The Minister for Infrastructure and Transport

HAVING REGARD TO Legislative Decree No 285 of 30 April 1992 on the 'New Highway Code', hereinafter referred to as the 'Code';

HAVING REGARD TO Article 201(1-bis) (f) and (1-ter) of the Code;

HAVING REGARD TO Article 35 of the Code, which defines the powers to issue directives for the organisation of traffic and the related road signs and establishes the criteria for traffic planning to be followed by the road-owning entities as well as for adapting, by means of decrees of the Minister for Infrastructure and Transport, the rules of the Regulations to the relevant EU directives and international agreements;

HAVING REGARD TO Article 45 of the Code, which regulates, inter alia, the approval or type approval by the Ministry of Infrastructure and Transport of devices, equipment and other technical means suitable for the detection and automatic detection of violations of traffic regulations, subject to verification of their geometric, photometric, functional and suitability characteristics and any other specific requirements;

HAVING REGARD TO Article 4(1) and (3) of Decree-Law No 121 of 20 June 2002, converted, with amendments, by Law No 168 of 1 August 2002;

HAVING REGARD TO Article 5(3-bis) of Decree-Law No 73 of 21 May 2025, converted, with amendments, into Law No 105 of 18 July 2025;

HAVING REGARD TO Presidential Decree No 495 of 16 December 1992 on the *'Regulation for the execution and implementation of the new Highway Code'*, hereinafter referred to as the 'Regulation';

HAVING REGARD TO Rule 192 of the Rules of Procedure, which governs the procedures for approval and type approval;

HAVING REGARD TO Decree No 282 of the Minister for Infrastructure and Transport of 13 June 2017, which regulates, inter alia, the procedures for the initial and periodic calibration checks of devices, equipment and technical means for the detection of violations of maximum speed limits and, in particular, Article 1;

HAVING REGARD TO Decree No 105 of 12 April 2024 of the Minister for Infrastructure and Transport, adopted in agreement with the Minister for the Interior, which regulates the methods of placement and use of devices or technical means of control, aimed at the remote detection of breaches of the rules of conduct referred to in Article 142 of the Code;

HEARING Accredia as the only national body authorised to carry out accreditation activities pursuant to the Decree of the Minister for Economic Development of 22 December 2009, adopted in agreement with the Ministers for the Interior, Agricultural and Forestry Policies, the Environment and Protection of Land and Sea, Infrastructure and Transport, Labour and Social Policies, Health, Education, University and Research, and Defence;

TAKING INTO ACCOUNT the findings that have emerged in the context of the work of the Technical Table established with the Ministry of the Interior, the Ministry of Business and Made in Italy *and ANCI, on the approval and type approval of all instrumental devices for the remote detection of traffic violations, established by note of the Chief of Cabinet prot. no 33115 of 6 September 2024;*

CONSIDERING also in the light of the findings of the technical round table, the need to establish unambiguous requirements to which all devices and systems must conform when carrying out measurements to ascertain violations of speed limits, in accordance with the combined provisions of Articles 45 and 142(6) of the Code as well as Article 192 of the Regulation;

HAVING REGARD TO the opinion expressed by the Ministry of Enterprise and Made in Italy in note prot. no 5855 of 18 March 2025;

HAVING REGARD TO note no 7609 of 23 March 2025 in which the Ministry of Infrastructure and Transport asked the Ministry of Enterprise and Made in Italy to withdraw the notification sent for the purposes of the information procedure under Legislative Decree No 223 of 15 December 2017 implementing Directive (EU) 2015/1535, considering it necessary to carry out technical checks with a view to a prior census of the devices in use, with the aim of ascertaining both the number of devices actually used and the relevant approval scheme;

HAVING REGARD TO note no 8836 of 27 March 2025 in which the Ministry of Enterprise and Made in Italy reported that the European Commission had closed the notification dossier relating to the draft Decree sent on 18 March 2025;

HAVING REGARD TO the notes of 27 March 2025 and 30 March 2025 in which the Minister for Infrastructure and Transport highlighted to the ANCI the need to launch a census

capable of providing, at the national, regional, and local levels, a clear quantitative and qualitative picture of the devices in use, given that the availability of analytical statistics is an essential prerequisite for the reorganisation of the rules governing the sector, both through the definition of the Decree on standards and approval procedures and with a view to preventing situations of uncertainty regarding the continued regularity over time of the approval regime for individual devices, in relation also to any extensions of individual approvals;

HAVING REGARD TO Decree No 305 of 18 August 2025, adopted by the Ministry of Infrastructure and Transport in implementation of the provisions of the aforementioned Article 5-bis of Decree-Law No 73 of 2025, on the procedures for the establishment and operation of the electronic platform for the transmission of data on devices for the detection of speed limit violations and communication to the Ministry of Infrastructure and Transport;

HAVING REGARD TO note no XXXX of..... forwarding the draft Decree to the Ministry of Enterprise and Made in Italy for the purposes of the information procedure under Directive (EU) 2015/1535;

HAVING REGARD TO note no XXXX of ..... with which the Ministry of Enterprise and Industry informed the European Commission on ..... no. XXXX/I of the draft standard prepared by the Ministry of Infrastructure and Transport governing the type approval of technical control equipment and devices for detecting speed limit violations;

CONSIDERING that by note no XXXX of ....., the Ministry of Enterprise and Made in Italy reported that in the three-month period since notification of the draft standard was sent to the European Commission pursuant to Legislative Decree No 223 of 15 December 2017, no comments were received from EU Member States;

HAVING REGARD TO the opinion of the Higher Council of Public Works expressed in the meeting of .....;

HEREBY DECREES

Article 1
(*Subject matter and scope*)

1. This decree defines the characteristics, requirements and procedures for the type approval of the prototype, of the calibration and functionality checks of the devices, of the equipment and technical means referred to in Article 201(1-bis)(f) of the Code for the detection of violations of the maximum speed limits pursuant to Article 142 of the Code.
2. The type approval of the prototype is carried out in order to ascertain that the devices or systems produced in compliance with the aforementioned prototype are suitable as speed-

measuring devices and meet the requirements of Annex A, which forms an integral part of this Decree.

Article 2
(*Type approval)*

1. Upon the positive outcome of the verification of the conditions set forth in Article 1, the Ministry of Infrastructure and Transport issues the prototype type approval decree, which is communicated to the manufacturer and published on the institutional website of the same Ministry.

Article 3
(*Characteristics and requirements*)

1. Devices and control systems used in the detection of violations of the maximum speed limits are subject to prototype type approval pursuant to Article 192(2) of the Regulation. The characteristics of the prototype are given in the identification table of the device or system and the requirements for the approval of prototypes are given in Chapter 1 of Annex A.

Article 4
(*Calibration; initial and periodic functionality checks*)

1. Calibration and initial and periodic functionality checks shall be carried out to ensure that each unit of the device or system with a measuring function meets the requirements for speed measurement and maintains the performance required in Chapter 2 of Annex A throughout its service life.
2. In the event of negative calibration results, the device cannot be used until a new initial or periodic calibration has been carried out with positive results.
3. In the event of a negative outcome of the functionality checks, the device cannot be used until the checks are successful.

Article 5
(*Conformity checks*)

1. Conformity checks on the manufacture of equipment, as referred to in Article 192(8) of the Regulation, shall be carried out by bodies specifically accredited and authorised by the Ministry of Infrastructure and Transport by means of a subsequent Decree adopted by the competent Directorate-General of that Ministry.
2. For the purposes of this Article, bodies shall perform:

a) the verification of the conformity control system of the production process carried out by the manufacturer at the production facilities in case ISO 9001 certification is not available;
b) the verification of the conformity of the product with the approved type at the manufacturer's production facilities, at the distribution network, at the commercial network, including devices and systems already in use.

3. The selection of samples for verification is conducted randomly and the minimum number of samples for verification, as referred to in paragraph 2(b), is determined on the basis of the results of the manufacturer's own checks.
4. The verifications referred to in paragraph 2(b) shall be carried out every three years, in the case of ISO 9001certification; otherwise, they shall be carried out annually. These checks are carried out on a sample of at least 10% of those produced in the last calendar year, with the costs borne by the manufacturers themselves.
5. The checks referred to in paragraph 2 may also be carried out by the competent Directorate-General of the Ministry of Infrastructure and Transport at the expense of the manufacturer.
6. In the case of new applications for type approval, in order to be eligible for series production, it is mandatory to hold **ISO 9001** certification.
7. For devices and systems already in use, the suitability for series production shall be replaced by the valid periodic or initial calibration certificate.

Article 6
(*Transitional provisions*)

1. Annex B contains the list of decrees approving prototypes for detecting violations of maximum speed limits pursuant to Decree of the Minister for Infrastructure and Transport No 282 of 13 June 2017, in accordance with the provisions of Chapter 1 of Annex A to this Decree. Devices or systems conforming to the prototypes approved by the Decrees referred to in Annex B shall be deemed to be approved for all the purposes referred to in this Decree.

2. Devices or systems complying with the prototypes referred to in Annex B shall include on the identification plate, by the time of the first appropriate calibration, the references of this Decree in addition to those already present.
3. The holder of the approval of a prototype, approved prior to the entry into force of Decree of the Minister for Infrastructure and Transport No 282 of 13 June 2017, may apply for type approval pursuant to this Decree by supplementing the documentation, submitted at the time of approval, in accordance with Chapters 1 and 3 of Annex A, with the exception of the testing required in the case of average speed measurement systems.
4. The holder of the approval of a prototype referred to paragraph 3, already in possession of suitable documentation demonstrating compliance with the calibration requirements and laboratory tests required by Chapter 1 of Annex A, may apply for type approval pursuant to this Decree from the Ministry of Infrastructure and Transport, which shall express its

opinion within the following 60 days, adopting, in the event of a positive verification, the relative type approval decree.

5. The provisions relating to periodic calibration referred to in Chapter 2 of Annex A and those relating to paragraph 2 shall apply upon expiry of the calibration certificate issued pursuant to the Decree referred to in paragraph 1 with which each individual device or system is equipped, with effect from the date of entry into force of this Decree.
6. Applications for approval of prototypes, submitted pursuant to Decree No 282 of the Minister for Infrastructure and Transport of 13 June 2017,before the entry into force of this Decree and not yet defined, shall be converted ex officio into applications for approval pursuant to this Decree.
7. Applications for extension of approval of prototypes approved after the entry into force of Decree No 282 of the Minister for Infrastructure and Transport of 13 June 2017, submitted prior to the date of publication of this Decree and not yet defined, shall be considered as applications for extension of approvals within the meaning of Article 6(1). Applications for extension of the approval of prototypes approved before the entry into force of the Decree referred to in paragraph 1, already submitted on the date of publication of this Decree, may be assessed only after the approval has been obtained.
8. Approvals of prototypes shall not be granted from the entry into force of this Decree.

Article 7
(Repeals)

1. Decree No 282 of the Minister for Infrastructure and Transport of 13 June 2017, published in the Official Gazette no 177 of 31 July 2017, is repealed with the exception of Chapter 7 of the Annex and the provisions relating to periodic calibrations. The validity of the latter shall expire one year after the entry into force of this Decree.

This Decree has been published in the Official Gazette of the Italian Republic.

THE MINISTER

Ministry of Infrastructure and Transport

ANNEX A

Characteristics, requirements and procedures for type approval, calibration and verification of functionality of devices and systems for detecting violations of maximum speed limits pursuant to Article 142 of the Highway Code

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DEFINITIONS

SUBJECTS

1. **MIT**: Ministry of Infrastructure and Transport

2. **PRODUCER:** producer means the holder of the type approval, which may be one of the following entities:
   - the manufacturer of the device or system;
   - the importer and/or distributor of the device or system;
   - the manufacturer's representative;

3. **TYPE APPROVAL OFFICER:** subject, either the manufacturer or distributor, who applies to the MIT for type approval/extension of the device or system prototype. If the procedure is successful, he obtains the type approval/extension decree in his name;

4. **USER:** the traffic police body entitled to use the devices or systems for control purposes and in the manner defined in the Code and its Regulation.

5. **Testing Laboratory**: an entity operating in compliance with the requirements of ISO IEC 17025:2017 (and subsequent revisions) as a testing laboratory, accredited by ACCREDIA or other accreditation bodies that are international signatories of mutual recognition agreements for the specific test. MIT recognises certificates and reports issued in Italian or English; for other languages, a sworn translation is required.

6. **LAT (Calibration Laboratory)**: an entity operating in compliance with the requirements of the standard UNI CEI EN ISO/IEC 17025 (and subsequent revisions) as a calibration laboratory, accredited by ACCREDIA or other accreditation bodies that are international signatories to mutual recognition agreements for the specific quantity and measurement range being calibrated. MIT recognises certificates and reports issued in Italian or English; for other languages, a sworn translation is required.

DEVICES

7. **DEVICE**: any instrument, apparatus or technical means of control, used to detect the speed of vehicles.

8. **SYSTEM: a** set of devices, used in two or more locations, aimed at detecting the average speed on a road section.

9. **DEVICE OR SYSTEM NAME:** commercial name of the device or system, which uniquely identifies it, declared when applying for type approval/extension.

10. **MODEL CODE:** for each device, the code that specifically identifies a version/model.

11. **SERIAL NUMBER:** alphanumeric identification sequence, assigned in a unique way to distinguish one specimen from a series.

12. **DEVICE OR SYSTEM IDENTIFICATION TABLE**: an identity card of the device or system whose purpose is to unambiguously identify all its features, modes and functions.

13. **MANAGEMENT SOFTWARE**: software contained in the device or system, which is necessary to guarantee the complete operation of the device, including the calculation of speed and, for example, the management of hardware resources, the execution of the main functions and interfacing with any additional components or applications. Ancillary software components such as violation display, operator interfaces and graphical interfaces are excluded.

14. **RELEVANT SOFTWARE MODULE RELATED TO THE MEASUREMENT:** software module responsible for calculating the speed measurement, identifiable by the HASH or CRC code of the software part of the device or system, or firmware of the relevant component involved in the measurement.

15. **PARTS RELEVANT TO THE MEASUREMENT (GROUP 1):** components (HW and SW) of the device or system that contribute to the determination of the speed measurement. The following is an illustrative and non-exhaustive list:
    - radar sensor;
    - laser sensor;
    - magnetic coils;
    - stereoscopic cameras;
    - speed calculation software module;
    - OCR camera, if functional to the detection of the average speed.

16. **PARTS NOT RELEVANT TO THE MEASUREMENT THAT CONTRIBUTE TO THE CORRECT CAPTURE OF THE VIOLATION (GROUP 2):** components (HW and SW) of the device or system that do not contribute to the determination of the speed measurement, but are decisive for the correct detection of the violation. The following is an illustrative and non-exhaustive list:
    - OCR camera;
    - context camera;

- illuminator;
- sensor classifier;
- protective case.

17. **PARTS NOT RELEVANT TO THE MEASUREMENT WHICH DO NOT CONTRIBUTE TO THE CORRECT CAPTURE OF THE VIOLATION (GROUP 3):** device or system components that do not contribute to the determination (Group 1) and capture (Group 2) of the violation. For these components, no notification to MIT is required for any replacement, provided that it is made with components having the same or better performance than the replaced component.

18. **PROTOTYPE**: prototype means:
    - in the case of instantaneous speed measurement, the device in its invariant configuration, which concentrates in itself the essential functions aimed at detecting the violation, including the speed calculation software;
    - in the case of average speed measurement, the system in its invariant configuration, which concentrates in itself the essential functions aimed at detecting the violation, including the software for calculating the average speed, which can be replicated indefinitely to make up the system.

    Adaptations for road use made necessary by local conditions of use (e.g. brackets, poles, portals, etc.) are excluded from the prototype.

    The prototype must be equipped with the parts referred to in definitions 13 to 17, which must be made explicit during type approval.

MEASURES

19. **PROTOTYPE APPROVAL:** procedure through which the MIT ascertains on a documentary basis the compliance of the device and/or system with the provisions and requirements of these regulations. In the event of a positive outcome, the procedure ends with the issuing of an executive decree allowing the use, on national territory, of all devices conforming to the type-approved prototype for the purpose of ascertaining violations of instantaneous and/or average speed limits.

20. **TYPE APPROVAL EXTENSION:** procedure through which the MIT approves new and different models and versions of the prototype, following the modification and/or addition of one or more components or functions of an already type-approved device or system. The MIT verifies, for modified and/or added components, the fulfilment of the requirements defined in this document. The extension is made official through an executive decree. In the case of an extension of type approval, the opinion of the Consiglio Superiore dei Lavori Pubblici can also be used.

21. **TAKEOVER OF OWNERSHIP OF THE TYPE APPROVAL**: procedure by means of which the MIT authorises a change in the ownership of type approval and any subsequent extensions.

22. **CERTIFICATE OF CONFORMITY**: certificate issued by the holder of the type approval for each device or system before it is placed on the market, attesting the conformity of the device or system with the deposited prototype.

CHARACTERISTICS

23. **SHORT BASE**: section of road within which the device performs the point speed measurement of vehicles.

24. **EXTENDED BASE**: section of road within which the system measures the average speed of vehicles.

25. **POINT-TO-POINT OR INSTANTANEOUS SPEED DETECTION DEVICES**: devices used to ascertain the point speed of a vehicle by measuring speed on a short base.

26. **AVERAGE SPEED DETECTOR SYSTEM**: a system used to ascertain the average speed of a vehicle on an extended base of known length. Excluded from this discussion is the system based on the chronological entries stamped on motorway tickets when the toll is issued and collected.

27. **MODE OF OPERATION:**
    - **Manual:** mode of operation of the device or system that necessarily requires the presence and intervention of the operator who controls the methods of installation, detection, verification;
    - **Automatic:** a device or system that, according to the type approval conditions, functions automatically;

28. **CONTROL STATION**

    A control station (or station) is defined as the assembly consisting of the device, or several devices relating to the same detection section, and the other complementary components, such as, but not limited to, guards, boxes, supports, vehicles of the traffic police, necessary for the operation of the devices. Average speed detection systems consist of two control stations (start and end). The end control station can be used as the start control station, at different times, for the next extended base.

29. **TYPES OF LOCATION**:

- **Mobile**: when the devices are installed in temporary activation mode in a variable or predetermined location on the road infrastructure; devices installed in such locations may be held by traffic police officers or housed inside vehicles parked outside the carriageway, or placed on stands or in removable or non-removable structures placed outside the carriageway; for such devices, supervision, even if only at a distance from the device, by traffic police officers is required during the investigation of the violation;
- **Fixed**: when the devices are installed in a specific location, placed at a precise point on the road infrastructure; for these devices, automatic operation is possible without the need for traffic police to be present when the violation is detected; fixed locations include those permanently equipped for the installation of the devices, even if only temporarily.

30. **DIRECTIONALITY OF MEASUREMENT OF INSTANTANEOUS OR AVERAGE SPEED:**
    - One-way: measurement of vehicle speed in one direction of travel.
    - Two-way: measurement of vehicle speed in both directions.

31. **INSTANTANEOUS SPEED MEASUREMENT MODE:**
    - **Distancing:** a device designed to measure speed with the vehicle moving away from the location of the device;
    - **Approach:** device designed to measure speed with the vehicle approaching the location of the device;
    - **Transverse:** device designed to measure vehicle speed at the device;
    - **On board a moving vehicle:** when devices are installed in temporary activation mode on board vehicles to measure speed in a dynamic manner, i.e. 'dynamic detection'; for such devices, the presence of traffic police officers is always required when the violation is detected.

32. **MODE OF RECORDING**
    - **Front view:** photo/video recording of the offending vehicle with front view.
    - **Rear:** photo/video recording of the offending vehicle with rear view.

33. **SPEED MEASURING RANGE:** set of speed values that can be measured by a given device under conditions of use defined at the time of type approval of the prototype, i.e. the speed range that the device is capable of measuring, containing at least the range between 30 km/h and 230 km/h.

34. **SPEED LIMIT:** Maximum speed limit imposed where the device is used.

35. **USE LOCATION:** The place of use is where the device or system is located. If the device is used alternately at several locations with different speed limits, the location where the device is used is considered to be the location with the highest speed limit for initial and periodic calibration and functionality checks.

36. **INSTALLATION CONFIGURATIONS**: The devices or systems may be installed in the following ways:
    a. portal and/or column;
    b. at vehicle height (e.g. on a stand);
    c. on board moving vehicle.

37. **RANGE OF USE:** subset of the speed measuring range of a device in which it is actually used.
    The lower extreme of this subset is 30 km/h, except for further reductions requested by the user.
    The upper extreme is equal to the value obtained by summing:
    a. speed limit;
    b. 60 km/h (so as to reach the maximum applicable violation under Article 142 of the Highway Code);
    c. the legal tolerance of 5% of the sum of the addends in the previous points.
    The resulting sum total is rounded up to the nearest 10 km/h.

EVIDENCE

38. **MEASUREMENT UNCERTAINTY:** parameter associated with the result of a measurement, characterising the dispersion of the value that can be reasonably attributed to the measurand.

39. **CALIBRATION**: set of operations linking, to each quantity to be measured, a measurement result (reading) and an associated uncertainty, designed to verify that the measurement error of the device or system complies with the requirements set out in this document, on the basis of which the declaration of conformity is to be made.

40. **CALIBRATION OF THE PROTOTYPE**: checking the values provided by the calibration of a device or a system prototype, at the type approval stage, against the requirements set out in this document.

41. **INITIAL CALIBRATION:** checking the values provided by the calibration of each specimen of a device or a system, prior to its first use, against the requirements set out in this document.

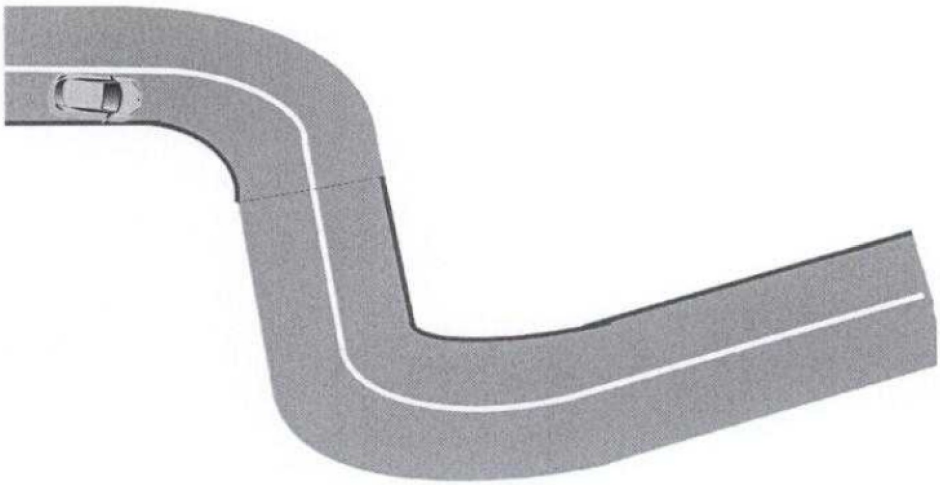
42. **PERIODIC CALIBRATION:** periodic check of the values provided by the calibration of each device or system in use against the requirements set out in this document.

43. **CALIBRATION WITH REAL VEHICLE FOR POINT SPEED:**
    calibration method involving the transit of a real vehicle over the short detection base.
    The speed measured by the device or system under test is compared with the speed measured by the reference device or system. The two devices or systems must be

completely independent and without any physical or other connection between them.
It is possible that the passing vehicle itself is equipped with an appropriate reference measurement device or system.

44. **CALIBRATION BY DIRECT METHOD FOR AVERAGE SPEED:**
calibration method involving the transit of a real vehicle over the extended detection base.
The length of the extended base is subject to calibration in each case, as distinct from the average speed calibration.
This method of verification involves evaluating the error by comparing the speed measured by the system under test with the speed of the reference system. The reference system is calculated by evaluating the transit time of the actual vehicle between the two measuring stations and the length of the extended base.
The two systems must be completely independent and without any physical or other connection between them.
It is possible that the passing vehicle itself is equipped with an appropriate reference measurement system.

45. **EXTENDED BASE LENGTH:** defined by the minimum geometric development of the road section, counted along the right-hand edge of the rightmost lane when on the right-hand side, and along the left-hand edge of the leftmost lane when on the left-hand side, irrespective of the number of lanes and the direction of travel, provided that they are part of the same carriageway. The extremes of the base must be identified, even by fixed references, and preferably coincide with the axis of the camera field.
In order to perform this operation, it is therefore necessary not to measure a single continuous line from the beginning to the end of the section but several portions of the section, since between two bends with different directions (e.g. one to the right and the other to the left) it will be necessary to move to the opposite side. This move can be performed at any point where the section is straight between two curves.



46. **TIME LAG:** difference between the time references (time base/clock) of two average speed measuring devices placed at the entrance and exit of the section under verification. The difference is assessed by measuring the time deviation of each individual local reference against the national UTC (IT) time scale.

47. **CALIBRATION BY INDIRECT METHOD FOR AVERAGE SPEED:** calibration method involving the evaluation of the speed indication error through the disjointed evaluation of space and time.
    In particular, for the average speed, the error is to be assessed through:
    - the calibration of the length of the extended base between the two measuring stations at the input and output of the system under verification;
    - the calibration of the time lag between the local time references of the two measuring stations at the input and output of the system under verification;
    - the evaluation of other possible sources of uncertainty including the variability of the position or the instant of detection of the vehicle when crossing the extremes of the base.

48. **SPEED SIMULATOR:** an apparatus capable of artificially stressing a device or system in order to produce the same response, in terms of speed, as when a real vehicle passes on the road.

49. **CALIBRATION WITH SPEED SIMULATOR:** periodic calibration method involving the reproduction of the transit of a vehicle by means of a simulator.
    The simulator, the method and the calibration procedure with simulator must be evaluated and accredited by ACCREDIA or other accreditation bodies that are international signatories of mutual recognition agreements, in order to assess and calculate all possible forms of uncertainty.

50. **EXPERIMENTATION**: a period of at least six months during which data is collected for functionality checks for the type approval of an average speed detection system.

51. **FUNCTIONALITY CHECKS:** set of tests to verify the functions of correctly associating the detected speed with the passing vehicle and, as applicable, correctly capturing the images, classifying the vehicles at least into macro-classes, and recognising the number plates of the vehicles detected during type approval. In the initial and periodic phase for average speed, these checks are limited to correctly capturing the images, classifying the vehicles at least in macro-classes, and recognising the number plates of the vehicles detected. In the type approval phase, these tests are carried out by the manufacturer and validated by a third party (universities, traffic police bodies, laboratories accredited pursuant to UNI EN 17025, and certification bodies are permitted), while in the initial and periodic phase they are carried out and recorded by the user's traffic police body.

52. **SAFETY CHECKS AT THE PLACE OF USE:** check carried out at possible and safe speeds on the road section, which may be higher than the speed limit of the road. Checks in excess of the speed limit may only be carried out when traffic is stopped and at

speeds indicated by the user. In this case, the transits must be carried out by the user or by a third party authorised by the user.

53. **CAPTURED VEHICLES:** this refers to vehicles actually captured by the device or system and not those that have passed on the road. The definition is applicable to the capturing of transit data and vehicle images. For devices or systems not equipped with image documentation, the capturing is related only to transit data, as indicated in the installation, operation and maintenance manual.

CHAPTER 1 – PROTOTYPE APPROVAL

PROTOTYPE

1.1 Devices and systems used in the detection of violations of the maximum speed limits are subject to prototype type approval pursuant to Article 192(2) of the Regulation. Type approval of the prototype is understood to refer exclusively to the deposited prototype and not to each individual specimen placed on the market in conformity with the prototype. The competence for type approval of speed measuring devices or systems lies with the MIT.

1.2 The prototype is deposited with the MIT for type approval in its invariant configuration. In the event that the prototype consists of several identical modules, only one module needs to be deposited with the MIT. The integrated management software, but not the operator interface software, must be deposited together with the prototype.

1.3 The identification of the prototype is completed by the technical and administrative documentation filed at the same time as the application for type approval and, if necessary, supplemented during the preliminary investigation phase. The technical documentation must necessarily include the manual(s) of the prototype relating to installation, operation and maintenance, the identification of Groups 1 and 2 relating to the parts relevant to the measurement and not relevant for measurement purposes, the documents relating to calibration, functionality checks and testing as defined in this Chapter 1, in addition to any specific and/or sector-specific tests required by the MIT and further documentation spontaneously provided by the applicant for type approval.

1.4 The equipment can be approved as instantaneous speed detector devices or average speed detector systems. A part of the system may also be approved for instantaneous speed detection.

1.5 The prototype type approval procedure involves calibration and subsequent functionality checks to determine the suitability of the device or system to perform the required service.

1.6 The deposited prototype is the device or system on which the calibration and functionality checks are carried out during type approval.

1.7 In the application for type approval, the applicant must fill in the device or system identification table, which summarises the characteristics and mode of operation of each device or system. The device or system identification table will have to be filled in again in the event of an application for an extension of the type approval. Multiple boxes can be ticked for the operation option for devices or systems with multiple functionalities.

1.8 It is the manufacturer's responsibility to ensure that each device or system placed on the market conforms to the prototype deposited with the MIT. Devices or systems placed on the market must comply with the documentation submitted at the time of type approval and subsequent extensions of type approval.

DEVICE OR SYSTEM IDENTIFICATION TABLE

1	*DEVICE NAME:*	
	MODEL CODE (IF APPLICABLE)	
1	DETAILS OF THE APPROVAL DECREE (FIELD TO BE FILLED IN BY THE MIT AT THE END OF THE TYPE APPROVAL PROCESS):	
2	TYPE APPROVAL HOLDER	
3	TYPE OF SPEED DETECTED	☐ INSTANTANEOUS ☐ AVERAGE
4	MODE OF OPERATION	☐ MANUAL ☐ AUTOMATIC
5	TYPE OF LOCATION	☐ MOBILE ☐ FIXED
6	DIRECTIONALITY OF SPEED MEASUREMENT	☐ ONE-WAY ☐ TWO-WAY.
7	INSTANTANEOUS SPEED MEASUREMENT MODE	☐ DISTANCING. ☐ APPROACH ☐ SIMULTANEOUS DISTANCING AND APPROACH. ☐ TRANSVERSE ☐ ON BOARD MOVING VEHICLE.
8	RECORDING MODES	☐ FRONT ☐ REAR
9	SPEED MEASURING RANGE	MINIMUM SPEED [km/h]: MAXIMUM SPEED [km/h]:
10	NUMBER OF LANES CHECKED	
11	SIMULTANEOUS VEHICLE DETECTION	☐ YES. ☐ NO.

12	LIGHTING SYSTEM	☐ VISIBLE ILLUMINATOR ☐ INFRARED ILLUMINATOR ☐ OTHER
13	CLASSIFICATION OF VEHICLES	☐ YES NO. OF CLASSES DETECTED: ... ☐ NO
14	PRESENCE OF OCR	☐FUNCTIONAL FOR SPEED DETECTION ☐VERBALISATION SUPPORT
15	OTHER CHARACTERISTICS	**IP RATING** VALUE: **OPERATING TEMPERATURE RANGE AND CLIMATIC CONDITIONS** MINIMUM TEMPERATURE: MAXIMUM TEMPERATURE: OTHER:

Table 1: Device or system identification table with a list of all its features.

1.9 If the same device or system is available in several models/versions with different ticked boxes in the device or system identification table, the manufacturer shall compile a different device or system identification table for each available model/version.
In this case, the tests required for the type approval of the prototype relating to the characteristic(s) differing between one model/version and the other will have to be carried out in the different options.

1.10 In the case of recording the front of the offending vehicle, the manufacturer must provide evidence of the device or system's ability to automatically obscure parts of images that allow the identification of persons on board, even before the validation phase of the detected violation.

1.11 In the case of photographic evidence produced by the device or system, this shall contain, in addition to the image of the offending vehicle, at least the following data:

- date and time of the violation (in the case of average speed, start and end time of detection);
- device installation site;
- registration number of the device;
- measured speed in km/h (only for devices used for instantaneous speed detection).

1.12 The device or system shall only detect as offending vehicles those which, after the application of the speed reduction referred to in Article 345(2) of the Regulation, exceed the speed limit in force on the road.

1.13 In order to ensure authenticity, integrity and non-repudiation, images and data must be encrypted and digitally signed by the device and/or system.

1.14 The storage of images and data must include encryption techniques and passwords.

1.15 The device or system may perform additional functions, as declared by the manufacturer in the filed documentation, which are not subject to type approval and therefore cannot be used for the purpose of detecting traffic violations, in compliance with applicable privacy and cybersecurity regulations (e.g. traffic monitoring, statistics, etc.).

1.16 Among the documentation to be produced for prototype type approval, it is necessary to detail:

- The list of the relevant parts of the device or system relevant to the measurement – Group 1;
- The list of parts of the device or system not relevant for measurement purposes that contribute to the correct capture of the violation - Group 2;
- The list of parts of the device or system that are not relevant for measurement purposes and do not contribute to the correct capture of the violation - Group 3.

1.17 Further data and information specific to the device or system, in addition to those given in the device or system identification table, must be available in the documentation provided for prototype type approval.

MODIFICATIONS OF THE DEVICE OR SYSTEM

1.18 When changes are made to the device or system identification table or to the components of an already type-approved device, it is necessary, depending on the case, to proceed with a new type approval or with an extension of the type approval already granted, as specified in the table below.

REQUEST	MODIFICATION OF COMPONENTS	ACTIVITY OR ACTIVITIES
NEW TYPE APPROVAL	PARTS RELEVANT TO THE MEASUREMENT (GROUP 1)	The manufacturer must make a new application for type approval of the device or system. It is possible to use documentation already sent previously.
EXTENSION	PARTS NOT RELEVANT TO THE MEASUREMENT THAT CONTRIBUTE TO THE CORRECT CAPTURE OF THE VIOLATION (GROUP 2)	The manufacturer must establish and produce documentation, tests and analyses relating to the modifications made and forward them to the MIT, together with the modified part and the updated device or system identification table. The MIT has the right to request explanations, further documentation and further testing and analysis of the changes made.
NONE	COMPONENTS NOT INCLUDED IN GROUPS 1 AND 2	The manufacturer does not have to notify the MIT of any replacement,

		provided that it is made with components that perform as well or better than the replaced component.

Table 2: Activities to be carried out in case of modifications of device or system components.

1.19 Each new type approval or extension process produces a new device or system identification table. The details of the type approval and/or extension decree are entered in the device or system identification table at the end of the re-approval or extension process.

1.20 The documentation to be updated in the case of type approval and extension also includes the list of parts in Groups 1, 2, and 3.

1.21 The device or system identification table and the list of updated Group 1, 2 and 3 parts must be sent to the MIT whenever they change.

CALIBRATION

1.22 Calibration during prototype type approval must be carried out by a LAT and a calibration certificate must be issued.

1.23 Calibration must be carried out by a laboratory whose instrumentation has an expanded uncertainty (with 95% probability of coverage) resulting from the accreditation table of not more than 0.5 km/h for speeds up to 100 km/h and 0.5% for speeds above 100 km/h.

1.24 For systems measuring average speed, the calibration of the base length shall be carried out by a laboratory whose equipment has an expanded uncertainty (with 95% confidence level) resulting from the accreditation table of not more than 0.3% (percentage value relative to the length of the track). The measurement of the length of the base must be carried out with a calibration certificate issued by an accredited body/laboratory.

1.25 For calibrations involving the passage of a real vehicle, the device or system under test and the reference measurement system shall be positioned so that the measurements are made at a coincident point or area; if this is not possible, the devices shall be positioned so that the measurements are as close together as possible.
The LAT must take into account all significant figures provided or detectable by the device or system under test.

1.26 Calibration shall be carried out in all installation configurations for which type approval is requested. The calibration carried out on the pole also includes that on the portal, for the same number of lanes.

1.27 The extended calibration uncertainty must be taken into account when assessing the measurement accuracy of the device or system.

Instantaneous speed

The following definitions apply:

S	$(V_{(UUT)} - V_{REF})$, speed deviation
$\mathbf{U_S}$	Extended uncertainty associated with speed deviation estimation
R	(V_{UUT} / V_{REF}), speed ratio
$\mathbf{U_R}$	Extended uncertainty associated with speed ratio estimation
$\mathbf{S_m}$	Average value of speed deviations
$\mathbf{U_{Sm}}$	Extended uncertainty associated with the estimation of the mean value of speed deviations
$\mathbf{R_m}$	Average value of speed ratios
$\mathbf{U_{Rm}}$	Uncertainty extended to the estimation of the average value of speed ratios
$\mathbf{L_S}$	Maximum limit on individual speed deviation measurement
$\mathbf{L_{R1}}$	Minimum limit on individual speed ratio measurement
$\mathbf{L_{R2}}$	Maximum limit on individual speed ratio measurement
$\mathbf{L_{Sm}}$	Maximum limit on average speed deviation measurements
$\mathbf{L_{R1m}}$	Minimum limit on average speed ratio measurements
$\mathbf{L_{R2m}}$	Maximum limit on average speed ratio measurements

In order to comply with the limits, it must be verified that

	UP TO 100 km/h	OVER 100 km/h
FOR EACH INDIVIDUAL MEASUREMENT	$-L_S + U_S \leq \mathbf{S} \leq L_S - U_S$	$L_{R1} + U_R \leq \mathbf{R} \leq L_{R2} - U_R$
FOR THE AVERAGE OF THE MEASUREMENTS	$-L_{Sm} + U_{Sm} \leq \mathbf{S_m} \leq L_{Sm} - U_{Sm}$	$L_{R1m} + U_{Rm} \leq \mathbf{R_m} \leq L_{R2m} - U_{Rm}$

Average speed

The following definitions apply:

S	$(V_{(UUT)} - V_{REF})$, speed deviation
$\mathbf{U_S}$	Extended uncertainty associated with speed deviation estimation
$\mathbf{S_{\%}}$	$[(V_{UUT} - V_{(REF)}) / V_{REF}]$, relative speed deviation expressed as a percentage
$\mathbf{U_{S\%}}$	Extended uncertainty associated with estimation of speed deviation expressed as a percentage
$\mathbf{L_S}$	Maximum limit on individual speed deviation measurement
$\mathbf{L_{S\%}}$	Maximum limit on individual speed deviation measurement, expressed as a percentage

In order to comply with the limits set out in this document, it must be verified that

	UP TO 100 km/h	OVER 100 km/h
FOR EACH INDIVIDUAL MEASUREMENT	$-L_S + U_S \leq \mathbf{S} \leq L_S - U_S$	$-L_{S\%} + U_{S\%} \leq \mathbf{S_{\%}} \leq L_{S\%} - U_{S\%}$

1.28 The speed indication provided by the device or system undergoing calibration during prototype type approval phase must have an error in relation to the reference measuring device or system that meets the conditions defined in the table below.

	CALIBRATION DURING PROTOTYPE TYPE APPROVAL	
	UP TO 100 km/h	**OVER 100 km/h**
MAXIMUM PERMISSIBLE ERROR PER MEASUREMENT	3,00 km/h	3,00%
MAXIMUM PERMISSIBLE ERROR PER MEASUREMENT	1,0 km/h	1,0%

AVERAGE (IF APPLICABLE TO THE ACCREDITED METHOD)		

Table 3: Criterion for assessing calibration error during prototype type approval

In relation to the definitions set out above, the criteria for assessing error result in the following limits.

		CALIBRATION DURING PROTOTYPE TYPE APPROVAL	
		UP TO 100 km/h	**OVER 100 km/h**
INSTANTANEOUS SPEED	FOR EACH INDIVIDUAL MEASUREMENT	L_S = 3,00 km/h	L_{R1} = 0,9700 L_{R2} = 1,0300
	FOR THE AVERAGE OF THE MEASUREMENTS	L_{Sm} = 1,0 km/h	L_{R1m} = 0,990 L_{R2m} = 1,010
AVERAGE SPEED	FOR EACH INDIVIDUAL MEASUREMENT	L_S = 3,00 km/h	$L_{S\%}$ = 3,00%

Table 4: Limits of error during prototype type approval

1.29 Depending on the type of speed detected (point 3 of the device or system identification table) and the other characteristics of the device or system, the conditions for carrying out calibrations are described below.

1. Type of Speed Detected (point 3 of the device or system identification table)

INSTANTANEOUS

CALIBRATION:

N°	METHOD	SITE CONSTRAINTS	RANGE [KM/H]	PASSAGES PER LANE
1A	**DIRECT SNAPSHOT**	TRACK OR ROAD NOT OPEN TO THE PUBLIC	30 ÷ 230	MINIMUM 100, MAXIMUM 200

AVERAGE

CALIBRATION:

When calibrating the average speed, regardless of the method used, the calibration of the extended base length must be carried out.
For the indirect averaging method (no. 1C), a time lag calibration must be carried out, assessed by measurements taken at intervals of no more than 5 minutes over a period of at least two days.

N°	METHOD	SITE CONSTRAINTS	RANGE [KM/H]	PASSAGES
1B	**DIRECT**	TRACK OR ROAD ROUTE LESS THAN OR EQUAL TO THE MINIMUM	FROM 30 KM/H TO 230 KM/H	MINIMUM 100, MAXIMUM 200

			DECLARED ROUTE		
	1C	**INDIRECT**	TRACK OR ROAD	30 ÷ 230	/

The length of the section to be calibrated may be less than or equal to the declared minimum section length in cases where this option and the characteristics of the system allow a simplification of the test site and/or an increase in the maximum speeds achievable on the basis of the method used.

Table 5: Verification tables (prototype type approval) in relation to the type of speed detected

If even by extending the number of passes or tests up to the maximum allowed, the defined limits are not respected, the prototype type approval is rejected.

2. Directionality of measurement (point 6 of the device or system identification table)

ONE-WAY	**CALIBRATION:** The tests must be carried out for the declared direction of travel.
TWO-WAY	**CALIBRATION:** The tests must be carried out for both directions of travel.

3. Instantaneous speed measurement mode (point 7 of the device or system identification table)

DISTANCING	**CALIBRATION:** The tests must include the distancing mode.
APPROACH	**CALIBRATION:** The tests must include the approach mode.
SIMULTANEOUS DISTANCING AND APPROACH	**CALIBRATION:** The tests must include the approach and distancing modes simultaneously under safe conditions. The tests must be shared equally between the measurement modes.
TRANSVERSE	**CALIBRATION:** The tests must include the transverse mode.
ON BOARD MOVING VEHICLE	**CALIBRATION:** The tests must include the moving vehicle mode.

4. Vehicle recording mode (point 8 of the device or system identification table)

FRONT	**CALIBRATION:** Evidence of the correct attribution of the measurements made to the vehicles detected. Documentary evidence of the darkening of the passenger compartment.
REAR	**CALIBRATION:** Evidence of the correct attribution of the measurements made to the vehicles detected.

5. Speed measuring range (point 9 of the device or system identification table)

CALIBRATION: Speeds must be evenly distributed in intervals of no more than 20 km/h.

6. Number of lanes checked (point 10 of the device or system identification table)

CALIBRATION: Evidence of operation on the maximum number of lanes checked by the device.

7. Presence of OCR (point 14 of the device or system identification table)

FUNCTIONAL FOR SPEED DETECTION	Performance of the tests required by the UNI 10772 technical standard. (see section on laboratory tests)
VERBALISATION SUPPORT	No tests required.

1.30 For systems that detect average speed, the manufacturer shall specify the minimum distance over which they can guarantee compliance with the error limits given in Table 4 in the speed range between 30 km/h and 230 km/h. The calibration of the prototype, irrespective of the method used, must be carried out on a route with a length less than or equal to the minimum route declared by the manufacturer.
In the case of calibration by the direct method, the distance must be calibrated; however, in the case of calibration by the indirect method, it may be set arbitrarily to a value less than or equal to the minimum distance specified by the manufacturer, whatever the actual installation position of the two measuring points; in this case, a calibration uncertainty of 0.3 % of the distance must be taken into account when calibrating the average speed.
Regardless of the minimum route declared by the manufacturer, the system may not be installed on a route of less than 500 metres, as per Interministerial Decree No 105 of 2024.
During type approval, the manufacturer must declare the vehicle detection area of the individual device.

FUNCTIONALITY CHECKS

1.31 The purpose of the functionality checks at the type approval stage is to assess the functioning of the device or system under the different conditions of use through testing carried out by the manufacturer under the supervision of one of the third bodies referred to in the definition in paragraph 51.
Part of the functionality checks and experiments includes transits during all times of the day, including dawn, midday, dusk and night, depending on the characteristics of the device or system. The data must come from tests on different days and be related to different weather conditions: clear, sunny, overcast, rainy days, compatible with the characteristics of the device. Samples must be extracted from the data collected

to cover all the cases described. Other indications of specific functionality checks and testing are defined in relation to the type and characteristics of the device or system.

1.32 Functionality checks shall be performed in all installation configurations for which type approval is requested. The functionality checks carried out on the pole also includes that on the portal, for the same number of lanes.

1.33 Upon completion of the functionality checks, the manufacturer shall prepare a technical report containing information highlighting the results of the checks, including detection, identification, classification and attribution of measurements to the vehicle, if applicable, in relation to the characteristics and functionality of the device or system. The manufacturer may supplement the functionality check report with other useful data and information.
If necessary, or in order to shorten the typical use session, in order to make the duration of the verification session reasonable, it is permissible to reduce the speed limit set on the device that discriminates vehicle capture, in accordance with the mode and limits of image and data capture of the device, as indicated in the installation, operation and maintenance manual of the device or system. Evidence of the operational limits of the devices or systems are not to be understood as malfunctions.

1.34 Some functionality check activities can be performed remotely, if provided for in the installation, operation and maintenance manual of the device or system.

1.35 The functionality check also includes the following activities:

- verification that all components of the device or system are functional; these verifications must be carried out according to the methods and with the tools indicated in the installation, operation and maintenance manual for the device or system;
- verification of the integrity of the device or system;
- verification of any seals present;
- self-diagnosis using the tools defined in the installation, operation and maintenance manual of the device or system, when present;
- any further checks required in the installation, operation and maintenance manual of the device or system.

The manufacturer has the right to integrate the information gathered and the verification activities carried out during the functionality check, again according to the instructions in the installation, operation and maintenance manual of the specific device or system.

1.36 The device or system only passes the functionality check if each individual check is successful.

1.37 Functionality checks do not replace the calibration carried out by the LAT and the maintenance and/or overhaul checks defined by the manufacturer in the installation,

operation and maintenance manual of the device or system. Maintenance and/or overhaul checks must be carried out in accordance with the schedule and as defined in the installation, operation and maintenance manual.

1.38 The possibility of using the findings of the functionality checks for the application of sanctions for breaches of rules of conduct is in any case excluded.

1.39 In relation to the type of speed detected (point 3 of the device or system identification table), the conditions for carrying out functionality checks and testing are described below.

1. Type of Speed Detected (point 3 of the device or system identification table)

INSTANTANEOUS	**FUNCTIONALITY CHECKS:** The total number of transits must be at least 10 000 for automatically operated devices or systems and 5 000 for manually operated devices or systems. All transits must be verified individually. The minimum duration of the detection session must be at least 24 hours in total for automatically operating devices or systems with different lighting conditions. In the case of manually operated devices or systems, 12 one-hour sessions with different lighting conditions must be carried out. The minimum number of buses to be recorded is 50, the minimum number of trucks, lorries and articulated vehicles is 250, and the minimum number of motorbikes and mopeds is 100. By setting the maximum permitted speed limit to a value close to zero on the device, the functionality check is considered successful if the device is able to detect at least 90% of the passing vehicles: • correctly attribute the speed of at least 95% of the vehicles detected; • correctly capture the image and/or video (if any) of at least 95% of the vehicles detected; • correctly classify at least 90% of the detected vehicles according to the classes defined in point 13 of the device identification table (if classification is provided); • read and correctly attribute the number plates of 95% of the vehicles detected (if applicable). If it is not possible to detect passing vehicles in compliance with the minimum limit of 90% due to objective impossibility (e.g. obstruction of the measuring field), the manufacturer must submit an appropriate deviation report.
AVERAGE	**TESTING:** The data collection associated with the test campaign will involve a total of 1 million transits or a total period of at least six months, divided between the two start and stop stations (hereafter also referred to as start and stop), with random vehicle transit on all lanes. Of these transits, a sample, having the numbers and characteristics described in the following points, will have to be verified transit by transit by an experienced operator with the production of an appropriate test report, while all other transits will only be recorded and archived. All data collected, including data that has not been verified by the operator, will subsequently be exported to appropriate storage media and handed over to the Ministry to enable independent verification.

	FIRST TEST – SINGLE STATION, BOTH START AND STOP: The peripheral system must be configured to record and historicise data and photos of each individual vehicle in transit. The system must not be able to access external databases to supplement any missing information (e.g. MCTC). The test shall be carried out on a specific pair of stations installed on a road or motorway carriageway. Using a CCTV camera (or similar) completely independent of the infringement detection system, the number of vehicles correctly detected and photographed by the control post shall be checked against the total number of vehicles counted by analysing the video recording, which shall be a total of 10 hours, five for each control post, with a minimum of one hour of uninterrupted footage, different between start and stop, and thus divided according to environmental conditions: o one hour at night; o one hour during daytime; o one hour at dawn; o one hour at sunset; o one hour with rain and/or fog. The system is considered suitable if, for each of the two detection stations – entry and exit – it is able to correctly capture images for more than 95% of the total number of detections processed in each session. SECOND TEST – SINGLE STATION, BOTH START AND STOP: the class indicated by the peripheral system for each vehicle must be compared with what can be detected by the frame taken by the cameras, with a minimum of 50 000 total vehicles, drawn randomly from the total number of transits, for each of the two portals. In order to assess the system's ability to classify vehicles correctly, it must be shown that at least 5% of the total number of transits analysed belong to the heavy vehicle category. Specifically, this number being 50 000 vehicles, at least 2 500 must be heavy vehicles, of which at least 500 must be buses and 2 000 must be trucks, lorries and articulated vehicles, and at least 250 motorbikes. The system must classify the vehicles into a minimum number of classes that can be traced back to the vehicle categories to which the speed limits currently stipulated in Article 142(3) of the Highway Code apply, it being understood that an indication must be given of the vehicle classes that the system was unable to recognise. The classification test is considered successful if, both for each class and out of the total number analysed, the number of correctly classified vehicles is more than 90%. THIRD TEST – SINGLE STATION, BOTH START AND STOP: comparison between the number plate read by the OCR, if present, and the number plate visible in the photo taken by the cameras, using the same analysis sample as in the classification test. The system is considered suitable if, for each of the two detection locations, inbound and outbound, it is able to correctly recognise the number plate for more than or at least 95% of the vehicles that passed.

	FOURTH TEST – PAIR OF STATIONS: The test shall be carried out on a specific pair of stations installed on a road or motorway section with a carriageway consisting of at least two lanes + emergency lane (the latter, if any, shall be monitored in the same way as the other lanes) and 'hermetic', i.e. without any entrances/exits or single points such as service areas/parking areas, so that the matching of all transits can be verified. It is suggested that the pair of stations be configured with a speed limit close to zero (e.g. average speed limit of 5 km/h on the motorway), so that almost all vehicles passing through the section under consideration are considered to be offending vehicles. The test will involve a minimum of 5 000 total vehicles, randomly drawn from the total number of transits, in a data collection in multiple sessions of suitable duration to collect at least 500 alleged violations each, with each of the following environmental conditions: o at night; o during daytime; o at dawn; o at sunset; *o* with rain and/or fog. For each vehicle matching test campaign, it is suggested to start the normal operation of the stop station after a reasonable time after the start of the normal operation of the start station, in order to ensure that all vehicles within the route have already been detected by the start station, and thus the vehicle matching test can be meaningful. In this way, the system is theoretically able to match all vehicles in transit to the stop portal from the moment it starts. In addition, it is suggested that video footage be taken by means of a video surveillance camera (or similar) that is completely independent of the violation detection system, to allow for better verification by the operator. For all transits matched by the system, a comparison must be made between the frame collected by the start station and the one collected by the stop station, to verify that the system has matched the same vehicle and that no malfunctions occur. A system is considered adequate if it is capable of correctly matching the images of vehicles passing under the two stations for more than 95% of those taken in the single session and of the total number passed; correct matching means that the same vehicle must be represented in the image pair. To be successful, all transits must be correctly detected by the device and photographed within the declared area. For all transits not matched by the system, each image shall be subdivided, including with the help of the analysis of the video recording made at the above-mentioned station, into: • missed detections at the stop portal (evidenced by the analysis of the video surveillance footage); • missed matches (transits detected at the stop but not matched by the system); • transits that cannot be physiologically matched (e.g. transits of vehicles without number plates, transits detected twice by the stop detection station, etc.).

Table 6: Verification tables (prototype type approval) in relation to the type of speed detected

If even by extending the number of passes or tests up to the maximum allowed, the defined limits are not respected, the prototype type approval is rejected.

2. Directionality of measurement (point 6 of the device or system identification table)

ONE-WAY	**FUNCTIONALITY CHECKS:** The tests must be carried out for the declared direction of travel.
TWO-WAY	**FUNCTIONALITY CHECKS:** The tests must be carried out for both directions of travel.

3. Vehicle recording mode (point 8 of the device or system identification table)

FRONT	**FUNCTIONALITY CHECKS:** Evidence of the correct attribution of the measurements made to the vehicles detected. Documentary evidence of the darkening of the passenger compartment.
REAR	**FUNCTIONALITY CHECKS:** Evidence of the correct attribution of the measurements made to the vehicles detected.

4. Simultaneous detection of vehicles (point 11 of the device or system identification table)

FUNCTIONALITY CHECKS: Evidence of operation in cases of simultaneous passage in both same- and opposite-direction lanes.

5. Classification of vehicles (point 13 of the device or system identification table)

CLASSES OF VEHICLES DETECTED	**FUNCTIONALITY CHECKS:** Evidence of performance as defined in the installation, operation and maintenance manual. Classification, as far as possible, into one or more groups according to the following example table, pursuant to Article 142(1) and (3) of the Code. Vehicles from the undetected groups are to be merged into a single 'undefined' group. If the device or system does not perform classification, any type approval decree will contain the requirement for installation and use only on roads where the speed limit applies to all vehicles.

	Gruppo
Motoveicoli	A
Autoveicoli fino a 3,5 t	
Autoveicoli trasporto merci da 3,5 a 12 t	B
Autobus oltre 8 t	
Autobus fino a 8 t	C
Autoveicoli trasporto merci oltre 12 t	D
Autotreni	
Autoarticolati	
Autosnodati	
Quadricicli	E
Ciclomotori	F

Gruppo, Motoveicoli, Autoveicoli fino a3.5t, Autoveicoli trasporto merci da 3.5 a12t, Autobus oltre 8t, Autobus fino a8t, Autoveicoli trasporto merci oltre 12t, Autotreni, Autoarticolati, Autosnodati, Quadricicli, Ciclomotori

Group, Motorcycles, Motor vehicles up to 3.5t, Goods transport vehicles from 3.5 to 12t, Buses over 8t, Buses up to 8t, Goods transport vehicles over 12t, Trucks, Lorries, Articulated vehicles, Quadricycles, Mopeds

Table 7: Vehicle groups for classification purposes.

6. Other features (point 15 of the device or system identification table)

The manufacturer identifies among the tests required below those relevant to its own type of device or system and integrates any additional ones dependent on its specific technology.

TEMPERATURE RANGE OF USE	Documentary evidence of the analyses, tests and trials carried out (see section on laboratory tests).
IP RATING	Documentary evidence of the analyses, tests and trials carried out (see section on laboratory tests).

LABORATORY TESTS

In addition to the above tests, the following laboratory tests must also be carried out on the device or system prototype:

- functional testing of the device or system under particular climatic conditions, according to the following standards.
  - EN 60068-2-1 - Test A: Cold;
  - EN 60068-2-2 - Test B: Dry heat;

- EN 60068-2-14 - Test N: Change of temperature.

These tests will also have to demonstrate that the entire device or system is capable of operating in a declared temperature range.

- IP protection test according to technical standard EN 60529. The IP rating of the entire device must be at least IP66 for fixed-location devices.
  If the IPX7 grade verification test is passed successfully, the IPX6 grade verification shall also be performed.
- If laser sensors are present, the laser source classification test according to the technical standard EN 60825-1 must also be performed.
  The laser must be class 1.
- If illuminators are present, it is also necessary to perform the photobiological safety test according to the technical standard EN 62471.
  The light source must belong to risk group '1' at the most.
- If radar sensors are present, the documentation must be accompanied by EU Declarations of Conformity, produced by the manufacturers, in accordance with Directives 2014/53/EU (Radio Equipment - RED), 2014/30/EU (Electromagnetic Compatibility - EMC) and 2014/35/EU (Low Voltage - LVD), where relevant.
- If the automatic number plate reading (OCR) capability is to be recognised within the scope of the type approval, the device or system must be tested in accordance with UNI 10772 for rear number plates of motor vehicles and number plates of mopeds and motorbikes, up to the upper limit of the speed range. If the device also detects the speed when approaching with the front shot of the offending vehicle, the extended test according to the above-mentioned standard for front plates up to the upper limit of the speed range must also be carried out. For both front and rear number plates of motor vehicles, if the device or system is capable of monitoring two or more lanes, tests according to UNI 10772 must also be conducted in non-channelled traffic mode.

The tests described in this paragraph must be carried out, with the issue of a specific test report, by testing laboratories accredited to UNI CEI EN ISO/IEC 17025 for the specific tests provided for in the relative technical reference standards listed above, by ACCREDIA or by other accreditation bodies that are signatories to international mutual recognition agreements.

CHAPTER 2 – CALIBRATION AND INITIAL AND PERIODIC FUNCTIONALITY CHECKS AND CERTIFICATE OF CONFORMITY

CALIBRATION

2.1 Initial and periodic calibrations must be carried out to ensure that the device or system meets the speed measurement requirements and maintains the performance required in this Chapter 2, throughout the useful life of the device.

2.2 Each device or system shall undergo initial calibration before being put into operation. Within one year after the initial calibration has been carried out and at least annually thereafter, periodic calibration must be carried out on each device or system in use.
If the annual periodic calibration deadline is not met, the device or system must be taken out of service; before being put back into service, the device or system must undergo periodic calibration. If the latter is not carried out within three years of the last successful calibration, a new initial calibration must be carried out before the device or system is put back into service.
In the case of devices used exclusively in fixed locations, if the characteristics of the infrastructure of the place of use or the place of use itself change, it is necessary to carry out a new initial calibration.

2.3 Initial and periodic calibrations must be performed for each of the device or system functions used by the user. Devices used both for instantaneous speed and within an average speed system require tests for both types of speeds.

2.4 When extending the field of use or changing the location of use of a single device or system, or if the characteristics of the road infrastructure change, a new initial calibration test of the device or system must be carried out. In the event that the initial calibration test is carried out in two tests (case 2B of the table of initial and periodic tests in relation to device or system characteristics), only the second test must be carried out when the place of use is changed.

2.5 Initial and periodic calibrations must be performed by a LAT and a calibration certificate must be issued.

2.6 Calibrations must be carried out by a laboratory whose expanded uncertainty resulting from the accreditation table is no greater than 0.5 km/h for speeds up to 100 km/h and 0.5% for speeds above 100 km/h.

2.7 For systems measuring average speed, the calibration of the base length must be carried out by a laboratory whose expanded uncertainty resulting from the accreditation table does not exceed 0.3% (percentage value relative to the length of

the route). The measurement of the length of the base must be carried out with the issue of a calibration certificate.
The calibration of the base length does not expire and only needs to be repeated in the event of changes to the geometric development of the section, including a change in the number of lanes.

2.8 For the direct method, the device or system under test and the reference measuring device or system must be positioned so that measurements are taken at a coincident point or area. If this is not possible, the devices or systems must be positioned so that the measurements are as close as possible to each other.
The LAT must take into account all significant figures provided or detectable by the device or system under test.

2.9 The extended calibration uncertainty must be taken into account when assessing the accuracy of the device or system.

Instantaneous speed

The following definitions apply:

S	$(V_{(UUT)} - V_{REF})$, speed deviation
$\mathbf{U_S}$	Extended uncertainty associated with speed deviation estimation
R	(V_{UUT} / V_{REF}), speed ratio
$\mathbf{U_R}$	Extended uncertainty associated with speed ratio estimation
$\mathbf{S_m}$	Average value of speed deviations
$\mathbf{U_{Sm}}$	Extended uncertainty associated with the estimation of the mean value of speed deviations
$\mathbf{R_m}$	Average value of speed ratios
$\mathbf{U_{Rm}}$	Uncertainty extended to the estimation of the average value of speed ratios
$\mathbf{L_S}$	Maximum limit on individual speed deviation measurement
$\mathbf{L_{R1}}$	Minimum limit on individual speed ratio measurement
$\mathbf{L_{R2}}$	Maximum limit on individual speed ratio measurement
$\mathbf{L_{Sm}}$	Maximum limit on average speed deviation measurements
$\mathbf{L_{R1m}}$	Minimum limit on average speed ratio measurements
$\mathbf{L_{R2m}}$	Maximum limit on average speed ratio measurements

In order to comply with the limits, it must be verified that

	UP TO 100 km/h	OVER 100 km/h
FOR EACH INDIVIDUAL MEASUREMENT	$-L_S + U_S \leq \mathbf{S} \leq L_S - U_S$	$L_{R1} + U_R \leq \mathbf{R} \leq L_{R2} - U_R$
FOR THE AVERAGE OF THE MEASUREMENTS	$-L_{Sm} + U_{Sm} \leq \mathbf{S_m} \leq L_{Sm} - U_{Sm}$	$L_{R1m} + U_{Rm} \leq \mathbf{R_m} \leq L_{R2m} - U_{Rm}$

Average speed

The following definitions apply:

S	$(V_{(UUT)} - V_{REF})$, speed deviation
$\mathbf{U_S}$	Extended uncertainty associated with speed deviation estimation
$\mathbf{S_{\%}}$	$[(V_{UUT} - V_{(REF)}) / V_{REF}]$, relative speed deviation expressed as a percentage
$\mathbf{U_{S\%}}$	Extended uncertainty associated with estimation of speed deviation expressed as a percentage
$\mathbf{L_S}$	Maximum limit on individual speed deviation measurement
$\mathbf{L_{S\%}}$	Maximum limit on individual speed deviation measurement, expressed as a percentage

In order to comply with the limits set out in this document, it must be verified that

	UP TO 100 km/h	OVER 100 km/h
FOR EACH INDIVIDUAL MEASUREMENT	$-L_S + U_S \leq \mathbf{S} \leq L_S - U_S$	$-L_{S\%} + U_{S\%} \leq \mathbf{S_{\%}} \leq L_{S\%} - U_{S\%}$

2.10 The speed indication provided by the device or system undergoing calibration testing during the initial and periodic calibration testing shall have an error relative to the reference measuring device or system that meets the conditions defined in the table below.

	INITIAL CALIBRATION		PERIODIC CALIBRATION	
	UP TO 100 km/h	**OVER 100 km/h**	**UP TO 100 km/h**	**OVER 100 km/h**
MAXIMUM PERMISSIBLE ERROR PER MEASUREMENT	3,00 km/h	3,00 %	4,00 km/h	4,00 %
MAXIMUM PERMISSIBLE ERROR PER MEASUREMENT AVERAGE (IF APPLICABLE TO THE ACCREDITED METHOD)	1,0 km/h	1,0%	1,5 km/h	1,5%

Table 8: Initial and periodic calibration error evaluation criteria

In relation to the definitions set out above, the criteria for assessing error result in the following limits.

		INITIAL CALIBRATION		PERIODIC CALIBRATION	
		UP TO 100 km/h	**OVER 100 km/h**	**UP TO 100 km/h**	**OVER 100 km/h**
INSTANTANEOUS SPEED	FOR EACH INDIVIDUAL MEASUREMENT	$\mathbf{L_S}$ = 3,00 km/h	$\mathbf{L_{R1}}$ = 0,970 $\mathbf{L_{R2}}$ = 1,030	$\mathbf{L_S}$ = 4,00 km/h	$\mathbf{L_{R1}}$ = 0,960 $\mathbf{L_{R2}}$ = 1,040
	FOR THE AVERAGE OF THE MEASUREMENTS	$\mathbf{L_{Sm}}$ = 1,0 km/h	$\mathbf{L_{R1m}}$ = 0,990 $\mathbf{L_{R2m}}$ = 1,010	$\mathbf{L_{Sm}}$ = 1,5 km/h	$\mathbf{L_{R1m}}$ = 0,985 $\mathbf{L_{R2m}}$ = 1,015
AVERAGE SPEED	FOR EACH INDIVIDUAL MEASUREMENT	$\mathbf{L_S}$ = 3,00 km/h	$\mathbf{L_{S\%}}$ = 3,00%	$\mathbf{L_S}$ = 4,00 km/h	$\mathbf{L_{S\%}}$ = 4,00%

Table 9: Initial and periodic calibration test error limits

2.11 Depending on the type of speed detected (point 3 of the device or system identification table) and the other characteristics of the device or system, the conditions for carrying out calibrations are described below.

1. ***Type of Speed Detected (point 3 of the device or system identification table)***

INSTANTANEOUS

INITIAL CALIBRATION:

For devices placed at fixed locations, for which it is not possible to evaluate the entire measuring range at the place of use, two different tests are foreseen during initial calibration.

- The first test verifies the device over the entire measuring range on a track or road not open to the public. This test can be carried out by the manufacturer.
- The second test verifies the functioning of the device once it has been deployed over a reduced range of use with an upper limit equal to the maximum speed limit of the specific road.

A maximum time of two years is allowed between the first and second test; the calibration date to be considered for the definition of the periodicity of the tests will be the date of the second test. The second test must have been carried out before commissioning.

N°	METHOD		SITE CONSTRAINTS	RANGE [km/h]	PASSAGES PER LANE
2A	**DIRECT SNAPSHOT** (EXCLUDING DEVICES IN FIXED LOCATIONS)		TRACK, OR ROAD NOT OPEN TO THE PUBLIC, OR PLACE OF USE	30 ÷ MEASURING RANGE	MINIMUM 100 MAXIMUM 200
2B	**DIRECT SNAPSHOT**	FIRST TEST	TRACK OR ROAD NOT OPEN TO THE PUBLIC	30 ÷ MEASURING RANGE	MINIMUM 100 MAXIMUM 200
		SECOND TEST	SITE OF OPERATION	SPEEDS SAFELY POSSIBLE AT THE PLACE OF USE	MINIMUM 100 MAXIMUM 200

PERIODIC CALIBRATION:

N°	METHOD	SITE CONSTRAINTS	RANGE [km/h]	PASSAGES
3A	**DIRECT SNAPSHOT** (EXCLUDING DEVICES IN FIXED LOCATIONS)	TRACK OR ROAD NOT OPEN TO THE PUBLIC OR PLACE OF USE	30 ÷ MEASURING RANGE	MINIMUM 50 MAXIMUM 100
3B	**DIRECT SNAPSHOT** (ONLY FOR DEVICES IN FIXED	SITE OF OPERATION	30 ÷ SPEEDS SAFELY POSSIBLE AT THE PLACE	MINIMUM 50 MAXIMUM 100

	LOCATIONS)		OF USE	
3C	**SIMULATION** (ALTERNATIVE TO THE TESTS REFERRED TO IN 3B)	N. A.	30 ÷ MEASURING RANGE	FOR EACH SIMULATED SPEED MINIMUM 50 MAXIMUM 100

The modes to be tested are all those provided for in the device or system identification table. It is possible, at the option of the user, to test a subset of it; in that case, the specimen may be used in the modes tested for it only.
The simulator of vehicle transits at various speeds shall be capable of generating speeds between 30 km/h and 230 km/h with an uncertainty of not more than 0.5% for speeds above 100 km/h and 0.5 km/h for speeds up to 100 km/h in increments of 20 km/h.

AVERAGE

INITIAL CALIBRATION:

When calibrating the average speed, regardless of the method used, the calibration of the extended base length must be carried out.
For calibration with the indirect method for the average speed (point 2D in the following table), a time lag calibration must be carried out, assessed by measurements taken at intervals of no more than five minutes over a period of at least two days.

N°	METHOD	SITE CONSTRAINTS	RANGE [KM/H]	PASSAGES
2C	**DIRECT AVERAGE**	SITE OF OPERATION	SPEEDS SAFELY POSSIBLE AT THE PLACE OF USE	MINIMUM 100 MAXIMUM 200
2D	**INDIRECT AVERAGE**	SITE OF OPERATION	30 ÷ RANGE OF USE	/

PERIODIC CALIBRATION:

When calibrating the average speed, regardless of the method used, it is necessary to calibrate the length of the extended base if the geometry of the section is changed.
For the indirect mean (3D) method, a time lag calibration must be carried out, assessed by measurements taken at intervals of no more than five minutes over a period of at least two days.

N°	METHOD	SITE CONSTRAINTS	RANGE [km/h]	PASSAGES
3C	**DIRECT AVERAGE**	SITE OF OPERATION	SPEEDS SAFELY POSSIBLE AT	MINIMUM 100

				THE PLACE OF USE	MAXIMUM 200
	3D	**INDIRECT AVERAGE**	SITE OF OPERATION	30 ÷ RANGE OF USE	/

Table 10: Description of initial and periodic calibrations

If the defined limits are not respected even by extending the number of tests up to the maximum permitted, the device or system is not suitable for use.

2. Directionality of measurement (point 6 of the device or system identification table)

ONE-WAY	**INITIAL AND PERIODIC CALIBRATION:** Tests must be carried out for the direction of travel used.
TWO-WAY	**INITIAL AND PERIODIC CALIBRATION:** The tests must be carried out for both directions of travel.

3. ***Instantaneous speed measurement mode (point 7 of the device or system identification table)***

DISTANCING	**INITIAL AND PERIODIC CALIBRATION:** The tests must include the distancing mode.
APPROACH	**INITIAL AND PERIODIC CALIBRATION:** The tests must include the approach mode.
SIMULTANEOUS DISTANCING AND APPROACH	**INITIAL AND PERIODIC CALIBRATION:** The tests must include the approach and distancing modes simultaneously under safe conditions. The tests must be shared equally between the measurement modes.
TRANSVERSE	**INITIAL AND PERIODIC CALIBRATION:** The tests must include the transverse mode.

4. Speed measuring range (point 9 of the device or system identification table)

INITIAL AND PERIODIC CALIBRATION: Speeds must be evenly distributed in intervals of no more than 20 km/h.

5. Number of lanes checked (point 10 of the device or system identification table)

INITIAL AND PERIODIC CALIBRATION: On-site calibration tests must be distributed over all lanes checked by the device or system.

FUNCTIONALITY CHECKS

2.12 The functionality check is performed to ensure that the already type-approved device or system shows no evidence of malfunctioning and is reported by the user after the initial or periodic calibration of the device or system, prior to the first use of the device.

2.13 With regard to the characteristics and modes of operation of the device or system summarised in the device identification table, it is necessary to carry out a functionality check for each device or system in use following the initial calibration and a functionality check following each periodic calibration, which include specific tests and analyses for each characteristic and/or requirement possessed, according to the table of initial and periodic tests in relation to the characteristics of the device or system.

2.14 When using a subset of the options shown in the device or system identification table, it is sufficient to carry out initial and periodic verification only for the options used by the individual specimen: (point 3) type of speed detected – instantaneous or average; (point 6) directionality of speed measurement – one-way or two-way; (point 7) mode of measurement of instantaneous speed – distancing, approaching, transverse or on board vehicle; (point 10) number of lanes measured.
Should the user intend to expand the subset of use of the individual device or system, a new initial calibration test must be carried out which includes all options considered.

2.15 In cases of the new initial calibration provided for in paragraph 2.4, a new initial functionality check must be performed.

2.16 Some functionality check activities can be performed remotely, if provided for in the installation, operation and maintenance manual of the device or system.

2.17 The functionality check also includes the following activities:

- verification that all components of the device or system are functional; these verifications must be carried out according to the methods and with the tools indicated in the installation, operation and maintenance manual for the device or system;
- verification of the integrity of the device or system, including through remote controls or checks on correct operation;
- verification of any seals present;
- self-diagnosis using the tools defined in the installation, operation and maintenance manual of the device or system, when present;
- any further checks required in the installation, operation and maintenance manual of the device or system.

The user has the option of integrating the information gathered and the verification activities performed during the functionality check, again according to the instructions in the installation, operation and maintenance manual of the specific device or system.

2.18 The initial and periodic functionality checks are documented by means of a report, drawn up by the user pursuant to Article 2700 of the Civil Code.

The functionality check report includes at least the following information:

- type of verification, whether initial or periodic;
- device or system data: name, device serial number(s), details of type approval decree, details of calibration certificate;
- verification and verifier data: date of verification report, place of verification, name of verifier(s);
- detection data: day, start and end time, captured data.

For each activity subject to the functionality check of the device or system, the positive result must be recorded in the report.

2.19 The device or system only passes the functionality check if each individual check is successful.

2.20 Functionality checks do not replace the calibration carried out by the LAT and the maintenance and/or overhaul checks defined by the manufacturer in the installation, operation and maintenance manual of the device or system. Maintenance and/or overhaul checks must be carried out in accordance with the schedule and as defined in the installation, operation and maintenance manual.

2.21 The possibility of using the findings of the functionality checks for the application of sanctions for breaches of rules of conduct is in any case excluded.

2.22 In relation to the type of speed detected (point 3 of the device or system identification table), the conditions for carrying out the functionality checks are described below, taking into account the categories of vehicles allowed to circulate in a given road category.

1. ***Type of Speed Detected (point 3 of the device or system identification table)***

INSTANTANEOUS	**INITIAL FUNCTIONALITY CHECKS:** Upon first installation (if fixed device) or use (if mobile device), the total number of transits shall be at least 300 for automatically operated devices or systems and 150 for manually operated devices or systems. All transits forming part of the check must be verified individually with the possible aid of a video surveillance camera (or similar) which must also be independent of the infringement detection system. The checks shall be carried out under different lighting conditions, taking into account the classification of vehicles performed by the device. By setting the maximum permitted speed limit to a value close to zero on the device, the functionality check is considered successful if the device or system is able to detect at least 90% of the passing vehicles: • attribute the speed of at least 95% of the vehicles detected; • correctly capture the image and/or video (if any) of at least 95% of the vehicles detected; • correctly classify at least 90% of the detected vehicles according to the classes defined in point 13 of the device identification table (if classification is provided); • read and correctly attribute the number plates of 95% of the vehicles

	detected (if applicable). If it is not possible to detect passing vehicles in compliance with the minimum limit of 90% due to objective impossibility (e.g. obstruction of the measuring field), the user must submit an appropriate deviation report. **PERIODIC FUNCTIONALITY CHECKS:** The total number of transits must be at least 200 for automatically operated devices or systems and 100 for manually operated devices or systems. All transits forming part of the check must be verified individually. The checks shall be carried out taking into account the classification of the vehicles carried out by the device. By setting the maximum permitted speed limit at a value close to zero on the device, the functionality check shall be considered successful if the device or system is able to: • attribute the speed of at least 95% of the vehicles detected; • correctly capture the image and/or video (if any) of at least 95% of the vehicles detected; • correctly classify at least 90% of the detected vehicles according to the classes defined in point 13 of the device identification table (if classification is provided); • read and correctly attribute the number plates of 95% of the vehicles detected (if applicable).
AVERAGE	**INITIAL FUNCTIONALITY CHECKS:** Data collection related to the test campaign shall be carried out at both the start and end of detection stations (hereinafter also called start and stop), with random vehicle transits in all lanes. A sample of transits with the number and characteristics described in the following points must be checked and a report produced. FIRST TEST – SINGLE STATION, BOTH START AND STOP: at the time of the first installation, the peripheral system must be configured to detect the vehicle in transit, providing a minimum of 300 total vehicles for each of the two portals. The system must not be able to access external databases to supplement any missing information (e.g. MCTC). The test shall be carried out on a specific pair of stations installed on a road or motorway carriageway. With the possible aid of a video surveillance camera (or similar), which is independent of the violation detection system, a check will be carried out on the number of vehicles correctly detected and photographed by the station in relation to the total number of transited vehicles counted by analysing the video recording. The system is considered suitable if: - it is able to detect at least 90% of vehicles in transit; - for each of the two detection stations – entry and exit – it is able to correctly capture images for a number of detections greater than or at least equal to 95% of the total detected. SECOND TEST – SINGLE STATION, BOTH START AND STOP: the class indicated by the peripheral system for each vehicle must be compared with what can be

	detected by the frame taken by the cameras, with a minimum of 300 vehicles in total for each of the two portals. The system must classify the vehicles into a minimum number of classes that can be traced back to the vehicle categories to which the speed limits currently prescribed for each of the vehicle classes apply, according to the category of road on which the system is installed (pursuant to Article 142(3) of the Code). The classification test is considered successful if, both for each class and out of the total number analysed, the number of correctly classified vehicles is more than 90%. THIRD TEST – SINGLE STATION, BOTH START AND STOP: comparison between the number plate read by the OCR, if present, and the number plate visible in the photo taken by the cameras, using the same analysis sample as in the classification test. The system is considered suitable if, for each of the two detection locations – entry and exit – it is able to correctly recognise the number plate for a number of detections greater than or equal to 95% of the vehicles detected. FOURTH TEST – PAIR OF STATIONS: It is suggested that the pair of stations be configured with a speed limit close to zero (e.g. average speed limit of 5 km/h on the motorway), so that almost all vehicles passing through the section under consideration are considered to be offending vehicles. The test involves a minimum of 300 vehicles. A system is considered adequate if it is capable of correctly matching the images of vehicles passing under the two stations for more than 95% of those taken in a single session and of the total number of vehicles passed through; correct matching means that the same vehicle must be represented in the image pair. For each vehicle matching test campaign, it is suggested to start the normal operation of the stop station after a reasonable time after the start of the normal operation of the start station, in order to ensure that all vehicles within the route have already been detected by the start station, and thus the vehicle matching test can be meaningful. In this way, the system is theoretically able to match all vehicles in transit to the stop portal from the moment it starts. It is possible to derogate from matching all vehicles only in sporadic cases where there are junctions and service or parking areas between the two portals that have been assessed as having no impact on the performance of the system. In addition, it is suggested that video footage be taken by means of a video surveillance camera (or similar) which is independent of the violation detection system, to allow for better verification by the operator. For all transits matched by the system, a comparison must be made between the frame collected by the start station and the one collected by the stop station, to verify that the system has matched the same vehicle and that no malfunctions occur. **PERIODIC FUNCTIONALITY CHECKS:** The data collection related to the test campaign must be carried out at both the start and stop stations, with random vehicle transits in all lanes. The system must not be able to access external databases to supplement any missing information (e.g. MCTC). The test shall be carried out on a specific pair of stations installed on a road or motorway carriageway.

	FIRST TEST – SINGLE STATION, BOTH START AND STOP: the class indicated by the peripheral system for each vehicle must be compared with what can be detected by the frame taken by the cameras, with a minimum of 150 vehicles in total, for each of the two portals. The system must classify the vehicles into a minimum number of classes that can be traced back to the vehicle categories to which the speed limits currently prescribed for each of the vehicle classes apply, according to the category of road on which the system is installed (pursuant to Article 142(3) of the Code), with an indication of the number of vehicles that the system has not been able to classify. The classification test is considered successful if, both for each class and out of the total number analysed, the number of correctly classified vehicles is more than 90%. SECOND TEST SINGLE STATION, BOTH START AND STOP: comparison between the number plate read by the OCR, if present, and the number plate visible in the photo taken by the cameras, using the same analysis sample as in the classification test. The system is considered suitable if, for each of the two detection locations – entry and exit – it is able to correctly recognise the number plate for a number of detections greater than or equal to 95% of the vehicles detected. THIRD TEST – PAIR OF STATIONS: It is suggested that the pair of stations be configured with a speed limit close to zero (e.g. average speed limit of 5 km/h on the motorway), so that almost all vehicles passing through the section under consideration are considered to be offending vehicles. The test involves a minimum of 150 vehicles. A system is considered adequate if it is capable of correctly matching the images of vehicles passing under the two stations for more than 95% of those taken in a single session and of the total number of vehicles passed through; correct matching means that the same vehicle must be represented in the image pair. It is suggested to start the normal operation of the stop station after a reasonable time after the start of the normal operation of the start station, in order to ensure that all vehicles within the route have already been detected by the start station, and thus the vehicle matching test can be meaningful. In this way, the system is theoretically able to match all vehicles in transit to the stop portal from the moment it starts. It is possible to derogate from matching all vehicles only in sporadic cases where there are junctions and service or parking areas between the two portals that have been assessed as having no impact on the performance of the system. In addition, it is suggested that video footage be taken by means of a video surveillance camera (or similar), which may be independent of the violation detection system, to allow for better verification by the operator. For all transits matched by the system, a comparison must be made between the frame collected by the start station and the one collected by the stop station, to verify that the system has matched the same vehicle and that no malfunctions occur.

Table 11: Table of initial and periodic verifications

1. ***Simultaneous detection of vehicles (point 11 of the device or system identification table)***

INITIAL AND PERIODIC FUNCTIONALITY CHECKS: The checks at the place of use must include the simultaneous passage of vehicles, respecting safety conditions, both in the case of lanes with the same and opposite directions.

2.23 The devices and systems must be taken out of service in the case of:

- tampering with any seals of the LAT;
- tampering with any manufacturer's seals;
- damage, breakage, failure of the device;
- as a precaution, if the manufacturer or user believes that the device or system is no longer suitable for service.

Devices or systems that are out of service must be restored by the manufacturer or a person authorised to do so. The manufacturer shall, in the event that the Group 1 parts relevant to the measurement have been used for the re-commissioning of the device or system, indicate whether or not new initial or periodic calibration is required, as applicable, provided that the components are the same as those subject to prototype type approval.

2.24 In addition to periodic calibration and functionality checks, the device or system is subject to maintenance and/or overhaul checks as prescribed in the installation, operation and maintenance manual of the device or system, which is part of the prototype type approval documentation. After maintenance and/or overhaul, the manufacturer or party authorised to do so is responsible for ensuring that the device or system complies with the specifications of the sample deposited with the MIT.

2.25 Reports drawn up at the end of the initial or periodic functionality checks are kept by the Road Traffic Police.

CERTIFICATE OF CONFORMITY

The certificate of conformity shall be issued by the holder of the type approval for each device or system before it is placed on the market and shall attest the conformity of the device or system with the deposited prototype.
The certificate must be kept by the user and contain at least the following data:

- certificate number;
- device registration number or system identifier;
- details of the approval or extension of approval decree;
- date of production.

CHAPTER 3 –- DOCUMENTATION TO BE SUBMITTED FOR APPLICATION FOR TYPE APPROVAL

3.1 APPLICATION FOR TYPE APPROVAL

In order to apply for type approval, the prototype of the device or system, together with the following documentation, must be submitted by PEC to the competent MIT office:

a) application for type approval, on legal paper;
b) receipt of payment for technical and administrative operations, referred to in Row I of Table VII.1 of the Regulation;
c) detailed illustrative technical report of the device or system and its components, as well as the management software;
d) installation, operation and maintenance manual, containing at least the minimum information required by paragraph 1.7.4.2 of Annex I of Directive 2006/42/EC and the installation geometry of the device or system. The manual must be digitally signed;
e) calibration certificates, reports of functionality checks and laboratory tests referred to in Chapter 1;
f) Chamber of Commerce certificate of the company producing the device or system and a photocopy of a valid identity document of the legal representative;
g) HASH or CRC code of the software part of the device or system dedicated to speed calculation, or firmware of the relevant component related to measurement;
h) EU Declaration of Conformity of the components of the device or system, relating to electrical safety, in accordance with Directive 2014/35/EU (low voltage - LVD) and electromagnetic compatibility, in accordance with Directive 2014/30/EU (electromagnetic compatibility - EMC) and Directive 2014/53/EU (radio equipment - RED), if relevant;
i) Declaration of Conformity with the RoHS Directive according to the harmonised standards of Directive 2011/65/EU;
j) declaration of a certified copy of the documents referred to in the previous points;
k) declaration by the manufacturer that it has been verified that the device or system (made up of the same components as those referred to in Groups 1 and 2) has not been previously approved;
l) ISO 9001 certification or declaration referred to in Article 5(6) of this Decree.

If the documentation is not complete according to this list, the application must be supplemented according to the instructions of the competent organisational unit of the Directorate General for Road Safety and Road Transport.

The competent office reserves the right to request additional documentation, if necessary for the complete examination of the application for type approval.
Each document will be validly deposited by the manufacturer by sending it to the Certified Electronic Mail address of the organisational unit responsible for the preliminary investigation of the procedure or by means of the MIT's file delivery portal, which allows the sending of files larger than 100 MB.
Reports (or Test Reports) of tests performed on the device or system must be:

- in Italian or English; if in a different language, accompanied by a sworn translation;
- produced in original or certified copies and carried out by laboratories accredited by ACCREDIA or other accreditation bodies that are international signatories of mutual recognition agreements.

The type approval of the device or system is formalised by executive decree.

3.2 APPLICATION FOR EXTENSION OF TYPE APPROVAL

With the type approval extension procedure, the MIT extends the previous type approval to new and different models and versions of the prototype with the same basic functions, following the modification and/or addition of one or more of the Group 2 components and/or functions.
The competent office of the MIT verifies, for the modified and/or added components and functions, the fulfilment of the requirements defined in this document.
The extension of the type approval is also formalised by means of an executive decree.
In order to apply for an extension of type approval, prototype components, if any, conforming to those tested must be submitted, together with the following documentation:

a) application on legal paper or via PEC with stamp duty paid virtually, addressed to the competent organisational unit of the Directorate General for Road Safety and Road Transport;
b) receipt of payment for technical and administrative operations, as referred to in Row M of Table VII.1 of the Regulation;
c) detailed technical illustrative report of the proposed new version of the device or system with its components;
d) digitally signed updated version of the installation, operation and maintenance manual, referred to in (d) of paragraph 3.1 above;
e) test reports of the laboratory tests referred to in Chapter 1, carried out on new components;
f) any update of the HASH or CRC code of the software part of the device or system dedicated to speed calculation, or of the firmware of the relevant component related to measurement;
g) declaration of a certified copy of the documents referred to in the previous points.

If the documentation is not complete according to this list, the application must be supplemented according to the instructions of the competent organisational unit of the Directorate General for Road Safety and Road Transport.
The MIT reserves the right to request additional documentation if necessary for the complete examination of the application for extension of type approval.
Each document will be validly deposited by the producer by sending it to the Certified Electronic Mail address of the organisational unit of the MIT responsible for the preliminary investigation of the procedure or by means of the MIT's file delivery portal, which allows the sending of files larger than 100 MB.
Reports (or Test Reports) of tests performed on the device or system must be:

- in Italian or English; if in a different language, accompanied by a sworn translation;
- produced in original or certified copies and carried out by laboratories accredited by ACCREDIA or other accreditation bodies that are international signatories of mutual recognition agreements.

3.3 APPLICATION TO TAKE OVER OWNERSHIP OF THE TYPE APPROVAL

With the type approval takeover procedure, the MIT authorises a change in type approval ownership and possible subsequent extensions.
The application must also be submitted in the event of changes to the name, company name and registered office of the current holder of the type approval.
The takeover of the ownership of type approval is also formalised by means of an executive decree.
To apply for takeover, the following documents must be submitted:

a) application on legal paper or via PEC with stamp duty paid virtually, addressed to the competent organisational unit of the Directorate General for Road Safety and Road Transport, listing the decrees to be taken over;
b) receipt of payment for technical and administrative operations, as referred to in Row M of Table VII.1 of the Regulation;
c) alternatively:
    1. in the event of a change in the company name, trade name or registered office, the minutes, registered with the Revenue Service, of the shareholders' meeting of the company by which the above is resolved;
    2. in the event of a sale, lease of a branch of business or merger by incorporation, the contract, registered with the Revenue Service;
d) valid Chamber of Commerce certificate of the successor company;
e) sworn statement in lieu of an affidavit, pursuant to Presidential Decree No 445 of 28 December 2000, dated 31 December 2023, in which the assigning company declares that it has duly carried out its production and marketing activities in accordance with the aforementioned decrees, and that it has not committed any violations thereof;

f) sworn statement in lieu of an affidavit, pursuant to Presidential Decree No 445 of 28 December 2000, dated 31 January 2024, in which the transferee company declares that it has sufficient documentation, means and technical capacity to allow the project to remain unchanged and the subsequent production to conform to the prototypes already approved;
g) digitally signed copies of the manuals mentioned in the decrees mentioned in (a), updated with the new header.

If the documentation is not complete according to this list, the application must be supplemented according to the instructions of the competent organisational unit of the Directorate General for Road Safety and Road Transport.
The MIT reserves the right to request additional documentation, if necessary for the complete examination of the application to take over ownership of the type approval.
Each document will be validly deposited by the producer by sending it to the Certified Electronic Mail address of the organisational unit of the MIT responsible for the preliminary investigation of the procedure or by means of the MIT's file delivery portal, which allows the sending of files larger than 100 MB.

The Ministry for Infrastructure and Transport

ANNEX B

List of decrees approving prototypes of devices and systems for detecting violations of maximum speed limits issued pursuant to Decree No 282 of the Minister of Infrastructure and Transport of 13 June 2017.

PROTOTYPE	APPROVAL DECREE
AUTOVELOX 106	Executive Decree No 476 of 09/12/2025[1]
VRS-EVO-T12-5-R	Executive Decree No 342 of 02/10/2025[2]
VELOCAR RED&SPEED EVO-R	Executive Decree No 342 of 02/10/2025[3]
CELERITAS MSE 2021	Executive Decree No 401 of 19/08/2024
TUTOR 3.0	Executive Decree No 305 of 20/06/2024
VERGILIUS PLUS	Executive Decree No 149 of 27/03/2024
CELERITAS MVD 2022	Executive Decree No 290 of 25/07/2023
VRS EVO 2	Executive Decree No 271 of 11/07/2023
T-EXSPEED	Executive Decree No 236 of 05/06/2023
K53800_SPEED	Executive Decree No 549 of 21/12/2021
TCS - Traffic Control System	Executive Decree No 378 of 09/09/2021
Autosc@n Speed	Executive Decree No 356 of 18/08/2021
CELERITAS MVD 2020	Executive Decree No 349 of 16/08/2021
AGUIA Red & Speed	Executive Decree No 48 of 01/03/2021
VELOCAR RED&SPEED EVO M	Executive Decree No 5240 of 31/08/2017

[1] Confirmation of approval of Executive Decree No 3758 of 06/08/2014
[2] Confirmation of approval of Executive Decree No 129 of 07/04/2021
[3] Confirmation of approval of Executive Decree No 4708 of 01/08/2016