

Motor Vehicle Type Approval System (MVTAS) in Europe

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„Energy Efficiency and Climate Change
in the Land Transport Sector in the ASEAN Region“

Three Levels of Vehicle Control

1. Type Approval

- Describe and explain exactly the design and the performance of the product

3. Conformity of Production

- Prove that the mass-produced vehicles meet the standards of the type-approved prototype

5. In-Use Compliance

- Ensure that the vehicles in real traffic meet the requirements over the useful lifetime (5 years / 80,000 km or 10 years / 160,000 km)

Type Approval of Motor Vehicles

Background and History (1: ECE)

UNECE: World Forum for Harmonization of Vehicle Regulations

UN Agreements from 1958, 1997 and 1998 provide the legal framework.

Contracting Parties (member countries) attending sessions of Working Party 29 to establish regulatory instruments for motor vehicles and equipment.

[WP.29](#) established six permanent Working Parties (GRs)

- Noise ([GRB](#))
- Lighting and Light-Signalling ([GRE](#))
- Pollution and Energy ([GRPE](#))
- Brakes and Running Gear ([GRRF](#))
- General Safety Provisions ([GRSG](#))
- Passive Safety ([GRSP](#)).

Type Approval of Motor Vehicles Background and History (2. EC)

EC: European Community (formerly EEC: European Economic Community)

EEC was founded in 1957.

Since 1970, Directive [70/156/EEC](#) has been the main legal instrument for implementing the single market in the motor vehicle sector.

The Directive has been amended many times in order to keep pace with this sector's development.

Directive [2007/46/EC](#) established an improved and enhanced framework. It retains (in revised form) the majority of the older provisions but introduces new concepts and requirements. Several new amendments have already referred to it.

Type-approval for vehicles and for components



To obtain a (type-)approval, vehicles and/or component must comply with [ECE regulations](#) or [EC guidelines](#).

ECE approvals are issued for systems, individual technical units or components. In the legislation, this is indicated with a large 'E'. This is based on the globally accepted ECE regulations.

For systems, individual technical units or components, EC approvals are mandatory in all Member States of the European Union. These approvals are indicated with a small 'e'. The approvals are issued on the basis of EC guidelines.

“Manufacturer” and Conformity of Production (CoP)

For each approval it is necessary to declare a manufacturer for the product. This does not necessarily have to be the company that actually manufactures the product but it must be a company that can take, and prove, responsibility for the design and manufacture and hence can control conformity to type of production samples.

Conformity of production requirements are based around established quality systems principles, and certification to ISO9001 may be acceptable as a basis, with appropriate control plans to deal with the specific approval aspects.

EC Type-Approval System

Type-approval is based on the principle that manufacturers must issue a certificate of conformity for each vehicle manufactured, attesting that it conforms to the approved type.

The manufacturer can opt for one of the following procedures:

- step-by-step type-approval,
- single-step type-approval, or
- mixed type-approval.

The EC introduces a new method "multi-stage type-approval". Each manufacturer involved in manufacturing a vehicle will fill in the part of the certificate relating to its own stage.

EC Policies are based upon the Common-Market Concept

No Member State may refuse a product onto her market when this product meets the prescriptions of a Directive, and for which product an EU-type approval has been granted.

A Member State is also not allowed to apply stricter prescriptions to those products for which an EU-type approval has been granted and an e-certificate has been issued.

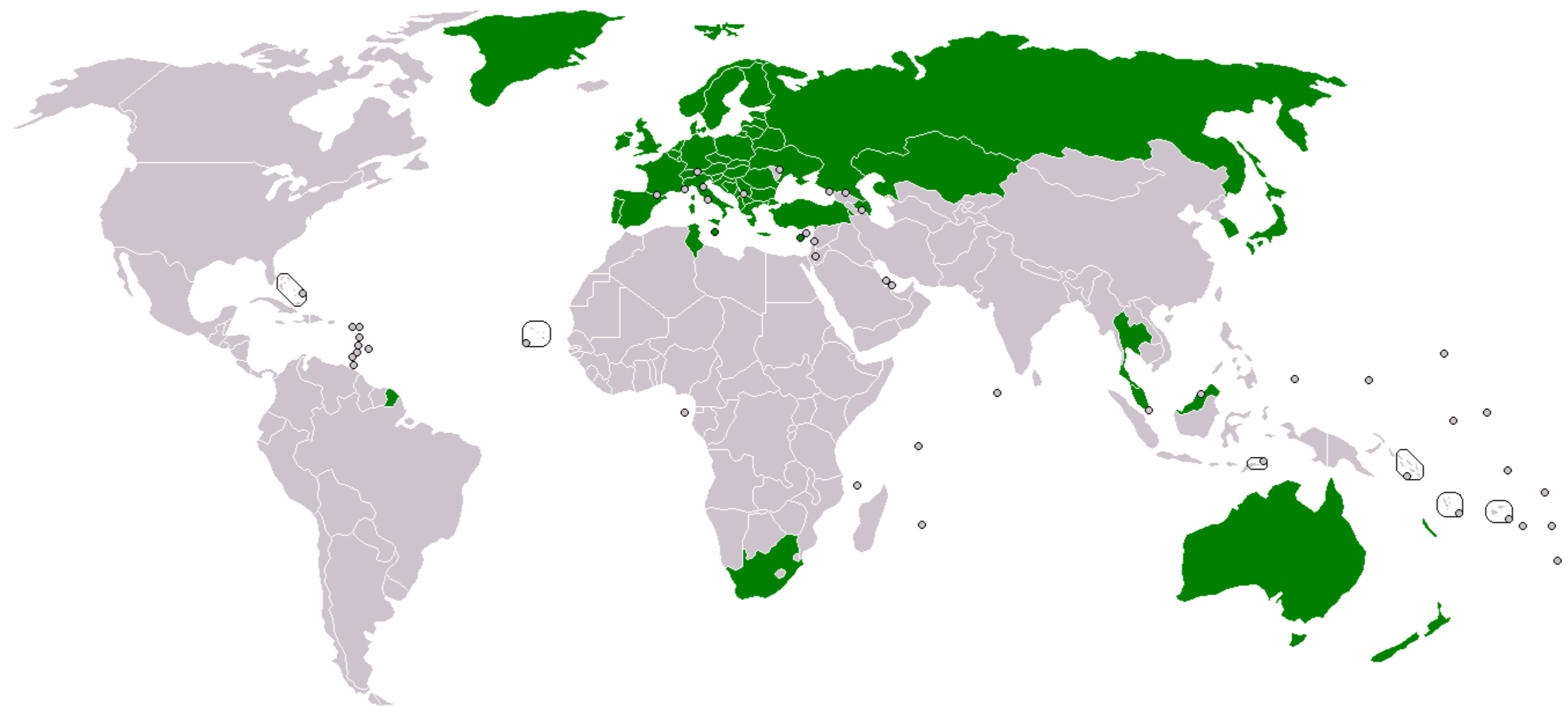
Third Party Approval

Automotive EC Directives and UN Regulations require third party approval - testing, certification and production conformity assessment by an independent body.

Each Member State is required to appoint an Approval Authority to issue the approvals and a Technical Service to carry out the testing to the EC Directives and Regulations.

An approval issued by one Authority will be accepted in all the Member States. A similar situation exists for UN regulations where Contracting Parties have similar role to the EC Member States.

Participating Countries of the World Forum for
Harmonisation of Vehicle Regulations of the Inland Transport
Division of the United Nations Economic Commission of
Europe (UNECE)



Technical ECE Regulations in Applied by Thailand Whole Vehicle Type Approval

- Door lock & retention
- Braking
- Seatbelt anchorage
- Lighting installation
- Rear protective device
- Engine power
- Seat belt (DLT: Installation)
- Safety glazing (TISI)
- Tyre
- Steering device
- Seat strength
- Interior fitting (pass. cars)
- Steering effort
- Head restraint (pickups)
- Speedometer
- Audible warning device
- Device for indirect vision
- Radio suppression
- Fuel consumption (except N1 in combustion)
- Fuel tank & installation

- Headlamp
- Rear registration plate lamp
- Retro-reflective device
- Direction indicator/ Hazard warning signal
- Position lamp/ Tail lamp/ Stop lamp
- Reversing lamp
- Washer/ Wiper
- Identification of controls, Telltale, Indicators
- Wheel guard
- Diesel smoke (TISI)
- Diesel emission (TISI)
- Sound level
- Emissions
- Mass & Dimension
- VIN, Engine number, Vehicle plate
- External projection

MC (20 items)

- Electromagnetic Compatibility
- Braking
- Identification controls
- Lighting installation
- Headlamp
- Engine power
- Tyre
- Speedometer
- Audible warning device
- Rear view mirror
- Position/stop/direction indicator lamp/rear registration plate lamp
- Retro-reflector
- Exhaust emission (TISI)
- Noise
- Stand
- Mass & Dimension
- Registration plate space
- Handholds
- Fuel tank
- VIN/Data plate

Actual topics in the EC/ECE discussions on MVTA

Road safety: making devices compulsory, including ABS (anti-lock braking system), new and more effective rear-view mirrors (including the new front rear-view mirror), improved lights, protection for pedestrians.

Buses and coaches must have emergency exits and ensure access for persons with reduced mobility, sufficient "survival space" in the event of the vehicle rolling over etc.).

Provisions will be phased in gradually until 2014.

Regulative Work of UNECE and EC on Vehicle Safety (1)

GLOBAL REGISTRY

Created on 18 November 2004, pursuant to Article 6 of the

AGREEMENT CONCERNING THE ESTABLISHING OF GLOBAL TECHNICAL REGULATIONS FOR WHEELED VEHICLES, EQUIPMENT AND PARTS WHICH CAN BE FITTED AND/OR BE USED ON WHEELED VEHICLES

(ECE/TRANS/132 and Corr.1)

Done at Geneva on 25 June 1988

Addendum

Global technical regulation No. 9

PEDESTRIAN SAFETY

(Established in the Global Registry on 12 November 2008)



UNITED NATIONS

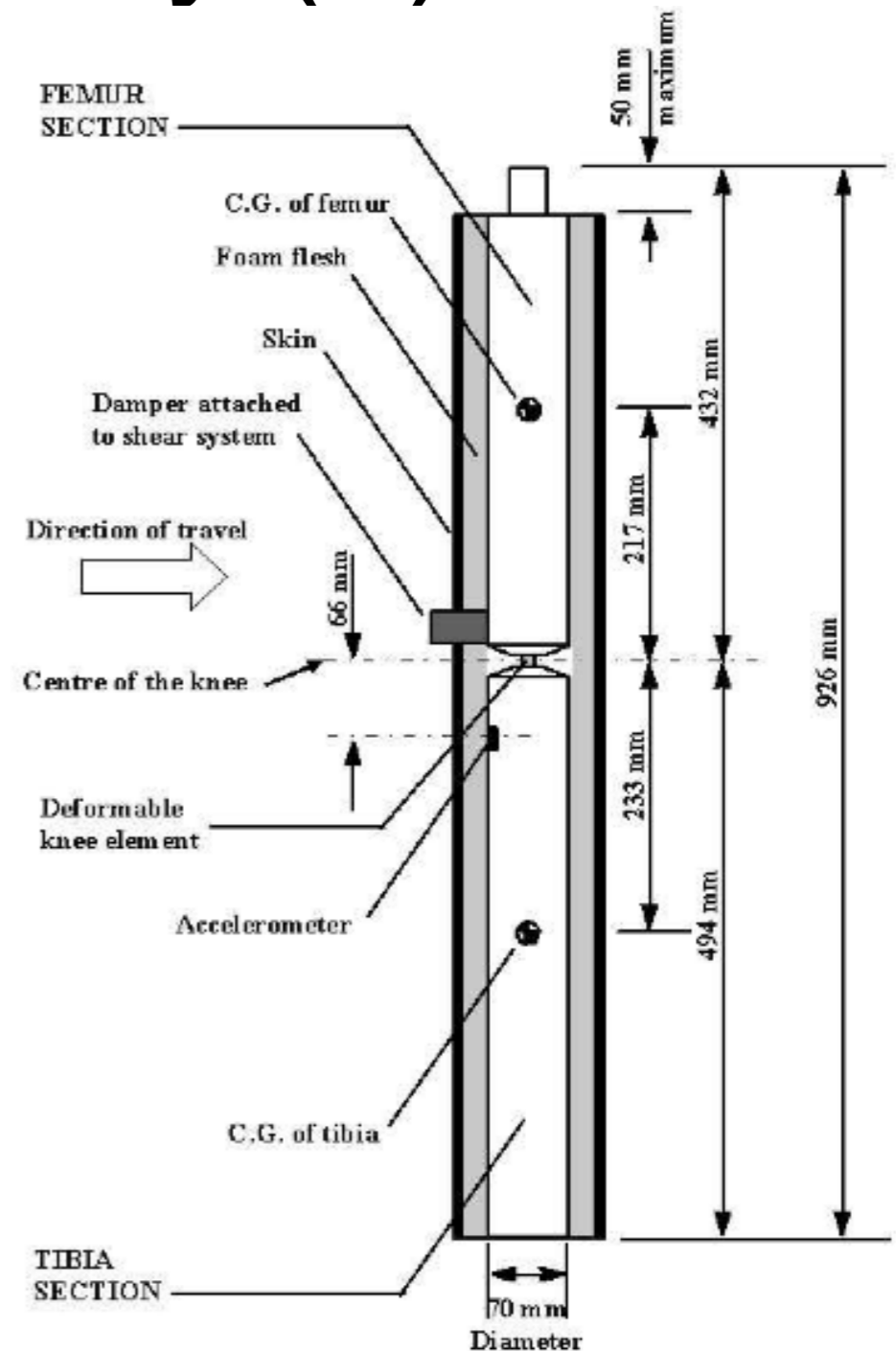


Figure 12: Lower legform impactor (see paragraph 6.3.1.1.)

Regulative Work of UNECE and EC on Vehicle Safety (2)

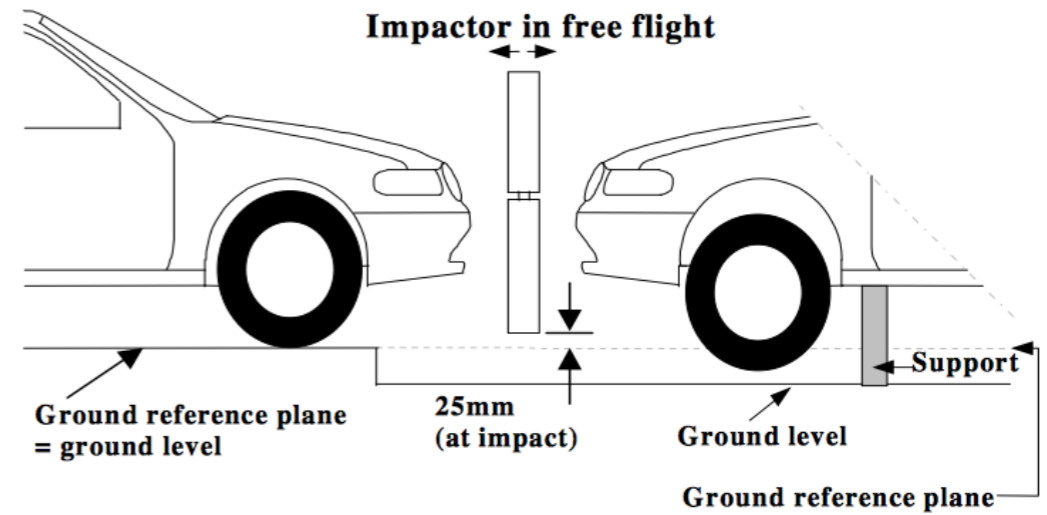


Figure 17: Lower legform to bumper tests for complete vehicle in normal ride attitude (left) and for cut-body mounted on supports (right) (see paragraph 7.1.1.3)

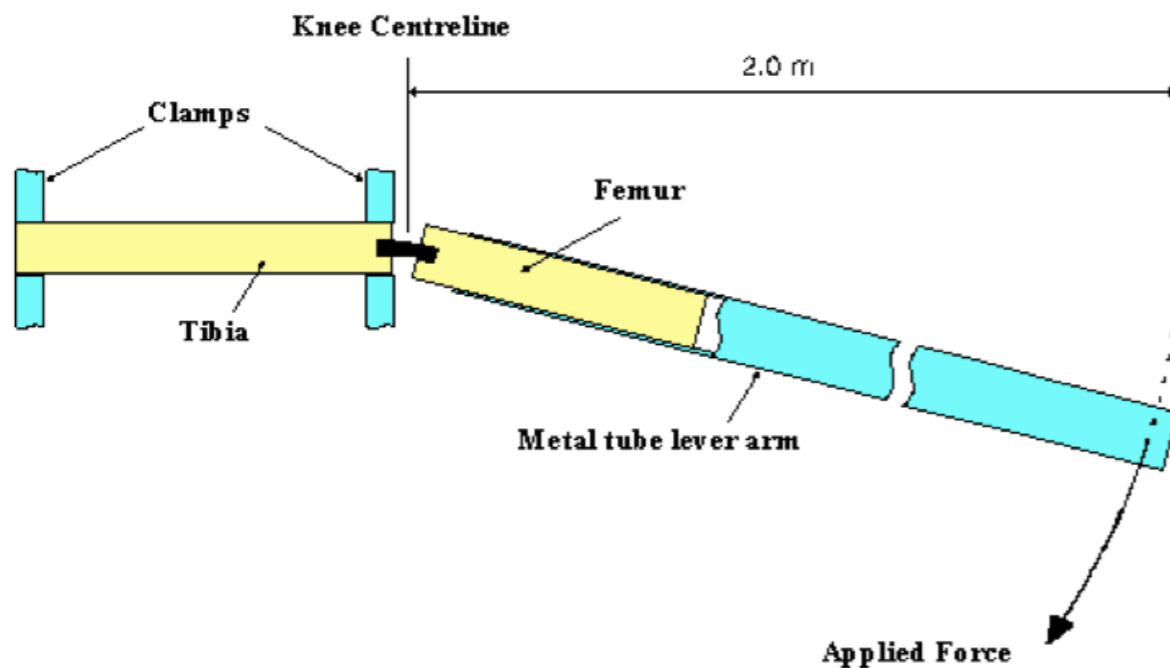


Figure 20: Top View of Test set-up for static lower legform impactor bending certification test (see paragraph 8.1.1.4.)

Regulative Work of UNECE and EC on Vehicle Safety (3)

131. The European Union analysis also provides cost estimates to implement necessary changes to the vehicles to meet the gtr leg and head requirements (Table 1). These costs include the price of parts and the costs to the manufacturer for tooling and assembly line outlays. These costs are dependant on lead time to implement the regulation and advancements in technologies developed to address the gtr requirements. It is expected that some of these costs will decrease with time.

Table 1

Vehicle Style	Cost per vehicle (Euros)
Super Mini	45.98
Small Family Car	27.76
Large Family Car	36.93
Executive Car	37.64
Sports Car	85.77
Small MPV	30.80
Large MPV	34.53
Large Off-Roader	47.41

Type Approval for Motorcycles

A system of mandatory European Community Whole Vehicle Type Approval (EC-WVTA) has been in place for motorcycles for a number of years.

The scheme was originally framed under Directive 92/61/EEC, which was subsequently replaced and repealed by Directive 2002/24/EC, as amended. There will be a [new Framework Directive](#) effective from January 2016.

The Framework Directive covers 2, 3 and some light 4 wheeled vehicles (quadricycles).

Topics of new motorcycle regulations

1. Durability of anti-pollution devices
2. In-Use conformity
3. CO₂ emissions and fuel consumption
4. New set of pollutant emission limit values for tricycles and quadricycles
5. New set of pollutant emission limit values for mopeds
6. OBD systems on two and three-wheel motor vehicles
7. Evaporative emissions on two and three-wheel motor vehicles
8. Impacts of the mandatory use of the new WMTC

Pollutant emissions from motor vehicles of L-category

Environmental concern: high share of hydrocarbons, carbon monoxide and particles

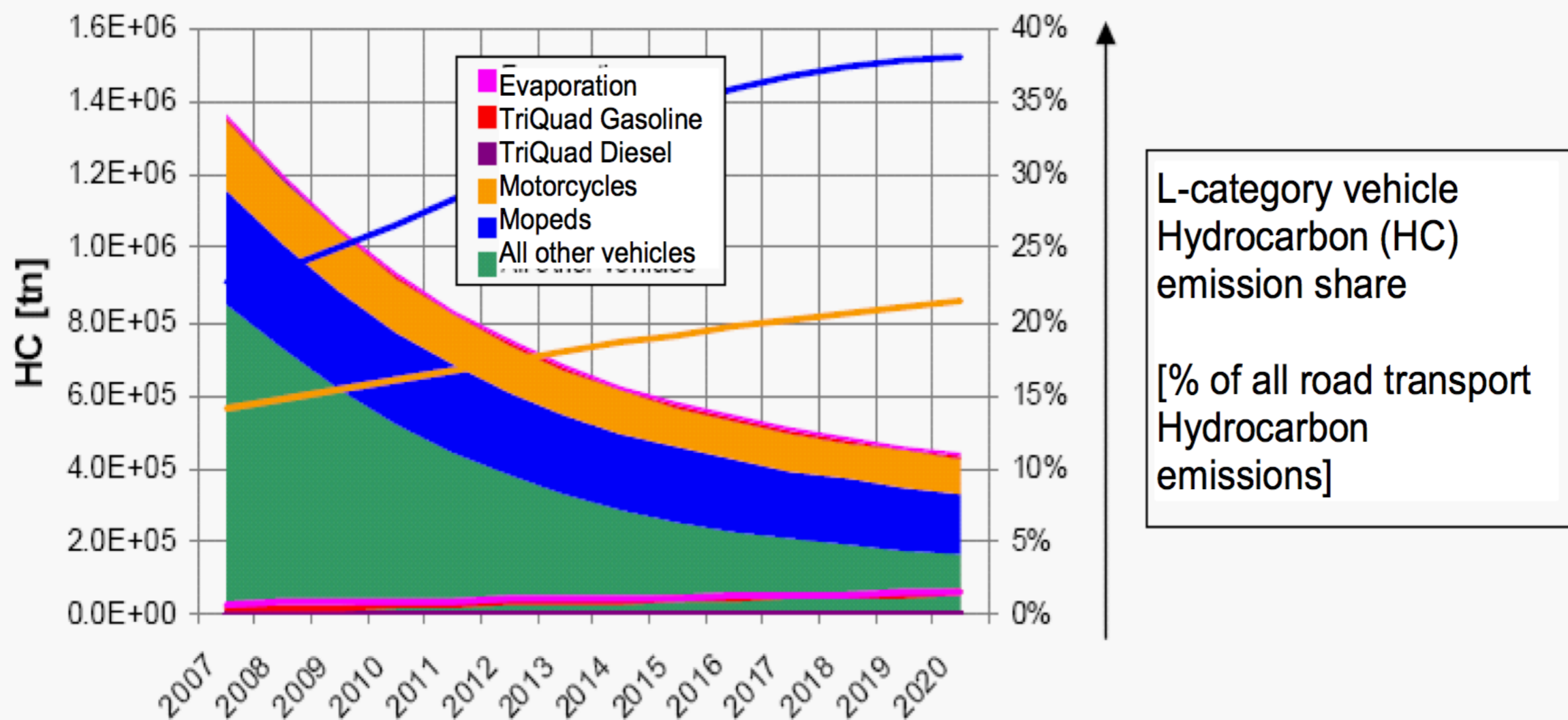









Figure 1: Trend over time of L-category vehicle, absolute and relative share of hydrocarbon emissions if no change in policy.

NB. The “all other vehicles” category includes passenger and delivery cars, trucks and busses. Source: the LAT report



Primary Y-axis (left): HC = HydroCarbon emissions; 2.0E+05 = 200,000, 1.0E+06 = 1,000,000, 1tn=1000 kg.

Secondary Y-axis (right): L-category vehicle Hydrocarbon (HC) emission share as % of all road transport Hydrocarbon emissions





Light-category vehicles 1 to 4

Category & Category Name	Sub category & Sub category name	Example
L1e, light two-wheel vehicle	L1A e powered cycle	
	L1Be Moped	 
L2e Three-wheel moped		
L3e, motorcycle	A1, A2, A3 < 130 km/h ≥ 130 km/h	 
L4e, motorcycle with side car	-	

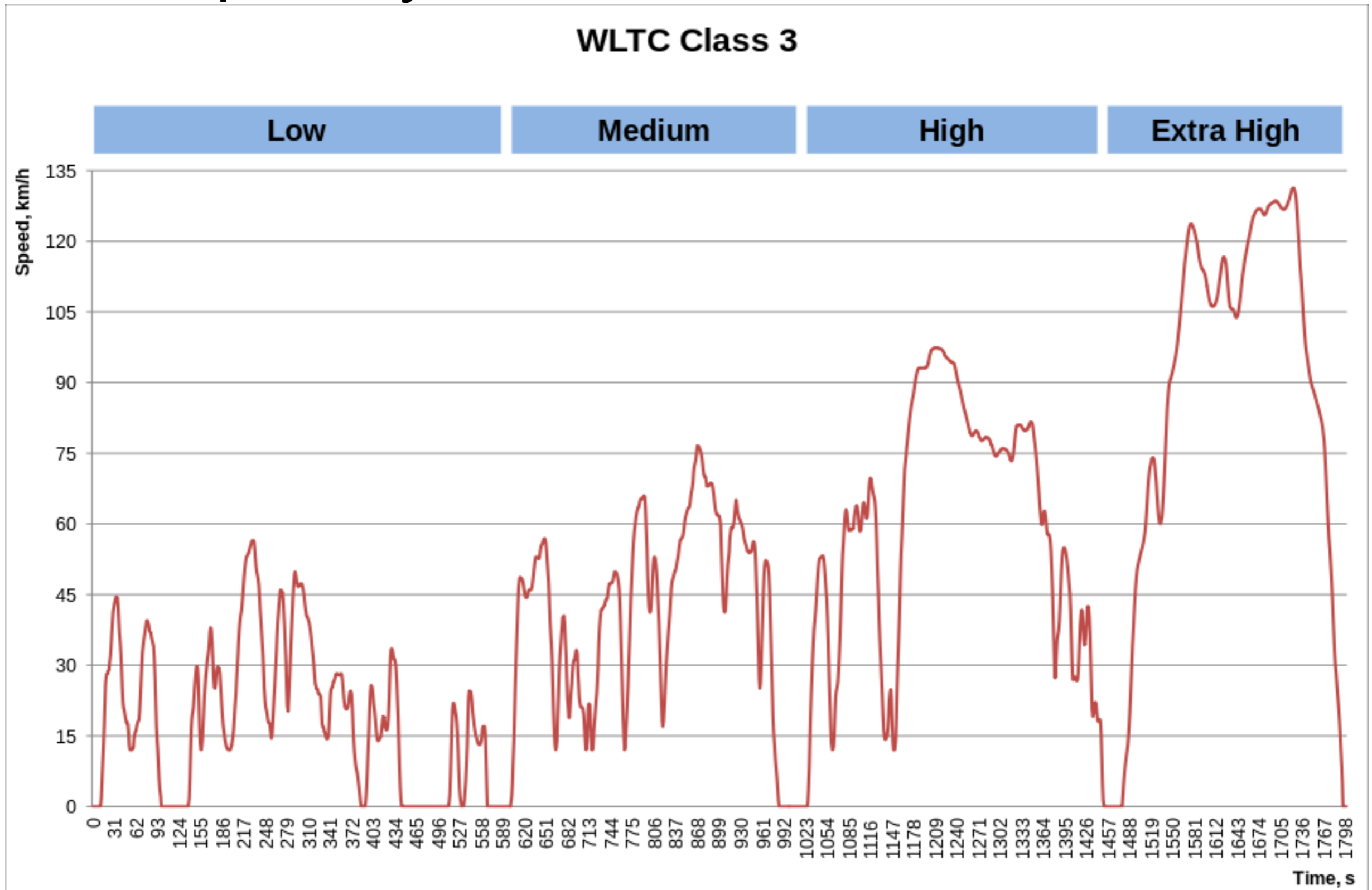
Light-category vehicles 5

Category & Category Name	Sub category & Sub category name	Example
L5e, tricycles	L5Ae Tricycles	
	L5Be Commercial tricycles	

Light-category vehicles 6 and 7

Category & Category Name	Sub category & Sub category name	Example
L6e, Light quadricycle	L6Ae Light on-road quad	
	L6Be Light mini-car	
L7e, Heavy quadricycle	L7Ae Heavy on-road quad	
	L7Be Heavy mini-car	

World Light Duty Test Procedure (WLTP) adopted by the UN-ECE for use >2017



Thank you for your kind attention !

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Dates	Vehicle category	Vehicle cat. description	Test cycle	Propulsion class	CO (g/km)	THC (g/km)	NOx (g/km)	PM (g/km) ⁽⁵⁾	THC+NOx (g/km)
Euro 3 ⁽¹⁾									
NV: 01 July 2013 (Optional) 01 Jan 2014 (Obligatory) AV: 01 Jan 2015 (Obligatory)	L1Ae	Powered cycle ⁽⁴⁾	UNECE R47	PI/CI/Hybrid	0.56	0.10	0.13	-	-
	L1Be	Two-wheel moped		PI/CI/Hybrid	1.00	-	-	-	1.20
	L2e	Three-wheel moped		PI/CI/Hybrid	3.50	-	-	-	1.20
	L3e ⁽¹⁾ L4e L5Ae L7Ae	<ul style="list-style-type: none"> • Two-wheel motor-cycle w and w/o sidecar • Tricycle • Heavy on-road quad 	WMTC, phase 2	PI, V _{max} < 130 km/h	1.97	0.56	0.13	-	-
	PI, V _{max} ≥ 130 km/h			1.97	0.25	0.17	-	-	
	CI/ Hybrid			1.00	0.10	0.57	0.10	-	
	L5Be	Commercial tricycle	UNECE R40	PI	4.00	1.00	0.25	-	-
				CI/ Hybrid	1.00	0.15	0.65	0.10	-
	L6Ae L6Be	Light on-road quadricycle Light mini-car	UNECE R47	PI	3.50	-	-	-	1.20
				CI/ Hybrid	1.00	0.15	0.65	0.10	-
L7Be	Heavy mini-car	UNECE R40	PI	4.00	1.00	0.25	-	-	
			CI/ Hybrid	1.00	0.15	0.65	0.10	-	

Dates	Vehicle category	Vehicle cat. description	Test cycle	Propulsion class	CO (g/km)	THC (g/km)	NOx (g/km)	PM (g/km) ⁽⁵⁾	THC+NOx (g/km)
Euro 4 ⁽²⁾									
NV: 01 Jan 2015 (Optional) 01 Jan 2017 (Obligatory) AV: 01 Jan 2018 (Obligatory)	L1Ae	Powered cycle	UNECE R47	PI/CI/Hybrid	0.56	0.10	0.07	-	-
	L1Be	Two-wheel moped		PI/CI/Hybrid	1.00	0.63	0.17	-	-
	L2e	Three-wheel moped		PI/CI/Hybrid	1.90	0.73	0.17	-	-
	L3e ⁽²⁾ L4e L5Ae L7Ae	<ul style="list-style-type: none"> • Two-wheel motorcycle w and w/o sidecar • Tricycle • Heavy on-road quad 	WMTC, phase 2	PI, $V_{max} < 130$ km/h	1.14	0.38	0.07	-	-
	PI, $V_{max} \geq 130$ km/h	1.14		0.17	0.09	-	-		
	CI/ Hybrid	1.00		0.10	0.30	0.08	-		
	L5Be	Commercial tricycle	UNECE R40	PI	2.00	0.55	0.25	-	-
				CI/ Hybrid	1.00	0.10	0.55	0.08	-
	L6Ae L6Be	Light on-road quadricycle Light mini-car	UNECE R47	PI	1.90	0.73	0.17	-	0.08
				CI/ Hybrid	1.00	0.10	0.55	0.10	-
	L7Be	Heavy mini-car	UNECE R40	PI	2.00	0.55	0.25	-	-
				CI/ Hybrid	1.00	0.10	0.55	0.10	-

Dates	Vehicle category	Vehicle cat. description	Test cycle	Propulsion class	CO (g/km)	THC (g/km)	NOx (g/km)	PM (g/km) ⁽⁵⁾	THC+NOx (g/km)
Euro 5 ⁽³⁾									
NV: 01 Jan 2018 (Optional) 01 Jan 2020 (Obligatory) AV: 01 Jan 2021 (Obligatory)	L1Ae	Powered cycle	Revised WMTC	PI /CI/ Hybrid	0.50	THC 0.010	0.060	0.0045	-
	L1Be-L7e ⁽³⁾	All other L-category vehicles	Revised WMTC	PI	1.00		0.060	0.0045	-
			Revised WMTC	CI / Hybrid	0.50	NMHC 0.068	0.060	0.0045	-

(1) Category L3e: Euro 4

(2) Category L3e: Euro 5

(3) Category L3e: Euro 6

(4) Bicycle with auxiliary engine

(5) PM measured in CI engines or in hybrids with CI engines

NV: New vehicle

AV: All vehicles

NMHC: Non-methane hydrocarbon.