



The
Motorcycle
Industry In
Europe

RIGHTSIZING URBAN MOBILITY

The L-Category integration guide for
European cities

Contents

Executive Summary	3
1. Introduction	4
1.1 The SUMP framework.....	4
1.2 The L-category opportunity	5
2. Understanding the L-category	6
2.1 Diverse use cases	7
2.2 Rightsizing Urban Mobility.....	7
3. Meeting urban mobility challenges	9
3.1 Mobility and efficiency benefits	9
Time savings	9
Space efficiency.....	10
Congestion reduction.....	11
3.2 Environmental benefits.....	11
Emissions performance	11
Electrification momentum.....	11
3.3 Economic and social benefits	12
Affordability and accessibility	12
3.4 The power of a small shift.....	13
4. L-category vehicles in SUMP: diagnosis and approach.....	14
4.1 The gap in current indicator requirements.....	14
4.2 Optimising urban mobility with L-category vehicles	15
Recommended indicators:.....	15
4.3 Recognising riders as Vulnerable Road Users	16
Mandatory Safety Indicators (Draft EU Implementing Act).....	16
Recommended supplementary indicators.....	16
4.4 Assess vehicle emissions across the municipality	17
Mandatory environmental indicators (EU Implementing Act).....	17
Recommended supplementary indicators	17
5. Conclusion	18
ANNEX 1	19

Executive Summary

By December 2027, 431 European cities designated as urban nodes under the revised TEN-T Regulation must implement Sustainable Urban Mobility Plans (SUMP). As local authorities develop these plans, they face the challenge of meeting ambitious sustainability and efficiency targets while addressing persistent urban mobility challenges: congestion, air quality, spatial constraints, and equitable access to transport.

L-category vehicles - motorcycles, mopeds, tricycles, and quadricycles - represent a significant component of the European mobility system, with more than 40 million vehicles in circulation and 6.4 million daily motorcycle commuters (a 28% increase since 2019). However, these vehicles remain systematically underrepresented in urban mobility planning. Many SUMP fail to collect relevant usage data, recognise their distinct characteristics, or integrate them into policy frameworks. This oversight represents a significant missed opportunity for cities seeking to balance mobility needs with sustainability requirements.

Yet L-category vehicles are not a marginal or emerging mode: they are an established and growing reality in European cities that requires strategic integration within urban mobility planning. The vehicles have special characteristics that distinguish them from other modes of transport. Their presence requires deliberate management within urban mobility planning processes to ensure that cities can benefit from their efficiency, compact size, flexibility and lower emissions, while also addressing potential externalities, including road safety considerations, in a balanced and structured way.

The evidence base for L-category integration is compelling. Research demonstrates that a 10% modal shift from cars to L-category vehicles reduces total traffic congestion by nearly 40% for all road users. L-category vehicles occupy approximately 2.9 square metres of parking space compared to 11.5 square metres for cars — nearly four motorcycles fit in a single standard car parking space. Moreover, commuters already choosing motorcycles are contributing to a measurable reduction in overall CO₂ emissions and associated economic costs.

This guidance document provides local authorities with a practical framework for integrating L-category vehicles into their SUMP – ensuring that cities can unlock the full potential of these vehicles to deliver smarter, safer, and more sustainable urban mobility.

1. Introduction

Europe is one of the most urbanised regions in the world. According to the European Commission's knowledge platform, approximately 75% of the EU population currently lives in urban areas¹ – cities, towns, and suburbs. This proportion is projected to continue growing, reaching 84% by 2050. These urban areas generate over 80% of European GDP and concentrate the majority of employment, education, and services².

Urban concentration brings significant mobility challenges. European cities face persistent congestion, with urban transport responsible for approximately 23% of all transport greenhouse gas emissions³. The diversity of road users in dense urban environments, including pedestrians, cyclists, micromobility users, powered two-wheeler riders, cars, delivery services and public transport, underscores the need for rightsizing mobility: matching vehicle size, speed, and characteristics to the specific requirements of urban journeys and street contexts. These challenges require strategic, evidence-based approaches to urban mobility planning.

1.1 The SUMP framework

The European Commission introduced Sustainable Urban Mobility Plans (SUMPs) in 2013 as a comprehensive framework guiding cities toward integrated, sustainable transport policies. A SUMP is a strategic plan designed to satisfy the mobility needs of people and businesses in cities and their surrounding functional urban areas, while improving the quality of life.

The 2024 revision of the Trans-European Transport Network (TEN-T) Regulation significantly strengthened SUMP requirements. Under the revised regulation, 431 cities designated as urban nodes must adopt a SUMP and collect standardised urban mobility indicators by 31 December 2027. An Implementing Act, currently under preparation by the European Commission, will define the specific indicators, methodology, and reporting timeline.

¹ European Commission, *New Eurobarometer survey highlights urgent urban challenges and investment needs across EU cities*, 19 Jun 2025, https://ec.europa.eu/regional_policy/whats-new/newsroom/19-06-2025-new-eurobarometer-survey-highlights-urgent-urban-challenges-and-investment-needs-across-eu-cities_en.

² Eurostat, *Urban-rural Europe – demographic developments in cities*, version 650416, Eurostat Statistics Explained, European Commission, <https://ec.europa.eu/eurostat/statistics-explained/index.php?oldid=650416>

³ European Commission, *Sustainable urban mobility*, Mobility and Transport – Urban transport (European Commission) https://transport.ec.europa.eu/transport-themes/urban-transport/sustainable-urban-mobility_en

1.2 The L-category opportunity

L-category vehicles – two-, three-, and four-wheeled motor vehicles, including mopeds, motorcycles, tricycles, and quadricycles (defined under EU Regulation 168/2013), play an increasingly important role in European urban mobility. More than 40 million L-category vehicles are currently in circulation across the EU, and new registrations continue to grow. Across the EU, 6.4 million people commute to work by motorcycle each day, an increase of 28% compared with 5.0 million motorcycle commuters in 2019.

Both electric and combustion engine L-category vehicles offer substantial advantages to urban environments. They are agile, space-efficient, and low-emission, improving the mobility of people and small freight both in urban and peri-urban areas.

Despite their documented benefits and widespread use, L-category vehicles remain systematically underrepresented, a reflection of the broader urban gap in local mobility policies. Many SUMP's fail to recognise the category's unique characteristics, or overlook the mobility advantages these vehicles offer to those using them and wider society. Failing to explicitly address this segment of mobility may limit cities' ability to optimise their contribution to congestion reduction, space efficiency and emissions objectives, while also reducing their capacity to manage associated externalities in a structured and proportionate manner.

By recognising motorcycles as a strategic part of the urban mobility system, cities can fully leverage their potential for smarter, more sustainable mobility.

We call on all urban policymakers to embrace this guidance and actively incorporate L-category vehicles into their mobility planning, ensuring that cities are equipped to meet the mobility challenges of today and tomorrow.

2. Understanding the L-category

The L-category encompasses a diverse range of vehicles designed for different purposes and users. Understanding this diversity is essential for developing appropriate policies and infrastructure. Under EU Regulation 168/2013, L-category vehicles are classified as follows:

- **L1e (Two-wheel mopeds):** Maximum design speed ≤ 45 km/h, engine capacity ≤ 50 cm³ or motor power ≤ 4 kW, and maximum dimensions ≤ 4 m x1m. Standard mopeds.
- **L2e (Three-wheel mopeds):** Same power and speed limits as L1e, but with three wheels and maximum dimensions of ≤ 4 m x2m.
- **L3e (Two-wheel motorcycles):** Design speed >45 km/h and/or engine >50 cm³ and maximum dimensions ≤ 4 m x2m. Subdivided by power and speed into categories from low performance to unlimited performance motorcycles.
- **L4e (Two-wheel motorcycles with sidecar):** Motorcycles equipped with a sidecar for passengers or cargo.
- **L5e (Powered tricycles):** Three-wheeled vehicles with design speed >45 km/h and maximum dimensions ≤ 4 m x2m, including both passenger and commercial variants.
- **L6e (Light quadricycles):** Four-wheeled vehicles with unladen mass ≤ 425 kg and maximum continuous power ≤ 6 kW with a maximum design speed ≤ 45 km/h and maximum dimensions ≤ 4 m x2m
- **L7e (Heavy quadricycles):** Four-wheeled vehicles with unladen mass ≤ 450 kg (passenger) or ≤ 600 kg (goods), power ≤ 15 kW and maximum dimensions ≤ 4 m x2m.



2.1 Diverse use cases

L-category vehicles serve multiple functions in the urban mobility ecosystem. Beyond personal transport, they are extensively used for cargo transport and delivery services, providing efficient solutions for urban logistics. Their compact dimensions and manoeuvrability enable access to areas often inaccessible to larger vehicles, making them particularly suitable for last-mile deliveries, courier operations, and light commercial transport. Their characteristics make them easily compatible with walking and cycling. In addition, they play an important role in public and community services, including police, emergency response, and municipal operations, where efficient intervention, agility, and accessibility are essential.

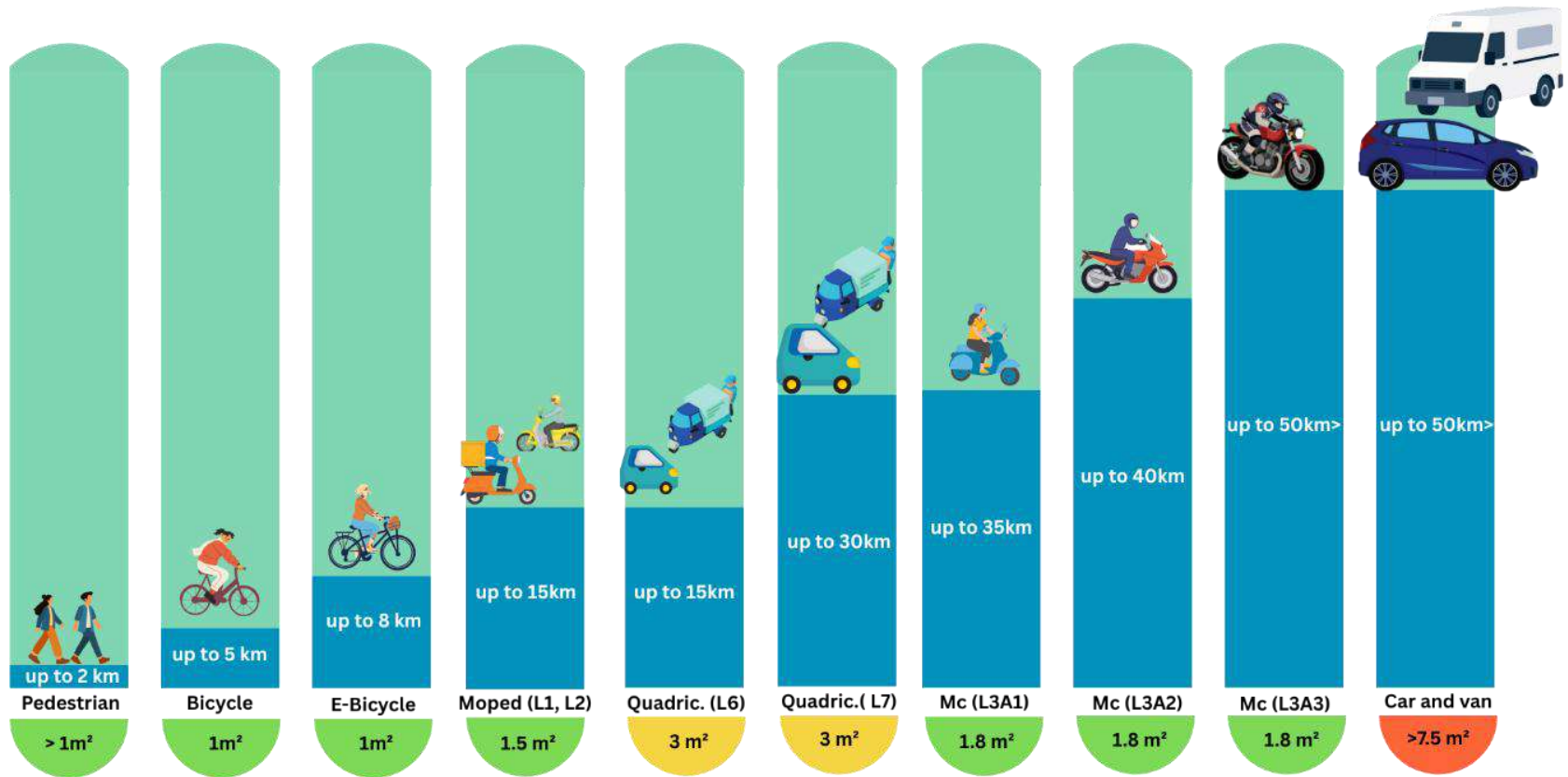
The rapid growth of food delivery, e-commerce logistics, and courier services across European cities has increased reliance on L-category vehicles. Electric mopeds and small motorcycles are increasingly deployed by sharing operators and fleet managers for sustainable urban delivery.

Quadricycles and microcars provide weather-protected and cargo-friendly solutions that are particularly well-suited for longer commutes in suburban and peri-urban environments. Their larger size and enclosed structure offer additional design flexibility, enabling the integration of electric powertrains and battery systems that can deliver extended range and practical everyday usability, while meeting the evolving mobility needs of users.

2.2 Rightsizing Urban Mobility

Functional Urban Areas (FUAs) – encompassing city centres and their surrounding commuting zones – require transport solutions adapted to varying distances, densities, and purposes. The concept of "rightsizing" mobility involves choosing the most appropriate vehicle for each trip based on efficiency, space, environmental impact, and practicality.

L-category vehicles play a central role in rightsizing urban transport. For trips too long for walking or cycling but where a full-sized car is unnecessary – typically 5-30 km urban and suburban journeys – L-category vehicles offer optimal efficiency. By integrating these vehicles into the urban mobility mix, cities can reduce car dependency, lower congestion, and optimise street use while maintaining individual mobility options.



3. Meeting urban mobility challenges

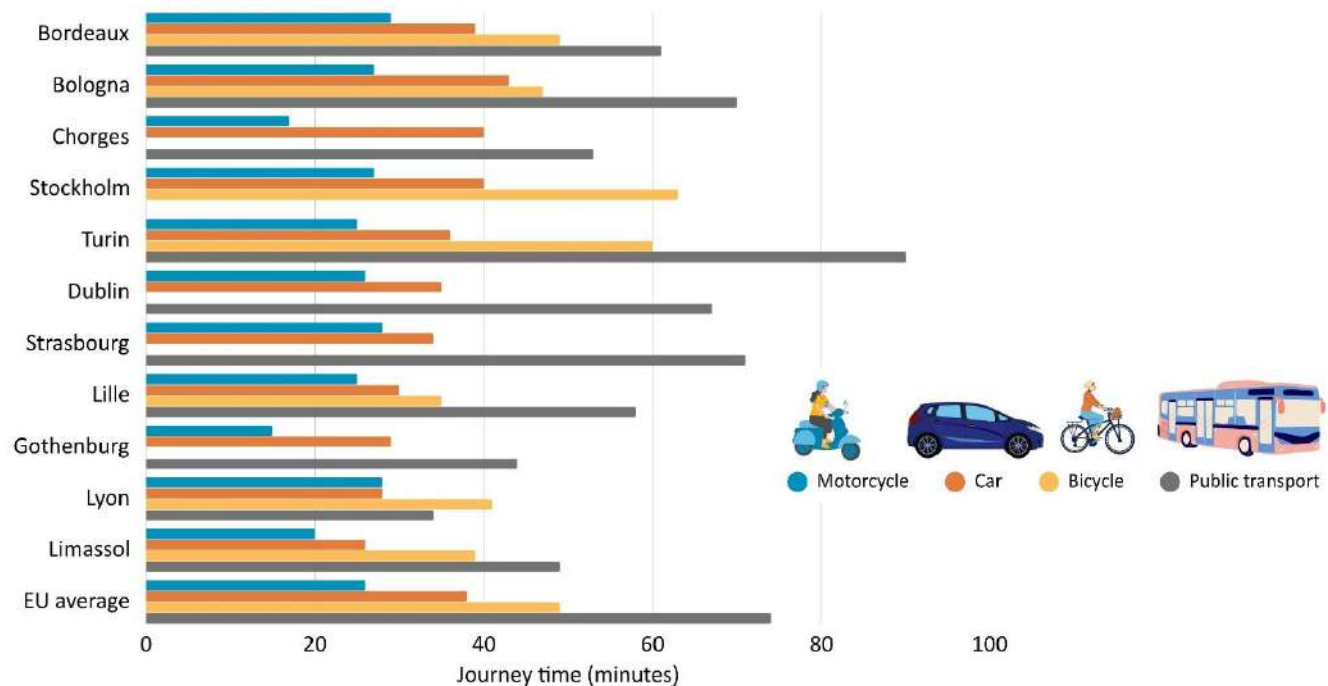
Sustainable urban mobility planning requires evidence-based assessment of how different transport modes contribute to policy objectives. This section presents research findings on the performance of L-category vehicles across three areas critical to SUMP development: mobility and efficiency benefits, environmental performance, and economic and social outcomes.

3.1 Mobility and efficiency benefits

Time savings

Journey time efficiency is a critical metric for evaluating urban transport performance and modal competitiveness. Multiple independent studies demonstrate substantial time savings from L-category vehicle use. A comprehensive study published in *Transport Policy*, analysing Paris mobility data⁴, found that switching from cars to motorcycles yields significant journey time reductions – with time savings translating directly into improved quality of life, reduced commuting stress, and economic productivity gains.

The Federation of European Motorcyclists' Associations (FEMA) mobility tests⁵ across 12 European cities consistently show that powered two-wheelers complete urban journeys, reducing commuting time by 33% compared with cars - 26 minutes versus 38 minutes — and significantly faster than public transport. Additionally, the search for a parking space can also be a time-consuming aspect of car travel. Car drivers spend an average of between 10 to 15 minutes searching for a parking spot⁶ — significantly longer than motorcycles, which generally require less time to find a suitable parking space.



Source: Federation of European Motorcyclists' Associations (FEMA), 2023.

⁴ Pierre Kopp, *The unpredicted rise of motorcycles: a cost-benefit analysis*, *Transport Policy*, volume 18, issue 4, 2011 https://www.researchgate.net/publication/227427438_The_Unpredicted_Rise_of_Motorcycles_A_Cost_Benefit_Analysis_of_the_Paris_Case

⁵ Federation of European Motorcyclists' Associations (FEMA), *Mobility test 2023* <https://www.femamotorcycling.eu/mobility-test-2023/>

⁶ APCOA Parking – Search for parking space devours time and money (2013) Accessible [here](#).

Space efficiency

Urban space is finite and valuable. L-category vehicles use less space than cars, both when parked and in motion.

A typical car parking space measures about 11.5 square metres, while a motorcycle needs only around 2.9 square metres — including room to mount and dismount. This means nearly four motorcycles can fit in a single standard car parking space.

Mode and configuration	Space consumption per vehicle m ²	Occupancy rate	Space consumption per person m ²
Car (on-street, parallel)	10	1,39	7,2
Car (on-street, angled)	12	1,39	8,6
Car (car park)	25	1,39	18
PTW (on-street)	1,5	1	1,5
PTW (car park)	2,5	1	2,5
Bicycle (stand)	0,8	1	0,8
Bicycle (two-level rack)	0,6	1	0,6
Bus (12m)	70	20	3,5
Bus (12m, peak hour)	70	50	1,4

⁷ Source : Transport & Mobility Leuven, VIAS & FPS Mobility (2022); calculations based on Héran et al. (2011)

⁷ Transport & Mobility Leuven, VIAS Institute, & FPS Mobility and Transport. (2022). *Powered two-wheelers and their impact on mobility, the environment and road safety: A study on the Belgian market.* <https://vias.be/publications/Powered%20two-wheelers%20and%20their%20impact/Powered%20two-wheelers%20and%20their%20impact.pdf>

Congestion reduction

Perhaps the most compelling efficiency argument concerns congestion. A landmark study by Transport & Mobility Leuven⁸, examining the Brussels-Leuven corridor, found that replacing 11% of cars with motorcycles reduced total time lost in traffic for all road users by 39%. This is not a marginal improvement; it represents a transformative reduction benefiting everyone on the road.

3.2 Environmental benefits

Emissions performance

Under the Euro 5+ standard, which became mandatory for all new L-category vehicles from January 2025, tailpipe emission limits for motorcycles are aligned with those of Euro 6 passenger cars. In practice, emission factors from the COPERT database show that Euro 4 and Euro 5 motorcycles already emit significantly less PM and NOx than many Euro 6 cars. Combined emissions of hydrocarbons and nitrogen oxides have been reduced by over 96% since Euro 1 standards were introduced.

Additionally, the lower weight and smaller contact area of powered two-wheelers reduce road surface degradation, which in turn reduces airborne particulate matter from tyre and road wear, an increasingly recognised source of urban air pollution that persists even with vehicle electrification.

Electrification momentum

The L-category sector is actively transitioning to electric propulsion. This rapid adoption is driven by falling battery costs, improving range, and urban access policies favouring zero-emission vehicles.

Electric L-category vehicles offer multiple advantages. Zero tailpipe emissions contribute directly to urban air quality goals; significantly quieter operation reduces noise pollution; short charging times and low energy consumption make them practical for daily use. Moreover, removable battery systems enable convenient charging.

The combination of already-low emissions from conventional Euro 5+ vehicles and rapid electrification positions the L-category sector as a key partner in achieving urban air quality and climate objectives for the cities.

⁸ Transport & Mobility Leuven, VIAS Institute, & FPS Mobility and Transport. (2022). *Powered two-wheelers and their impact on mobility, the environment and road safety: A study on the Belgian market.* <https://vias.be/publications/Powered%20two-wheelers%20and%20their%20impact/Powered%20two-wheelers%20and%20their%20impact.pdf>

3.3 Economic and social benefits

Affordability and accessibility

L-category vehicles represent the most affordable motorised transport option across purchase, maintenance, and operating costs.

Fuel consumption data from the EMISIA COPERT model shows that motorcycles consume an average of 3.85 litres per 100 km compared to 7.57 litres for cars, approximately half the fuel use. Maintenance costs are correspondingly lower due to reduced wear and tear. Using Italian government business mileage rates as a benchmark, the 2024 cost per kilometre for a typical city motorcycle (€0.17) is less than half that of a compact city car (€0.38), with total operating costs lower than public transport for daily commuting.

This affordability makes motorised mobility accessible, providing crucial access in suburban and peri-urban areas where public transport coverage may be limited. For many lower- and middle-income households, L-category vehicles represent the difference between mobility and isolation.

3.4 The power of a small shift

Even modest changes in commuting patterns can yield remarkable system-wide benefits. Consider what would happen if just 0.5% of car commuters across Europe switched to motorcycles, adding around 700,000 new motorcycle riders to our roads. This seemingly small shift would save approximately 5,800 collective days of commuting time across all riders on a typical commute day, totalling 3.2 million days saved annually. For individual commuters, this translates to 99 hours saved per year - more than four full days.

The economic implications are equally compelling. That same 0.5% modal shift would generate €860 million in total savings across the EU and UK. Scale this to 5% of commuters - approximately 6.6 million people, and the savings multiply to €8.6 billion. At the individual level, commuters switching from car to motorcycle could save approximately €580 annually in reduced fuel consumption, maintenance, and operating costs.

Beyond time and money, the spatial efficiency gains are transformative. The Oxford Economics study on the importance of motorcycles in Europe estimates that replacing just 1% of cars with motorcycles across the EU and UK would free up approximately 25 km² of parking space, roughly half the size of Luxembourg City. A 5% shift would exceed the entire area of Paris, freeing 124 km² for alternative uses. At 10%, nearly 250 km² of urban space would be reclaimed, roughly the size of Bucharest. Space that could be repurposed for other community-focused developments that make cities more liveable.

The congestion benefits extend to all road users, not just those who switch modes. Research by Transport & Mobility Leuven demonstrated that a 25% modal shift to motorcycles would effectively eliminate congestion on the studied Brussels-Leuven corridor, proving that L-category integration is a system-level intervention improving conditions for everyone on the road.

Environmental benefits accompany these efficiency gains. A 5% shift from cars to motorcycles across the EU and UK would reduce CO₂ emissions by 2.6 million tonnes annually, delivering €308 million in avoided climate costs. Current motorcycle commuters, representing 3.4% of the roughly 188 million people who commute by private or public transport across the EU and UK, are already contributing significantly, having reduced emissions by 1.8 million tonnes and saving €209 million in economic costs.

These findings underscore a critical insight: promoting L-category vehicles isn't simply about accommodating an existing transport mode; it's about unlocking systemic improvements in urban mobility that benefit entire communities.

4. L-category vehicles in SUMP: diagnosis and approach

To properly integrate L-category vehicles into SUMP, local authorities need to understand how these vehicles are used in their municipality. This knowledge enables the design of measures that promote safe, efficient, and complementary transport alongside other modes.

Within private motorised transport, L-category vehicles should be prioritised over larger vehicles due to their higher efficiency, lower emissions, reduced space requirements, and lower energy consumption. SUMP should reference relevant public data and include measures that improve coexistence between L-category vehicles and other road users.

Effective L-category integration requires a comprehensive approach addressing three interconnected action fields:

- **Mobility:** Leveraging space efficiency to improve traffic flow and reduce congestion.
- **Safety:** Recognising riders as vulnerable road users requiring specific protective measures.
- **Environmental aspects:** Supporting the transition to zero-emission mobility across all vehicle categories and ensuring environmental policies reflect the characteristics of different vehicle types.

These three dimensions are mutually reinforcing; many measures deliver benefits across multiple areas simultaneously. The Annex to this document provides a comprehensive catalogue of specific, actionable policy measures to support implementation planning.

4.1 The gap in current indicator requirements

The European Commission worked with mobility experts to develop detailed technical sheets defining comprehensive indicators, methodologies, and metrics covering traffic, safety, accessibility, and environmental aspects. However, in the draft Implementing Act, many of these proposed indicators have been reduced, and the role of L-category vehicles is barely reflected.

Cities should therefore complement the mandatory requirements with L-category-specific data to ensure that urban mobility is fully represented and that policies are based on a complete understanding of city transport. Only by integrating this data can policymakers capture the full urban mobility picture and design measures that reflect the diversity of vehicles, uses, and mobility patterns present in urban environments. **Recommended L-category indicators include:**

- **Fleet composition:** total L-category vehicles registered; breakdown by subcategory (mopeds, motorcycles, tricycles, quadricycles); age distribution; environmental classification (Euro standard, electric)
- **Market dynamics:** annual registrations and deregistrations over the previous five years; trend analysis
- **Modal share:** percentage of L-category trips in total motorised trips; comparison with car traffic
- **Ownership patterns:** private vehicles, commercial fleets, sharing/rental services
- **Licensing:** number of motorcycle licence holders by category

4.2 Optimising urban mobility with L-category vehicles

The integration of L-category vehicles into urban mobility should be approached from a system-wide efficiency perspective, taking into account traffic flow, the use of public space, the accessibility of different modes, and the capacity to move people and goods efficiently. This planning approach helps identify which modes are best suited for different trip types and highlights opportunities to optimise the urban transport system without compromising safety or sustainability.

Cities should consider policies on access, traffic management, parking, infrastructure, and urban logistics, as well as collect relevant indicators and metrics to support evidence-based planning and the implementation of measures for L-category vehicles. Strategic use of this data enables the design of solutions that are more efficient, inclusive, environmentally friendly and supportive of social inclusion, ensuring that light vehicles fully contribute to a balanced and integrated urban transport system.

Recommended indicators:

Travel times

- Average travel time for reference trips by public transport (including waiting and transfers)
- Average travel time for reference trips by private car (including parking search)
- Average travel time for reference trips by motorcycle (including parking search)
- Average travel time for reference trips by bicycle and on foot

Spatial efficiency

- Average circulating space occupied per passenger by mode (m² per passenger)
- Parking space required per vehicle by type
- Availability of parking spaces by vehicle type

Cities should leverage these vehicles' characteristics to improve overall traffic flow while ensuring that infrastructure and regulatory frameworks support their safe and efficient operation. Section A of the Annex details specific mobility measures organised into four key areas: traffic management and access policies, dedicated infrastructure, parking provision, and last-mile logistics support.

4.3 Recognising riders as Vulnerable Road Users

Motorcycle and moped riders must be recognised as vulnerable road users. The European Commission classifies powered two-wheeler riders alongside pedestrians and cyclists as vulnerable road users requiring specific consideration⁹.

Rider vulnerability differs from that of pedestrians and cyclists in important ways. Motorcyclists travel at higher speeds and often share space with faster traffic. Their injury mechanisms and crash circumstances require dedicated analysis distinct from other vulnerable road user categories.

Mandatory Safety Indicators (Draft EU Implementing Act)

Cities will be required to collect and report:

- SA.1: Annual road traffic accidents by all vehicle types
- SA.2: Seriously injured persons by gender, age, vehicle type used, and other party involved
- SA.3: Fatalities with the same breakdown

Recommended supplementary indicators

To enable more precise safety planning, cities should additionally collect:

- Accident frequency and severity specifically for L-category vehicles.
- Location analysis: road type, intersection versus road stretch, speed limit zones.
- Crash type classification: single vehicle, collision with car/HGV.
- Vehicle characteristics: engine size, category, ownership type.
- Rider demographics: age, sex, licence category, experience level.
- Exposure data, specifically estimated Vehicle Kilometres Travelled (VKT) for L-category vehicles

Collecting these indicators enables cities to develop targeted, effective safety measures to protect riders while supporting broader SUMP road safety objectives. Section B of the Annex provides comprehensive road safety measures specifically designed for L-category vehicles, organised into four subsections: speed management, infrastructure safety, lane access and filtering, and training and awareness.

⁹ European Commission, Directorate-General for Mobility and Transport, European Road Safety Observatory, *Road Safety Thematic Report – Powered Two-Wheelers*, 2024, https://road-safety.transport.ec.europa.eu/document/download/0d0ec5d4-86df-4e30-9a32-3a2730cc7583_en

4.4 Assess vehicle emissions across the municipality

The design of air quality improvement measures and traffic access restrictions in urban areas must be based on a rigorous comparative analysis of emissions across transport modes, including both greenhouse gases (GHGs) and pollutant emissions.

This requires the collection of specific, disaggregated data to accurately identify the real environmental impact of each mode and ensure that regulatory measures are evidence-based, proportional, and appropriate to the characteristics of each category.

Mandatory environmental indicators (EU Implementing Act)

- SU.1 Annual CO₂-equivalent emissions from road transport in the geographical area [t CO₂ e per year].
- SU.2 Number of trips per month made by people who have their usual residence in the geographical area, broken down by the following four travel modes: walking, cycling, individual motorised transport, and public transport
- SU.3 The stock of registered passenger cars in the geographical area, presented in a matrix format, broken down both by type of motor energy and by category of Euro emission standard.

Recommended supplementary indicators

- CO₂-equivalent emissions from road transport in the geographical area [t CO₂-e per year], broken down by European vehicle type-approval category (L, M, N) and subcategory, propulsion technology, and Euro emission standard. Each category should also be expressed as a percentage of total CO₂ emissions [%].
- Emissions of air pollutants (NO_x, PM_{2.5}, PM₁₀) from road transport in the geographical area [kg/year], broken down by European vehicle type-approval category, propulsion technology, and Euro emission standard. Each category should also be expressed as a percentage of total pollutant emissions [%].
- Road vehicle fleet in the geographical area, presented in a matrix format, broken down by European vehicle type-approval category (L, M, N), subcategory, propulsion technology, and Euro emission standard [# vehicles]

By evaluating outcomes using the collected indicators, cities can measure reductions in congestion, air pollution, improvements in travel times, spatial efficiency, parking utilisation, and complementarity with public transport, cycling, and walking, moving towards a multimodal transport system for the cities of the future.

5. Conclusion

L-category vehicles offer European cities a proven, practical, and sustainable mobility solution that remains significantly underutilised in urban planning. The evidence is clear: these vehicles reduce congestion for all road users, require minimal space, meet stringent environmental standards, and provide affordable mobility access across income levels.

The question for cities is not whether L-category vehicles exist in their transport system; they already do. The question is whether cities will actively integrate them into planning frameworks to leverage their benefits, or continue to treat them as an afterthought in mobility policy. The three action fields outlined in this guidance, Mobility, Safety, and Environmental aspects, provide a framework for optimising their urban transport systems using resources already present on their streets. Implementation requires no major infrastructure investment, only policy recognition and targeted measures that align with existing SUMP objectives.

The L-category sector – manufacturers, industry associations, and user groups – stands ready to partner with cities in developing effective integration strategies. Through collaboration and evidence-based planning, L-category vehicles can contribute significantly to making European urban mobility smarter, safer, and more sustainable.

ANNEX 1

Actionable policy measures for cities

This annex provides a comprehensive catalogue of specific, actionable measures that cities can implement to integrate L-category vehicles into their Sustainable Urban Mobility Plans. Measures are organised by thematic area and include priority ratings to support implementation planning.

Priority ratings: HIGH= essential measures with significant impact; MEDIUM= recommended measures; LOW= supplementary measures for comprehensive integration.

Some measures deliver benefits across multiple policy areas. These are marked with coloured tags: [Safety] [Mobility] [Environment]

Cross-cutting measures: priority actions

The following measures deliver benefits across multiple policy domains simultaneously. Cities should prioritise these for maximum impact with efficient resource use.

[A2.2/B2.4] Bus/Taxi / Special lane access [HIGH] [Safety] [Mobility]

Separates vulnerable two-wheelers from general traffic (safety) while reducing journey times (mobility). Single infrastructure decision, dual benefit.

[A2.3/B2.3/ B3.1] Advanced stop lines + traffic light filtering [HIGH] [Safety] [Mobility]

Improves rider visibility and reduces rear-end collisions (safety) while enabling efficient circulation (mobility).

[B3.3] Strategic parking location [HIGH] [Safety] [Mobility]

Placing motorcycle parking near pedestrian crossings improves visibility for ALL road users (safety) while providing parking provision (mobility).

[A2.1/C1.1] Differentiated access and LEZ treatment [HIGH] [Mobility] [Environment]

Recognises L-category's lower spatial and environmental impact. Maintains urban access (mobility) while achieving emission targets (environment).

[C2.2/B4] Battery swapping infrastructure [HIGH] [Environment] [Mobility]

Supports electrification (environment) while enabling efficient last-mile logistics operations (mobility).

[B2.1] Motorcycle road safety audit [HIGH] [Safety] [Mobility]

Identifies hazards affecting riders (safety) and informs infrastructure planning for better traffic flow (mobility).

[C2.1] Dedicated charging spaces [HIGH] [Environment] [Mobility]

Designate exclusive charging spaces for L-category electric vehicles, ensuring they are not occupied by larger vehicles. Minimum provision should reflect the percentage of electric L-category vehicles in the municipal fleet. Improve signage for L-category charging points and include Schuko chargers.

A. Mobility and circulation measures

Measures addressing the integration of L-category vehicles into urban traffic management, access policies, and daily mobility operations.

A.1 Institutional Governance

[A1.1] Formal recognition in SUMP [HIGH] Explicitly acknowledge the L-category sector and its benefits in the Sustainable Urban Mobility Plan. Include L-category as a distinct mode within motorised transport analysis, not merged with general vehicle categories.

[A1.2] Motorcycle Working Group [MEDIUM] Establish a dedicated motorcycle working group bringing together municipal authorities, industry representatives, user associations, and road safety experts to advise on L-category policy development.

[A1.3] Annual reporting [MEDIUM] Include specific L-category data and analysis in annual mobility and road safety reports, tracking fleet evolution, modal share, and safety performance.

A.2 Access and Circulation

[A2.1] Differentiated access restrictions [HIGH] [Mobility] [Environment] When implementing access restrictions for private vehicles (historic centre management, pedestrianisation, etc.), analyse whether differentiated treatment for L-category vehicles is appropriate given their lower spatial and environmental impact.

[A2.2] Special lane access [HIGH] [Safety] [Mobility] Permit motorcycles to use special and/or segregated lanes (bus, taxi, HOV) where this can be safely implemented. This measure simultaneously improves motorcycle safety and journey times.

[A2.3] Traffic light filtering [HIGH] [Safety] [Mobility] Allow mopeds and motorcycles to filter through stationary vehicles at traffic lights to reach advanced stop areas, improving visibility and reducing rear-end collision risk.

A.3 Parking management

[A3.1] Motorcycle parking policy [HIGH] Define a comprehensive motorcycle parking policy establishing principles, targets, and standards for L-category parking provision across the municipality based on local fleet.

[A3.2] On-street parking provision [HIGH] Ensure adequate motorcycle parking spaces on carriageways to minimise pavement parking. The proportion of space allocated should be commensurate with the percentage of motorcycles in the municipal fleet.

[A3.3] Strategic parking location [HIGH] [Safety] [Mobility] Locate motorcycle parking spaces strategically to improve overall road safety. Priority locations include: adjacent to pedestrian crossings (improving driver visibility); at intersections with limited visibility; in roundabouts where design permits. Converting the first car parking space near crossings to motorcycle parking improves sightlines for all road users.

[A3.4] Parking in economic activity areas [MEDIUM] Increase motorcycle parking provision in areas of high economic activity, employment centres, and locations with significant population influx, including in proximity to mobility hubs, intermodal nodes, and public transport stations, to enhance connectivity and support seamless multimodal journeys.

[A3.5] Regulated parking exemption/Reduction [MEDIUM] Where regulated (paid) parking operates, exempt motorcycles from payment or apply significantly reduced rates reflecting their smaller space occupation and environmental performance.

[A3.6] L-category cross-parking [LOW] Allow L-category vehicles to park both longitudinally and transversely in standard parking spaces when the vehicle dimensions allow, addressing the lack of dedicated spaces and preventing enforcement issues.

A.4 Last-mile logistics

[A4.1] Loading/Unloading zones [MEDIUM] [Mobility] [Environment] Provide appropriate loading and unloading spaces in city centres accessible to L-category delivery vehicles, supporting the growing role of the L-category in urban logistics.

[A4.2] Restricted area access [MEDIUM] [Mobility] [Environment] Allow L-category vehicles access to semi-pedestrianised or mixed-access areas, under clearly defined conditions such as reduced speed limits. This approach recognises their lower spatial footprint, reduced environmental impact particularly in the case of low- and zero-emission vehicles and their suitability for efficient urban logistics compared to larger delivery vehicles.

[A4.3] Flexible delivery hours [LOW] Allow flexible operating hours for L-category delivery vehicles in semi-pedestrianised, mixed-access, or time-regulated areas. This would enable more efficient and less disruptive last-mile operations, particularly when using low- and zero-emission vehicles.

B. Road Safety Measures

Road safety measures specifically addressing L-category vehicle users, recognising their status as vulnerable road users requiring dedicated safety strategies. Most of the proposed measures also benefit other vulnerable road users, including cyclists, who face similar issues as motorcyclists when they share the road with bigger vehicles at high speeds.

B.1 Speed Management

[B1.1] Traffic calming measures [HIGH] Implement traffic calming measures designed to avoid creating additional hazards for motorcyclists (e.g., avoid raised elements that could cause falls or loss of balance). Speed humps, Berlin cushions, and other vertical deflection devices should be assessed for motorcycle safety impacts before installation.

[B1.2] Automatic speed enforcement [MEDIUM] Implement automatic speed control systems on roads with speed limits of 50 km/h or higher. Install photo-red technology at high-risk intersections to enforce traffic signal compliance and reduce collision likelihood.

B.2 Infrastructure Safety

[B2.1] Motorcycle road safety audit [HIGH] [Safety] [Mobility] Conduct a comprehensive urban motorcycle road safety audit, identifying high-risk locations and elements. The audit should cover: tactical urbanism features dangerous for riders (raised dividers, Berlin cushions, concrete blocks near roadway); visibility issues at intersections; road hazards (potholes, construction gravel, tram rails, metal grates); and road surface conditions.

[B2.2] Motorcyclist impact assessment [HIGH] Require a 'Motorcyclist Impact Report' in all municipal tenders involving road reconfiguration affecting motorcycle traffic. Incorporate this requirement into contract specifications.

[B2.3] Advanced Stop Lines (ASL) [HIGH] [Safety] [Mobility] Create advanced stop lines for motorcyclists at signalised intersections, allowing riders to position themselves ahead of other traffic for improved visibility and safer starts.

[B2.4] Motorcycle Priority Lanes [MEDIUM] [Safety] [Mobility] Introduce motorcycle priority lanes at major intersections to allow riders to filter safely to the front at traffic lights. Recommended dimensions: approximately 70 metres in length and minimum 1.3 metres in width. Where space is limited, widen existing lanes to allow motorcycle passage through stationary traffic, or at least the one farthest left.

[B2.5] Textured Road Markings [MEDIUM] Use textured horizontal road markings with improved grip characteristics to prevent motorcyclist falls, particularly at intersections and pedestrian crossings.

[B2.6] Accident Hotspot Identification [HIGH] Identify and map accident hotspots for motorcyclists and other vulnerable road users. Implement targeted mitigation measures at identified locations.

[B2.7] Road Maintenance Programme [MEDIUM] Establish a road maintenance plan with specific attention to motorcycle safety: asphalt condition monitoring, appropriate marking paint application (avoiding excessive paint that reduces grip), and prompt repair of potholes and surface defects.

B.3 Lane Access and Filtering

[B3.1] Bus/Taxi Lane Access [HIGH] [Safety] [Mobility] Authorise motorcycles to use bus and taxi lanes under specified conditions (e.g., maximum speed of 30 km/h where road conditions permit). This separates vulnerable two-wheelers from general traffic flow while reducing journey times.

[B3.2] High Occupancy Vehicle (HOV) Lane Access [MEDIUM] [Safety] [Mobility] Permit motorcycle access to HOV lanes where these exist, recognising the space efficiency of single-occupant motorcycle travel.

[B3.3] Lane Filtering Authorisation [MEDIUM] [Safety] [Mobility] Authorise lane filtering for motorcycles under specific conditions: only in congested or stationary traffic; only between the outermost lanes; on roads with separated directional flows; and subject to an appropriate maximum speed that ensures safe interaction with surrounding traffic.

B.4 Training and Awareness

[B4.1] Post-Licence Training Promotion [MEDIUM] Promote voluntary post-licence training in safe and responsible motorcycle use. Support programmes certified under the European Motorcycle Training Quality Label, which ensures instructor qualifications and effective teaching methods.

[B4.2] Training at the workplace [MEDIUM] Promote targeted training within Occupational Health and Safety (OHS) programmes for municipal employees, as well as for employees of companies operating in the city, who use PTWs for work purposes and for commuting. This measure can help reach urban riders who may not perceive the need for post-licence training, improving risk awareness and reducing work-related road incidents.

[B4.3] Training Incentives [LOW] Consider incentives for riders who complete certified training programmes: reduced parking fees, priority access to certain facilities, or recognition schemes.

[B4.4] Coexistence Awareness Campaigns [MEDIUM] Develop awareness campaigns for all road users highlighting motorcycle vulnerability. Topics should include: safe approaches to motorcycles, positioning at intersections, risks of wet road conditions, and behaviour when motorcycles enter high-speed urban roads.

[B4.5] Protective Equipment Campaigns [MEDIUM] Conduct education campaigns ensuring helmets and protective equipment are correctly used.

C. Environment and Low Emission Zones

Measures addressing environmental aspects of L-category integration, with particular focus on Low Emission Zone management and electrification support.

C.1 Low Emission Zone Treatment

[C1.1] Differentiated LEZ treatment [HIGH] [Environment] [Mobility] Recognise that L-category vehicles, both combustion engines and electric, should not receive identical treatment to passenger cars in LEZ restrictions when their actual emissions are substantially lower. Implement a differentiated approach where L-category vehicles are treated more favourably than cars

[C1.2] Strengthen roadside checks and fleet performance monitoring [HIGH] [Environment] [Safety] Reinforce roadside technical checks in line with the EU roadworthiness framework to ensure vehicles remain compliant throughout their lifecycle.

[C1.3] Phased restriction implementation [MEDIUM] Disconnect L-category vehicles from passenger cars, encouraging modal shift toward smaller vehicles. Similarly, regularly update implementation tables considering the latest L-category Euro Standards, encouraging the use of cleaner vehicles and fleet renewal.

C.2 Electric vehicle support

[C2.1] Dedicated charging spaces [HIGH] [Environment] [Mobility] Designate exclusive charging spaces for L-category electric vehicles (ePTWs), ensuring they remain accessible and are not occupied by larger vehicles. The minimum number of dedicated spaces should reflect the share of electric L-category vehicles within the municipal fleet, and clear, visible signage should be provided to improve usability and awareness.

Member States should prioritise interoperable and harmonised charging solutions over domestic plug systems when deploying infrastructure for ePTWs. National authorities must implement recharging infrastructure in line with Commission Delegated Regulation (EU) 2019/1745, ensuring:

For ePTWs up to 3.7 kVA: socket-outlets or vehicle connectors of Type 3A compliant with EN 62196-2.

For ePTWs above 3.7 kVA: at least socket-outlets or vehicle connectors of Type 2, as described in EN 62196-2.¹⁰

[C2.2] Battery swapping infrastructure [HIGH] [Environment] [Mobility] Promote installation of battery exchange stations for electric L-category vehicles, particularly supporting commercial delivery fleets.

[C2.3] Awareness campaigns for fleet renewal [MEDIUM] Conduct information campaigns to raise user awareness about fleet renewal benefits and available incentives.

C.3 Financial incentives

[C3.1] Purchase subsidies [MEDIUM] Establish subsidy programmes for electric moped and motorcycle purchases to accelerate fleet renewal.

¹⁰ European Association of Motorcycle Manufacturers (ACEM), Position Paper on E-mobility, 2020, [ACEM Position Paper - Emobility 2020.pdf](#)

[C3.2] Vehicle tax reductions [**MEDIUM**] Apply maximum available tax reductions for L-category vehicles, given their contribution to environmental objectives. Prioritise electric vehicles and newer, cleaner models.

[C3.3] Charging infrastructure grants [**LOW**] Include L-category charging infrastructure in grant programmes for EV infrastructure installation, covering private businesses, public access areas, and residential parking. Include battery swapping systems in eligible installations.

D. Data Collection and Monitoring

Indicators and data collection requirements to support evidence-based policy development and measure implementation progress.

D.1 Fleet and Usage Indicators

- Total L-category vehicles registered in municipality
- Fleet breakdown by subcategory (L1e–L7e)
- Average fleet age
- Fleet classification by environmental standard (Euro class) and label
- Percentage of L-category vehicles relative to population
- Percentage of L-category vehicles relative to total motor vehicle fleet
- Ownership breakdown: private, commercial fleet, sharing services
- Annual registrations and de-registrations (5-year trend)
- Licence holder data by category
- Modal share of L-category in urban trips

D.2 Safety Indicators

Mandatory indicators (per EU Implementing Act):

- SA.1: Annual road traffic accidents by vehicle types involved
- SA.2: Seriously injured persons by sex, age, vehicle type, other party involved
- SA.3: Fatalities with same breakdown as SA.2

Recommended additional indicators:

- Total accidents involving L-category vehicles
- L-category casualties by severity (fatal, serious, slight)
- Accident classification by road type

- Accident type analysis (single vehicle, intersection, rear-end, etc.)
- Vehicle characteristics in accidents (category, engine size, age)
- Rider demographics in accidents (age, sex, licence type)
- Other party involvement and responsibility attribution
- Accident hotspot mapping

D.3 Environmental Indicators

- L-category share of total municipal vehicle emissions (CO₂, NO_x, PM)
- Electric L-category vehicle registrations and fleet share
- L-category charging point utilisation
- Fleet age trend and renewal rate

About ACEM

The European Association of Motorcycle Manufacturers (ACEM) represents Europe's largest manufacturers of L-category vehicles - mopeds, motorcycles, tricycles and quadricycles.

Practical, space-efficient and low-emission, these vehicles help cities right-size their mobility mix cutting congestion, reclaiming road space, and decarbonising urban transport. An often-overlooked piece of the mobility puzzle, and one that makes cities measurably more liveable.

ACEM members include 16 manufacturing companies: BMW Motorrad, Bombardier Recreational Products (BRP), Ducati Motor holding, Harley-Davidson, Honda, Kawasaki, KTM, KYMCO, Peugeot Motorcycles, Piaggio, Polaris Industries, Royal Enfield, Suzuki, Triumph Motorcycles, Yamaha and Zero Motorcycles.

ACEM also represents 17 motorcycle industry associations in 16 different European countries. About 300,000 jobs depend on the L-category industry in Europe. There are more than 40 million motorcycles and scooters on Europe's roads (2024 estimate).