THE FUTURE OF TRANSPORT

Moving-Off Information Signal (MOIS) Regulation

Consensus Document for Proposed Updates to Draft VRU-Proxi-13-12

February 2020

TRL Background

TRL Background

Vision

World leader in creating the future of transport and mobility, using evidence-based solutions and innovative thinking

320

engineers, scientists, psychologists, IT experts and statisticians

Providing world-leading research, technology and software solutions for surface transport modes and the related markets of automotive, motorsport, insurance and energy

Mission

Challenge and influence our chosen markets, driving sustained reductions (ultimately to zero) in:

- Fatalities and serious injuries
- Harmful emissions
- Barriers to inclusive mobility
- Unforeseen delays
- Cost inefficiencies

1000 clients in

145 countries

TRL Background…delivering impactful innovation

1950's/70's

The UK Motorway network

1960s

Early simulator

1969

The self-driving Citroën DS19

1972

The magic round-about, Swindon

1997

NCAP launched

FOR SAFER CARS EURO NCAP

1980's

Deflectometer

2012

London Summer Olympics

2014

TRL cycle infrastructure development

2015

Gateway driverless shuttles

2016

Electric double decker bus

2018

London Smart Mobility Living Lab

2017

HGV Truck Platooning

Consensus Document Approach

Consensus Document Approach

	Key Proposal Categories
Q1	Child cyclist test dummies and testing requirements
Q2	Maximum forward detection distances
Q3	Minimum forward detection distance
Q4	Last point of information for VRU crossing from offside
Q5	Last point of information for VRU crossing from nearside
Q6	Ocular reference point position
Q7	Parking brake engagement
Q8	ADAS HMI harmonisation and information signal position
Q9	Signal response time and system initialisation
Q10	False positive testing
Q11	Testing burden

Consensus Document Approach

Structure of MOIS Regulation Update Proposal Discussions

- Proposed Update
  - Summary of proposed update
- Proposal Justification
  - Summary of justification for proposed update
- Previous/Alternative Options (if relevant)
  - Statement of other potential options available to address intention of proposed update
- Summary of VRU-Proxi-12 Decisions
  - Summary of relevant consensus agreements from VRU-Proxi-12
- Available Evidence Base
  - Inclusion of key available evidence to support decision making process
- VRU-Proxi-13 Decision:
  - Available Options
    - Series of statements on which options to take forward for the updates to the MOIS Regulation
  - Consensus Discussion Outcome
    - Space for summarising consensus position

Child Cyclist Testing

Child Cyclist Testing (Q1)

Shall child cyclists be removed from the testing procedures?

- OICA/CLEPA Proposed Update:
  - **Removal of the requirements to test MOIS performance using child cyclist soft test targets**
- Proposal Justification:
  - No existing standards for child cyclist dummy requirements
  - No existing commercially available child cyclist test target
  - Burden of testing?
- Previous/Alternative Options:
  - Maintain requirements to test MOIS performance using child cyclist soft test targets
  - Require the provision of evidence from manufacturers that MOIS system can detect child cyclists
- Summary of VRU-Proxi-12 Decisions:
  - Detection of both pedestrian and cyclist (VRU) test targets shall be required by the MOIS Regulation
  - VRU test targets shall include child sized test targets (similar to the approach in BSIS)
  - VRU test targets shall be based on ISO 19206-2/ISO 19206-4

Child Cyclist Testing (Q1): Evidence #1a

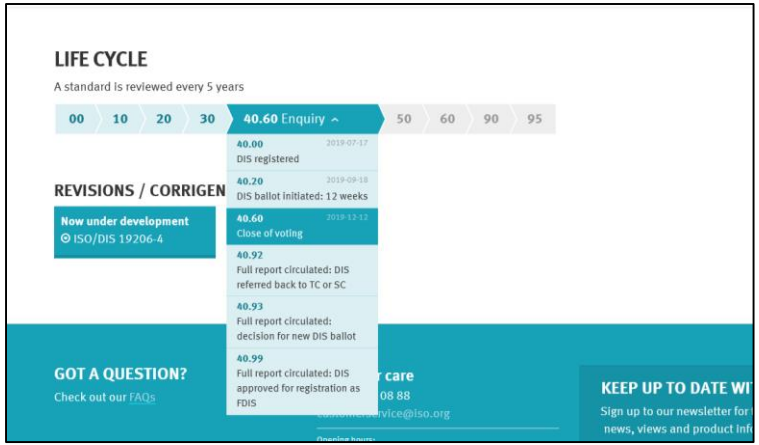
Shall child cyclists be removed from the testing procedures?

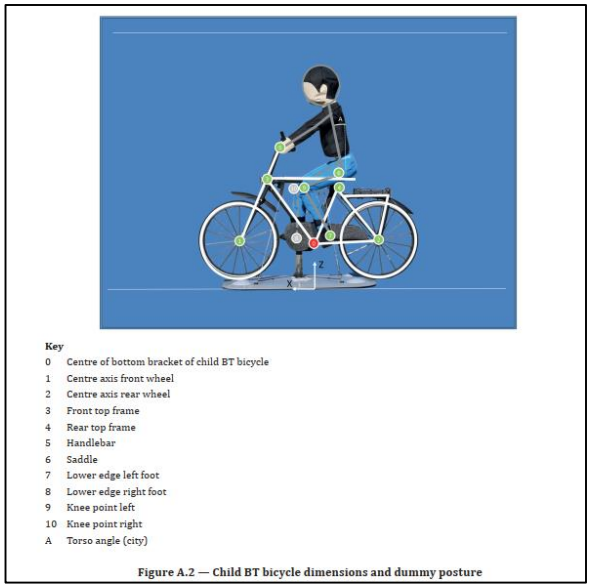
- Available Evidence Base:
  - No existing standards for child cyclist dummy requirements

ICS › 43 › 43.020

ISO/DIS 19206-4

ROAD VEHICLES — TEST DEVICES FOR TARGET VEHICLES, VULNERABLE ROAD USERS AND OTHER OBJECTS, FOR ASSESSMENT OF ACTIVE SAFETY FUNCTIONS — PART 4: REQUIREMENTS FOR BICYCLIST TARGETS





Key

0	Centre of bottom bracket of child BT bicycle
1	Centre axis front wheel
2	Centre axis rear wheel
3	Front top frame
4	Rear top frame
5	Handlebar
6	Saddle
7	Lower edge left foot
8	Lower edge right foot
9	Knee point left
10	Knee point right
A	Torso angle (city)

Figure A.2 — Child BT bicycle dimensions and dummy posture

Child Cyclist Testing (Q1): Evidence #1b

Shall child cyclists be removed from the testing procedures?

- Available Evidence Base:
  - No existing commercially available child cyclist test target

Confirmation from at least one supplier that a child sized cyclist, fully compliant with ISO 19206-4 requirements, is commercially available

The official Euro NCAP bicyclist target (EBT)

- ☑ standard average european utility bike – average male
- ☑ realistic properties in size, shape and rotating wheels
- ☑ complies with ISO 19206-4, Euro NCAP, UN-ECE, ...

Allows testing under rough conditions

- ☑ extreme lightweight and soft structure to prevent damage on VUT
- ☑ robust and modular system – easy and fast change of spare parts
- ☑ realistic response for Radar-, Lidar, Camera and IR-Systems

Available options

- ☑ bike for 7-year-old child
- ☑ different frame colours
- ☑ synchronized articulation (pedalling, arm signs, ...)

Child Cyclist Testing (Q1)

Shall child cyclists be removed from the testing procedures?

- Available Evidence Base:
  - Burden of testing? => to be discussed later on
- VRU-Proxi-13 Decision:
  - Proposed Consensus Statement Options:
    - Child cyclist soft test targets shall be tested by the MOIS Regulation
    - Child cyclist soft test target shall not be tested by the MOIS Regulation
    - Manufacturers shall provide evidence that MOIS system can detect child cyclists only
  - Consensus Discussion Outcome:
    - [To Be Completed via VRU-Proxi-13 Report]

Detection Boundaries

Max. Forward Detection Boundary (Q2)

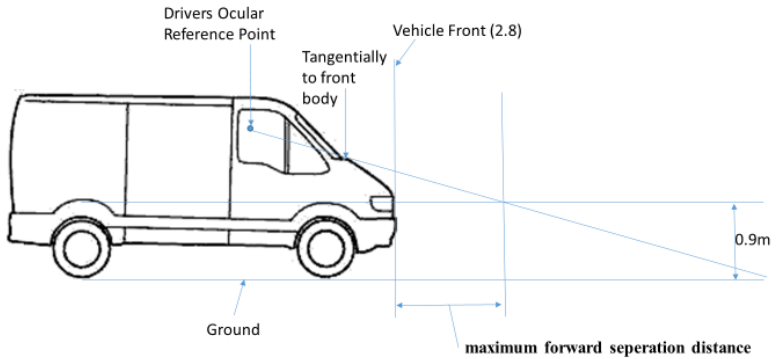
Shall the max. forward detection boundary depend on direct vision performance?

- OICA/CLEPA Proposed Update:
  - **Update definition of maximum detection boundary to be dependent on the maximum forward blind spot distance**
- Proposal Justification:
  - The direct vision performance of the vehicle can be taken into consideration through Regulation
  - Allows differentiated approach between vehicle categories, e.g. M2/M3 vehicles have better direct vision than the majority of N3 vehicles, so shorter max. forward detection distance criteria
  - Attempts to remove requirements to provide signal for VRUs that may be visible to driver
- Previous/Alternative Options:
  - Maintain requirements to test MOIS performance at a maximum forward detection distance of 3.7m
  - Set two boundaries (3.7m and a shorter range (1.25 m?)) that apply to different vehicle categories
- Summary of VRU-Proxi-12 Decisions:
  - Effect of direct vision shall be considered in the requirements for different vehicle categories
  - Worst-case direct vision blind spot distance from front end to be used to determine max. distance, with LDS calculating worst-case distance of 3.7 m

Max. Forward Detection Boundary (Q2)

Shall the max. forward detection boundary depend on direct vision performance?

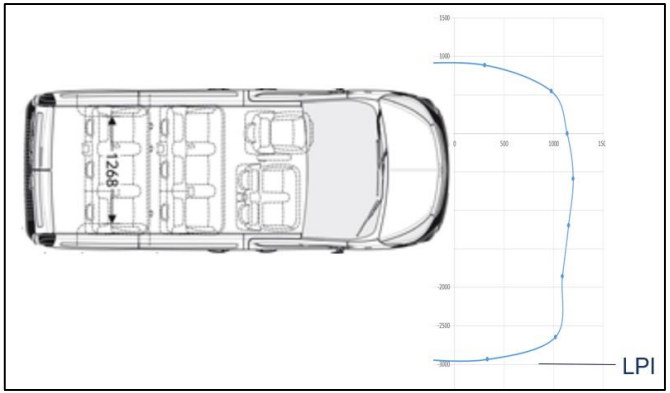
- OICA/CLEPA Proposal 1 Approach [superseded]:
  - Max. forward detection boundary determined by:
    - Forming a plane (a “driver vision plane”?) between ocular reference point and a tangent to the “vehicle front body”
    - Establishing the intersect between this plane and a plane 0.9 m above the ground plane
    - OR a distance of 3.7 m at the choice of the manufacturer
  - Approach challenges
    - Definition of vehicle front body not specified – is it a point or a line, is it the glazing or the bodywork, where along the glazing/bodywork?
    - Vehicle front body, when defined, may be very challenging to specifically and repeatably select
    - If vehicle front body a point, driver vision plane will not be fully constrained (two point constraint – what angle is the plane when constrained in this manner?)
    - May lead to vehicles with no requirement for a MOIS (if max. forward distance < min. forward distance)



Max. Forward Detection Boundary (Q2)

Shall the max. forward detection boundary depend on direct vision performance?

- OICA/CLEPA Proposal 2 Approach:
  - Max. forward detection boundary determined by:
    - Forming a plane (“max. forward detection boundary plane”?) parallel to vehicle front plane at furthest forward blind spot of the vehicle [*and within the boundaries of the maximum LPIs*]
    - Blind spot determined by projecting sightlines from ocular reference point onto plane 0.9 m above ground
    - OR a distance of 3.7 m at the choice of the manufacturer
    - [*BUT no less than 1.25 m for adult and 1.15 m for child (1.0 m clearance)*]
  - Approach challenges
    - Test method needs to be defined
      - Proposed to use light source at ORP and 0.9 m high pole to determine forward boundary of blind spot
    - How to deal with obscurations – e.g. mirrors/wipers?
    - How to deal with cab height variation?
    - Flat fronted designs typically have A-pillar blind spots that extend away from the vehicle – so max. distances will be determined by A-pillars
      - Bonneted designs will be determined by bonnet projection



Forward blind spot boundary for M2 vehicle

Max. Forward Detection Boundary (Q2): Evidence #2a

Shall the max. forward detection boundary depend on direct vision performance?

- Available Evidence Base:
  - Forward monocular blind spots for N3 vehicles
    - Legend:
      - Circles => Lowest cab height for given model
      - Triangles => Highest cab height for given model
      - Blue => Maximum forward blind spot distance
      - Orange => Mean forward blind spot distance
      - Assessment height => 1.117 m from ground
    - Conclusions:
      - N3 vehicles have a range of maximum forward blind spots – between ~0.9 m and ~4.2 m
      - N3 LECs have shortest max. forward blind spots
      - N2/M2/M3 vehicles likely to have similar forward blind spots to LECs
      - Some N3 vehicles have max. forward blind spots within range of ultrasonic sensors

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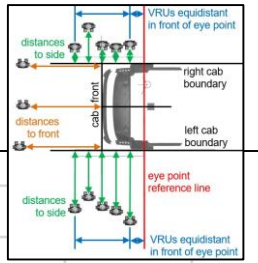
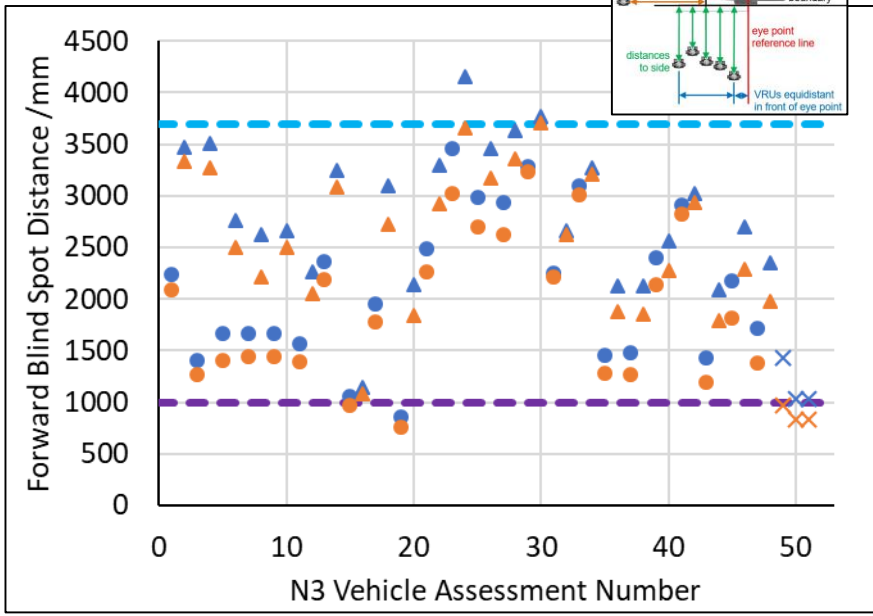
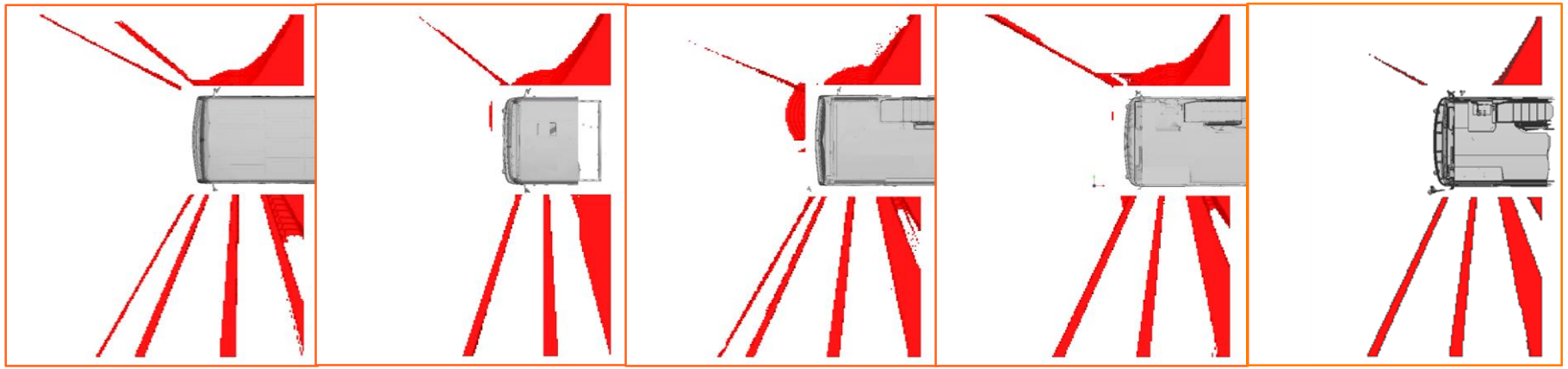




Max. Forward Detection Boundary (Q2): Evidence #2c

Shall the max. forward detection boundary depend on direct vision performance?

- Available Evidence Base:
  - Ambinocular direct vision blind spot zones for M3 vehicles
  - Blind spots above 1.117 m plane shown for 5 models (2 generations/2 decks) of London buses
  - Forward blind spots primarily caused by A-pillars – large glazed areas and low windscreen edge similar in design philosophy to Low-Entry Cabs



Max. Forward Detection Boundary (Q2)

Shall the max. forward detection boundary depend on direct vision performance?

- Available Evidence Base:
  - Single sample for forward direct vision performance of N2/M2 vehicles
  - Shorter maximum forward detection distance performance level requirements may be based on the ultrasonic sensor specifications from the reversing safety regulation (1.0 m separation?)
- VRU-Proxi-13 Decision:
  - Proposed Consensus Statement Options:
    - The max. forward detection distance shall be based on the direct vision of the vehicle
    - The max. forward detection distance shall be based on proposed “max. forward blind spot plane” approach
    - The max. forward detection distance shall be based on proposed “differentiated performance levels” approach
    - The max. forward detection distance shall be based on current “single performance level” approach
    - The max. forward detection distance shall be no greater than 3.7m for both adults and children
    - The max. forward detection distance shall be no less than 1.25m for adults and 1.15m for children
  - Consensus Discussion Outcome:
    - [To Be Completed via VRU-Proxi-13 Report]

Min. Forward Detection Boundary (Q3)

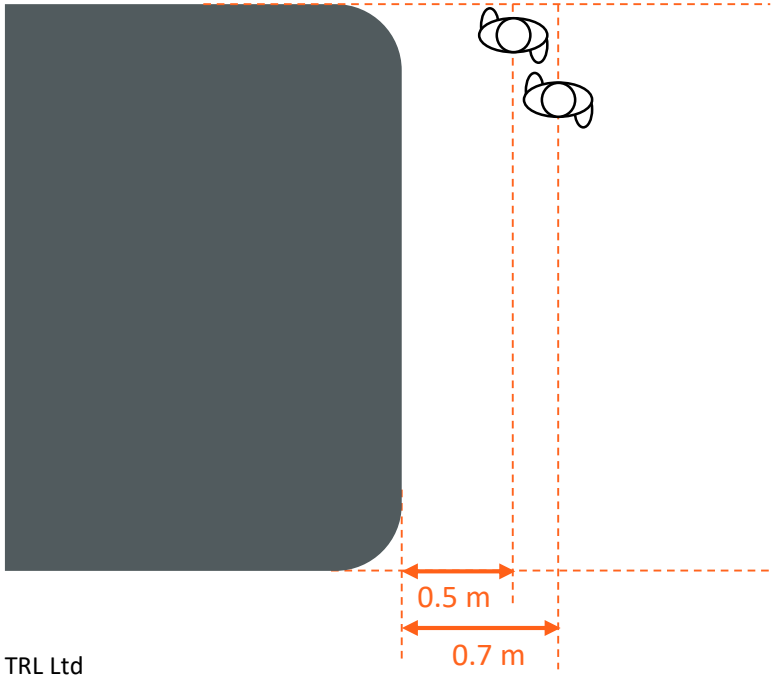
Shall the min. forward detection boundary be increased?

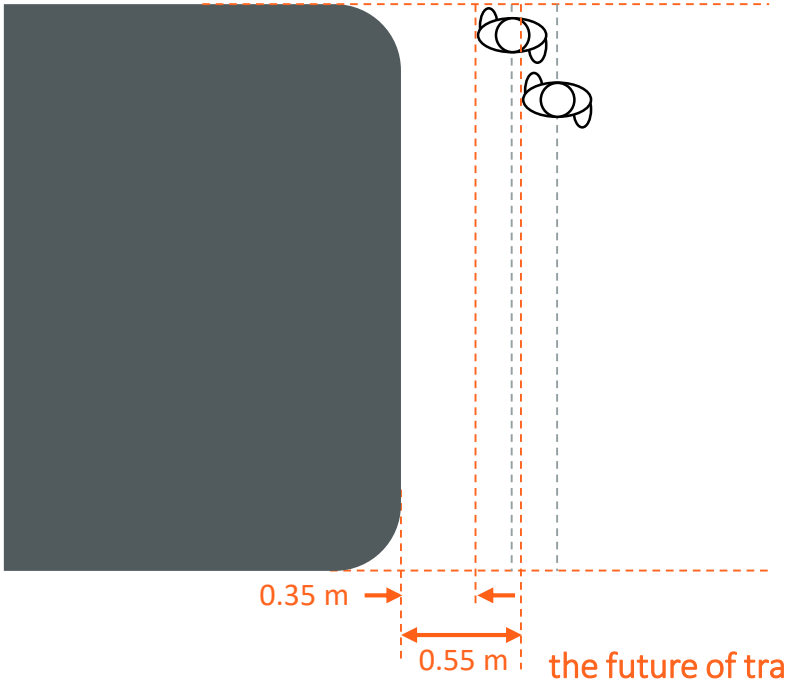
- OICA/CLEPA Proposed Update:
  - **Increase the minimum forward detection distance from 0.6m to 0.8m**
- Proposal Justification:
  - Challenging to use a single short-range radar sensor to detect distances <0.8m (0.55m separation)
  - Min. forward detection distance of 0.6m (0.35m separation) more suitable for ultrasonic sensors, but these cannot sense to 3.7 m
- Previous/Alternative Options:
  - Maintain minimum forward detection boundary requirement of 0.6m, but fusion of extra sensors will likely be needed for system (ultrasonic sensors on front of vehicle most likely approach)
  - Have two separate min. detection distances based on max. distance (N2/M2/M3 likely to have much shorter max. detection distances based on direct vision approach)
- Summary of VRU-Proxi-12 Decisions:
  - Minimum forward detection distance of [0.6]m ([0.5]m for child) agreed as temporary requirement
  - Industry would review minimum detection distances for potential MOIS systems

Min. Forward Detection Boundary (Q3): Evidence #3a

Shall the min. forward detection boundary be increased?

- Available Evidence Base:
  - What could this mean for the permitted forward blind spot?

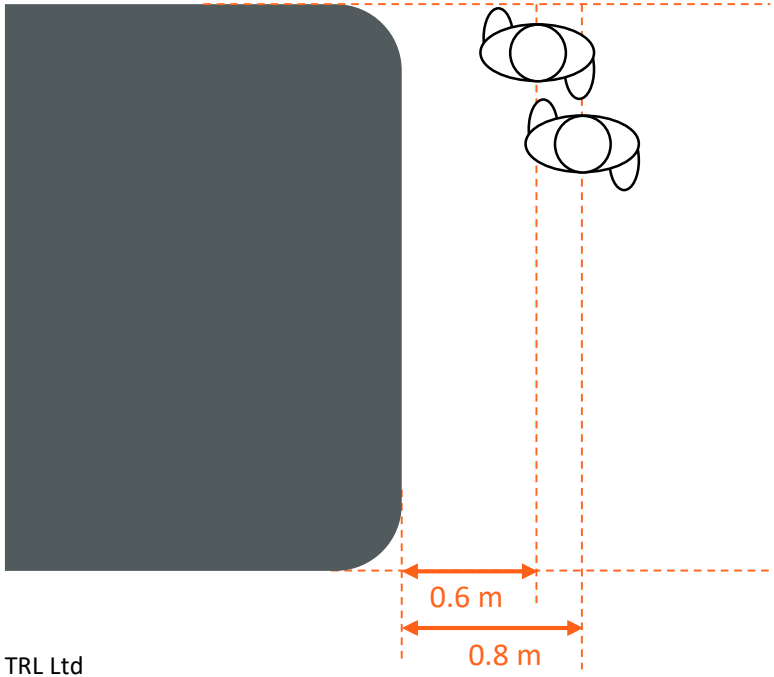


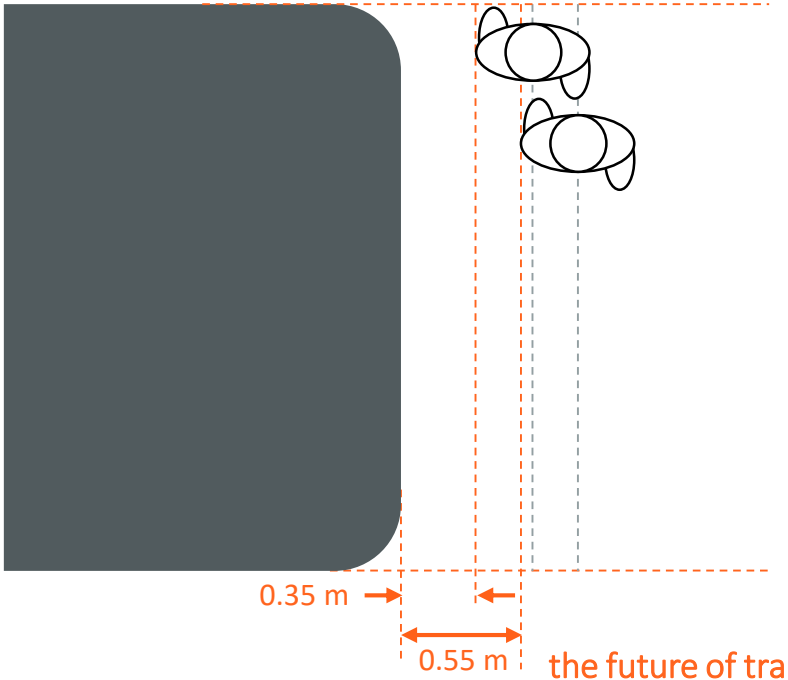


Min. Forward Detection Boundary (Q3): Evidence #3a

Shall the min. forward detection boundary be increased?

- Available Evidence Base:
  - What could this mean for the permitted forward blind spot?





Min. Forward Detection Boundary (Q3): Evidence #3a

Shall the min. forward detection boundary be increased?

- Available Evidence Base:
  - What could this mean for the permitted forward blind spot?

Min. Forward Detection Boundary (Q3): Evidence #3b

Shall the min. forward detection boundary be increased?

- Available Evidence Base:
  - Forward blind spot zones for N3 vehicles
    - Legend:
      - Circles => Lowest cab height for given model
      - Triangles => Highest cab height for given model
      - Blue => Maximum forward blind spot distance
      - Orange => Mean forward blind spot distance
      - Assessment height => 1.117 m from ground
    - Conclusions:
      - N3 vehicles with good direct vision (i.e. LEC) only required to fit MOIS with small forward detection area – as 0.8 m min. forward detection boundary is nearly met by ~1.0 m max. forward boundary
      - N2/M2/M3 vehicles likely to have similar forward blind spots to LECs
      - Case for 2 different min. detection distances based on max. detection distance criteria (e.g. 0.6 m when max. distance is 1.25 m)?

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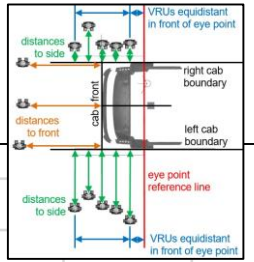
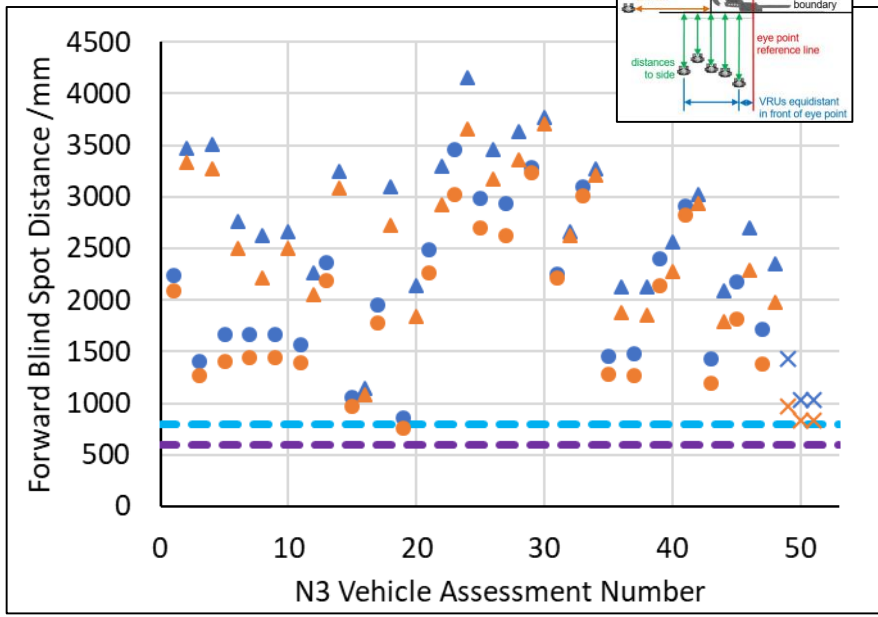




Min. Forward Detection Boundary (Q3)

Shall the min. forward detection boundary be increased?

- Additional Evidence
  - No existing evidence to establish normal VRU separation distances when crossing in front of vehicles
- VRU-Proxi-13 Decision:
  - Proposed Consensus Statement Options:
    - The minimum forward detection boundary shall be based on a single value of 0.8m for the adult test target and 0.7m for the child test target (0.55m separation to both)
    - The minimum forward detection boundary shall be based on a single value of 0.6m for the adult test target and 0.5m for the child test target (0.35m separation to both)
    - The minimum forward detection boundary shall be 0.8m for the adult test target and 0.7m for the child test target (0.35m separation to both), unless the lower threshold of the maximum forward detection boundary is declared by the manufacturer (1.25m adult/1.15m child) where it shall be 0.6 m for the adult test target and 0.5m for the child test target
  - Consensus Discussion Outcome:
    - [To Be Completed via VRU-Proxi-13 Report]

Offside LPI Boundary (Q4)

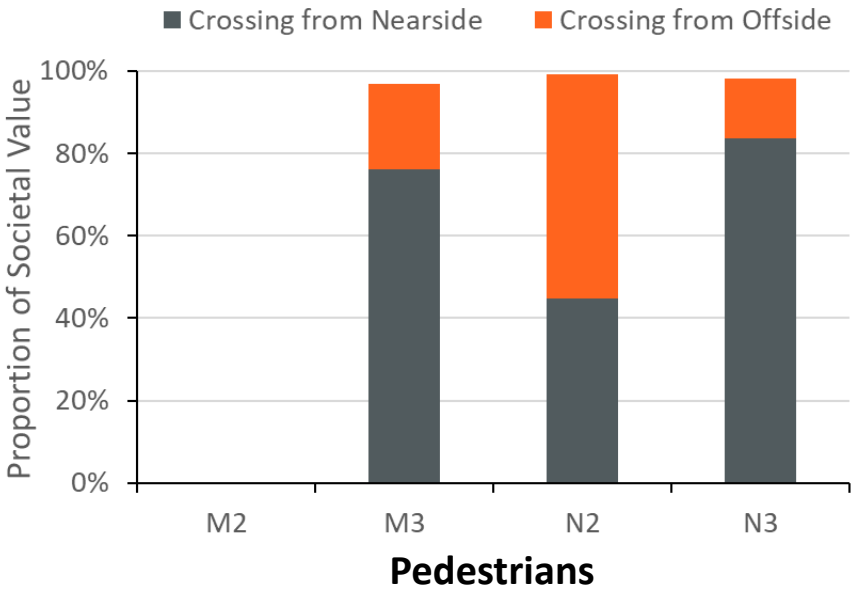
Shall the offside Last Point of Information (LPI) boundary be aligned with the offside plane?

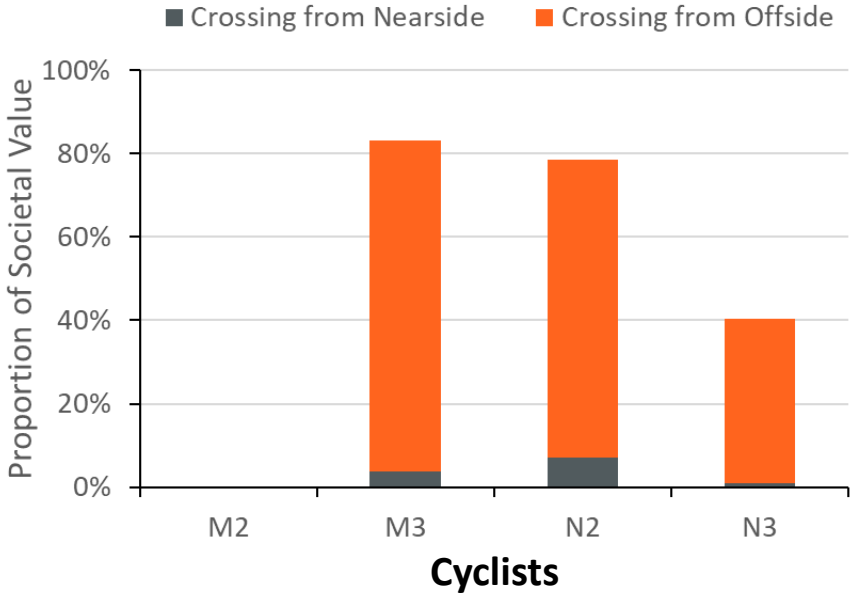
- OICA/CLEPA Proposed Update:
  - **Modify the offside Last Point of Information requirements to align with the vehicle offside plane**
- Proposal Justification:
  - Offside of vehicle has good direct vision therefore no requirement to provide information signal
  - VRU will have crossed a significant part of the carriageway already
- Previous/Alternative Options:
  - Maintain requirements to test MOIS performance at offside LPI based on VRU speed only
  - Modify offside LPI to be based on offside direct vision performance of vehicle
- Summary of VRU-Proxi-12 Decisions:
  - Effect of direct vision shall be considered in the requirements for different vehicle categories
  - Proximity information signals shall be provided to the driver when VRU test targets are in close proximity to the vehicle and VRU test targets are travelling at speeds of [3-5] kph and crossing in front of the vehicle from both the nearside and offside

Offside LPI Boundary (Q4): Evidence #4a

Shall the offside Last Point of Information (LPI) boundary be aligned with the offside plane?

- Available Evidence Base:
  - Accidentology analysis of VRU crossing manoeuvre during moving off and slowing/stopping collisions
  - Proportions compared to all moving off and slowing/stopping collisions with VRU





Offside LPI Boundary (Q4): Evidence #4b

Shall the offside Last Point of Information (LPI) boundary be aligned with the offside plane?

- Available Evidence Base:
  - Offside lateral blind spot zones for N3 vehicles
    - Legend:
      - Circles => Lowest cab height for given model
      - Triangles => Highest cab height for given model
      - Blue => Maximum forward blind spot distance
      - Orange => Mean forward blind spot distance
      - Assessment height => 1.117 m from ground
    - Conclusions:
      - Only four N3 vehicles have a max. offside blind spot of <0.5m (similar to earlier M2)
      - Most N3 vehicles have max. offside blind spot better than the worst-case LPI (5 kph)
      - However, significant number have a max. offside blind spot greater than worst-case LPI
      - LECs appear to have better offside visibility
      - Lowering same cab sometimes result in larger offside blind spot due to mirror cluster
      - Offside visibility likely to be affected by A-pillar and mirror cluster positioning

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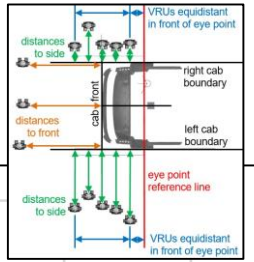

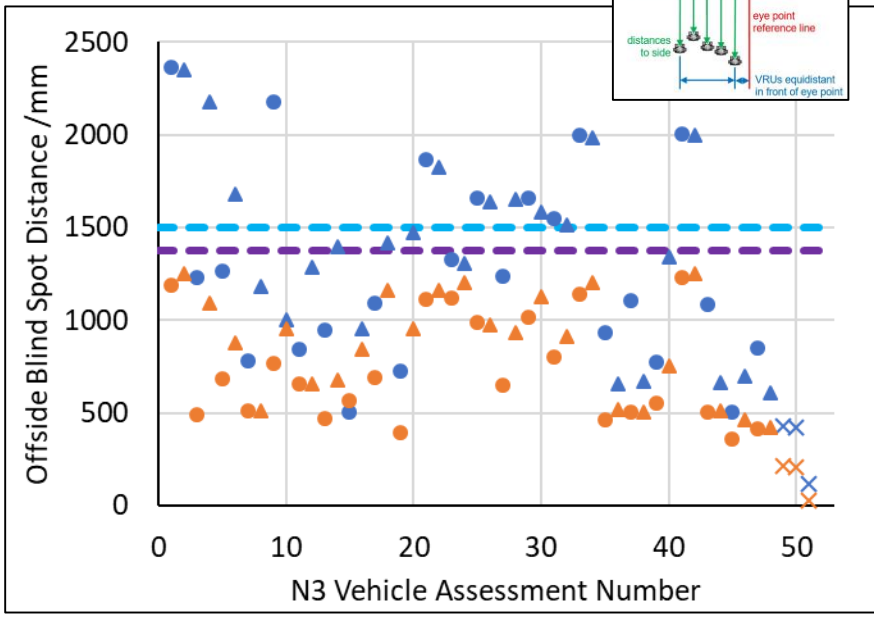

Offside LPI Boundary (Q4)

Shall the offside Last Point of Information (LPI) boundary be aligned with the offside plane?

- Available Evidence Base:
  - Single sample for forward direct vision performance of N2/M2 vehicles
- VRU-Proxi-13 Decision:
  - Proposed Consensus Statement Options:
    - The offside LPI distance shall be aligned with the offside plane
    - The offside LPI distance shall be based on the direct vision of the vehicle
      - The offside LPI distance shall be aligned with “max. offside blind spot plane”
      - The offside LPI distance shall be no greater than that calculated based on the speed of the VRU
      - The offside LPI distance shall be no less than 0.5m from the vehicle offside plane
    - The offside LPI distance shall be calculated based only on the speed of the VRU
  - Consensus Discussion Outcome:
    - [To Be Completed via VRU-Proxi-13 Report]

Nearside LPI Boundary (Q5)

Shall the nearside Last Point of Information (LPI) boundary depend on direct vision?

- OICA/CLEPA Proposed Update:
  - **Update definition of nearside LPI to be dependent on the maximum nearside blind spot distance**
- Proposal Justification:
  - Although most N3 vehicles do not perform well for nearside direct vision – N3 LECs and M2/M3/N2 vehicles may perform significantly better
  - Provides differentiated approach between vehicle categories based on direct vision capability
- Previous/Alternative Options:
  - Maintain requirements to test MOIS performance at offside LPI based on VRU speed only
- Summary of VRU-Proxi-12 Decisions:
  - Effect of direct vision shall be considered in the requirements for different vehicle categories
  - Proximity information signals shall be provided to the driver when VRU test targets are in close proximity to the vehicle and VRU test targets are travelling at speeds of [3-5] kph and crossing in front of the vehicle from both the nearside and offside

Nearside LPI Boundary (Q5): Evidence #5a

Shall the nearside Last Point of Information (LPI) boundary depend on direct vision?

- Available Evidence Base:
  - Nearside lateral blind spot zones for N3 vehicles
    - Legend:
      - Circles => Lowest cab height for given model
      - Triangles => Highest cab height for given model
      - Blue => Maximum forward blind spot distance
      - Orange => Mean forward blind spot distance
      - Assessment height => 1.117 m from ground
    - Conclusions:
      - Only three N3 vehicles have a max. nearside blind spot of <1.5m
      - Most have a max. nearside blind spot greater than 4.0m
      - LECs appear to have better nearside visibility
      - Lowering same cab sometimes result in larger nearside blind spot due to mirror cluster
      - Nearside visibility likely to be affected by A-pillar and mirror cluster positioning

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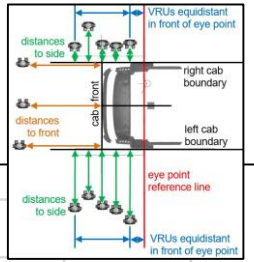
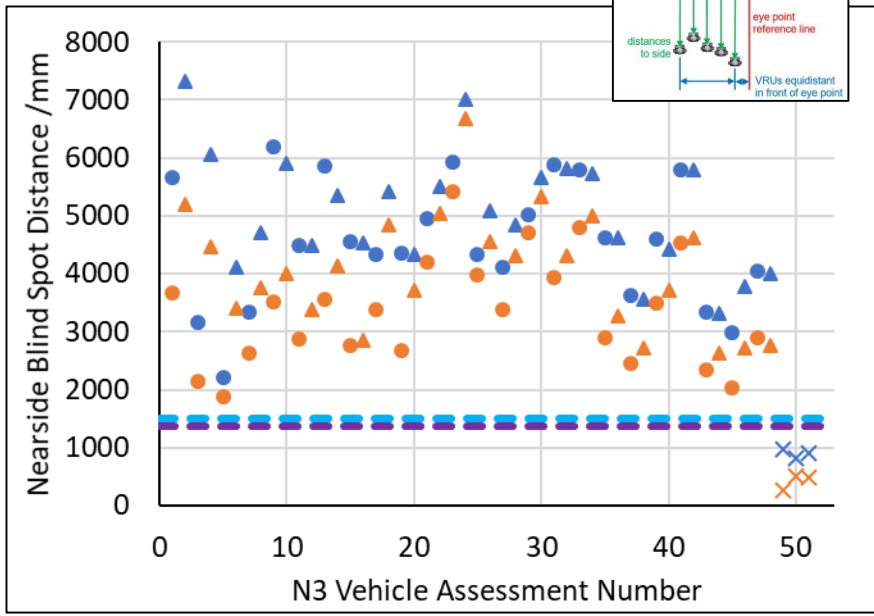




Nearside LPI Boundary (Q5)

Shall the nearside Last Point of Information (LPI) boundary depend on direct vision?

- Available Evidence Base:
  - Single sample for forward direct vision performance of N2/M2 vehicles
- VRU-Proxi-13 Decision:
  - Proposed Consensus Statement Options:
    - The nearside LPI distance shall be based on the direct vision of the vehicle
      - The nearside LPI distance shall be aligned with “max. nearside blind spot plane”
      - The nearside LPI distance shall be no greater than that calculated based on the speed of the VRU
      - The nearside LPI distance shall be no less than 0.5m from the vehicle nearside plane
    - The nearside LPI distance shall be calculated based only on the speed of the VRU
  - Consensus Discussion Outcome:
    - [To Be Completed via VRU-Proxi-13 Report]

Ocular Reference Point

Ocular Reference Point Position (Q6)

What position shall be defined for the ocular reference point?

- OICA/CLEPA Proposed Update:
  - **Ocular reference point to be located at same position as defined in UNECE R46**
- Proposal Justification:
  - Aligned with previous definition used for positioning of proximity information signal
- Previous/Alternative Options:
  - Direct vision regulation proposed to be forward reference eye point
  - Reversing motion regulation proposed to be R46 defined ocular reference point
- Summary of VRU-Proxi-12 Decisions:
  - No previous discussion on ocular reference point
  - Previously only used to define a plane above which proximity information signal shall be positioned

Ocular Reference Point Position (Q6)

What position shall be defined for the ocular reference point?

- Available Evidence Base:
  - Consensus agreement now required as ocular reference point central to performance criteria
  - R125/R46 ocular reference points based on distance from manufacturer defined R point
  - Proposed direct vision regulation forward reference eye point based on distance from AHP
  - Which is the preferred approach of VRU-Proxi IWG
- VRU-Proxi-13 Decision:
  - Proposed Consensus Statement Options:
    - The ocular reference point shall be defined as the V_2 (5^{th} percentile female) vision point from R125
    - The ocular reference point shall be defined as the V_1 (95^{th} percentile male) vision point from R125
    - The ocular reference point shall be defined as the ORP from R46
    - The ocular reference point shall be defined as the proposed reference eye point from direct vision regulation
  - Consensus Discussion Outcome:
    - [To Be Completed via VRU-Proxi-13 Report]

Parking Brake Engagement

Parking Brake Engagement (Q7)

Shall MOIS provide proximity information signal when parking brake engaged?

- OICA/CLEPA Proposed Update:
  - **Potential moving off manoeuvre defined as: *vehicle in operational mode with parking brake released, such that on release of service brake vehicle will move off***
- Proposal Justification:
  - Provide greater clarification as to the exact definition of the vehicle “stationary” scenario
- Previous/Alternative Options:
  - No previous definition
  - Vehicle in operational mode with parking brake engaged to also be included in scope?
- Summary of VRU-Proxi-12 Decisions:
  - The detection of VRU test targets shall be required when the vehicle is stationary, moving off from rest in a straight line and moving ahead slowly in a straight line.

Parking Brake Engagement (Q7)

Shall MOIS provide proximity information signal when parking brake engaged?

- Available Evidence Base:
  - Conceivable to release parking brake and move off from rest in <1 second – which will not allow elderly persons to clear vehicle trajectory
  - However, no driver behaviour studies on parking brake and moving off manoeuvre timings
  - Non-intrusive proximity information signal only to be provided when at standstill
- VRU-Proxi-13 Decision:
  - Proposed Consensus Statement Options:
    - The MOIS Regulation shall require proximity information signals when parking brake is released
    - The MOIS Regulation shall require proximity information signals when parking brake is engaged
  - Consensus Discussion Outcome:
    - [To Be Completed via VRU-Proxi-13 Report]

Human-Machine Interface of Signals

HMI Harmonisation (Q8a)

Shall MOIS Regulation consider HMI harmonisation with other ADAS regulation?

- OICA/CLEPA Proposed Update:
  - **Removal of several HMI requirements to improve integration with other ADAS HMI**
- Proposal Justification:
  - Wish to harmonise with other ADAS HMI, but as written has potential for conflicts
  - Currently no guidance for HMI harmonisation between ADAS Regulations
  - In lieu of HMI harmonisation guidance, propose to remove several HMI requirements to support with HMI integration between ADAS systems
    - Yellow optical signal, signal positioning boundaries, combination of failure warning and deactivation signals
- Previous/Alternative Options:
  - Maintain VRU-Proxi-12 agreed requirements
- Summary of VRU-Proxi-12 Decisions:
  - The proximity information signal shall consist of an optical signal
  - The collision warning signal shall consist of two different signal modes selected from audible, optical or haptic signals. If optical, it shall be different in activation to proximity information signal
  - Signals shall not be located below -30^{o} from the reference eye point

HMI Harmonisation (Q8a)

Shall MOIS Regulation consider HMI harmonisation with other ADAS regulation?

- Available Evidence Base:
  - No ADAS HMI harmonisation guidelines
- VRU-Proxi-13 Decision:
  - Proposed Consensus Statement Options:
    - The previously defined HMI requirements shall be maintained
    - Some HMI requirements shall be removed to promote HMI harmonisation
    - Future guidance on ADAS HMI harmonisation shall be adopted
  - Consensus Discussion Outcome:
    - [To Be Completed via VRU-Proxi-13 Report]

Proximity Information Signal Position (Q8b)

Shall MOIS Regulation require position of proximity information signal?

- OICA/CLEPA Proposed Update:
  - **Removal of positioning requirements for proximity information signal**
- Proposal Justification:
  - No constraint on positioning allows for greater design flexibility
- Previous/Alternative Options:
  - Maintain VRU-Proxi-12 agreed requirements and require forward of the ocular reference point
- Summary of VRU-Proxi-12 Decisions:
  - Signals shall not be located below -30^{o} from the reference eye point
- Available Evidence Base:
  - No evidence – but desire to minimise “eyes off the road” time with positioning of signal
- VRU-Proxi-13 Decision:
  - Proposed Consensus Statement Options:
    - Signals shall be located forward of the driver ocular reference point and not below the -30^{O} plane
    - No positioning requirements for the proximity information signal

Initialisation/Response Time for Signals

MOIS System Initialisation (Q9a)

Shall MOIS Regulation consider requirements for MOIS system initialisation time?

- TRL Proposed Update:
  - **Inclusion of requirements for maximum time for MOIS system initialisation**
- Proposal Justification:
  - Currently no requirements to initialise MOIS system within a set time from start up
- Previous/Alternative Options:
  - Base on Reversing Motion Regulation
- Summary of VRU-Proxi-12 Decisions:
  - No discussion
- Available Evidence Base:
  - No evidence – but desire to harmonise with Reversing Motion Regulation
- VRU-Proxi-13 Decision:
  - Proposed Consensus Statement Options:
    - MOIS Regulation shall require a maximum time for MOIS system initialisation
    - MOIS Regulation shall base such requirements on Reversing Motion Regulation

Signal Response Time (Q9b)

Shall MOIS Regulation consider requirements for MOIS signal response time?

- TRL Proposed Update:
  - **Inclusion of requirements for maximum time for MOIS system response to release of service brake (if this option selected from Q7)**
- Proposal Justification:
  - Currently no requirements for MOIS system response times
- Previous/Alternative Options:
  - Base on Reversing Motion Regulation => 0.6s response time
- Summary of VRU-Proxi-12 Decisions:
  - No discussion
- Available Evidence Base:
  - No evidence – but desire to harmonise with Reversing Motion Regulation
- VRU-Proxi-13 Decision:
  - Proposed Consensus Statement Options:
    - MOIS Regulation shall require a maximum time for MOIS system response
    - MOIS Regulation shall base such requirements on Reversing Motion Regulation

False Positive Tests

False Positive Tests (Q10)

Shall false positive testing specifications be included?

- OICA/CLEPA Proposed Update:
  - **Removal of requirement to perform false positive tests**
- Proposal Justification:
  - Manufacturers will drive towards minimising false positives in design
  - False positives may occur in real-world and may therefore also within tolerances of false positive test scenarios – should pass/fail be dependent on this?
  - Manufacturers only required to "ensure… false-positive warnings due to the detection of static non-VRU objects such as cones, traffic signs, hedges and parked cars [are] minimized"
- Previous/Alternative Options:
  - Current test requirements
    - Static pedestrian and environmental clutter (car and signpost) 1.0m from vehicle nearside/offside plane
    - Cyclist moving at 3-5kph longitudinally in vehicle travel direction and 1.0m from vehicle nearside/offside plane
  - AEBS (M1/N1) has false positive testing requirements – on which current requirements are based
  - Up to two repeat tests (three in total) could be permitted, should signal be falsely activated

False Positive Tests (Q10)

Shall false positive testing specifications be included?

- Summary of VRU-Proxi-12 Decisions:
  - Inclusion of false positive tests agreed.
    - The MOIS shall not give a proximity signal or warning signal when driving in a straight line passing VRU test targets placed at [1.0] m outside of the vehicle trajectory.
    - VRU test targets may be stationary/moving longitudinally to vehicle travel direction.
    - Environmental clutter may be placed at [1.0] m outside of the vehicle trajectory.
- Available Evidence Base:
  - No evidence available regarding false positive rates
  - General desire to ensure that due diligence is taken for reducing/eliminating false positives in certain common non-hazardous scenarios
- VRU-Proxi-13 Decision:
  - Proposed Consensus Statement Options:
    - False positive tests shall be included in the requirements of the MOIS Regulation
    - False positive tests shall have the option to perform up to two repeat tests should signal be falsely activated
    - The scope of the false positive tests shall be adjusted
  - Consensus Discussion Outcome:
    - [To Be Completed via VRU-Proxi-13 Report]

Testing Burden

Reduction of Testing Burden (Q11)

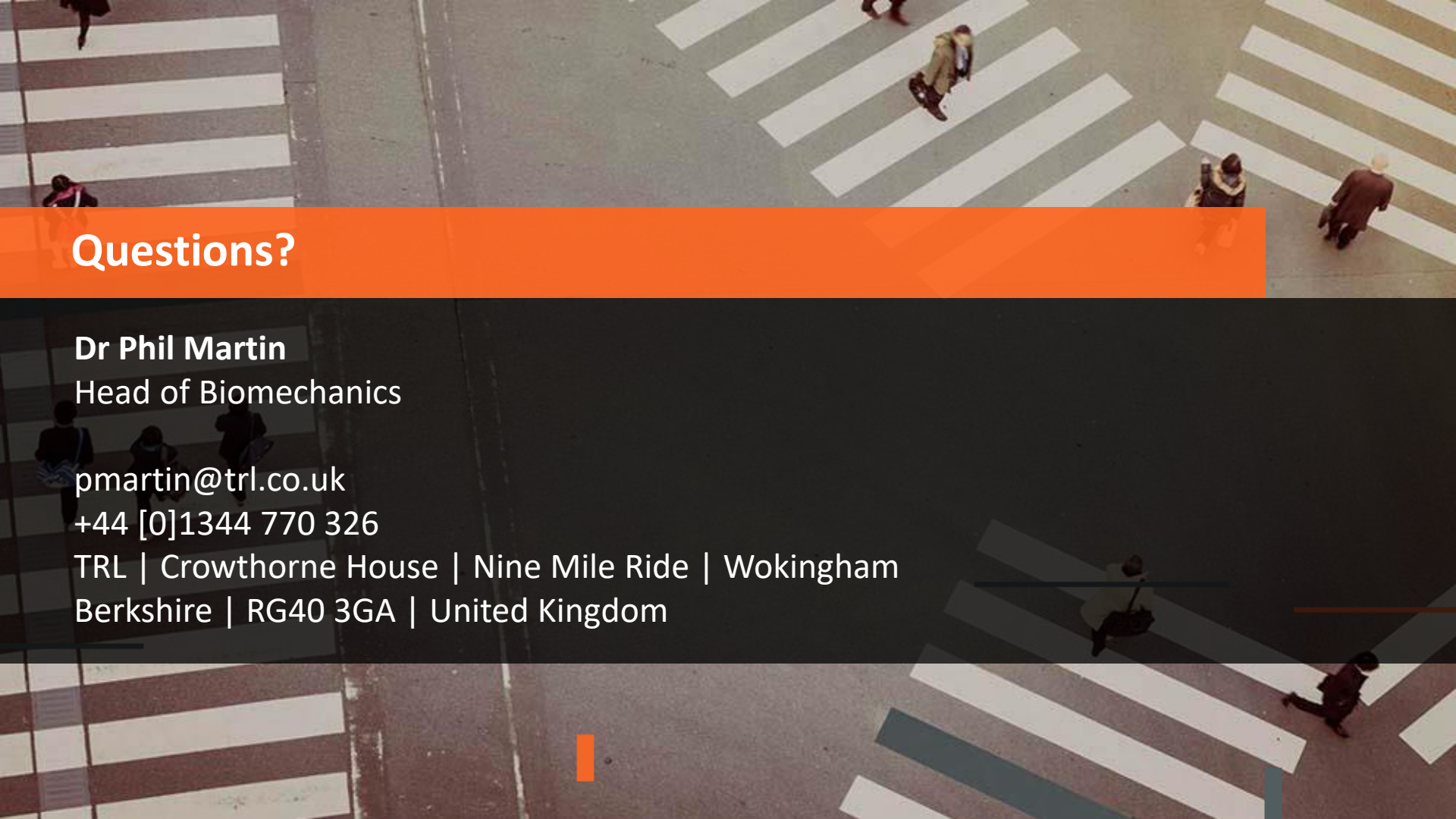
Shall the testing burden be reduced?

- OICA/CLEPA Proposed Update:
  - **Reduce requirement to test all proposed test cases to a requirement to test at least two test cases from proposed test cases, to reduce testing burden**
- Proposal Justification:
  - Currently Test Service may perform up to 32 functional performance tests
    - Minimum number of tests require to test all boundary conditions of MOIS Regulation requirements
    - 8 static crossing tests, 6 longitudinal stopping for moving off cyclist tests, 6 longitudinal moving off with cyclist tests, 2 false positive tests [up to 4 repeats], 1 failure detection test, 1 deactivation test, [1 initialisation test]
    - Includes additional 1 static crossing test, 1 longitudinal stopping for moving off cyclist test and 1 longitudinal moving off with cyclist test at Test Service selected configurations within requirements
  - Reduce to 2 selected test cases/category => total of up to 15 tests (9 tests if FP tests removed), with removal of additional Test Service selected configuration tests
- Previous/Alternative Options:
  - Removal of certain test scenarios => child cyclist testing, adult pedestrian testing, FP testing
  - Allow test service to choose test configurations
  - What is the minimum number of acceptable test cases? AEB (M1/N1) requires up to 13 test cases (+ 3 FP tests) when including proposed bicyclist test cases => is 2 tests too low?

Reduction of Testing Burden (Q11)

Shall the testing burden be reduced?

- VRU-Proxi-13 Decision:
  - Proposed Consensus Statement Options:
    - The total number of test cases required shall test all boundary conditions of the MOIS Regulation requirements and also include additional Test Service selected test configurations from within requirements
    - The total number of test cases required shall be a specified number of test cases selected from the specified boundary conditions associated with each test configuration
    - The specified number of test cases shall be two [three] per test configuration
  - Consensus Discussion Outcome:
    - [To Be Completed via VRU-Proxi-13 Report]



Questions?

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