approaches by considering
critical situations and not only accidents**
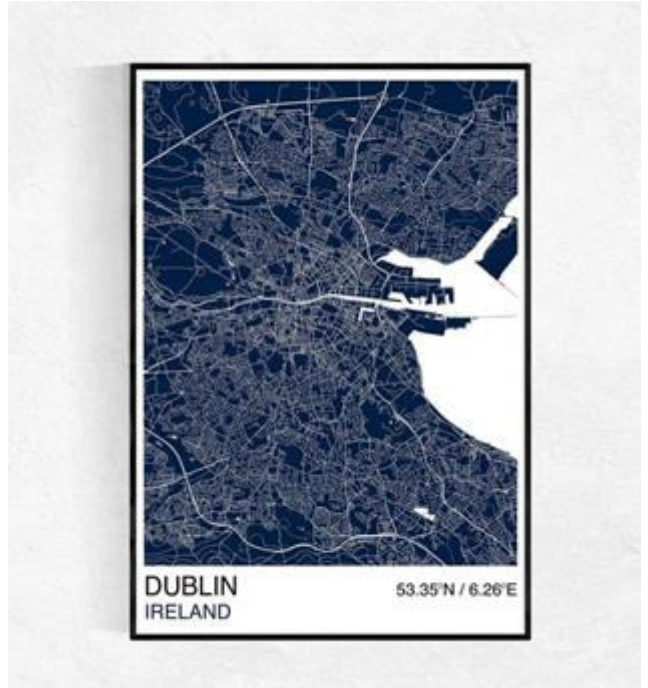
# **Expected results //** Road infrastructure

Cyclists' behaviors in cycling facilities (e.g. advanced stop line and contra-flow cycling in Paris)

Cyclists' behaviors in infrastructure made for all users (e.g. large roundabouts in Paris)

Cyclists' behaviors in facilities under experimentation, in order to validate or not the deployment of the studied solution

**> Rethinking of infrastructure design and space sharing based on real usage and cyclists' effective needs**

# Conclusion

In-depth study of the real usage is **necessary** in order to promote, supervise and design cyclists facilities **that are efficient and accepted by all users**

This set of tools could be easily adapted to other countries' cultural specificities and **exported to other cities**

**A global, shared EU project on NCS would help manage this goal.**

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