Towards a “forgiving” cycle path: a “light naturalistic cycling study”

Acquiring information about behaviour preceding potentially dangerous situations

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What are we forgiving?

› What have we done wrong??

› Sustainable Safety:
  • Humans make errors - system’s view: infrastructure should be such that imperfect behaviour does not lead to accidents immediately
We make errors and get off the road
We hit bollards
Infrastructure

Guidance  Space for correction  Objects
Project (3 years)

› Mobile camera study: Month 6-12
› Experimental research and subj. evaluation: Month 12-24
“Naturalistic cycling” for us:

- Participants
  - Target group 50+ (65+)
  - Control group (25-45)
    - European city bicycle
    - Electrical bicycle
- No fixed route
- No fixed time
- Just everyday cycling
Collecting data

Instrumented bicycle

Necessary?
Synchronisation
Contour +2

› Wide angle (170°)
› Battery: about 2 hours
› Memory: 12 hours
› GPS fix < 1 minute
› Sync OK
› Export (GPS) data
Results

Videos

› Not shocking

› However:
  • soft shoulder,
  • conflicts with curb and objects rare,
  • swerving; avoiding objects
Video example: shoulder
Conclusions
› (Natural) non extreme behaviour
› Shoulder
› Cycling with a companion

Two interventions applied:
› Buffer zone between cycle path and shoulder
› Virtual curb or objects??
Experimental Research

› Affect cyclist course: virtual objects
› Accident prevention: buffer zone
3D Optical illusion

› Virtual object
› Simulation of height
› Street art

Flat surface!!
‘Forgiving’ shoulder lanes

› Grey Coloured Artificial grass
› Green Coloured Artificial grass
› Concrete lanes (streetprint)
Grey coloured artificial grass
Green coloured artificial grass (standard)
Concrete lanes (streetprint)
Measurements

- Lateral position
- SD LP
- Speed
- Subjective experience
Lateral Position; SD LP

› Video measurements
› Widescreen lens

Visualize real distances:

Fish eye effect
Example: recorded image distortion
Experimental Method:

- Firmly mount and secure camera's
- Record measurement indication tool
- Remove surroundings
- Insert as mask
- Measure distances
**Results** (preliminary)

**Optical illusions**: No effects
However: only seen by 22%..

‘Forgiving’ shoulder lanes:
Lateral Position < Control Cycle Path
Very small or no differences between curb lane types
$N = 32$
$M = 68 \text{ yrs.}$
Conclusions

› Virtual objects ineffective in current format
› Shoulder lanes safety enhancing:
  • More space for correction
  • Cycle path departure warning
  • Efficient cycle path use
Thanks for listening!

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Ministerie van Infrastructuur en Milieu