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RTA

Bioptic Telescope System for driving all around the world

Enhancing Mobility for persons with low vision without compromising Road Safety: the Dutch example?

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The problem of low vision in a nutshell

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With low vision most of the times you can perfectly drive (not recognizing details).

However coming in the right place in time and safely is more difficult.



The solution: monocular BTS

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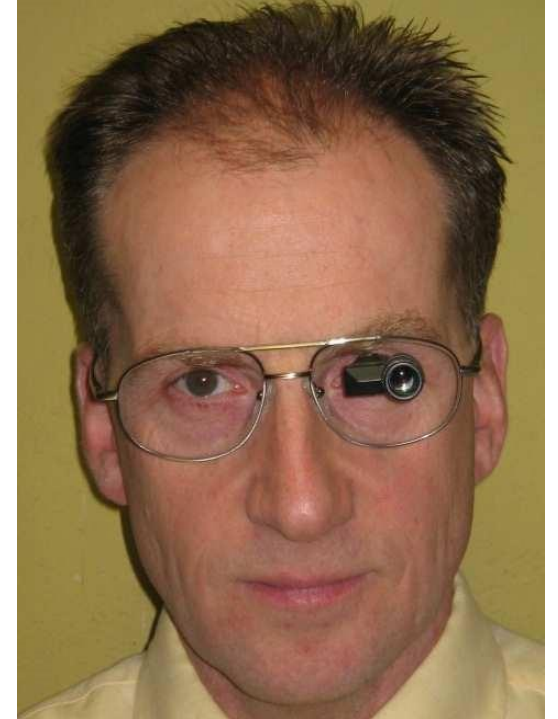
Visual acuity: direct perception!

- BTS from 0,16 (20/125) → 0,50 (20/40)

Visual fields: position on the road and hazards perception

Most difficult to learn:

- When and how to look through the telescope



The solution (2)



With a short nod of the head, you can see that you have priority and approach the sought for car park.



Who (potentially) qualify for bioptic driving (BTS)?

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Novice drivers: people with albinism, nystagmus, Stargard disease

Experienced drivers: macular degeneration

No other functional impairment than low vision

Proof of sufficient training out of car and in car

And finally: pass the bioptic driving on-road assessment (TRIP) from the CBR



Bioptic driving on-road assessment (TRIP)

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How?

- On public roads
- In learning car, with automated gear
- Net driving time at least 45 mins (90 minutes total)
- According to a strict protocol for bioptic driving by an expert on practical fitness to drive (EPD) from CBR



Bioptic driving on-road assessment (TRIP)



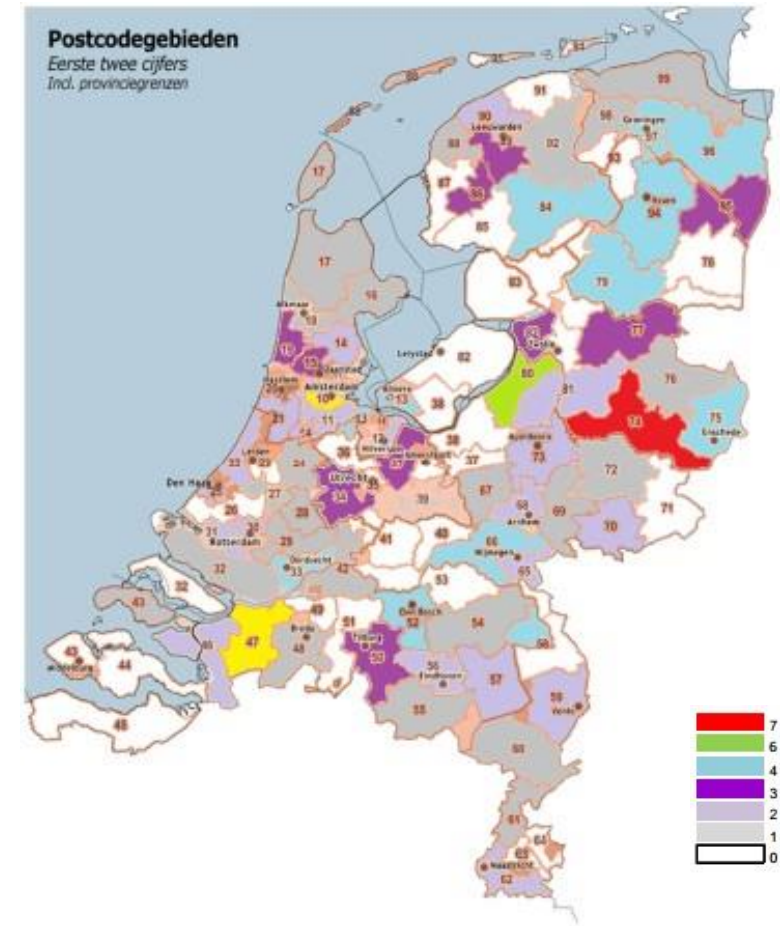
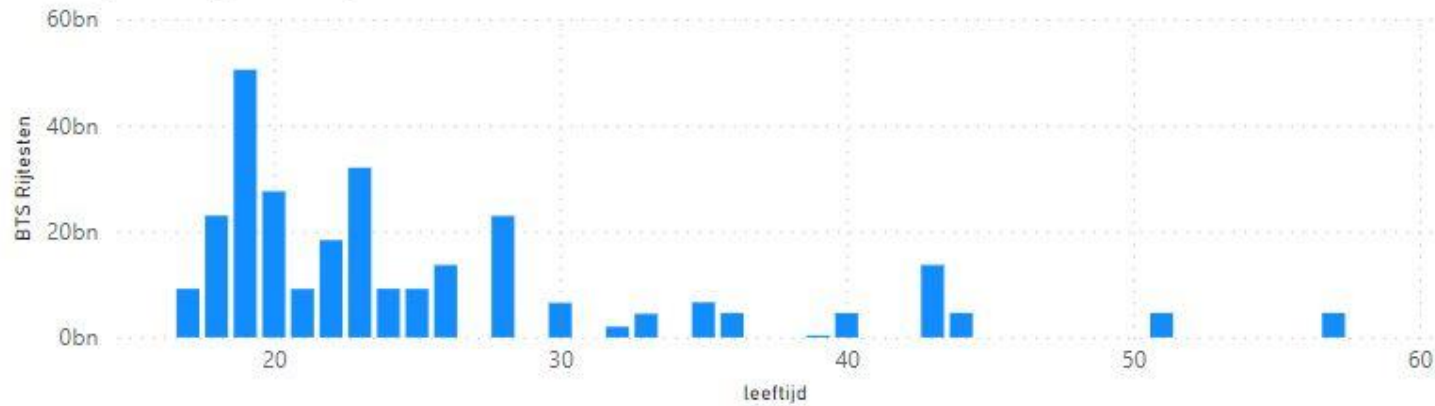
What is being assessed (4 aspects of the protocol)?

Aspects of assessment	Standard
Observing	Is able to orientate himself during the drive, also when approaching more complex traffic situations, in such a way that no danger or hindrance can arise concerning the traffic situation on the spot.
Position on road	Is able to take and maintain a safe position on the road at all times related to the position of other traffic and to road markings and signs
Divided attention	Is able to divide attention adequately between operating, steering and performing the traffic task
Decision-making	Is able to take well-considered and safe decisions in accordance with the pace of similar traffic

Some graphics on bioptic driving in the Netherlands



BTS Rijtesten per leeftijd



Inclusive mobility cannot be overestimated

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“A dream came true”

- Enhanced independency
- Higher quality of life
- Lowered economic costs
- More societal/work participation
- Adherence to the European fundamental non-discrimination rights



In which countries was bioptic driving legally allowed in 2017?

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Countries include: (with 30 years of practice, once legalised, no jurisdiction has ever ceased bioptic driving)

- Australia ⁽⁵⁾
- Canada ⁽¹¹⁾
- Columbia ⁽⁵⁾
- Switzerland ⁽⁵⁾
- Egypt ⁽⁵⁾
- Singapore ⁽⁸⁾
- Israel ⁽⁵⁾
- Lebanon ⁽⁵⁾
- Netherlands ⁽⁶⁾
- Turkey ⁽¹³⁾
- Portugal ⁽⁵⁾
- Saudi Arabia ⁽⁵⁾
- Uruguay ⁽⁵⁾
- 49 of 51 states of USA ⁽¹²⁾
- South Africa ⁽¹⁴⁾
- New Zealand ⁽⁷⁾

International research on Safety of bioptic driving (1)

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PubMed search with terms bioptic telescop* system [tiab] or bioptic* driving [tiab] yielded 19 articles of which 4 were relevant:

PMID 23640044 (2013): 96% (22/23) of bioptic drivers and 100% (23/23) of controls were rated as safe to drive by the (two back-seat) evaluators.

PMID 26436885 (2015): in 237 bioptic drivers previous driving experience, but not visual acuity or contrast sensitivity, was associated with yearly motor vehicle collisions rate.

International research on Safety of bioptic driving (2)

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PMID 32855861 (2020): in 292 hours of driving by bioptic drivers and 169 hours by control drivers, 7 bioptic drivers and 3 control drivers had 8 and 4 near-collisions, respectively (no significant difference).

PMID 19122754 (2008): people with moderately reduced visual acuity can be trained to achieve an adequate level of proficient and safe driving when using a bioptic telescope.

Conclusion from these 4 identified studies: there is no indication that bioptic driving is less safe than normal driving.

Discussion / Questions

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Is the Dutch (USA, Canadian) example, also applicable to your country?

For a wealth of extra information, also on implementation, see:

<https://www.biopticdriversaus.com>

Or mail: rob.kok@cbr.nl



Together safely forward

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THANK YOU

Rob Kok