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Presentation of “Putting safety in the driving seat”

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Putting Safety in the Driving Seat



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Loughborough University

Research School in Ergonomics & Human Factors

Ergonomics & Safety Research Institute (ESRI)

Vehicle Safety Research Centre (VSRC)

Accident investigation
Crash worthiness
Occupant protection
Safety research
25 staff

Transport Technology Ergonomics Centre (TTEC)

Vehicle telematics
Physical ergonomics
Vision/conspicuity
Mobile comms
12 staff

Human Focused Design Centre (HFDC)

Product design
Safety Strategy
Inclusive design
Usability
13 staff

In-vehicle systems

STANDARD

Primary driving controls
HVAC
Vehicle status
ICE

EMERGING

Navigation
Traffic information
Mobile office
Tolling

FUTURE

ACC
Collision warning
Vision enhancement
Driver status

The potential for overload

Information:

- Business appointment, unfamiliar town, late
- Multi-lane roundabout, take 4th exit
- Heavy traffic, wrong lane for exit
- Phone call from office re. the meeting

Result:

- Near miss on lane change
- Lose track of exit, take wrong turn
- Forget figures given by office

The informed passenger...

- “You need to move into the right-hand lane”
- “Watch out for the car on your inside”
- “Exit is the one after the church”
- “I’ll take the phone call for you”



The informed passenger embodied in a system

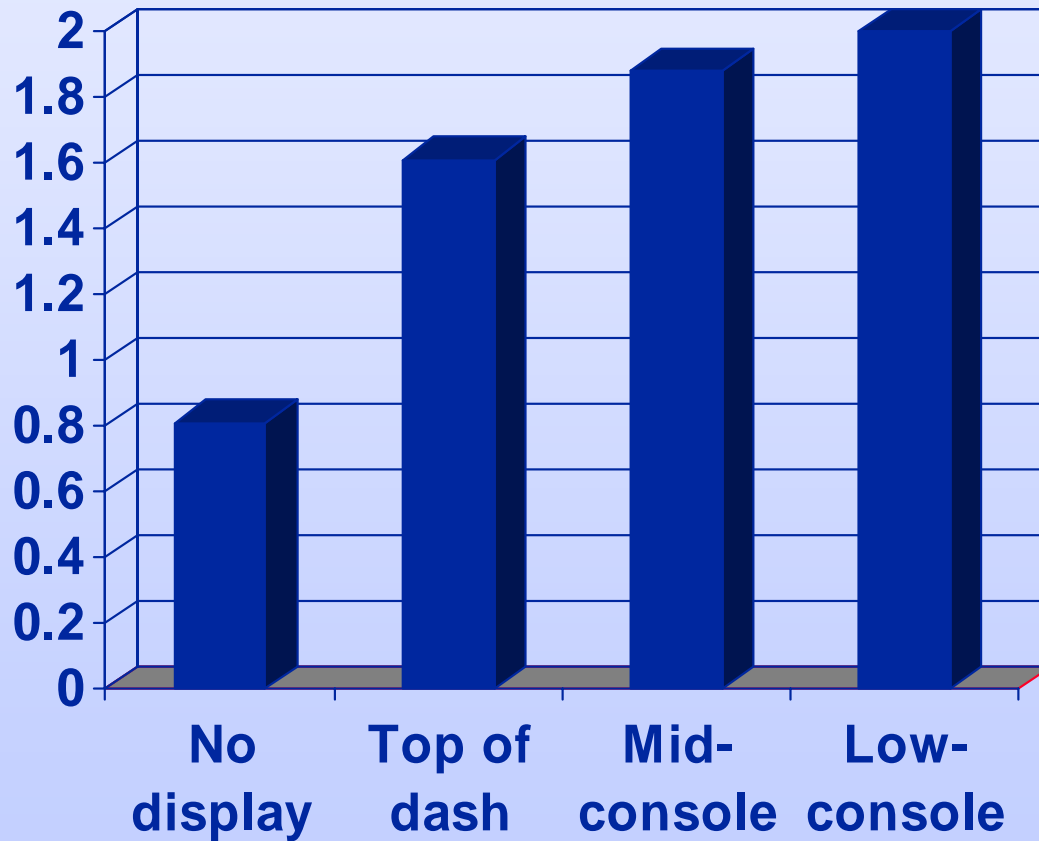
- Natural interaction
- Managed information
- Novel solutions

If you need convincing...



% of journey time glancing towards areas of visual scene
Passenger vs (Navigation System)

More evidence?



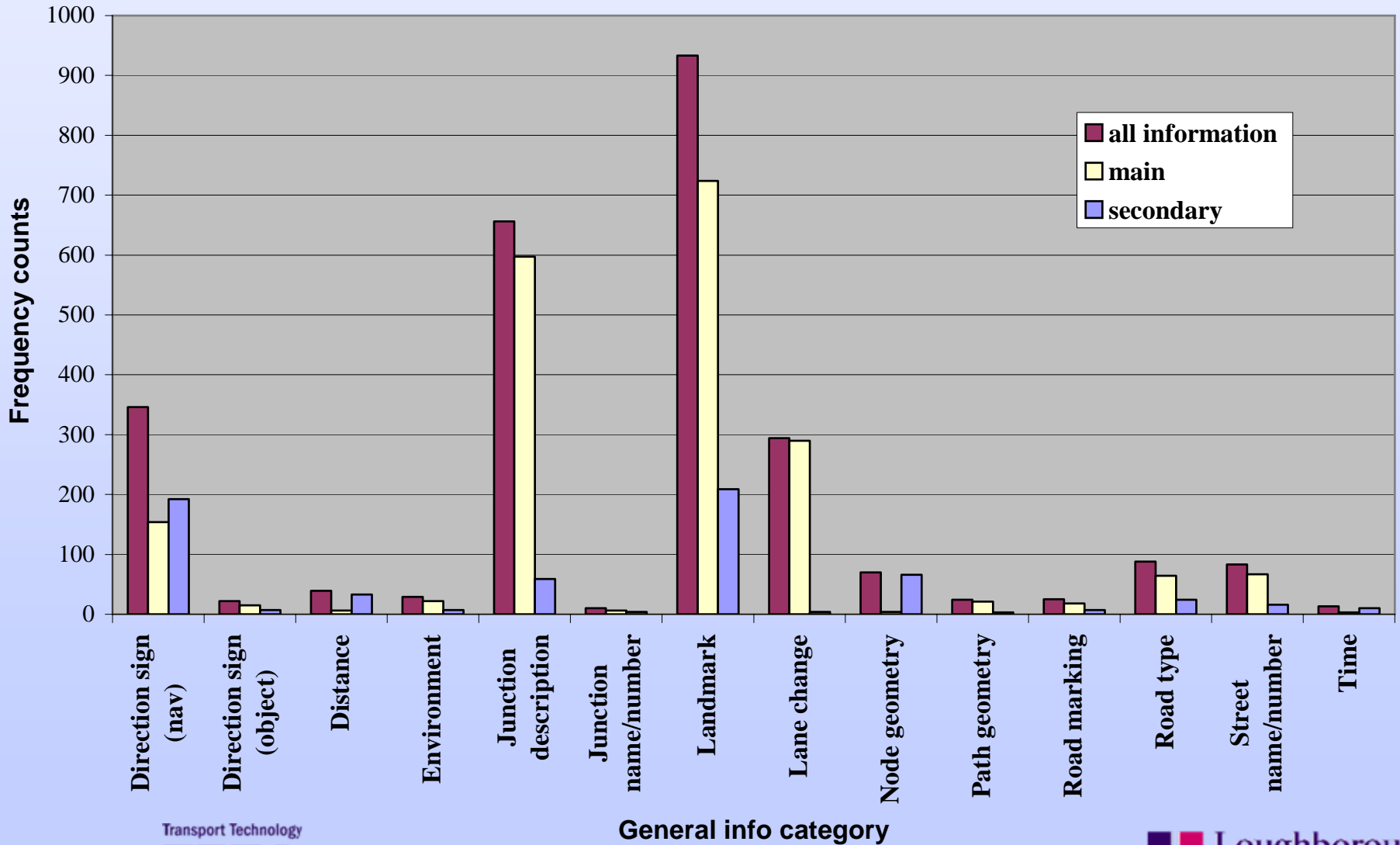
■ Reaction time to pedestrian (seconds)

Solutions

- Natural interaction:
Navigation study
'REGIONAL'
- Manage information
- Novel solutions

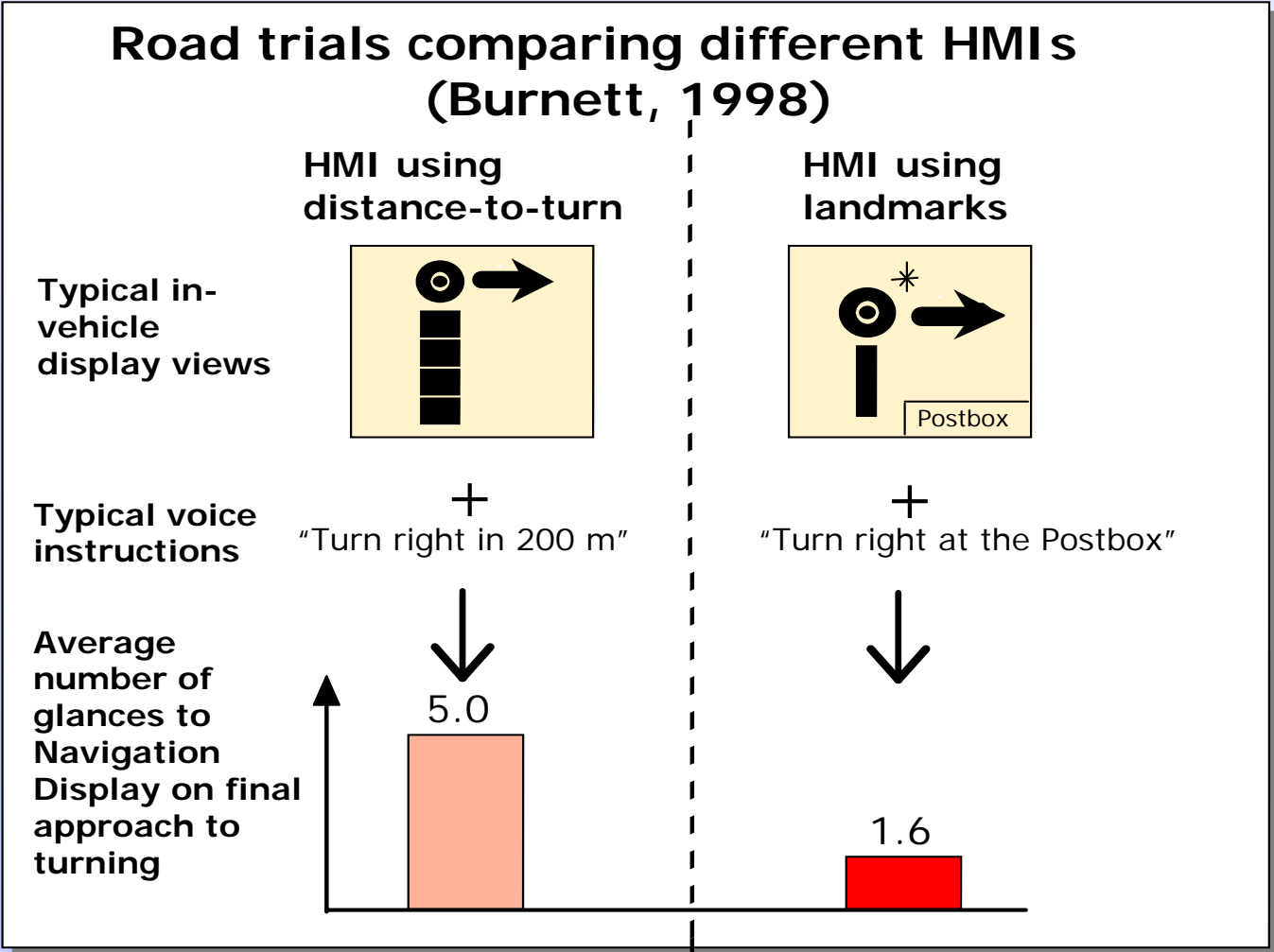


Information used by drivers





Improved safety



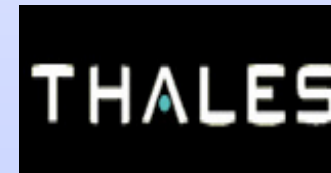
Solutions



- Natural interaction



- Managed information
Integration study
'VIVID'



- Novel solutions



The integration issue



- Reduce driver workload
- Increase usability
- Minimise safety implications
- Increase acceptance

The VIVID Tool

Environment

Driver behaviour

*Rule
base*

Priorities



Timing

*Road
layout*

Messengers

Waypoints

Application of VIVID

1. Dealing with conflicts
2. Scheduling of information
3. Mental models

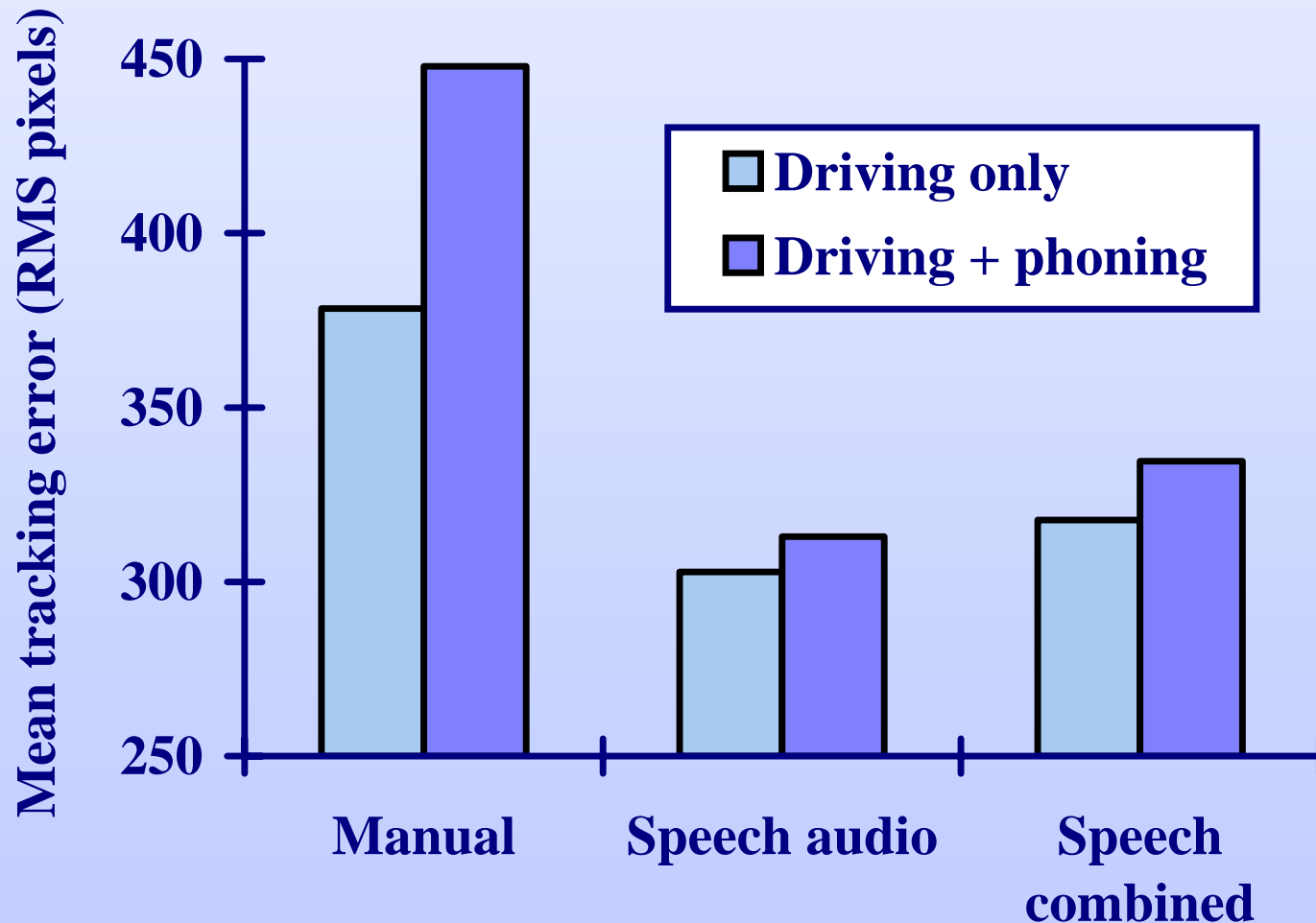
Solutions

- Natural interaction
- Managed information
- Novel solutions
Speech recognition study
'SPEECH IDEAS'

Telephone speech dialling

- Digits from memory
- Manual
- Speech (audio feedback)
- Speech (audio and visual feedback)
- Tracking task

Effects on tracking performance



Some current activity

- European Statement of Principles
 - ◆ HMI for in-vehicle information and communication systems

- ISO/TC 22/SC 13/WG 8
 - ◆ Visual distraction
 - ◆ Assessment of system suitability for use while driving
 - ◆ Message prioritisation
 - ◆ Driver-system integration