

Gamifying the Commute: from concepts to games

Dr. Rod McCall

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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

Designated Drinkers	4370
Norfolk-in-Chance	3260
Cuban Raft Riders	3180
The Muffin Stuffers	3030
team1	2830
Jamaican...pscoth Mafia	2820
The Cereal Killers	2640
Cow Tipping Dwarfs	2280
Cunnina Stunts	2240

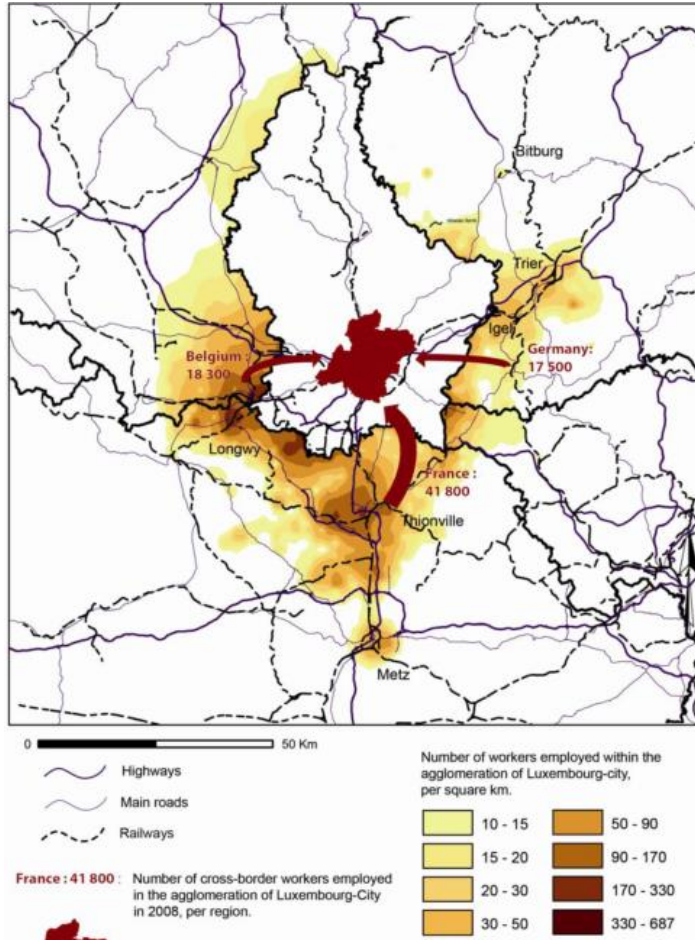


Main
 My Stats
 My Team
 Team Stats

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

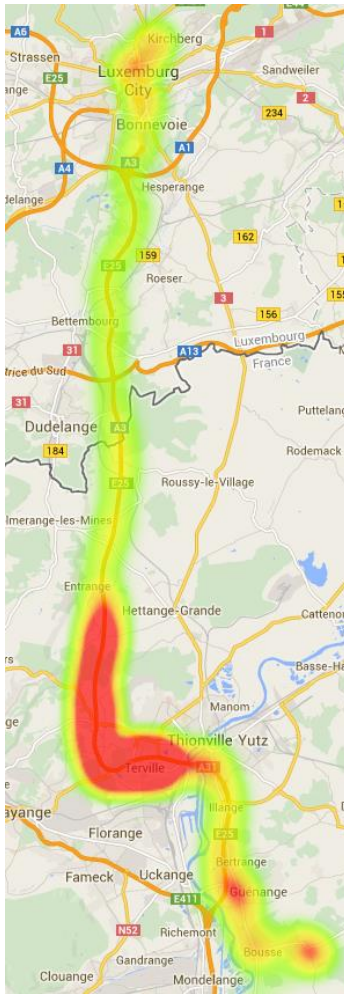
The Problem and the Philosophy



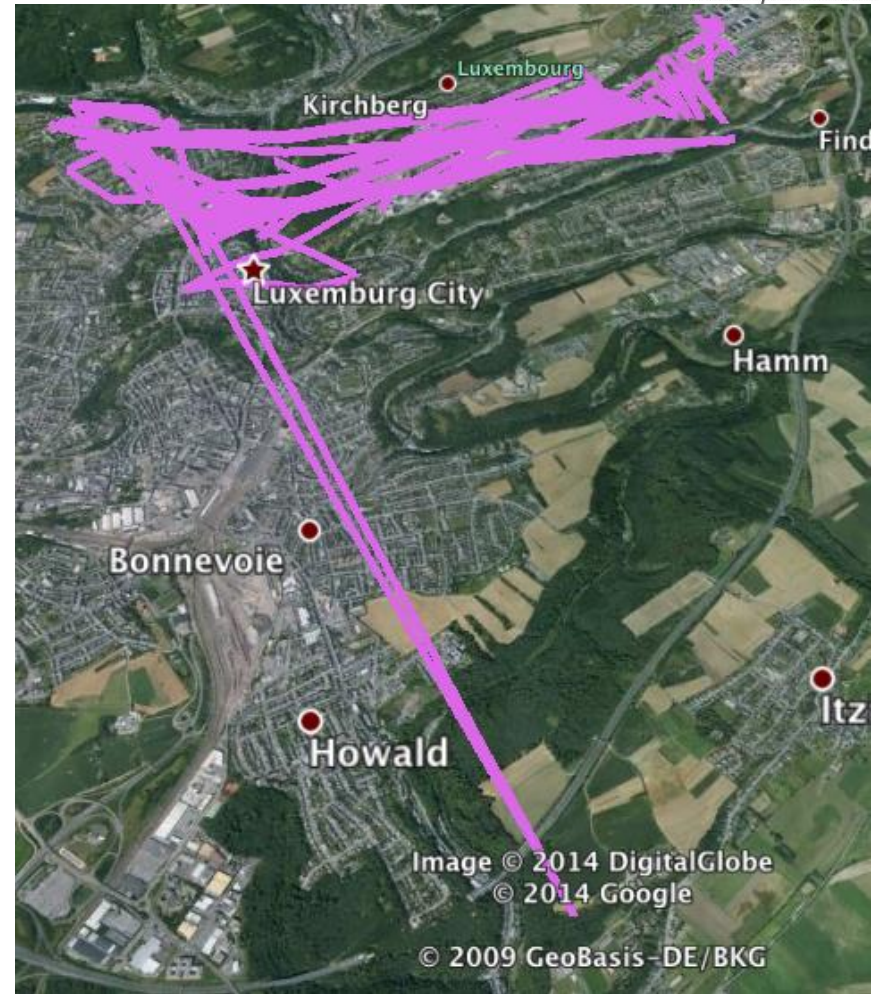
- Average time spent in traffic jams
 - Luxembourg (Country) 29 hours per year
 - Approx 1 day / 3.5 work days
 - Belgium 58 hours per year
 - Approx 2 days / 7 work days
- 1% of EU GDP lost in traffic
- Pollution, stress, accidents
- People have reasons for taking the car!

Relatively small behaviour changes = Major Benefits

Context – Luxembourg Traffic Flow



Heat Map Luxembourg

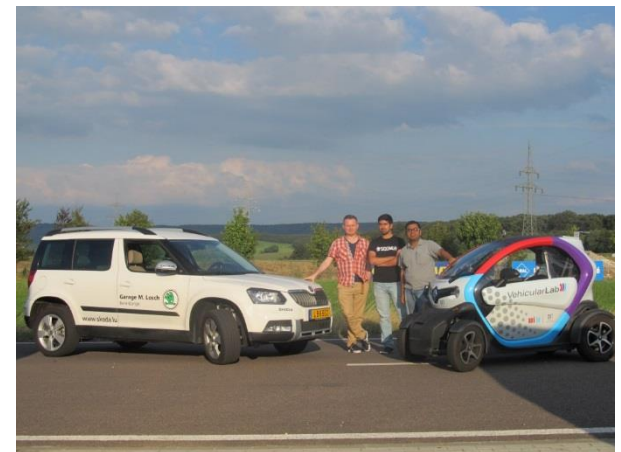


Sample travel trajectory in Luxembourg City

User Interfaces and Driver Safety

User Interface Issues and Challenges

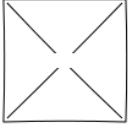
- Safety
- User Acceptance
- Cultural differences
- Cognitive Load
- Interface styles, game dynamics
- Testing approaches
- Task and context
- Auditory/Visual issues



Visual Manual Distraction Study

APPLICATION

Friend's Name



YES

NO

SCORE: 0

APPLICATION

Half an hour...

Alternative 1

Alternative 2

An hour...

Alternative 1

Alternative 2

SCORE: 0

An hour and a half

Alternative 1

Alternative 2


Two hours and more

Alternative 1

Alternative 2

APPLICATION

Available time

30 

OK

SCORE: 0

APPLICATION

Half an hour...

Alternative 1

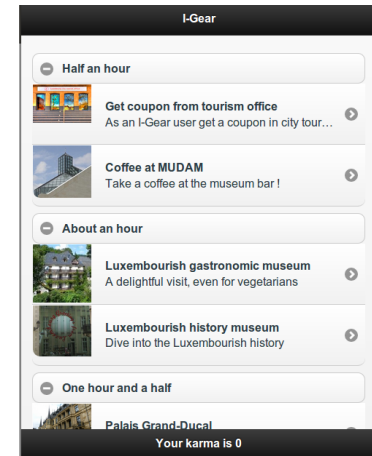
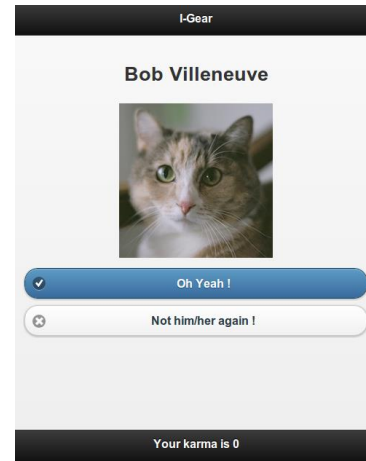
Alternative 2

An hour...

An hour and more

Two hours and more

SCORE: 0



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

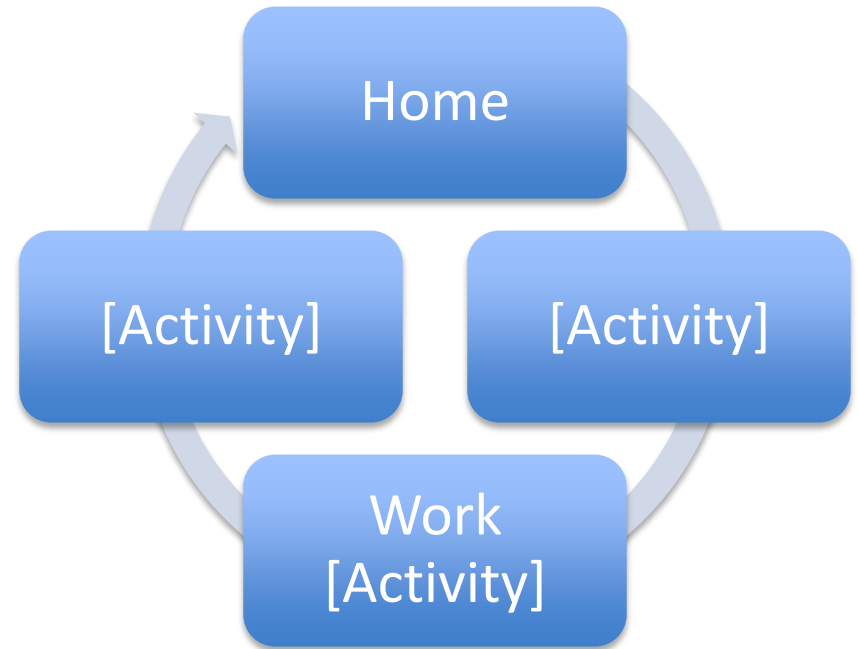
Player Skill

Social

Methodology for Capturing Activities and Designing the System

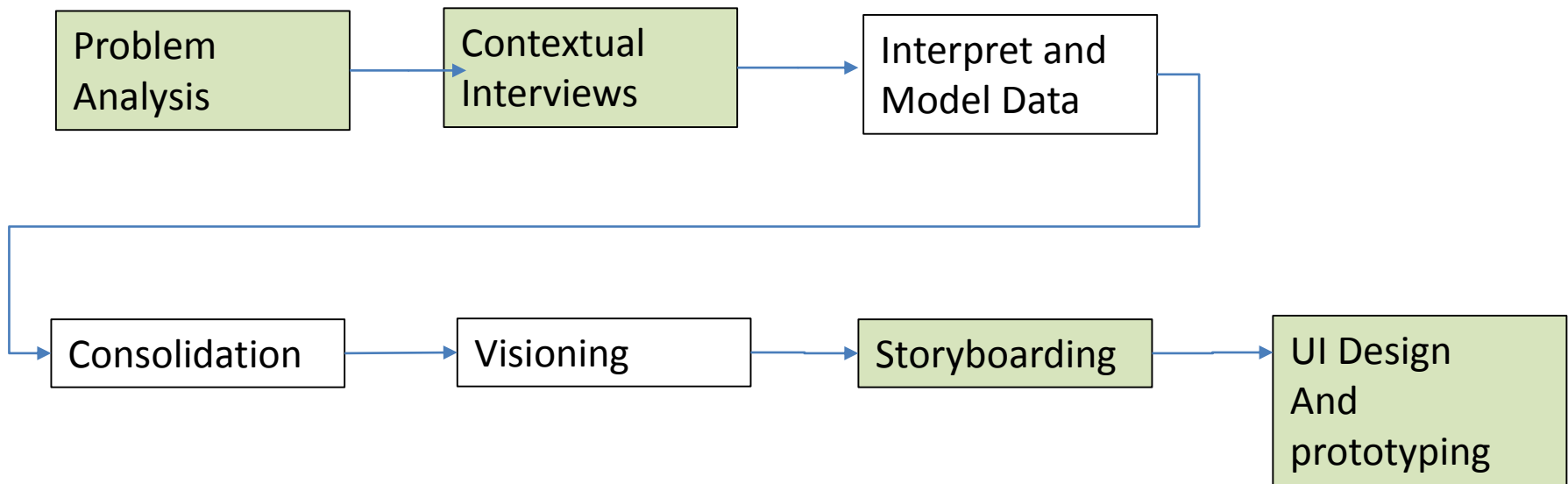
What interests us: Activity Chains

What degrees of possible intervention?



Contextual Design Approach

Understand the potential users within the relevant context



Our Approach

Metaphorical - “Coffee Games”

Online
Questionnaire

Mobile Application
Travel Diary

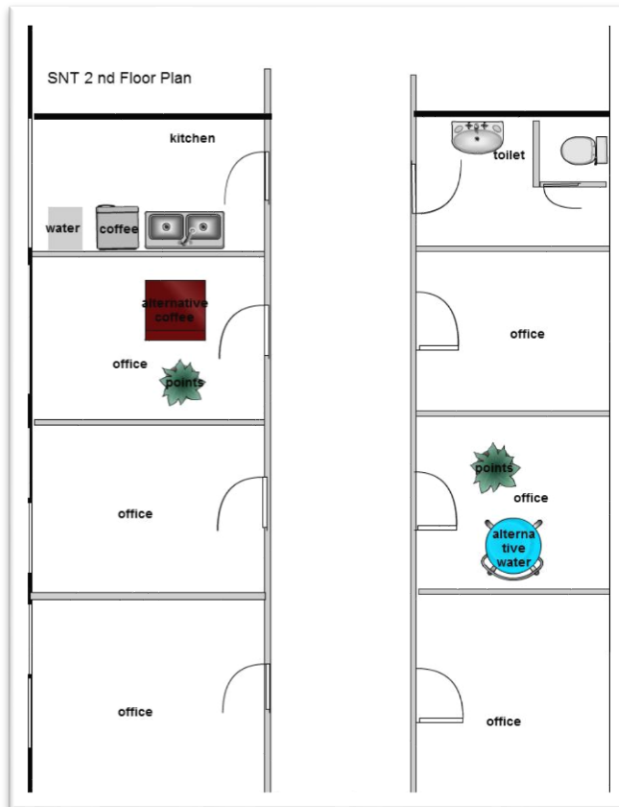
Focus Groups

Storyboarding

UI Design
And
prototyping

Observation

Metaphorical Games



Get Coffee at
Different Time



Get Coffee for
Someone else

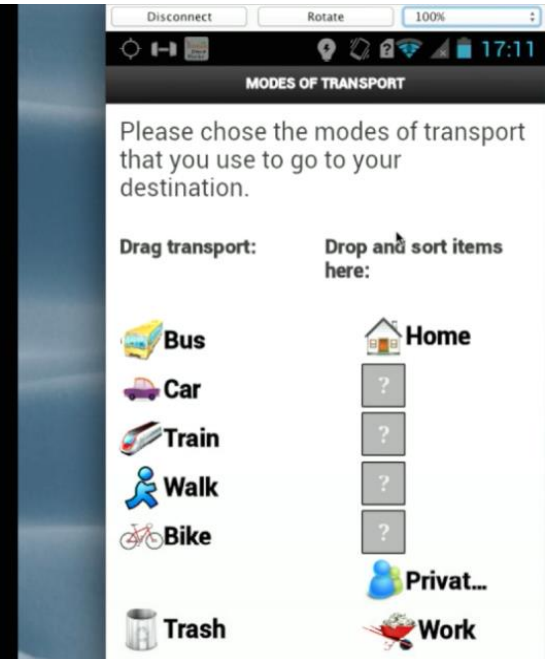
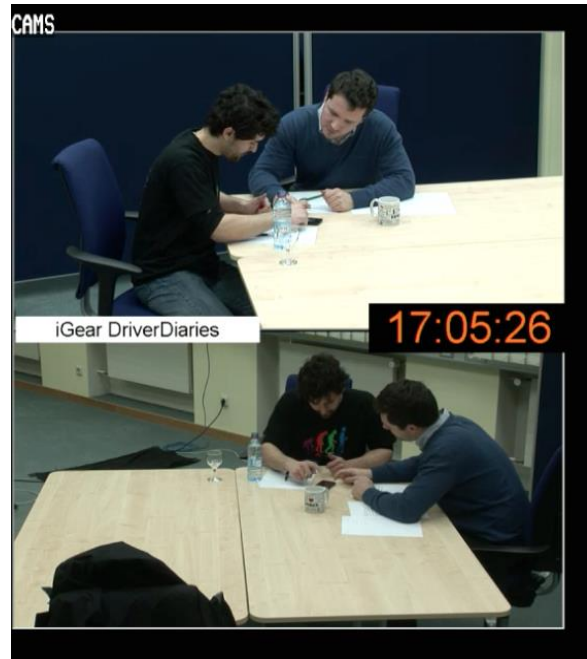
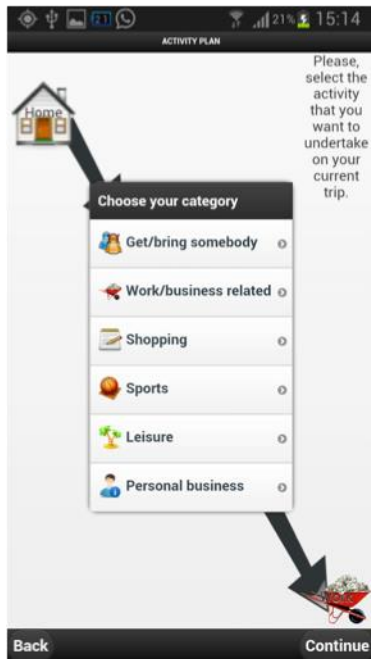
Get Coffee at
Different Place

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!

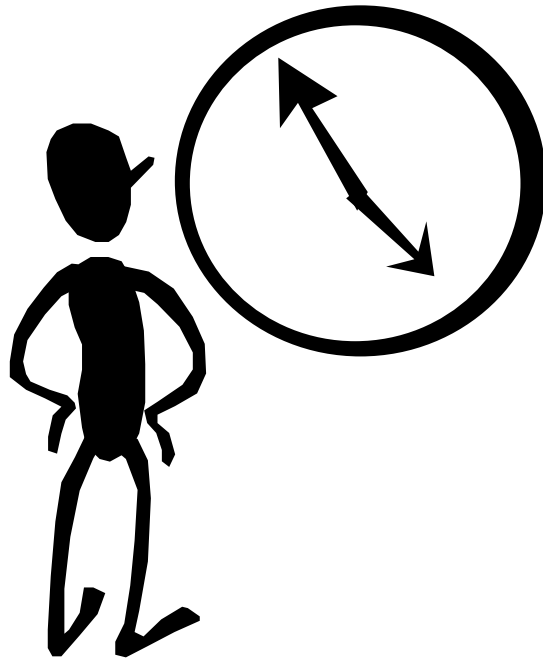
Next Steps - Games

Activity patterns to form basis
of future games.

“LeaveNow Game”



securityandtrust.lu



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

The screenshot shows the mobile app interface for the "LeaveNow Game". At the top, it displays "No SIM", "hgg", and "You have 9999 points!". The time is 16:20 on a Friday. Below the time, it asks "How will you travel?" with buttons for "CAR", "BUS", "MIX", and "OTHER". A "Go!" button is below the travel options. A "NOW" section shows a timeline from 16:20 to 17:00 with corresponding leaving times: 65 (highlighted in green), 60, 55, 50, and 45. The bottom navigation bar includes "Main", "My Stats", "My Team", and "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:

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

Reference: Rod McCall, “Gamifying the Commute” seminar given at Stanford University and UCLA, November 2014.