An appropriate interface for speed limit advice for older drivers

Mike Bradley, Suzette Keith, Catherine Wicks,
Irena Kolar, Reg Goodwin

Middlesex University

Who we are...

Project team:

Middlesex University

Product Design and Engineering

Computing Science

Project Partners:

Brunel University

Design Group

Ford Motor Company

Human Factors Department

Part of SPARC project…

‘The advanced technology needs, desires and requirements of older drivers’

- User led approach
- Categorisation of older drivers/users
- Opportunities of advanced technology for older drivers
- Interfaces for advanced technology for older drivers
- ‘Bridging the technology/user led divide’

Research questions

- What issues do older drivers have with driving?
- What do older drivers think of the potential of new technologies in cars?
- What are their experiences of advanced technology interfaces in cars?
- How can we design new technology interfaces more appealing to older users?

What have we done so far?

- Older People Panel
    - Drivers aged 50+
- Questionnaires, focus groups, interviews
- Selected three areas for further investigation
    - Speeding
    - Parking
    - Interaction with new interfaces
- Pilot prototype testing -> users as **co-designers**

New interfaces…

New interfaces…

Our approach...towards participation

- Users are design partners
  - defining ‘the need’
  - iterative development process
  - dissemination

Primary Research

- Questionnaires, focus groups, interviews

QUOTES FROM FOCUS GROUPS

"My car is an extension of me, I don't know what I would do if I couldn't drive"

"There are so many things I wouldn't be able to do without my car"

Primary Research

- SPEEDING -

"I think it is important not to break the law"

"I think it is important for safety"

"I feel in control of the car even when I exceed the speed limit"

"I would be mortified if I were prosecuted for speeding"

"I check my speedometer all the time"

" It's becoming much easier to break the law"

Legislation

- How fast is too fast?
  - Any speed in excess of the prescribed limit
- Prosecution
  - Fine of up to £1,000
  - 3-6 penalty points (possible disqualification)
  - 12 points total within 3 years -> disqualification for minimum 6 months.
- Criminal Offence

Speeding, Why?

84% of people disapprove of speeding but 70% admit to doing it *(Stradling et al, 2003)*

- 45% react to speed camera by braking automatically regardless of their speed *(Datamonitor, YouGov, 2006)*
- Most popular reason for speeding is that it is 'unintentional' *(Silcock et al, 2000).*

How fast am I going?

- The Car
  - Modern vehicles: safer, quieter, more comfortable

"It is difficult sometimes… 30mph in the modern car is nothing"

"Before you know it you can reach 43 in a 30mph zone"

"I find it difficult to stick to 30 as I have a powerful car."

- External Factors
  - Speed of other drivers
  - Surroundings and type of road

How fast am I going? – The speedometer

- Benefits
  - Fixed and continuous display of information
  - Normal, familiar – No behavioural change required.

- Problems
  - Overloading of visual sense
  - Visual Accommodation - Refocusing
  - “Eyes off the road”

Alternative modalities

- Auditory
  - Useful, familiar, non-visual
  - Intrusive, irritating
  - Competition with other systems (SatNav etc.)

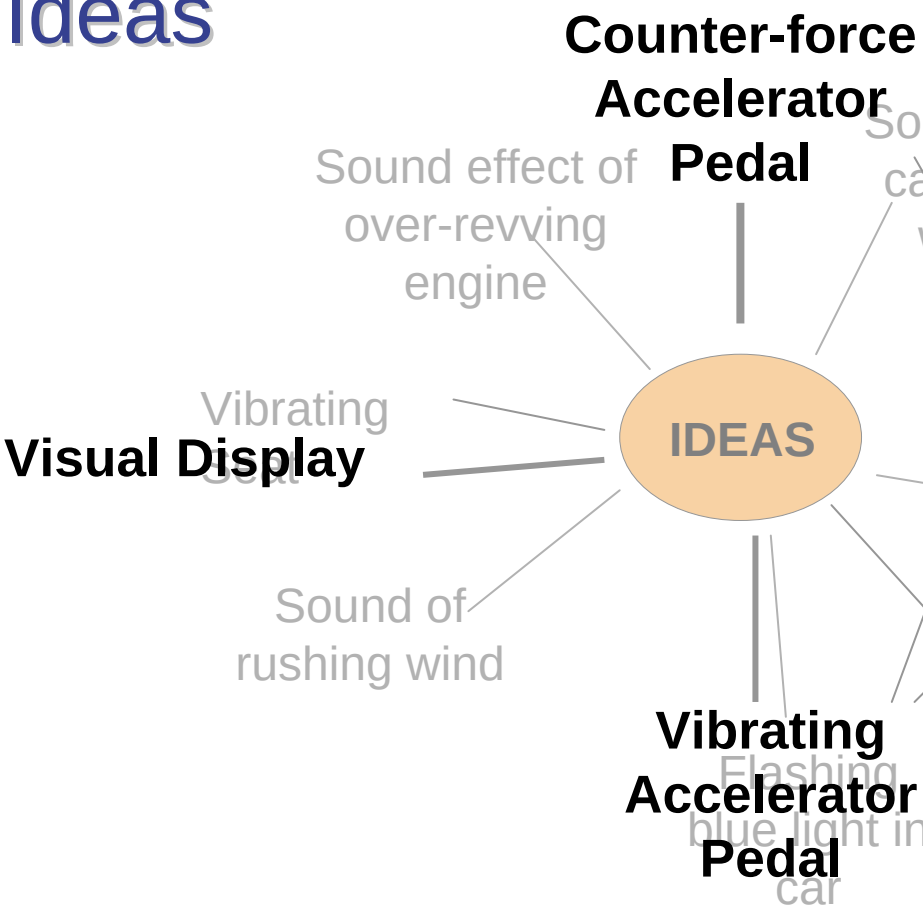
- Haptic
  - Continuous
  - Unify control and display
  - Instant, natural, easy to process feedback.

Technology

- Active Cruise Control
  - ‘Automated’ speed control
  - Doesn’t account for new speed limit zone

- Intelligent Speed Adaptation
  - Digital Speed Maps – Intelligent
  - Informative systems acceptable

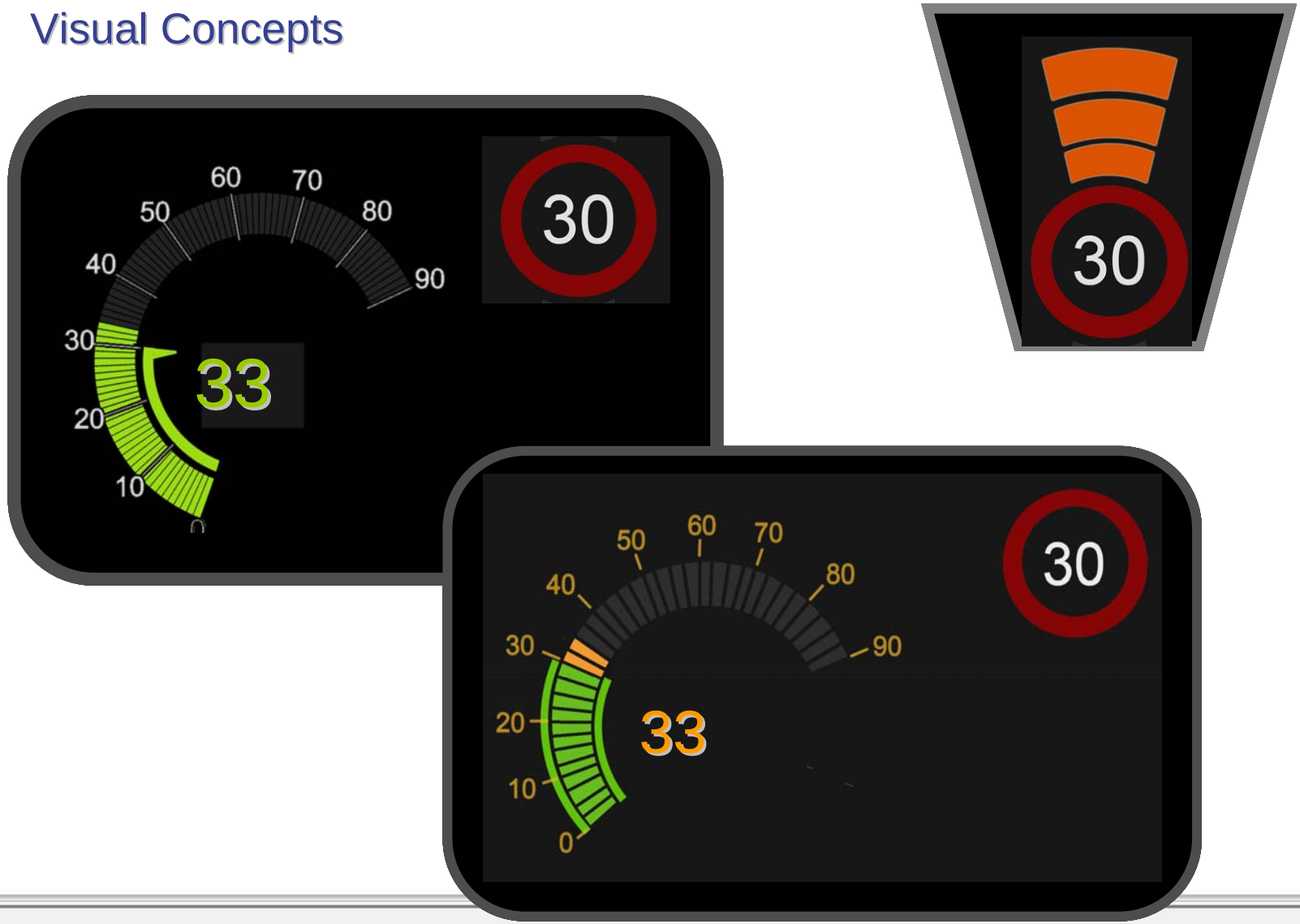
Ideas



*Acts directly through point we wish to affect – **Unifies***

Good comparison of 2 different systems vibration and force

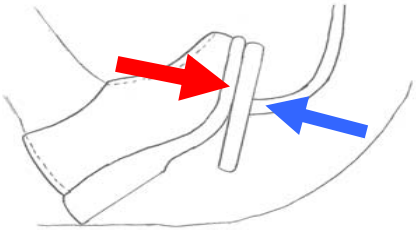
Visual Concepts

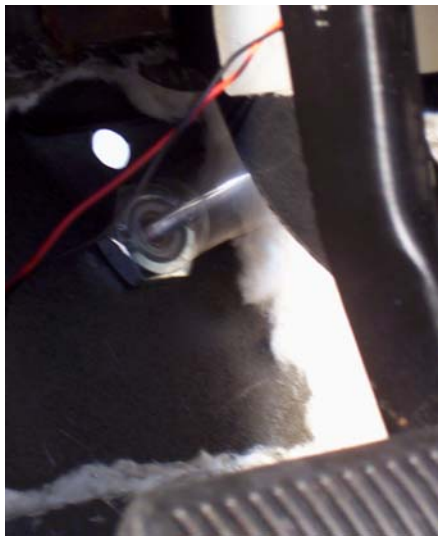


Haptic Interface

Counter force pedal

- Pedal ‘pushes back’
- Inc. force – easy over-ride
- Informative only





Vibrating Pedal

- Pedal vibrates
- Informative only

Test Vehicle

Pilot user testing

Pilot indications

- Checking speedometer manually concern for all participants
- Strong interest in assistance with speed checking task
- Modifications suggested for next design iteration
- Diversity of participant preference for concepts
- Desire for personalisation of interface characteristics

Next Stages

- Continue with participatory design methodology
- Create a more immersive and interactive test environment
- Test visual and haptic displays in combination