

# ISO 15007:2020 (E)

## Road vehicles — Measurement and analysis of driver visual behaviour with respect to transport information and control systems

---

### Contents

	Foreword
	Introduction
1	Scope
2	Normative references
3	Terms and definitions
3.1	Basic terms
3.2	Terms for metrics
3.2.1	Basic direct metrics
3.2.2	Glance derived metrics
4	Trial planning and evaluation
4.1	General
4.2	Trial planning
4.2.1	General
4.2.2	Roadway/traffic specification
4.2.3	Vehicle specification
4.2.4	TICS specification
4.2.5	Participant selection
4.2.6	Participant training
4.2.7	Data exclusion
4.3	Steps for data acquisition and data processing
4.4	Experimental conditions, tasks, subtasks, sub-subtasks, and relationship
4.4.1	Experimental condition
4.4.2	Task
4.4.3	Subtask
4.4.4	Sub-subtask
4.4.5	Relationship
5	Recording equipment
5.1	General
5.2	Eye tracking equipment
5.2.1	General
5.2.2	Head-mounted eye tracking systems
5.2.3	Remote eye tracking systems
5.3	Setup and verification of calibration of eye tracking systems
5.3.1	General
5.3.2	Recording with eye tracking systems
5.3.3	Recording with remote eye tracking systems
5.3.4	Camera only systems for manual eye-glance analysis
5.4	Setup and check of recording
5.5	Additional equipments
5.6	Installation
6	Data reduction
6.1	General
6.2	Sample interval
6.3	Manual reduction by raters/data analysts
6.4	Manual reduction by raters/data analysts of data from a camera only setup
6.5	Manual reduction by raters/data analysts of data from an eye tracking system

- 6.6 Data Protocol for manual reduction
- 6.7 Summary data
- 7 Data reduction using automated gaze analysis of eye tracking system
  - 7.1 General
  - 7.2 Data quality verification using 5 % of entire collected data
    - 7.2.1 Positional/orientation errors
    - 7.2.2 Detection time errors
    - 7.2.3 Verification of Cohen's kappa to secure accuracy of automated analysis
  - 7.3 Availability of the eye tracker data
- 8 Data analysis and presentation
  - 8.1 General
  - 8.2 Interpretation of findings from analyses of glance metrics
  - 8.3 Interpretation of multiple glance metrics
- Annex A (normative) Manual reduction procedures
  - A.1 Introduction
  - A.2 Procedure
    - A.2.1 Video reduction software
    - A.2.2 Coding of the glance in manual data
    - A.2.3 Quality assurance
    - A.2.4 How to produce the video material for the exemplar standard/template
- Annex B (normative) Verification of calibration — Check of availability and calibration accuracy of tracking equipment before recording data using a verification of calibration procedure
  - B.1 Introduction
  - B.2 Method — Iterative instructed glances onto natural AOIs (“bounding boxes”)
  - B.3 Method — Glances onto reference grids in front of each AOI
- Annex C (normative) Eye tracker validation task (EVT)
  - C.1 Introduction
  - C.2 Procedure
  - C.3 Participants for EVT
  - C.4 Participant instruction for EVT
  - C.5 Practice trials
  - C.6 Test metrics
- Annex D (normative) 5 % data verification — Check of reliability after data recording and before statistical data analysis
- Annex E (normative) Calculating a Cohen's kappa for one participant
- Annex F (informative) Supporting figures to explain terms and definitions
  - F.1 Visual behaviour in the vehicle
  - F.2 Glance duration
  - F.3 Duration of diversion
  - F.4 Dwell time
- Annex G (informative) Supporting information for performing and analysing experiments to determine driver visual behaviour
  - G.1 Quality of eye tracking data
    - G.1.1 Validity and validation of data
  - G.2 Artefacts
  - G.3 Blinks
- Annex H (informative) Collection and analysis of (long-term) on-road visual data
- Annex I (informative) Additional recording equipment
  - I.1 Cameras
  - I.2 Video monitor
  - I.3 Microphones
  - I.4 Event markers
  - I.5 Head tracker