



3. General Background

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Explanation of L-Category Vehicles

- LVs cover a wide range of vehicle characteristics and huge variability in their usage cases



- Motorcycles for road trips

- All-terrain on-road vehicles

- Urban solely, maximum designed vehicle speed ≤ 45 km/h

Explanation of L-Category Vehicles

- What do L-Category vehicles cover?
 - Not only two-wheelers are eligible for L-Category

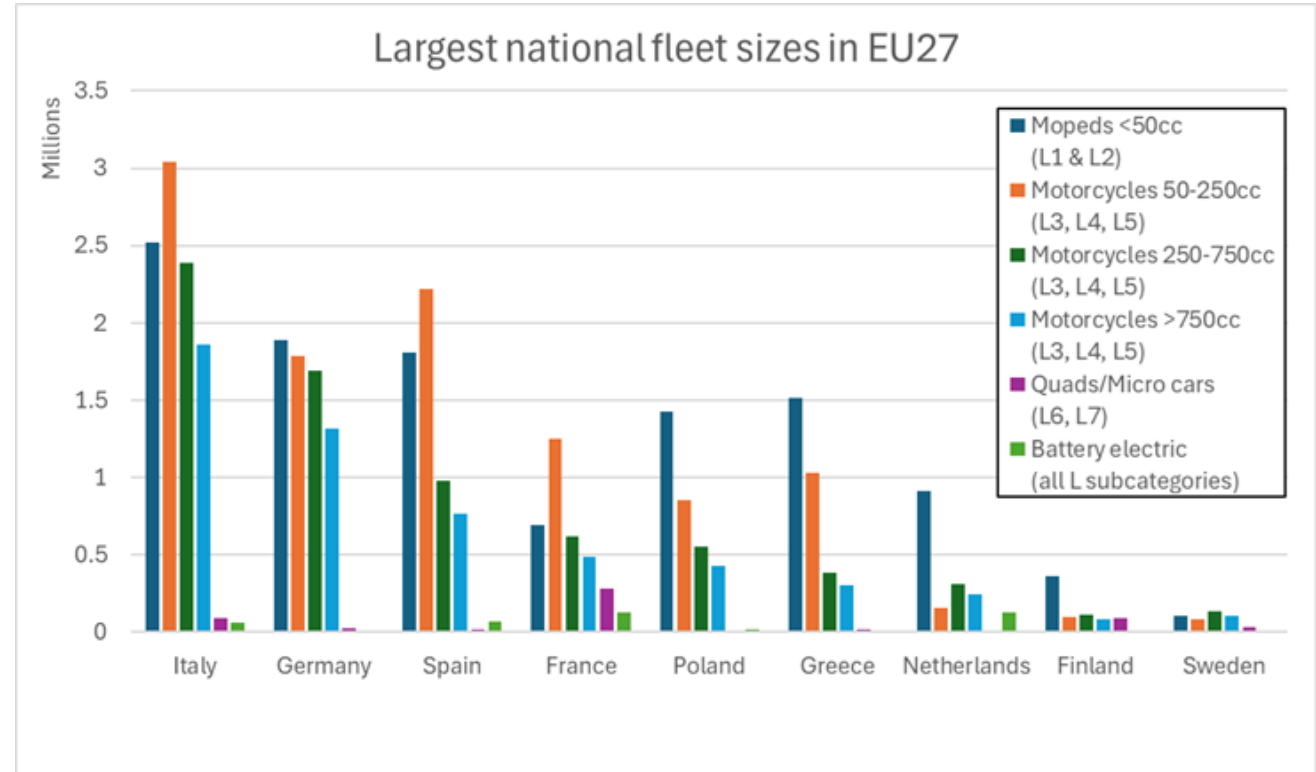
Category	Sub-Category	
L1e	L1e-B - Two-Wheel moped	
L2e	L2e-P - 3-wheel moped for passenger transport	
	L2e-U - 3-wheel moped for utility purposes	
L3e & L4e	L3e-A1 - Low-performance motorcycle	
	L3e-A2 - Medium-performance motorcycle	
	L3e-A3 - High-performance motorcycle	
	L3e-AxE - Enduro motorcycles	

Category	Sub-Category	
L5e	L5e-A - Tricycle	
	L5e-B - Commercial tricycle	
L6e	L6e-A - Light on-road quad	
	L6e-B - Light quadri-mobile	 BP
L7e	L7e-B1 - All terrain quad	
	L7e-B2 - Side By Side Buggy	

Source: R(EU) 168/2013, (european-union.europa.eu)

Explanation of L-Category Vehicles

- Usage of LVs vehicles in European regions
 - Urban mobility predominates
 - Young driver's mobility (>15 years)
 - Enthusiasts (touring and sports) profile drivers (eventual usage)
 - South Europe regions
 - Used throughout the year
 - More common than in northern regions
 - North Europe regions
 - Not usually used in cold weather season

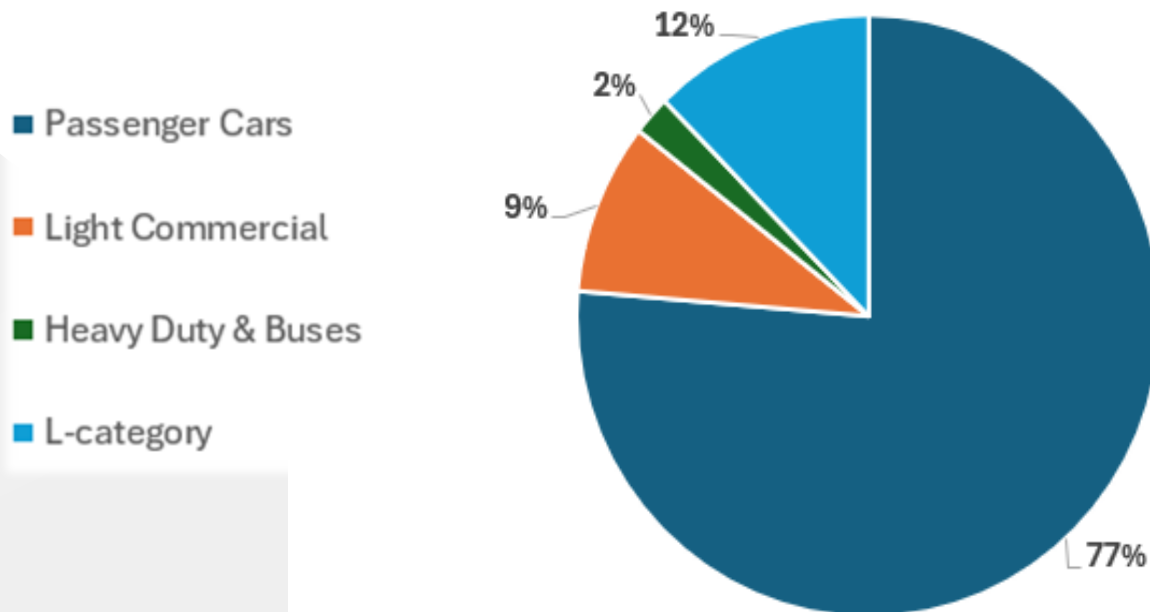


Source: ACEM, 2022 (www.acem.eu)

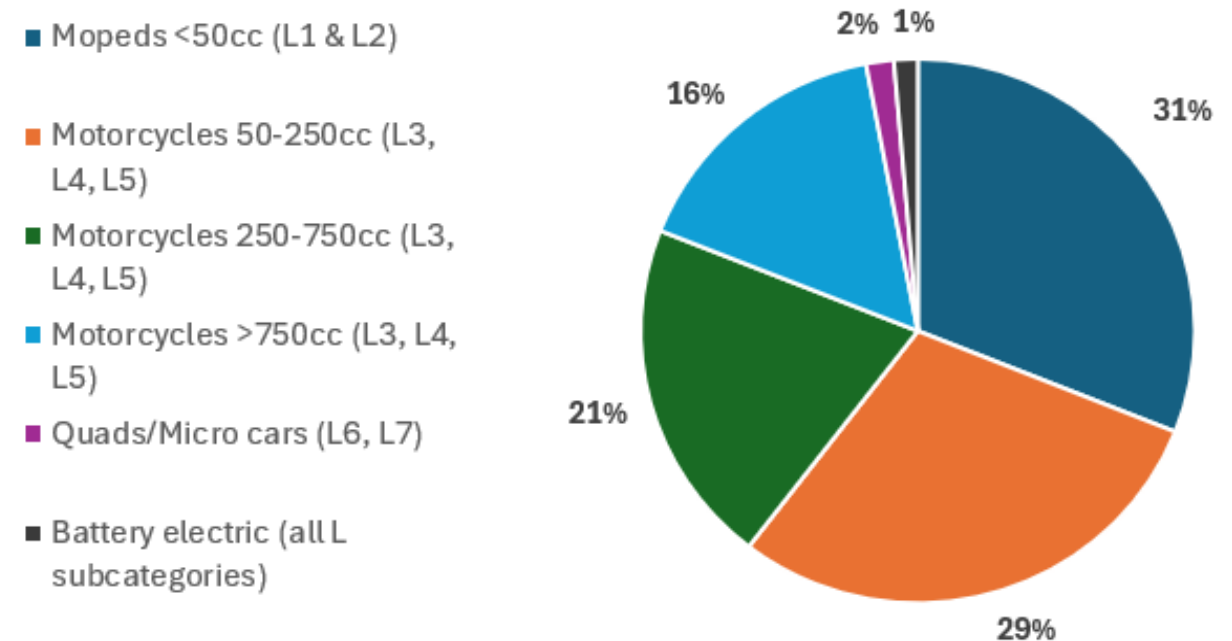
Population of L-Vehicles & Sub-Categories

- EU road vehicle fleet: 327 million vehicles (2022 data)

2022 European % fleet share



L subcategories % fleet share (2022)



Sources: 1. ACEA, 2022 (www.acea.auto) , 2. ACEM, 2022 (www.acem.eu)

Source: ACEM, 2022 (www.acem.eu)

Regulations for L-Category Vehicles

- REGULATION (EU) No 168/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 January 2013:
Approval and market surveillance of two- or three-wheel vehicles and quadricycles
 - Tailpipe emission limits after cold start
 - Sound-level limits — Euro 4 and Euro 5
- COMMISSION DELEGATED REGULATION (EU) No 134/2014 of 16 December 2013 supplementing Regulation (EU) No 168/2013:
Environmental and propulsion unit performance requirements and amending Annex V
 - Environmental & propulsion performance test procedures
- Several other regulations, also on traffic side, ...

Regulations for L-Category Vehicles

Evolution and extensions were done over the years, i.e introducing more dynamic driving for noise emission (ASEP) and exhaust emission (new driving cycle WMTC) as well as stricter limits.

Exhaust emission

- Euro 1→3: establish limits & basic procedures for L-category
- Euro 4: switch to WMTC, introduce OBD, broaden category scope
- Euro 5: strengthen limits incl. PM for DI, keep WMTC; harmonisation/maintenance via later updates
- Euro5+: introduction of catalyst ageing, additional OBD regulations

Regulations for L-Category Vehicles

Noise emission

- 1997: EU 97/24/EC sets early L-vehicle noise requirements. EUR-Lex
- 2012–2014: UN R41 (rev. text) consolidates PMR-based motorcycle limits and introduces ASEP; EU integrates UNECE references under the new framework. UNECE
- 2017–2020: Consolidations/updates of R63 (mopeds) and R9 (3-wheelers /quadricycles).
- 2023–2025: EU updates references (“Euro 5+” maintenance); many authorities switch to newer series (e.g., R41.05, R63.02, R9.07) for approvals from 1 Jan 2025; R41-06 / ASEP is adopted

Regulations for L-Category Vehicles

Key measurement figures for noise (sound pressure level) and emission (components)

- Regulated exhaust emission components; limits in [g/km] from laboratory measurements of driving cycles
 - CO, THC, NMHC, NO_x, (PM)
- Pass-by noise test results (R41 / R63 / R9)
 - **Maximum sound emission levels, Additional Sound Emission Provisions**
- Still some key figures are not considered: i.e. coverage of whole driving range and annoyance for noise, additional components like NH₃ or particulate number for all engine types
- Not all regulation components are mandatory EU-wide i.e. Periodic technical inspections (PTI), registration of small vehicles

Test by LENS

150

Vehicles



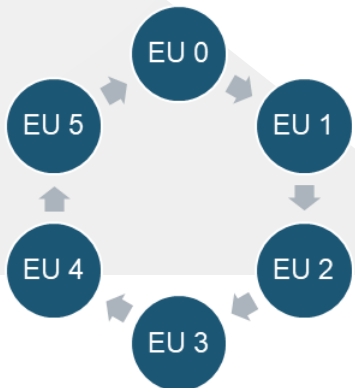
All L-categories

10k

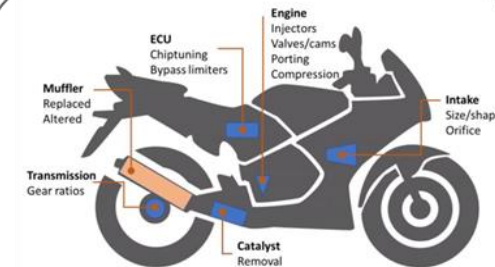


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Several emission classes



On-road & laboratory



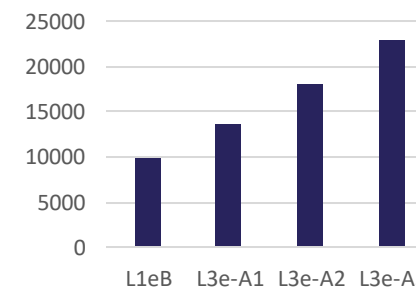
Source: [LENS D5.1 LVs tampering and undesirable effects](#), 2023 ([LENS](#))

Original setting & tampered



Various brands

Average Mileage (km)

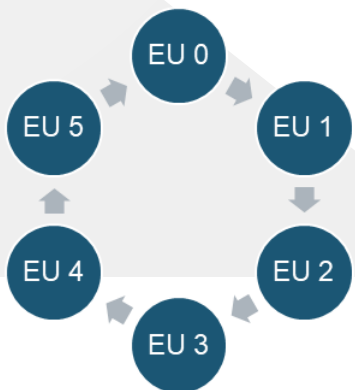


Different mileages

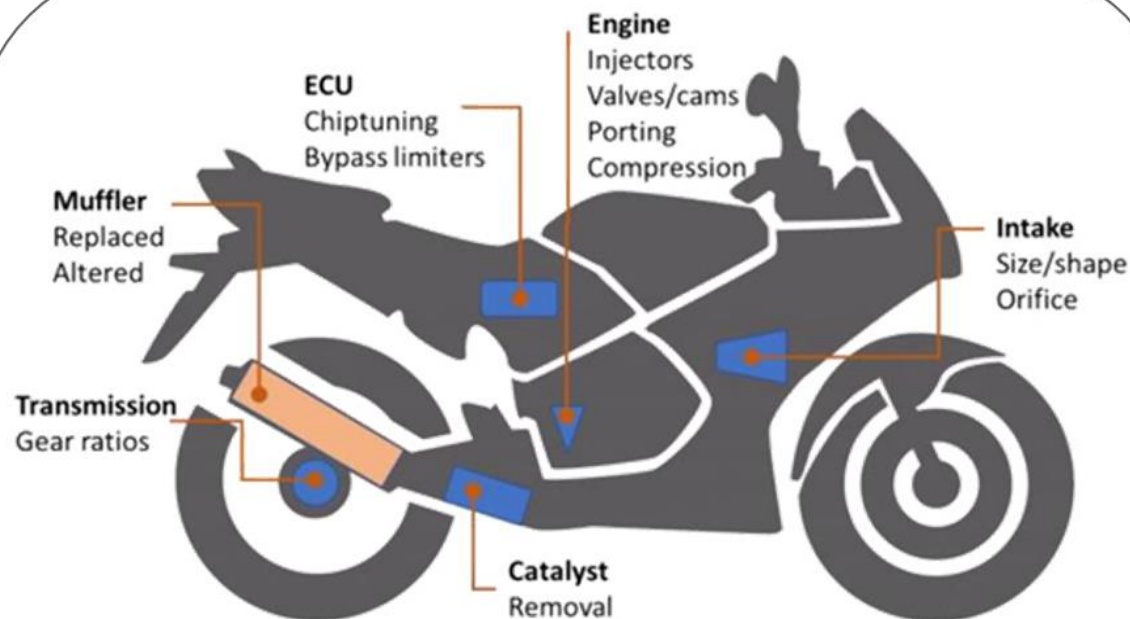
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Vehicles



Several emission classes

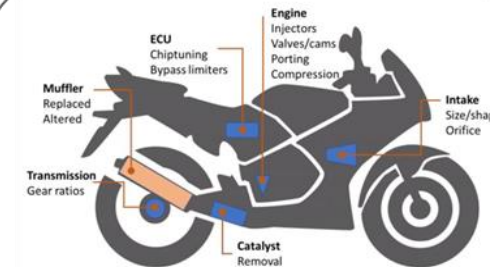


Tampering

modifications of the vehicle which puts the vehicle in a state non-conform with original type approval

For LENS:

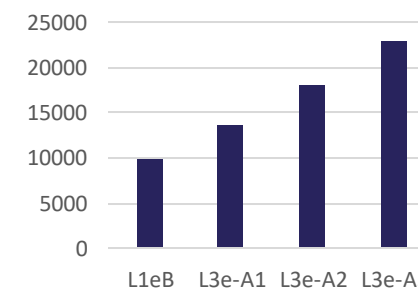
visual and obvious modification of the vehicle



Source: [LENS D5.1 LVs tampering and undesirable effects](#), 2023 ([LENS](#))

Original setting & tampered

Average Mileage (km)



Different mileages

Thank you for your attention!

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