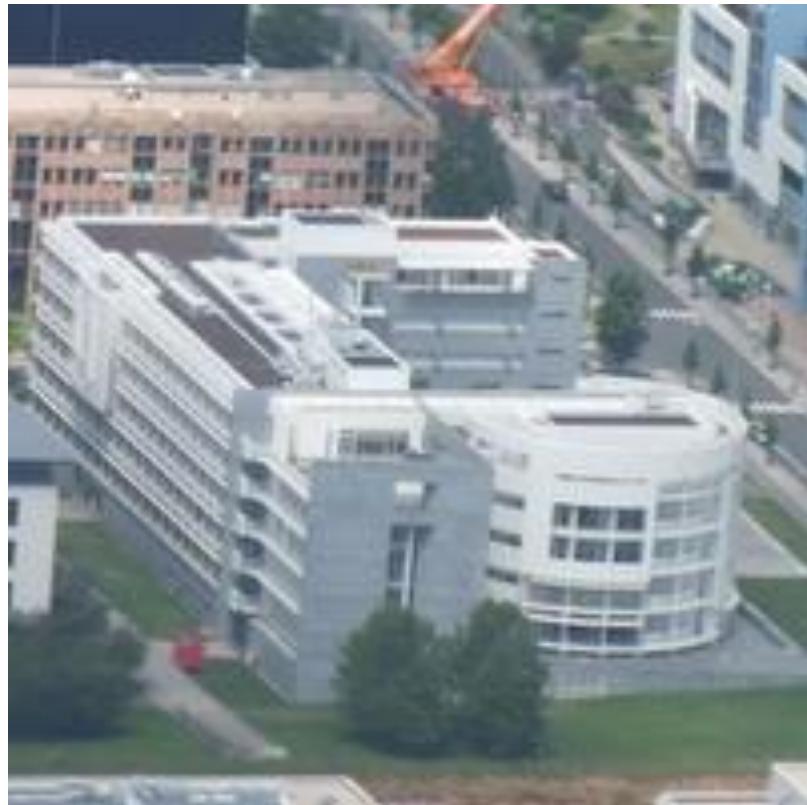


# Gamifying the Commute: from concepts to games

Dr. Rod McCall

Project members/contributors: Martin Kracheel, Dr. Nicolas Louveton, Dr. Vincent Koenig, Prof. Thomas Engel, Korok Sengupta, Sasan Jafarnejad, Hossein Arshad, Tom Kamarauskas, Fan Gao, Prof. Romain Martin

# About UL, SnT and Our Team



- University of Luxembourg
  - SnT, Interdisciplinary Centre
  - Around 230 staff (incl PhD students)
- IGNITE (Interaction, Games and Novel Interface Technologies) part of SECAN-Lab



# Structure and themes for this presentation



# I-GEAR: The Project and the Context

# I-GEAR Project Overview

*Incentives and Gaming Environments for Automobile Routing*

No SIM 16:08 100 %

## Team Leaderboard

<b>Designated Drinkers</b>	<b>4370</b>
<b>Norfolk-in-Chance</b>	<b>3260</b>
<b>Cuban Raft Riders</b>	<b>3180</b>
<b>The Muffin Stuffers</b>	<b>3030</b>
<b>team1</b>	<b>2830</b>
<b>Jamaican...pscoth Mafia</b>	<b>2820</b>
<b>The Cereal Killers</b>	<b>2640</b>
<b>Cow Tipping Dwarfs</b>	<b>2280</b>
<b>Cunning Stunts</b>	<b>2240</b>
 Main	 My Stats
 My Team	 Team Stats

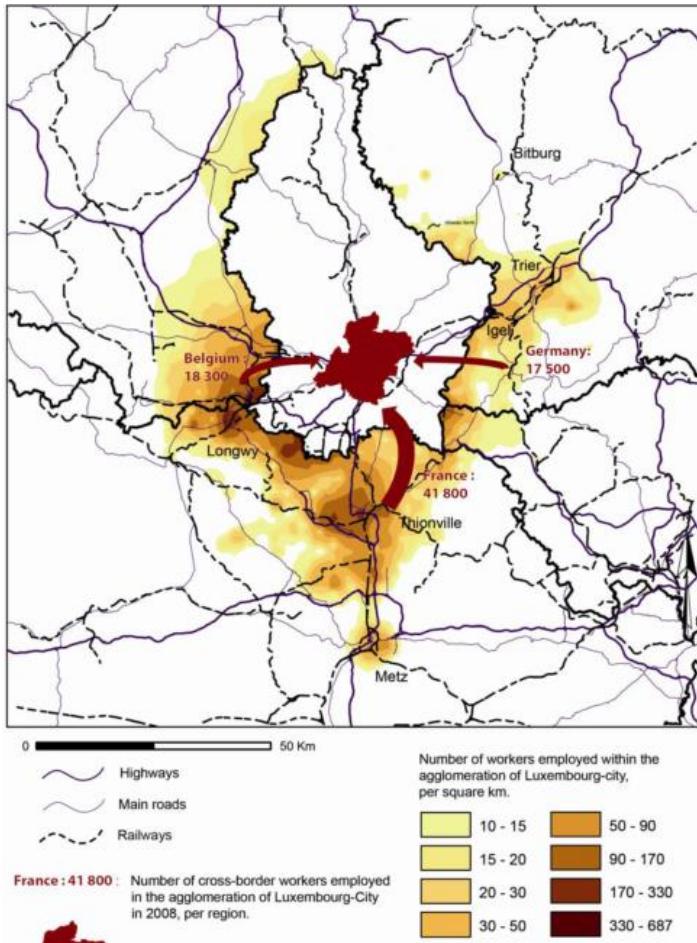


*Duration: 2012-2015 (submitted early 2011)  
Funded by Fonds National de la Recherche, Luxembourg*

# Underlying Concepts

- We should solve the cause not tinker with the symptoms
- Viewing commuting as a game or game-like world
- About suggesting alternative activities
- Introducing IVIS systems into a car raises usability and safety concerns
- Cannot get back time!

# Context – Luxembourg



- Population: 537k approx (City: 103k)
- High GDP
- 176k cross-border commuters per day (majority to Luxembourg City)
- Very high car ownership rate
- Relatively poor public transport outside of the city
- Very reliant on Greater Region countries
- Congested European City
- Low fuel prices

Sources: Daily Cross border commutes to Luxembourg (Decoville & Sohn 2012)  
STATEC (Luxembourg, 2013)

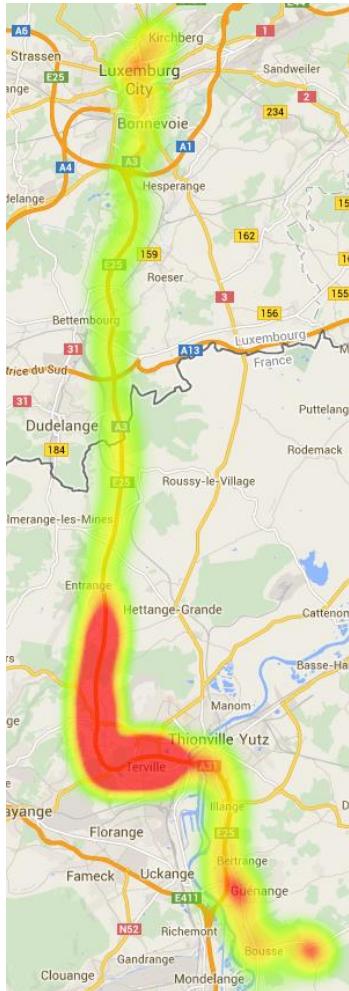
# The Problem and the Philsophy



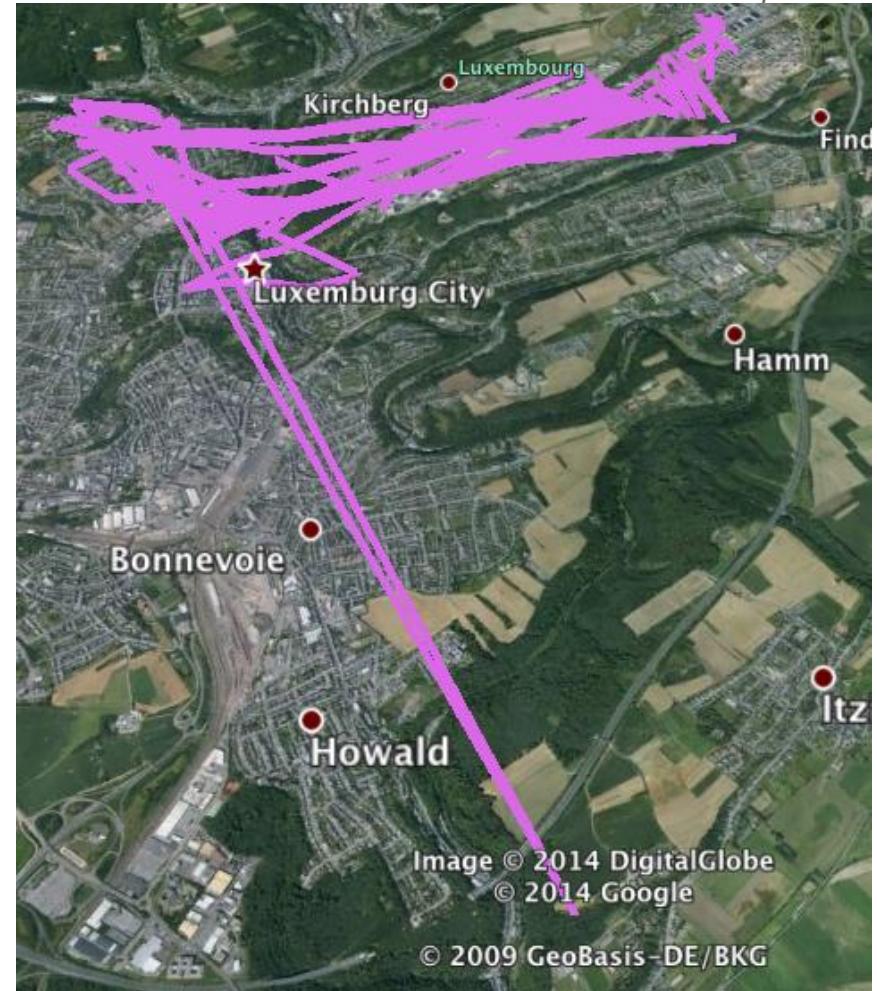
- Average time spent in traffic jams
  - Luxembourg (Country) 29 hours per year
    - Approx 1 day / 3.5 work days
  - Belgium 58 hours per year
    - Approx 2 days / 7 work days
- 1% of EU GDP lost in traffic
- Pollution, stress, accidents
- People have reasons for taking the car!

*Relatively small behaviour changes = Major Benefits*

# Context – Luxembourg Traffic Flow



Heat Map Luxembourg



Sample travel trajectory in Luxembourg City

Kracheel et al.

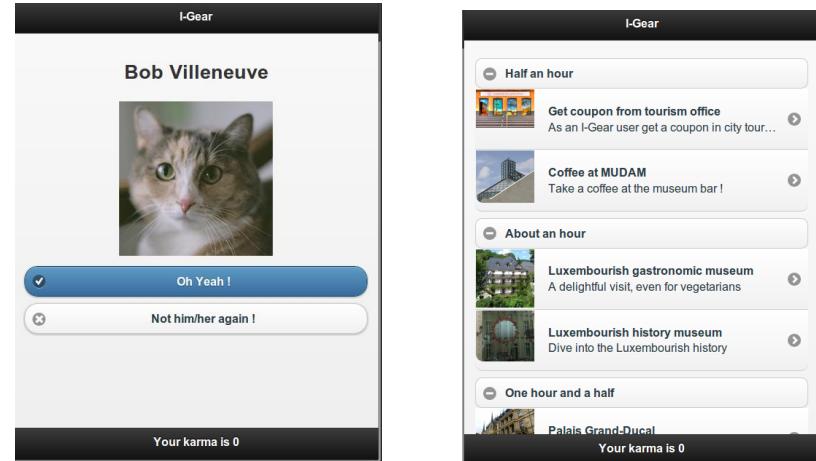
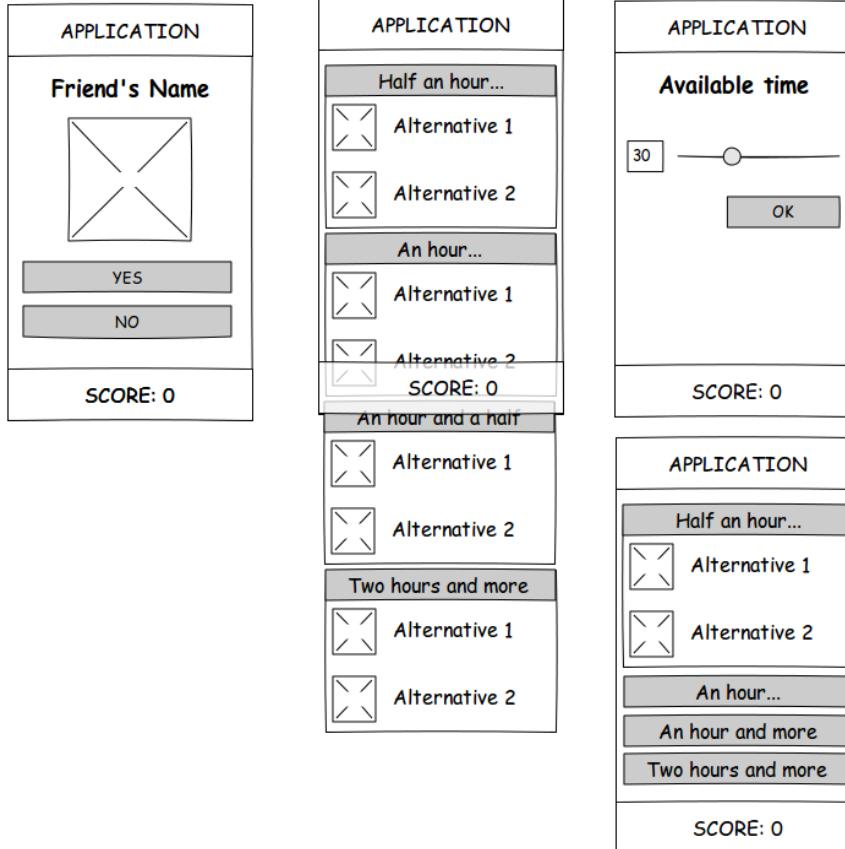
# User Interfaces and Driver Safety

# User Interface Issues and Challenges

- Safety
- User Acceptance
- Cultural differences
- Cognitive Load
- Interface styles, game dynamics
- Testing approaches
- Task and context
- Auditory/Visual issues



# Visual Manual Distraction Study



Two of the interfaces used in the study

- Study undertaken to assess impact of different user interface styles on driving performance and interaction under a simulated car following task environment.

Louveton & McCall et al. (under submission).

# Real and Simulated Track Studies



Mindcap XL Lowcost BCI

- Study undertaken to assess variation in driving behavior due to different user interfaces on a mobile device under track and simulated conditions
- Interaction, BCI and car data recorded
- Car following task

Pilot study. More detailed analysis to be undertaken and further studies conducted!

# The City, Games and Play

# The City and The Commute

View the the city and the commute as a  
place to play!

From Lynch, Alexander, to Ching, Gustavson and beyond

# Games and Game-Like Environments

- **Gamification** (Deterding et al)
- **Games with a purpose** (Ahn et al)
- **Persuasive Games** (Bogost)
- **Pervasive Games** (Montola et al)
- **Serious Games**
  - And of course just games!

# Games



**Completion**

**Focus**

**Challenge**

**Player Skill**

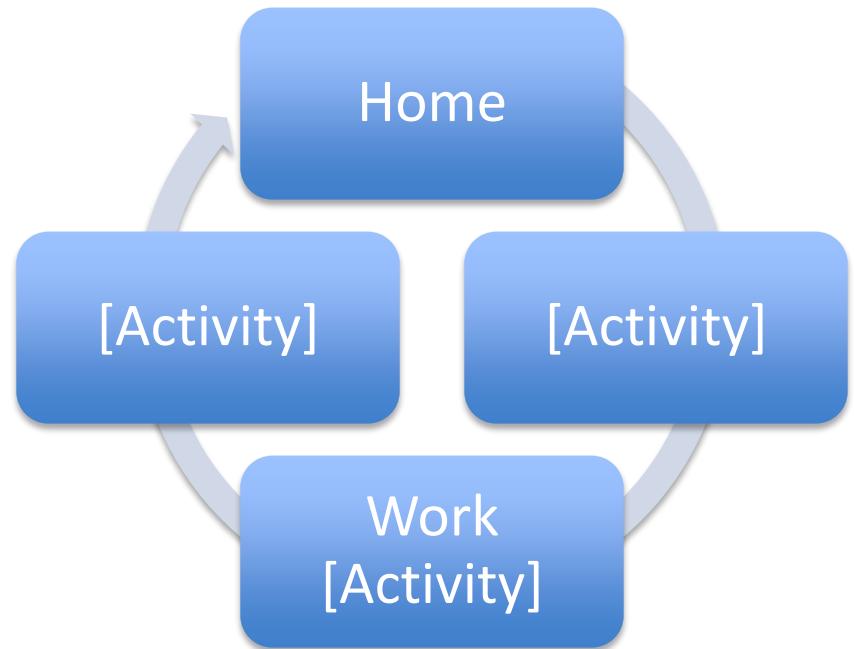
**Social**

Based on Sweetser & Wyeth 2010

# Methodology for Capturing Activities and Designing the System

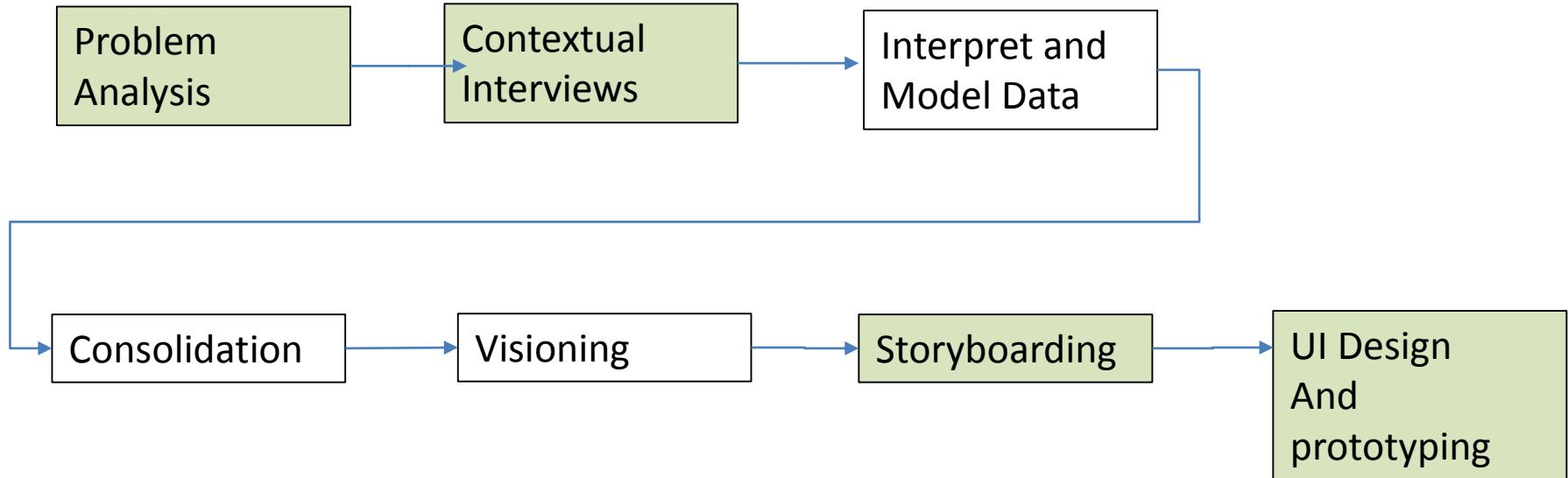
# What interests us: Activity Chains

What degrees of possible intervention?



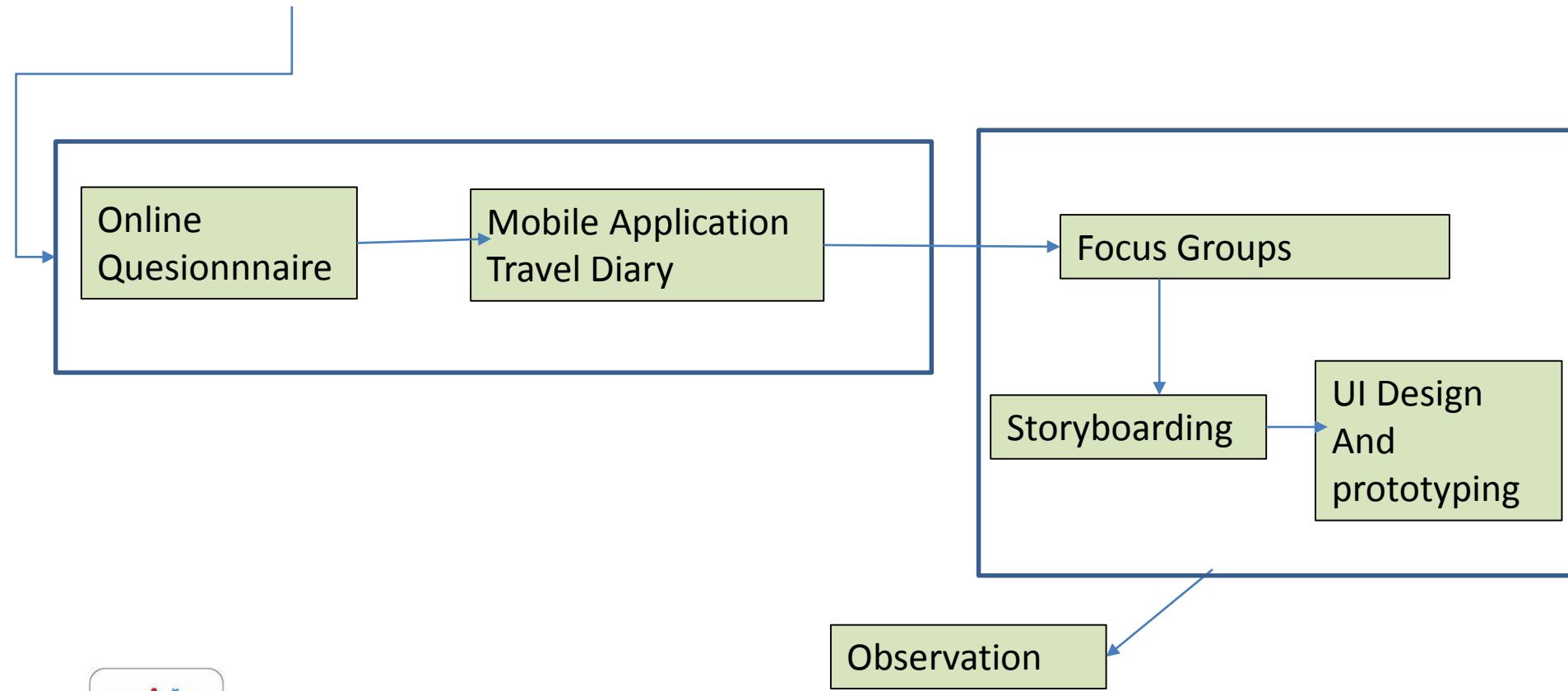
# Contextual Design Approach

Understand the potential users within the relevant context

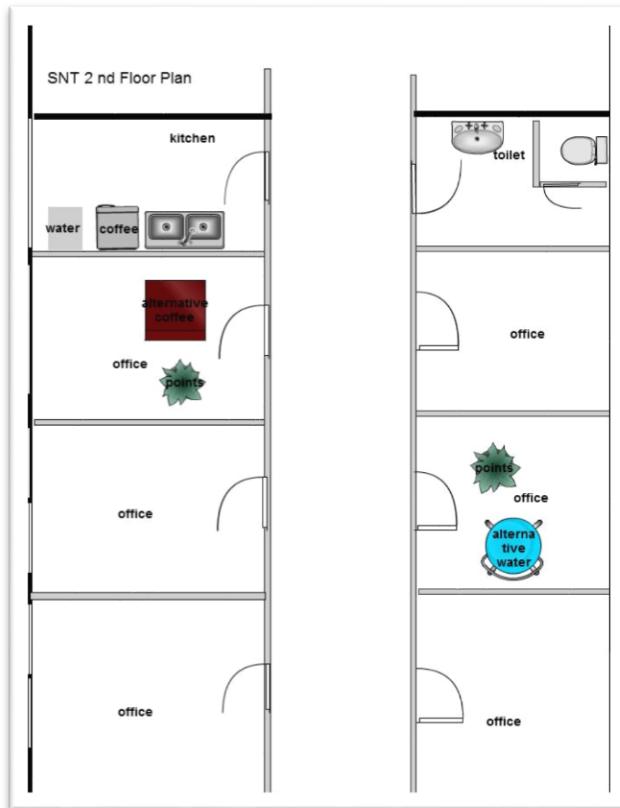


# Our Approach

## Metaphorical - “Coffee Games”



# Metaphorical Games



Get Coffee at  
Different Time



Get Coffee for  
Someone else

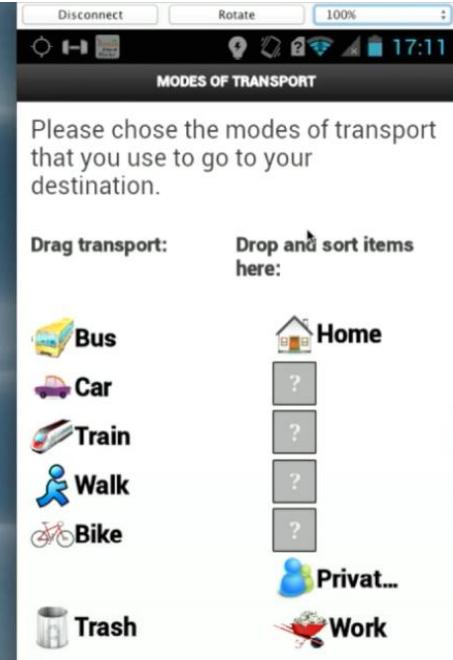
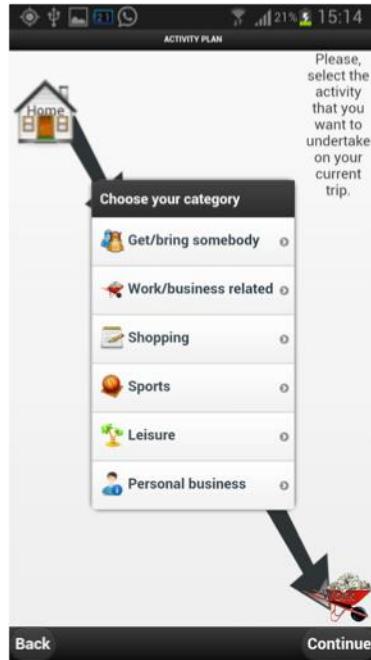
Get Coffee at  
Different Place

McCall and Kracheel et al (2013)

# Summary Results Coffee Games

- Social status issues of doing something for others
- Different classes of rules of play behaviour
- Competition important but not for all
- 50% changed behaviour
- Different degrees and types of participation should be supported

# Driver Diaries Screenshot and User Tests



Pre-Online Demographic questionnaire, mobile application then focus groups  
To/from work and lunchtime.

The study examined commuter activity patterns.

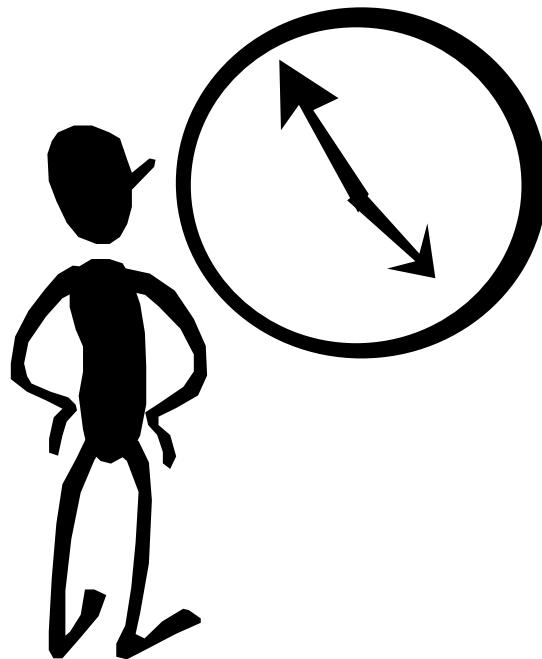
# Don't Forget Data Privacy!

Early work indicated that gamification has an effect on our willingness to disclose data!

# Next Steps - Games

Activity patterns to form basis  
of future games.

# “LeaveNow Game”



- Relative change in leaving time from home and office
- Leaving time has been extensively tested
- Three different controlled test conditions

No SIM 16:20 100 %   
hgg  
You have 9999 points!

[Settings](#)

16:20  
vendredi

How will you travel?

[CAR](#) [BUS](#) [MIX](#) [OTHER](#)

**Go !**

**NOW**

16:20 16:30 16:40 16:50 17:00

**65** **65** **60** **55** **50** **45**

Main My Stats My Team Team Stats

# The Future Commuting Experience



# Conclusions and Summary

- Consider the activity patterns of commuters and focus on those elements for behavior change
- The interface style has an effect on interaction and driver performance/safety
- Gamification impacts level of participation and also willingness to disclose private data

*In future will the car or I decide?*

# Information

For more information including the results, papers and references used in this presentation please contact:

[Roderick.mccall@uni.lu](mailto:Roderick.mccall@uni.lu)

Blog: [www.rodmc.com](http://www.rodmc.com)

University Publications server: [orbi.lu.uni.lu](http://orbi.lu.uni.lu)

Twitter: [rodlux](https://twitter.com/rodlux)

*Thanks for coming and my thanks to all those involved in the I-GEAR project*