July 2022. Sectoral report

Micromobility in Catalonia

ACCIÓ Catalonia Trade & Investment
Generalitat de Catalunya
Government of Catalonia
CataloniaConnects

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Regional Government of Catalonia (Generalitat de Catalunya)

Execution
ACCIÓ Strategic and Competitive Intelligence Unit

Barcelona, July 2022

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1. Overview of the micromobility industry

Definition of the sector

Definition of the micromobility sector

- There are **different definitions and classifications of micromobility** around the world. Most models consider the mass, the maximum speed, and the type of electric/mechanical propulsion of the vehicle.
- With regard to this study, micromobility vehicles are considered to include the group of **lightweight and SUSTAINABLE means of transport**, which are small in size and equipped with a low power electric motor or no motor at all, and are used **to cover short distances** to their destination or to a public transport stop. The following are considered to be included in micromobility:

Bicycles and tricycles (traditional and electric)

Electric motorbikes

PMV (personal mobility vehicles):

Scooters (traditional and electric)

Skateboards (traditional and electric)

Skates

Segways (electric)

Hoverboards (electric)

Solowheels (electric)

Micromobility-related mobility services (shared mobility, vehicle rental, etc.)

Source: ACCIÓ

Segments excluded from micromobility

The following means of transport **are not considered** within micromobility:

Cars (internal combustion and electric)

Internal combustion motorbikes

Mobility services related to combustion cars and motorbikes

Trucks/vans

Buses/coaches

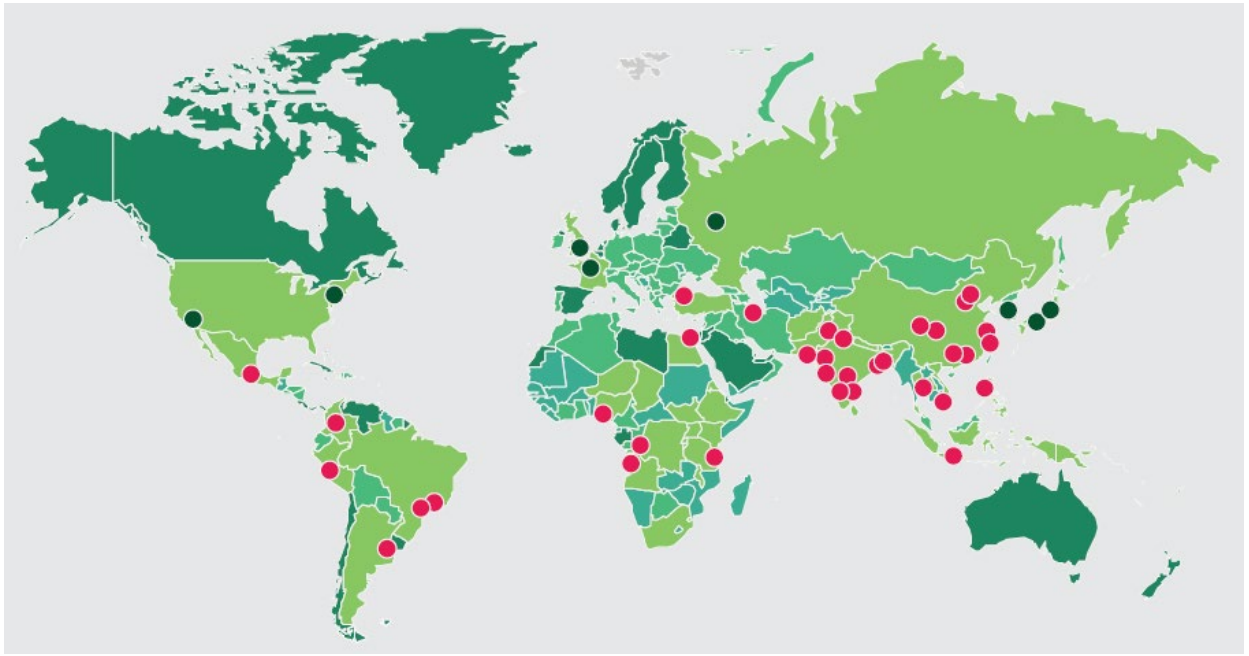
Train/underground

Principal data worldwide

Micromobility is key to overcoming the current saturated transport model in cities

Micromobility has become a **fundamental element in solving transport problems in major cities** and is key to planning future urban management models in order to solve the current collapsed system that requires innovative, safe and viable solutions.

Megacities and percentage of global urban population (estimate for 2030):

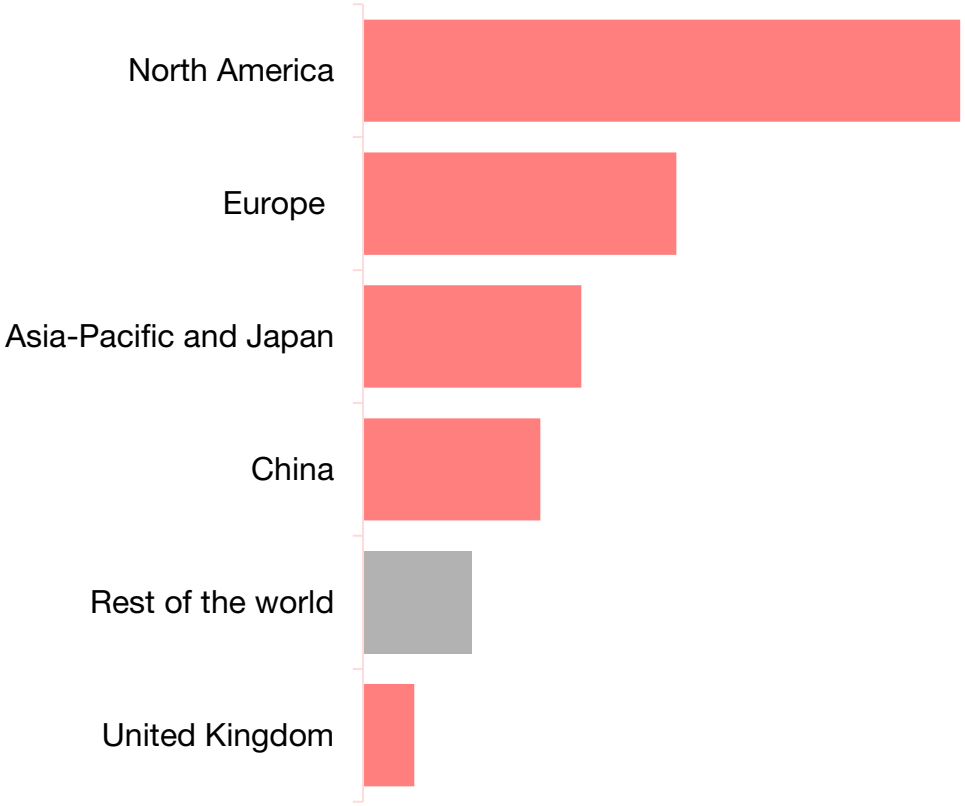


- It is estimated that the number of **megacities** (metropolis with more than 10 million inhabitants) will increase from the current 30 to 43 worldwide by 2030, **with over 750 million people**, **35% up** on today's figure.
- Meanwhile, it is predicted that **cities with over 1 million inhabitants** will reach a total population of **2.3 billion people**, a large part of this population being concentrated in emerging countries.
- It is also calculated that **65% of the world population will live in cities by 2030**.
- With the boom of urban development, **growing levels of atmospheric pollution,** and urban areas constantly collapsed due to vehicle traffic, **micromobility** could **solve** many conflictive situations.

Source: *ACCIÓ, based on the BCG report "Solving the Mobility Challenge in Megacities" and press articles*

Global valuation of the micromobility sector

Turnover of the micromobility sector by region (2019, in $M)



Global turnover in 2021:

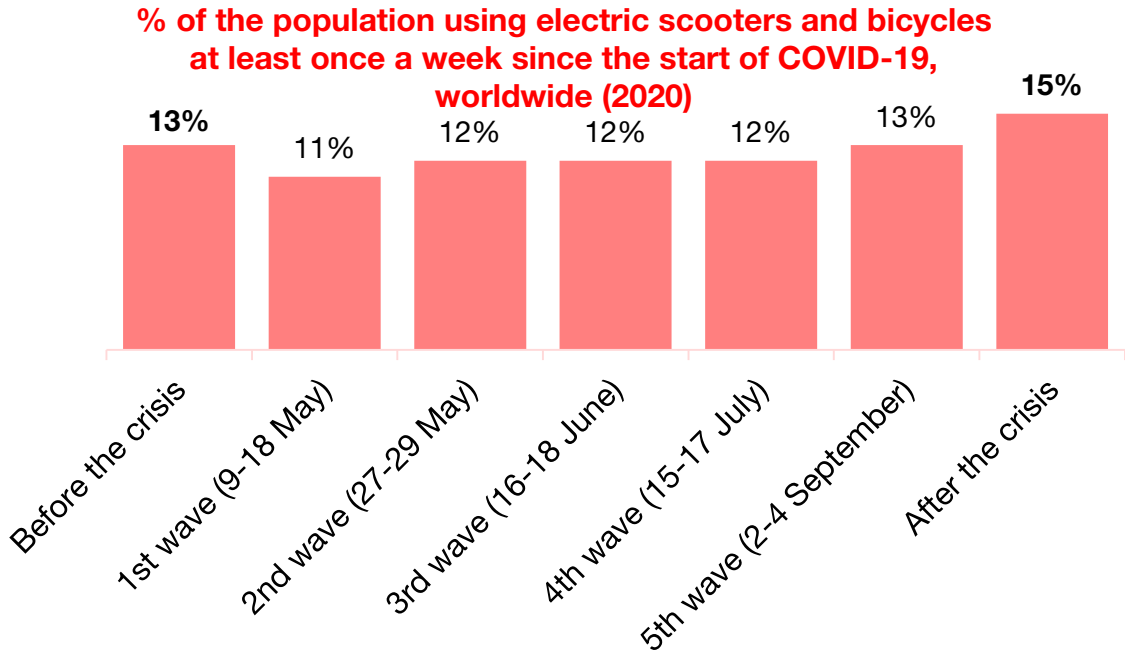
$2.8 Billion

- **North America** is the **main market** in terms of the development of micromobility, doubling the second-place European market in terms of value.
- The combined valuation of the region of **Asia-Pacific and Japan** and the region of **China** amounts to **689 USD**, which is higher than Europe.
- In the **rest of the world**, micromobility is not yet extensively widespread and **there is growth potential**.

Source: *ACCIÓ, based on Statista (based on data from Global Micro Mobility Market)*

Impact of COVID-19 on the global use of micromobility

- **Lockdown** due to the COVID-19 crisis in 2020 led to a **reduction in the use of all means of transport**, including micromobility. Despite this, the levels of use **after** lockdown not only recovered but **increased by 2%**.
- There is great growth potential in the micromobility sector, as the population seeks alternative, **more sustainable, individual and outdoor** transport.



Source: *ACCIÓ, based on Statista (based on data from Mckinsey)*

The world shared mobility market is expected to reach $350 M by 2025.

Global shared mobility market by type (in $M); 2025 forecast:

Network transport services: companies that use websites and apps to put drivers of rental cars in touch with passengers looking for a ride.

Car sharing: companies that manage a fleet of cars and makes them available to their subscribers. The same vehicle may be used by any subscriber to the service.

Vehicle sharing: cooperative system to share a vehicle with other people for both regular and one-off trips.

Bike sharing: system to share bicycles among a community of subscribing users. This is based on a network of docking stations with secured bicycles for use exclusively by subscribers.

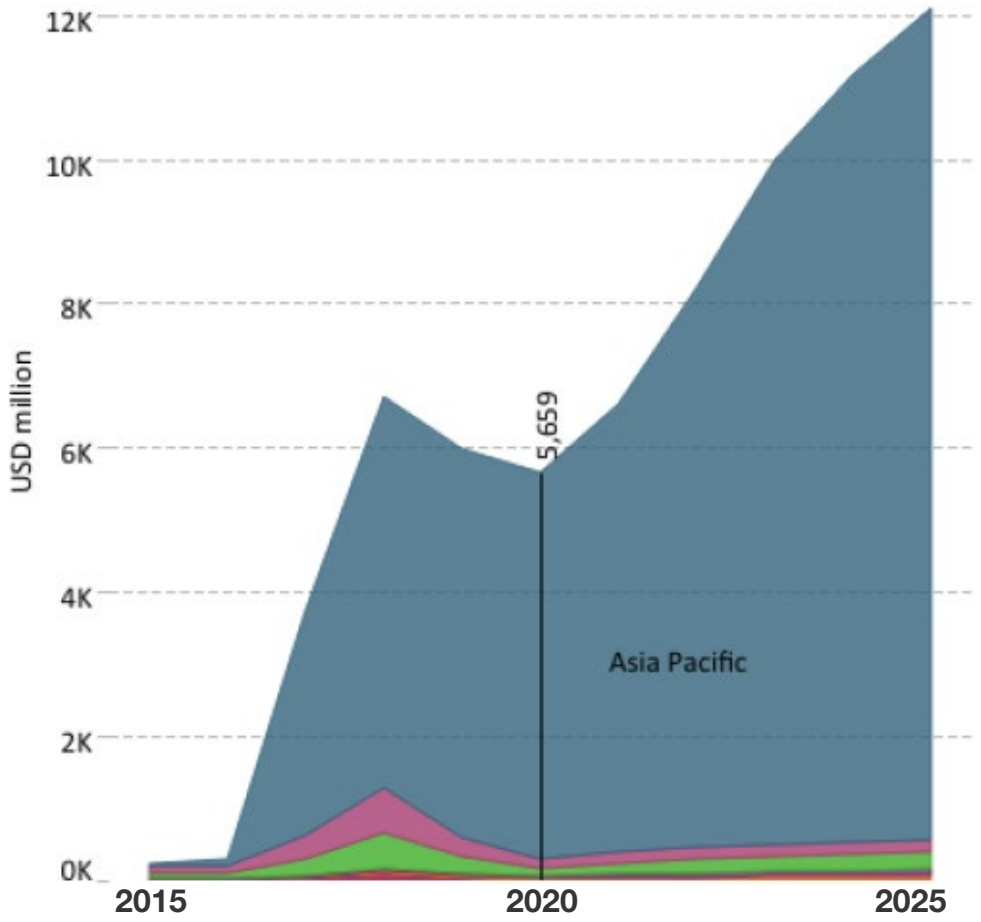
Electric scooter sharing: shared transport service in which motorised electric scooters are provided for short-term rental through a network of docking stations.

MICROMOBILITY

Source: *ACCIÓ, based on the Euromonitor report "World market for mobility, May 2021"*

World bike sharing market

Evolution and potential of the global bike sharing market (2015-2025)



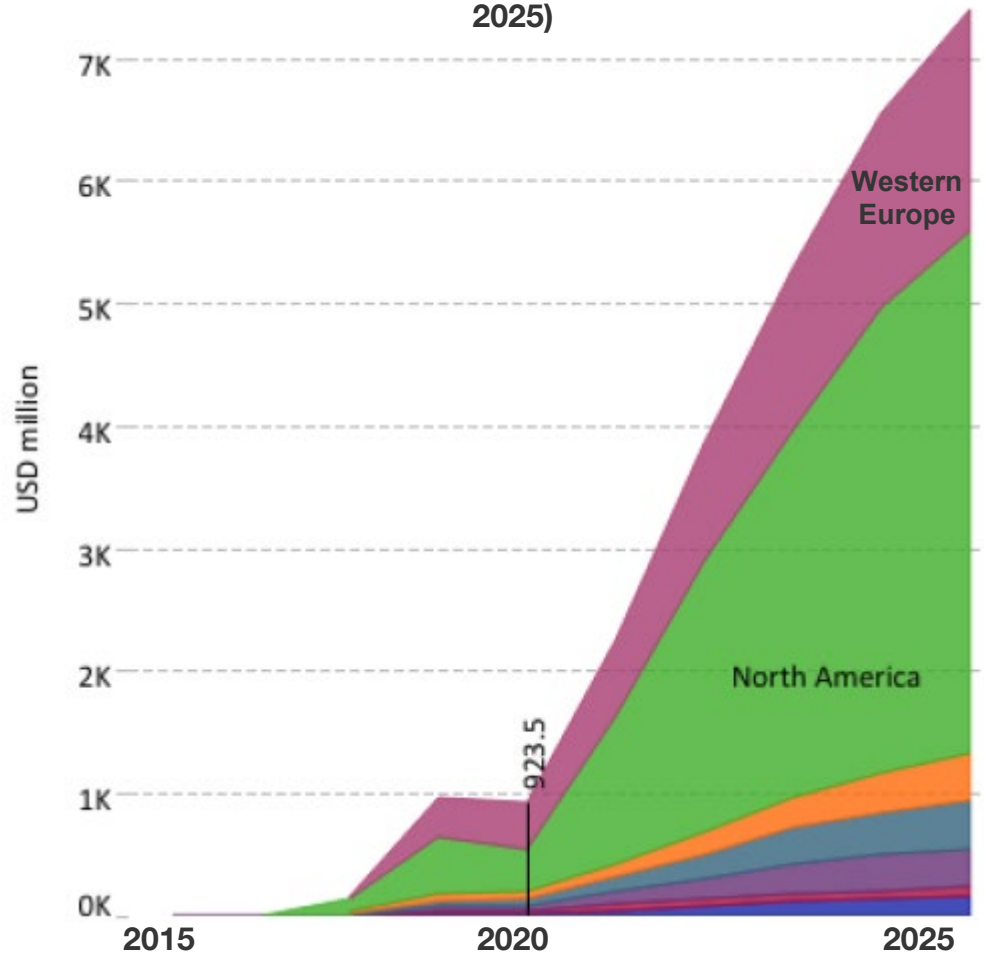
- The bike sharing market is **particularly developed in the region of Asia-Pacific**, where there is a higher concentration of megacities.
- Although the market was stagnant during the pandemic, **a high growth potential is expected** particularly in the Asia-Pacific region.
- The second most highly developed region is **western Europe**, although it remains a far cry from Asia-Pacific and has a great deal of terrain and **potential** yet **to explore**.

- Asia-Pacific
- Eastern Europe
- Middle East and Africa
- Western Europe
- Latin America
- North America
- Australasia

***Note**: data from 2021 onwards is estimated*
***Source:** ACCIÓ, based on the Euromonitor report "World market for mobility, May 2021"*

World electric scooter sharing market

Evolution and potential of the global scooter sharing market (2015-2025)



- The **two most highly developed** markets for electric scooter sharing are currently located in the regions of **North America** and **western Europe**.
- Although these two regions have high growth potential, **North America** has a **particularly high potential**.
- Development of the electric scooter sharing service in the **remaining regions** is relatively **low**, although most **will experience growth** over the coming 5 years.

- Asia-Pacific
- Eastern Europe
- Middle East and Africa
- Western Europe
- Latin America
- North America
- Australasia

***Note**: data from 2021 onwards is estimated*
***Source:** ACCIÓ, based on the Euromonitor report "World market for mobility, May 2021"*

Top world micromobility startups

Manufacturers of means of micromobility (bikes, electric motorbikes and PMV)

Bikes (traditional and electric)

Mopeds (small, lightweight motorbikes)

Scooters

Shared service platforms

Bikes (traditional and electric)

Mopeds (small, lightweight motorbikes)

Scooters

Multimodal

Fleet management and connectivity

e-bike enabling systems

Docking and charging

***Note**: PMV = personal mobility vehicles (skates, skateboards, scooters, segways, hoverboards, etc.)*
***Source:** ACCIÓ based on the CBInsights study "80+ Micromobility startups reshaping the future of urban transportation, Sept 2021"*

Micromobility is becoming key in progressing towards a more sustainable society and planet

According to the study by EIT InnoEnergy, it is calculated that **micromobility could have an extremely positive impact** on the environmental health of **European cities**, which would lead to:

Annual energy **SAVINGS** of **30.7 million tonnes of CO^2** and **127 TWh**.

The **FREEING UP** of **48,000 hectares of land** in European city centres.

The **CREATION** of around **990,000 direct and indirect jobs** throughout Europe.

An **INCREASE of €111,000 M in GDP** could be achieved through the savings yielded from the **decrease in traffic**[1].

***Note 1**: non-sustainable transport, such as cars, involve a daily expense for drivers in fuel wasted during hours spent in traffic jams. Micromobility would save part of this expense (the figure is based on a calculation consisting of adding up the cost saved by each driver at European level)*
***Source:** ACCIÓ based on the EIT InnoEnergy report "Examining the impact of a sustainable electric micromobility approach in Europe"*

The EU promotes micromobility through several platforms of grants and subsidies

Next Generation

The EU Next Generation grants for economic recover are structured around two main areas: sustainability and digitisation. **Sustainable transport** is one of the main chapters in the first area, with the **development of micromobility** as an aspect to be promoted.

Horizon Europe

Horizon Europe is the EU's key funding programme for research and innovation. **The climate, energy and mobility** is a chapter in the second pillar of this project (Global challenges and European industrial competitiveness), which includes **grants for micromobility**.

EIT Urban Mobility

EIT Urban Mobility is the leading initiative in Europe in urban mobility innovation, which works to promote **positive changes in the way we move around cities in order to make them more inhabitable.** Companies from the micromobility sector can join the call for yearly grants.

eit Urban Mobility

***Source:** ACCIÓ*

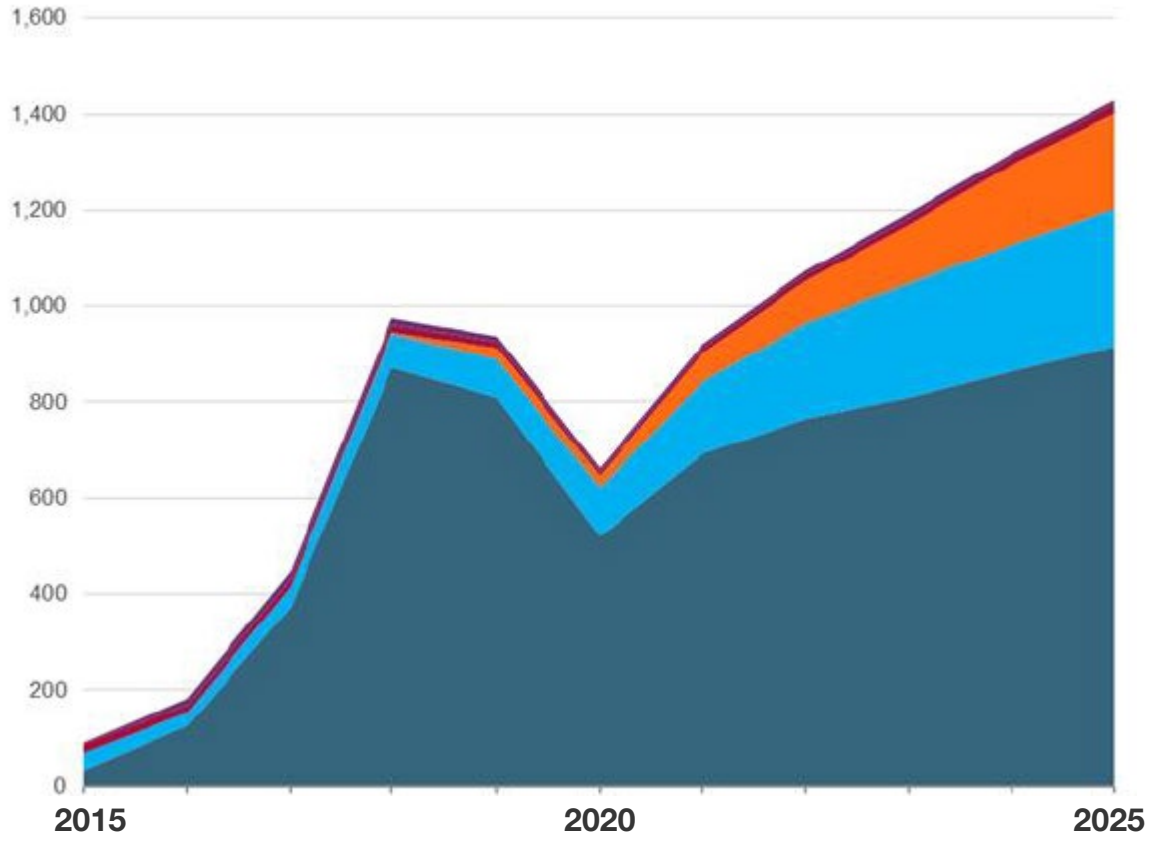
European MOBY project, electric micromobility and safety in European Cities

- MOBY is an *EIT Urban Mobility* project with the support of the EU, which began with the mission of **improving** the **integration** of **electronic micromobility vehicles into European cities**.
- **Goals**:
  - ✓ To increase the use of new means of transport (scooters, skateboards and unicycles).
  - ✓ To promote their integration with other forms of transport.
  - ✓ To use their potential to improve user and road safety.
- **Duration:** 2 years (2020-2021).
- **Two stages:**
  - **First stage:** identify and analyse the main incentives and barriers for implementing electronic micromobility vehicles safely for users and sustainably for cities.
  - **Second stage:** implement the different solutions from the first stage with pilot tests, through living labs in the member cities of the consortium.
- **Funding:** €499,647 (EIT Urban Mobility 2020 business plan).
- **Collaborators:** CARNET Barcelona, SEAT, i2cat, Barcelona Tech UPC and 9 other European members.

Source: *ACCIÓ, based on EIT Urban Mobility and the Future Mobility Research Hub (CARNET Barcelona)*

The shared mobility segment in Spain

Turnover of the Spanish scooter sharing market (€M) (2015-2025)



- The shared mobility sector in **pre-pandemic** Spain experienced a significant **growth of 81%**.
- Despite a 24% decrease between 2019 and 2020 due to the measures applied during lockdown, **global growth** for the entire estimated period **between 2015 and 2025** remains high (**52%**), with a turnover of over €1,400 M by 2025.
- **Scooter sharing is the category to have grown most between 2020 and 2025 (37%)**, due particularly to a combination of affordability and perceived safety of this means of transport, and to an increase in the availability of this kind of service in more cities around the country.

MICROMOBILITY

Ride hailing | Ride sharing | **Scooter sharing**

Bike sharing | Car sharing

MICROMOBILITY

***Note**: data from 2021 onwards is estimated*
***Source:** ACCIÓ based on the Euromonitor report "Mobility in Spain, July 2021"*

Technologies with an impact on micromobility

Technologies with an impact on micromobility - associated to industrial resilience and the green transformation

Associated to industrial resilience

Electric/micromobility vehicle

Electric micromobility vehicles, such as bikes, motorbikes, scooters, skateboards, segways and hoverboards.

Connected vehicle

One of the characteristics of micromobility, particularly shared, is its connectivity.

Microelectronics and nanoelectronic

These are the miniaturised electronic systems that contain sophisticated sensors, actuators and circuits providing smart control and communications.

They form the basis of all IoT, connectivity, management, control appliances, etc.

Semiconductors

Semiconductors are the material used to make chips, the basic components for electronics and the heart of management, automation appliances, etc.

Associated to the green transformation

Clean energies

Renewable energies such as photovoltaic solar energy and wind energy to produce electricity to supply batteries that run micromobility vehicles.

Batteries and storage

Most micromobility vehicles are equipped with an electric motor.

The energy is stored in the batteries.

Smart city

A smart city is characterised by the integration of technology into its development and its urban planning, with a strategic approach to become smarter and more efficient in the use of resources in order to cut costs, save energy, and improve its services and the quality of life of its citizens.

The city is the natural territory of micromobility, primarily for first and last-mile solutions, in both personal and goods traffic.

***Source:** ACCIÓ*

Technologies with an impact on micromobility - associated to the digital society (I)

Associated to the digital society

IoT/sensors

IoT can help find solutions for some of the challenges of micromobility, such as fleet management (many micromobility applications are of shared use and integrated IoT provides better control of the condition and position of the vehicles), compliance with city regulations (many cities have imposed basic rules such as speed limits, traffic along established lanes, parking, the number of moving vehicles, etc.), avoid vandalism and theft, and scale the sharing service.

Vehicle control: sensors, smart speed assistance, and autonomous emergency braking systems (AEBS) to improve active and passive safety.

Obstacle recognition: advanced emergency braking systems (AEBS) using radar sensors to detect obstacles and the movement of vehicles, pedestrians and cyclists.

Big data + artificial intelligence

Data and artificial intelligence can foster the growth and consolidation of micromobility business models. The IoT sensors installed on vehicles can collect and analyse data in order to improve fleet management, learn of vehicle movements and routes, conduct preventive maintenance, issue charge warnings, locate car parks and charging points, and find lost or stolen vehicles.

Photonics/quantum computing

Driver protection and visibility equipment: red LEDs are included at the rear of the helmet, as well as accelerometers that detect sudden movements by other drivers.

Traffic surveillance with optic sensors: special cameras and LIDAR 3D sensors both on board PMVs and on the roadway infrastructure to control traffic and detect situations that are potentially hazardous for micromobility.

RA

Integration of augmented reality into the helmet to project maps, routes and other data.

DLT/blockchain

The possibility of applying blockchain to share micromobility in cities is being explored. Blockchain technology allows for a secure, on-line digital identity to be established that could include documents such as a driving licence.

Source: *ACCIÓ based on the EIT Urban Mobility report "E-Micromobility Safety Assessment" and the Star report "Understanding the evolving micromobilty landscape" (Ericson, Mobisoft, Frankfurt School Blockchain Center)*

Technologies with an impact on micromobility - associated to the digital society (II)

Associated to the digital society

Cybersecurity

Many micromobility vehicles are able to connect to a mobile phone to manage the service and provide information on traffic and parking areas, etc. Any appliance connecting via internet or bluetooth has the risk of suffering a cyberattack that could jeopardise user and company data. The necessary measures must therefore be included to identify and detect threats, protect data, and ensure the correct working order of the service.

Connectivity

Connectivity forms the basis of the business model of many shared micromobility companies.

It therefore requires a fast, secure and reliable network.

Installation of Bluetooth low energy (BLE) posts in parking spaces to ensure correct parking. The new Bluetooth 5.1 version allows for a position c, which is ideal for the precise control of scooter parking.

Insurtech

Micromobility company must play a key role in the future of mobility solutions in cities around the world.

Insurance companies have created new services to provide coverage for fleet management companies and private users, with prices adapted to the service, legal requirements or real-time information.

Cloud

The cloud service is a remote server that stores data that users can freely access at no extra cost. The cloud service is a remote server that stores data that users can freely access. This technology can be used as support for implementing micromobility management services.

Source: *Source: ACCIÓ based on Insurtech Global Outlook 2021*

2. Micromobility industry in Catalonia

Micromobility industry support ecosystem

Value chain of the micromobility sector

Suppliers:

- Design/engineering companies.
- Mechanical vehicle components: handlebars, drive train, chassis, wheels, etc.
- Electrical vehicle components: chargers, batteries, connectors, etc.
- Technology: hardware and software of the electric vehicle.

Manufacturers:

- Electric motorbikes.
- Bikes (traditional and electric).
- PMV (skates, skateboards, scooters, segways, hoverboards, etc.).

Rental companies:

- Electric motorbikes.
- Bikes (traditional and electric).
- PMV (skates, skateboards, scooters, segways, hoverboards, etc.).

Shared mobility service operators:

- Electric motorbikes.
- Bikes (traditional and electric).
- PMV (skates, skateboards, scooters, segways, hoverboards, etc.).

USERS OF MICROMOBILITY VEHICLES

External/support bodies

- Local/national governmental organisations: micromobility regulation/policies.
- Smart cities: urban planning.
- Infrastructure: bike paths, parking facilities, charging stations, etc.
- Mobility management companies (routes/fleets/movement of people).
- Marketing, repair and maintenance of micromobility vehicles.
- Public transport: intermodality facilities.
- Mobility service apps for users.

Source: ACCIÓ

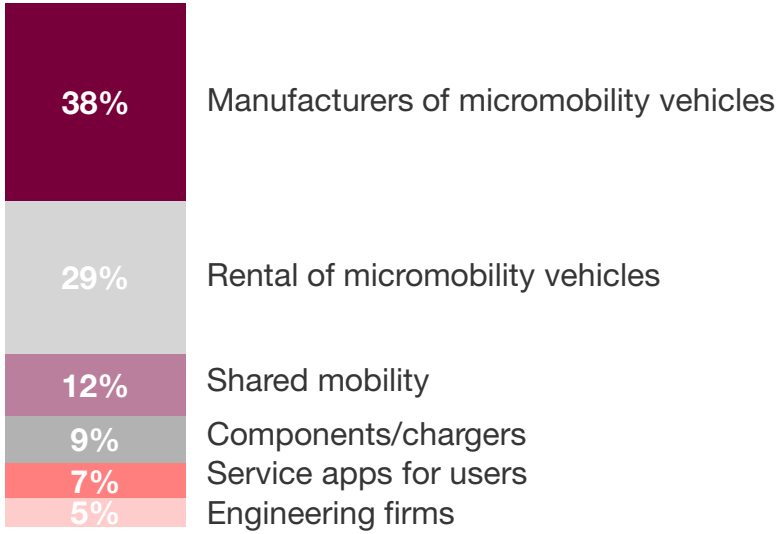
Micromobility industry in Catalonia

119 companies

1,313 employees

€255 M turnover

Main activity of micromobility companies:

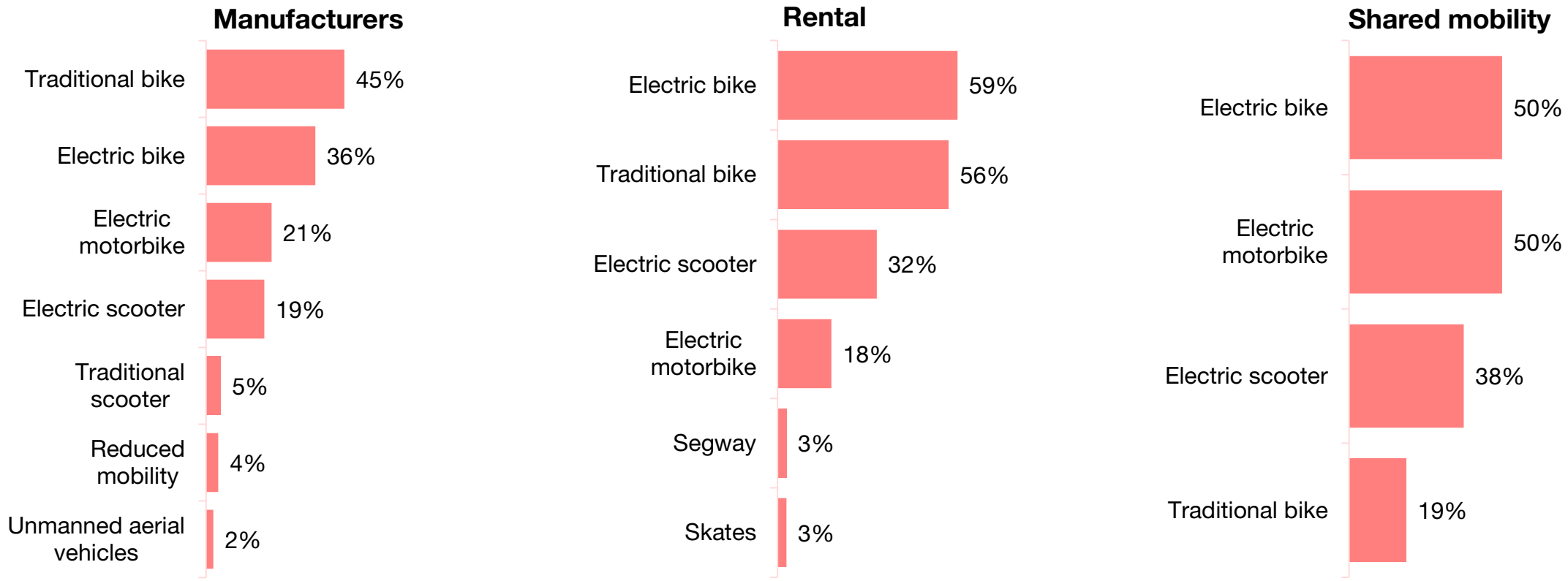


- **88%** of the companies are established in the **province of Barcelona** (7% in Tarragona and 5% in Girona). The **AMB**, the major urban area of Catalonia, is home to **68% of the companies**.
- **70% of the companies** are young, **less than 10 years old**.
- **92% of the companies** are **SL (limited companies)** and 4% are SA (public limited companies).
- The micromobility business network is made up **essentially of SMEs** (**84% micro-companies**, 12% small enterprises and 3% medium-sized enterprises). Only 1% are large enterprises.
- Most of the companies are **Catalan** (**85%**), whereas 6% are Spanish and 9% are from abroad.
- **36%** of the Catalan micromobility companies **export** abroad.

***Note**: distribution and/or marketing companies are not included*
***Source:** ACCIÓ*

Types of micromobility vehicles developed and/or operated by Catalan companies

The **manual and electric bike**, along with the **electric motorbike**, are the **most popular** types in Catalan micromobility companies.



Note: *the percentages of the graphs correspond to the % of companies and do not add up to 100%, as a given company could manufacture/operate more than one type of vehicle*
Source: *ACCIÓ*

Micromobility companies from Catalonia

Manufacturers of micromobility vehicles

Traditional bike

megamo, AMAT, TRS, MSC, elna activa, INTENSE, CLEAN, COMAS, CAMPMAJO BIKES, SPINTA, FORESTAL, CAPSULE, UNNO, unica, NUA BIKES, VK, Rabasa

Electric bike

megamo, BATEC MOBILITY, Youin, TRS, LEGEND, INTENSE, walk e.Bikes, BRAIH, SPINTA, TROMBER, LOBITO, RAYVOLT

Electric motorbike

SEAT MÓ, SILENCE, RIEJU, TORROT, volta, PURSANG, RAY, STARK

Electric scooter

SEAT MÓ, Youin, Öhll, SPINTA, GRAVITY, LOBITO, LAMPSY

Trad. scooter

JOYOR, GRAVITY

Reduced mobility

AyudasDinámicas, TEYDER

Aerial veh.

AAM Advanced Air Mobility

Micromobility vehicle rental companies

Traditional bike

BAMBOO BIKE TOURS, LemonBikes BARCELONA RENTAL, Kleta, Swapfiets, YES RENT, Green Bikes, Barcelona CicloTour, BARCELONA Rental Scooters, Bikemotions, Fun Bikes

Electric bike

mobike, mouters MOTO RENTING, LemonBikes BARCELONA RENTAL, Kleta, Deltaqueta, Swapfiets, Pedelec Mobility, YES RENT

Electric motorbike

mouters MOTO RENTING, MONDO Rent, MOTODDK, emoveyou

Electric scooter

LemonBikes BARCELONA RENTAL, YES RENT, JetScoot, RE, MONDO Rent, gomeep, RIVERA BIKE RENTAL

Segway

SEGWAY TARRAGONA

Skates

MONDO Rent

Shared mobility companies

Trad. bike

bicing, ridemovi, DONKEY REPUBLIC

Electric bike

cooltra, Reby, bicing, Pedelec Mobility, Bicibox, ridemovi

Electric motorbike

SEAT MÓtosharing, cooltra, Reby, acciona, avant., Cityscoot, Movo

Electric scooter

Reby, UFOSCOOTERS, Movo, DONKEY REPUBLIC

Service apps

FREENOW, YEGO, mapit, electromaps BORDERLESS CHARGING, smou, placetoplug

Components

wallbox, Unlimited, REGNER, SPEEDSIX, 3FStech bike components, duopower

Engineering

IDOM, vadecity, cero, aimsun., MILLOR, edenway, enide

Note: *example of companies by turnover: this is a partial representation to illustrate the companies belonging to the micromobility ecosystem in Catalonia, but there might be other companies that are not included in this study*

Source: *ACCIÓ*

Catalan support ecosystem for the micromobility industry

Technology centres and research groups

CARNET FUTURE MOBILITY RESEARCH HUB · CD6 UPC · eurecat Centre Tecnològic de Catalunya · Institut de Robòtica i Informàtica Industrial · easy · Centre de Disseny i Optimització de Processos i Materials · CIMNE · CVC Computer Vision Center · inLab FIB talent & tech · MCIA · CITCEA · i2cat · laSalle Ramon Llull University · CTTC · CIEMAT · UB CEMIC · CNM Centro Nacional de Microelectrónica · Centre Català del Plàstic · Applus IDIADA · ICFO · AMADE

Clusters

CEEC Clúster d'Eficiència Energètica de Catalunya · ciac Clúster de la Indústria d'Automoció de Catalunya · secpho collaborate to innovate · MAV · clustermoto cluster para el avance de la tecnología de la moto · in-move

Universities and training centres

Universitat Politècnica de Catalunya BarcelonaTech · UVIC Universitat de Vic Universitat Central de Catalunya · UVIC · euss enginyeria · Universitat de Lleida · Universitat Rovira i Virgili · update Formació Contínua en Enginyeria Formant Enginyers des del 1969 · CFPA · CIM UPC · Fes Fundació Eduard Soler · CFPA Centre de Formació Professional d'Automoció

Business organisations

pimec Micro, petita i mitjana empresa de Catalunya · VIAempresa · asinca · cecot · Secartys · amec · Foment del Treball Nacional · Barcelona Global

Trade fairs

SMART MOBILITY CONGRESS · TOMORROW. MOBILITY WORLD CONGRESS · SMART CITY EXPO WORLD CONGRESS · BNEW MOBILITY · VIVE LA MOTO · BARCELONA motorsport SHOW · AUTOMOBILE BARCELONA · 4YFN Connecting Startups · IOT SOLUTIONS WORLD CONGRESS · MWC Barcelona

Public policies

eit Urban Mobility · el teu municipi amtu · RACC Mobility Club · FemCAT Fundació d'Empresaris de Catalunya · Consell General de Cambres de Catalunya · ACCIÓ Catalonia Trade & Investment · Generalitat de Catalunya · AMB Àrea Metropolitana de Barcelona · Ajuntament de Barcelona · Barcelona Activa

Source: *ACCIÓ*

Catalan micromobility startups

UNICORN
Valued in €1,363 M

wallbox

Total investment: €197 M

6 rounds

cooltra

Total investment: €128 M

6 + 6 rounds

SILENCE
URBAN ECOMOBILITY

Total investment: €13 M

3 rounds

YEGO

Total investment: €10 M

5 rounds

Reby

Total investment: €4.5 M

5 rounds

Kleta

Total investment: €2.4 M

2 rounds

Unlimited

Total investment: €1 M

3 rounds

iomob

Total investment: €0.64 M

5 rounds

placetoplug

Total investment: €0.25 M

3 rounds

gomeep

Total investment: n.d.

1 round

mobike

Total investment: n.d.

mouters
MOTO RENTING

Total investment: n.d.

RAYVOLT
premium e-bikes

Total investment: n.d.

AAM
AdvancedAirMobility

Total investment: n.d.

Moovo
Una app de Cabify

Total investment: n.d.

RAY
ELECTRIC MOTORS

Total investment: n.d.

eosconnectivity

Total investment: n.d.

Source: *ACCIÓ based on Dealroom and the Barcelona & Catalonia Startup Hub*

Main micromobility business cases in Catalonia

The electric motorbike manufacturer Silence

- Silence is a Catalan company that has been **designing, developing and manufacturing electric motorbikes** and battery packs using its own technology for 9 years.
- With a turnover of close to €40 M in 2020, it is one of the **top Catalan micromobility companies**.
- The Silence team is formed by **200 professionals from different sectors**, such as engineers, pilots, mechanics, designers, and experts in electronics, and has obtained **different electronic patents** and awards in business and industry.
- It currently has **3 models** of motorbike for **individuals** (S01, S02 HS and S02 LS) and **3 models for business** (S02, S02 LS i S03), as well as a new model of electric microcar (S04).

Electric bike rental by eMobike

- eMobike is an **electric bike** rental service that is environment friendly, offers the user great mobility and autonomy, allows for sport to be enjoyed while controlling efforts, and promote sustainable mobility in cities.
- It has **4 lines of business**:
  - ✓ **eMobike Tourism:** rental from the stations installed at the main hotels in the city, tourist offices, cruise line companies, and camp sites.
  - ✓ **eMobike Public:** designed to meet the mobility needs of councils, universities, companies, and car parks.
  - ✓ **eMobike Urban:** to park the car in a public car park and pick up an eMobike.
  - ✓ **eMobike Work:** rental service for company employees.

Share mobility services by Cooltra

- Cooltra was established in Barcelona in 2006 with the idea of transforming cities into safer, more sustainable and efficient places to offer a **motorbike and bike sharing service** for individuals, companies, and the public authorities.
- The service later spread to other European cities, making the company an **international leader** in the sector. Cooltra is the main electric bike rental company in Europe.
- **Services for individuals** include rental for minutes, hours, days or months, whereas **services for businesses** include motorbike rental under the renting modality and even the rental of entire fleets under the private sharing modality (e.g. for companies such as Just Eat, Burger King, Domino's Pizza, Port de Tarragona or the Local Police of Barcelona).

***Source:** ACCIÓ*

Investment in micromobility in Catalonia

The micromobility sector has received €222 M of investment over the past five years (2017-2021)

21 FDI and reinvestment projects[1]

€222 M of invested capital

372 jobs created

***Note 1**: this includes foreign investment projects and national investment projects and mergers/acquisitions*
***Source:** ACCIÓ based on fDi Markets 2017-2021, Orbis Crossborders 2017-2021, and the investment charts for Catalonia from 2017 to 2021*

Foreign investment projects in Catalonia

Swapfiets, a Dutch **long-term bike rental company**, chooses **Barcelona** as the **first city in which to expand** in Spain.

(March 2021)

SEAT:CODE **has expanded its offices** in Barcelona with the creation of 90 new jobs. The R&D subsidiary of SEAT focuses its resources on **micromobility and urban mobility**.

€10.7 M/90 jobs

(December 2020)

Cityscoot, an **electric motorbike rental** service provided with head offices in France, has set up a subsidiary in Barcelona.

€0.7 M/14 jobs

(February 2020)

Hive, an **electric scooter rental** company belonging to Free Now, is to open its **European headquarters in Barcelona**. The company has hired an initial team of 20 people, with the expectation of reaching at least 60.

€1.2 M/20 jobs

(August 2019)

Moovel Group opens a **scooter sharing service** in Barcelona.

€25 M/4 jobs

(August 2019)

Trek, the manufacturer and distributor of **bikes** and cycling products, is opening a **repair and maintenance centre** in Barcelona.

€150 M/60 jobs

(July 2019)

The **bike sharing** company Mobike **has landed in Catalonia** with a fleet of 500 bikes and 15 stations.

€0.5 M/3 jobs

(February 2019)

The German **electric scooter** sharing company Wind Mobility has opened a new office in Barcelona.

€0.7 M/14 jobs

(December 2018)

Scoot Networks, an **electric motorbike and bike** company with head offices in the United States, has opened **new European headquarters** in Barcelona.

€3.7 M/17 jobs

(May 2018)

Source: *ACCIÓ based on fDi Markets 2017-2021, Orbis Crossborders 2017-2021, and the investment charts for Catalonia from 2017 to 2021*

Local investment projects in Catalonia

Kleta, a startup that offers **subscription bikes**, has closed a **financing round of €2 M** headed by Fons Borsa Social (which only invests in projects with social or environmental impact).

€2 M

(March 2022)

Voi is preparing the ground to **operate in Barcelona**. The **shared-use electric scooter** company is working with the City Council, Smart Mobility and Aesleme to gain a foothold in the city.

(July 2021)

The Girona **bike** company Megamo is opening **a new 4,000 square metre plant in Girona**. The factory will create 70 jobs directly and another 45 indirectly.

€115 M

(July 2021)

The **bike rental** company Cooltra has received investments for the sum of €10 M, €7 M and €20 M with the goal of promoting its growth and expansion while **increasing its fleet** of electric motorbikes.

€10 + 7 + 20 M

(June 2021, August 2018 and July 2017)

The electric scooter sharing company Reby is to create a **electric scooter and bike connection and assembly centre**.

(September 2019)

The company Buny **is landing** in Catalonia with a service of 50 **electric scooters for shared rental**, with which it started operations on 29 July.

(July 2019)

The manufacturer of **electric motorbikes** Silence (Scutum Logistic) has received investments in order to launch **two new models** into the market and promote company growth. In April 2017, it also set up a **new factory** in Molins de Rei.

€8.6 + 2 M/35 jobs

(July 2018 and December 2017)

The motorbike manufacturer Torrot is to invest €2 M to **adapt the plant** in Salt to its first **electric trial bike**.

€2 M

(February 2018)

Muving **has started operations in Barcelona** with 50 new **electric motorbikes** with a power equivalent to 125 cm^3.

€0.2 M

(May 2017)

Source: *ACCIÓ based on investment charts for Catalonia from 2017 to 2021 and press from 2022*

Mergers and acquisitions of companies from the micromobility sector in Catalonia

Quadis strengthens its position in the bike sector with the **purchase of Probike and Bicisport**. The dealership network has purchased two shops in Barcelona after having entered the business a year and a half ago.

(November 2021)

The energy company **Acciona** has taken a **majority shareholding** in the Spanish electric motorbike manufacturer **Silence**, taking control of the company after purchasing part of the shares that were previously held by other firms such as Repsol or Criteria.

(January 2021)

The Swedish group **MS Group has fully taken over** the company **Batec Mobility**, which deals in the manufacturing of **wheelchair-adaptable bicycles**.

(March 2020)

Torrot received a €24 M injection of capital from owners **Black Toro Capital Fund Management Sarl and Ivan Contreras**, **increasing their shareholding** to 100%.

(October 2017)

Source: *ACCIÓ based on Orbis Crossborders from 2017 to 2021, and the investment charts for Catalonia from 2017 to 2021*

3. Opportunities in the micromobility industry

International business opportunities for Catalan companies

There are 9 international business opportunities for Catalan micromobility companies

9 opportunities

89%

8 opportunities refer to smart cities.

44%

4 opportunities refer to mobility services.

22%

2 opportunities refer to shared mobility.

Countries with micromobility opportunities

Note: a given opportunity could refer to more than one specific area of micromobility
Source: ACCIÓ, based on the global map of international business opportunities of 2021

Details of the international business opportunities for Catalan micromobility companies

Mobility services

- Smart and sustainable urban mobility in the **United Kingdom**.
- The **Netherlands**, spearhead of sustainable mobility and mobility as a service.
- Shared mobility services in **South Korea** (electric car, bike and motorbikes).
- Shared mobility in **Italy** and mobility as a service (MaaS).

Electronics and electrical equipment

- **Chile** prepares for the increase in lightweight electromobility.

Automotive

- Speedy development of urban electric mobility in **Denmark**.
- **Malaysia** faces the challenge of developing the Next Generation Vehicle and mobility as a service.

Motorcycle and light mobility

- Electric and non-electric urban mobility equipment in **Peru**.

Other transport industries

- **Singapore** is the ideal location for pilot tests in bike sharing systems.

Source: ACCIÓ, based on the global map of international business opportunities of 2021

Future trends in the micromobility sector

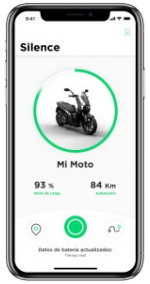
The new technologies help improve the safety and driving of micromobility users

Given their vulnerability, micromobility drivers are exposed to a certain **risk of incidents/accidents**. Recently, different **measures are being designed to improve the safety** of the driver and the vehicle, of the road and of other factors involved in driving:

- **Driver protection and visibility equipment:** red LEDs are included at the rear of the helmet, as well as accelerometers that detect sudden movements by other drivers.
- **Vehicle control:** sensors, smart speed assistance, and autonomous emergency braking systems (AEBS) to improve active and passive safety.
- **Traffic surveillance with optic sensors:** Special cameras and LIDAR 3D sensors both onboard PMVs and on the roadway infrastructure to control traffic and detect situations that are potentially hazardous for micromobility.
- **Recognition of obstacles:** advanced emergency braking systems (AEBS) using radar sensors to detect obstacles and the movement of vehicles, pedestrians and cyclists.
- **Traffic safety and management apps:** apps that can be synchronised with the screen on the handlebars of PMVs and process data in real time for information on accidents, effects of the weather, traffic density, speed limits, road closures, etc.
- **Parking control:** installation of Bluetooth low energy (BLE) posts in parking spaces to ensure correct parking. The new Bluetooth 5.1 version allows for a position c, which is ideal for the precise control of scooter parking.
- **GPS and geofencing:** tracking of electric scooter and bike locations and identification of areas where specific safety rules are applied, such as speed limits or scooter-free zones.

“my Silence” app

SILENCE URBAN ECOMOBILITY



This is a **free app** from the Catalan motorbike manufacturer Silence that **provides a series of functions**, including: switching the vehicle on and off from the app, geolocating the vehicle, consulting the vehicle status (charge, etc.), controlling connected accessories, activating the movement alarm, receiving alerts (high temperature, low battery, etc.) and planning routes.

Source: *ACCIÓ based on the EIT Urban Mobility report “E-Micromobility Safety Assessment” and the Star report “Understanding the evolving micromobilty landscape”*

The major OEMs and operators in the automotive sector are supporting urban mobility and micromobility

- According to a study by the association Pacte Industrial de la Regió Metropolitana de Barcelona, **58% of companies from the automotive sector in the metropolitan region** state that **they will invest in new mobility** in 2021 and that almost half of this investment will focus on the electric vehicle.
- Ford, Uber, Xiamoi and Cabify are examples of **international companies that support micromobility**:
  - ✓ **Ford:** has entered the electric scooter sharing business with its take-over of the startup Spin. Thanks to the experience of the emerging company, which is present in 9 cities in the United States, Ford was able to deploy its scooters for over 100 cities around the world in 2020. In August 2021, Spin announced its global integration into Google Maps to offer its electric bike and scooter sharing service to all users seeking a new form of transport to adopt it or combine it with other means.
  - ✓ **Uber:** Uber works with the shared micromobility company Lime as a strategic partner in the electric scooter area to offer the public a wider variety of forms of transport and to make life with cars increasingly easier.
  - ✓ **Cabify:** has invested in the Spanish startup Movo to promote micromobility with over 20,000 electric scooters that can be found in Spain, Chile, Colombia, Pery and Mexico in order to create the largest mobility as a service (MaaS) platform in Spain and Latin America.
  - ✓ **Xiamoi:** the tech company has recently launched its personal mobility vehicle called Mi Electric Scooter.

The great initiative of the Catalan manufacturer SEAT for new urban mobility and micromobility

SEAT MÓ, new urban mobility and micromobility vehicles:

SEAT MÓ 125
Electric motorbike

SEAT MÓ 25 & 65
Electric scooters

SEAT Minimó
Electric quadricycle

XMOBA, development of shared mobility services:

UFO – Shared electric scooters

Komuti – Ridesharing app

MÓtosharing – motorbike sharing

Source: *ACCIÓ based on the press and on the study on electromobility by Pacte Industrial de la Regió Metropolitana de Barcelona*

“Designer” micromobility

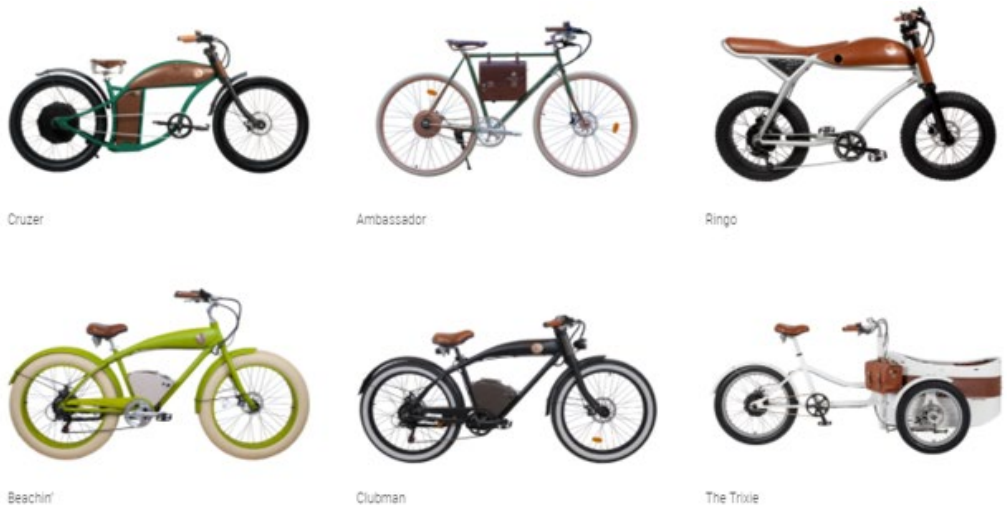
Consumers are increasingly searching for **more original, different and personalised products** that identify them as an individual human being. Embracing this trend, Barcelona, the capital city of design, is promoting micromobility startups that strive to stand out through innovative and original designs.

Lampsy, elegant electric scooters

- A company from Barcelona that was established in May 2019, it produces electric scooters **combining engineering, technology and design with extra quality materials**. Their design is based on the idea of offering a luxury, extremely elegant vehicle able to take passengers to a work meeting or a private party.
- Its scooters also **include state-of-the-art technology**: camera side mirrors, stereo Bluetooth speakers, Lampsy app, electronic lock and digital fingerprint access, ultrasound collision alert system, and built-in screen with rear wide-angle camera and GPS.

Raybolt Bikes, vintage electric bikes

- This company from Barcelona develops electric bikes with a **design that dates back to the legendary era of motorcycling**: the Indian motorcycle from the early 1900s, the *café racer* from 1969, and the *beach cruiser* from 1970. The result: timeless vehicles that seek a sentimental link with old classic motorbikes.
- Its bikes **include state-of-the-art technology**, controlled by a main smart computer called EIVA.



Source: *ACCIÓ*

New forms of micromobility vehicles

Given the boom in micromobility, manufacturers are increasingly innovating in the development of new forms of transport that **adapt to the different needs** of users:

Three-wheel scooters

Folding electric bikes

Scooters with seats

4-wheel electric motorbike

The 3-wheel electric motorbike by Silence

The Catalan electric motorbike manufacturer Silence has developed a three-wheel electric motorbike **with greater charging capacity and stability** thanks to its two wheels at the rear. Its characteristics make it the perfect ally for **delivery or last-mile logistics work**.

Campmajó Bikes and functional diversity

The **assisted electric tricycles** by the company from Tarragona Campmajó Bikes are aimed at people with **functional diversity** who, given their condition, need a **personalised** vehicle that is adapted to the preferences and needs of each individual.

Source: *ACCIÓ based on the CBInsights report "State of mobility: investment & sector trends to watch" and the EIT Urban Mobility report "MOBY Guideline of best practices, and results of e-micromobile integration potentials"*

New loyalty strategies for shared micromobility service companies

In order to retain their customers, micromobility companies are using several loyalty strategy, ranging from **reward programmes** to gamification in order to strengthen their brand and make micromobility a **sustainable solution for urban travel**.

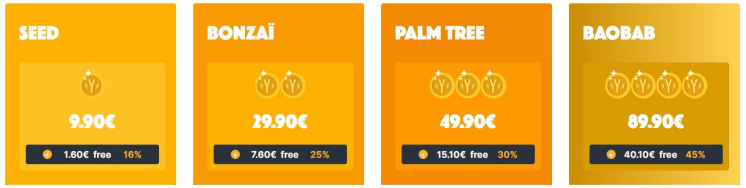
- **"Subscribe and save":** different operators (Lime, Bird, Helbiz, etc.) offer several subscription options, such as daily, weekly, monthly, two-monthly or quarterly payments, and a set rate per month to use the service for 30 minutes a day.
- **"Travel for everyone":** options for people with few financial resources (e.g. Lime Access offers a 70% discount, the Community Pass Program by Lyft offers a monthly rate of $5 + 5 cents per minute of travel, and Spin Access offers monthly discounts).
- **"Invite a friend":** minutes of free travel when a friend joins the service (Voi, Wind Mobility, Skip, Tier, Dott, etc.)
- **Strategic incentives:** frequent user loyalty programmes with discounts and road safety training programmes (Bird, Tier, Lime, etc.).
- **Gamification:** games to earn points or stars in aspects related to the micromobility experience, from meeting key milestones to charging the bike, reducing carbon emissions, taking part in events, sharing comments, etc. (Gogoro).
- **Annual rental:** establishing of long-term links with the user (Vogo, Bounce).

Cooltra Club loyalty programme

Cooltra, the shared mobility company from Barcelona, has set up a loyalty programmed called Cooltra Club to **reward users of the service**. Through a programme in which it is possible to earn points (Coolios) depending on the level of use of the service, **discounts can be obtained** on payment and on rental packages.

Yego pre-payment packages

Yego, the shared micromobility company from Barcelona, sells its **pre-payment packages with growing discounts** as use of the service increases.



Source: *ACCIÓ based on the Star report "Understanding the evolving micromobilty landscape" and the CBInsights report "The future of transportation: Impact of COVID-19 on mobility"*

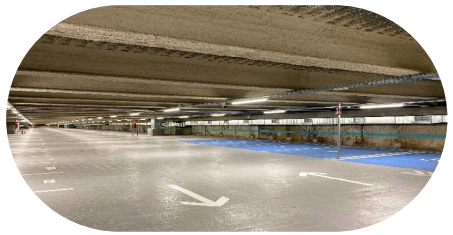
Intermodality: integration of micromobility into the other forms of urban mobility

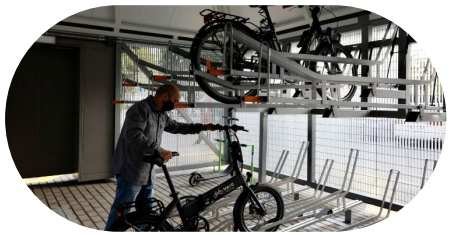
To **reduce the ecological footprint**, different initiatives are underway that include forms of urban transport. A basic lever in promoting the modal change is to solve the challenge of the first and last mile and, in this context, the **integration of micromobility into public transport** is key.

The support by FGC for intermodality

To foster intermodality, FGC is incorporating:

- **Bike and PMV parking at the stations:** the stations currently have 976 parking spaces for micromobility vehicles.
- **New, safe FGC parking (Bicitancat):** 10 new safe parking areas for bikes, to encourage intermodality between bikes/PMV and trains, with a control system to monitor entries and exists, where occupancy is published in real time.
- **Sant Cugat Hub:** The space has 1 Bicibox for 18 bikes/PMVs, 2 shared cargobikes, sockets to charge electric bikes/PMV, 1 repair table and 1 pump.
- **New modal exchange parking area at Sabadell Nord station:** 351 places at the new underground parking area which combines train lines, urban buses, private vehicles and micromobility services.





The new Renfe multimodal digital platform

- Renfe has awarded the development of an **integral digital mobility platform** to the temporary joint venture formed by Everis and Siemens, which is **to start during the third quarter of 2022** in 11 cities in Spain.
- The platform seeks **to integrate different forms of transport (train, bike, underground, bus, carsharing and scooter)** that offer customers a first and last-mile solution so that they can organise their trip from start to finish, **through one single payment**.
- It will be structured through **agreements** with public transport organisations, micromobility companies, carsharing companies, manufacturers of technology and payment systems.

Source: *ACCIÓ based on the press and the FGC report "L'aposta d'FGC per la intermodalitat"*

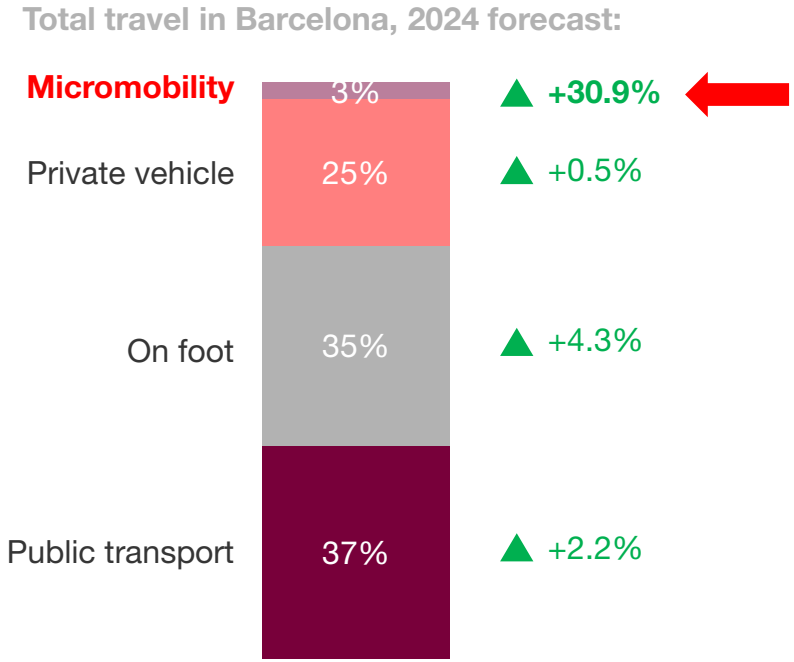
Micromobility in the major urban area of Catalonia

The Metropolitan Area of Barcelona (AMB) is home to the greatest intensity of traffic, congestion and pollution in Catalonia. It is therefore vital to **encourage the use of micromobility** to reduce the ecological footprint in urban and interuban areas.

Urban mobility in Barcelona

Ajuntament de Barcelona

Barcelona City Council estimates that total travel in the city will have **increased by 3.1%** by 2024 in comparison with 2018, and travel using **micromobility** will record **the highest increase**:



PMU (Urban Mobility Plans) for the AMB

AMB

The PMU of the municipalities in the AMB seek to meet the goals of **improving the environmental quality** of the Metropolitan Area of Barcelona, **increase** mobility in **public transport and non-motorised means,** and **decrease** the negative effects caused by **the use of private vehicles**. To implement these activities, the metropolitan transport tax was first collected in 1992 in 18 municipalities inside the 1st ring, with 18 municipalities from the 2nd ring joining in the year 2000:

Source: *ACCIÓ based on the report "Pla de mobilitat urbana 2024" by Barcelona City Council and the Urban mobility plans of the municipalities of the AMB*

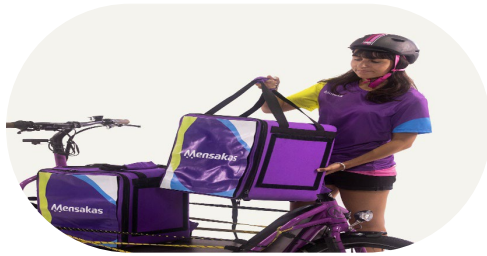
Micromobility in last-mile logistics

- The boom in **e-commerce**, which speeded up as a result of COVID-19, has **increased the transport of products to the home**. In Spain between 2019 and 2021, penetration of e-commerce increased from 71% to 76%. Youngsters below the age of 34 are the segment of the population to have recorded the greatest increase, with a penetration of 83%.
- Unfortunately, **last-mile logistics operations** (the last twenty kilometres of the supply chain) **are increasingly less efficient** and account for around **29% of total product transport costs**.
- Urban environments are also increasingly complex, with fewer parking spaces and more spaces reserved for pedestrians. This is the ideal setting for the appearance of **innovative last-mile logistics solutions based on e-micromobility**.
- The main idea of new electric charging micromobility transport is to **associate an electric bike with a box to transport packages**.

Responsible delivery by bike

Mensakas

Mensakas is a Catalan non-profit cooperate that was established in 2018 as a responsible delivery alternative, where the employee and sustainability are the mainstays of its business mission. **Delivery takes place by bikes** equipped with an area for loading goods:



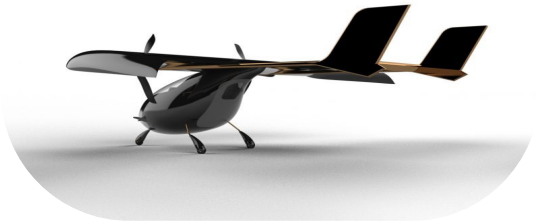
Source: *ACCIÓ based on the EIT Urban Mobility report "MOBY Guideline of best practices, and results of e-micromobile integration potentials" and the annual "e-commerce" study by Elogia, 2018 - 2021*

The future of micromobility: urban aerial mobility

- According to a recent study by the European Aviation Safety Agency (EASA), 83% of the population is in favour of urban aerial mobility, which would include **delivery drones and unmanned air taxis**. This would lead to a **decrease in traffic jams in urban areas** and a **drop in pollution** caused by traffic. These initiatives could also lead to **faster access for the emergency services** to the places where they are required.
- Despite this being in the distant future, work is already underway on the **development of a new mobility area in the skies of the metropolitan areas,** which would allow for the optimal integration of the programmed services to be designed, along with on-demand services that will travel along **aerial corridors** coordinated from a joint information exchange system.

The Catalan aerial vehicle by Advanced Air Mobility

The **Catalan startup** Advanced Air Mobility (AAM), which specialises in the personal urban aerial mobility sector, has created an **autonomous electric air taxi prototype** to save time on urban and interurban travel. The vehicle is equipped with **fixed wing technology eVTOL**, similar to that used in STOL plans, which reduces take-off and landing distances to less than 50 metres. The taxis can therefore enter and exit heliports, and users arriving at the destination can **switch to other micromobility vehicles** for the rest of the trip.



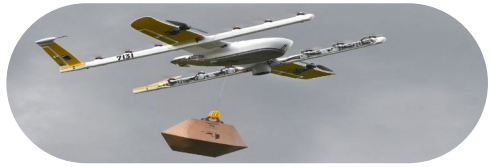
Delivery of e-commerce by drone

Different companies from the tech sector, from e-commerce and from courier services are supporting the development of different **drone prototypes** to deliver last-mile goods sustainably:

Amazon Prime Air

UPS Flight Forward

Rakuten: Sora Raku



Google: Wing project

Source: *ACCIÓ based on the European Aviation Security Agency (EASA) and the press*

Beyond micromobility: electric quadricycles for urban mobility

- To continue fighting the ecological footprint, manufacturers from the mobility industry are also developing other forms of sustainable transport, such as **electric quadricycles**, **adaptable to heavy traffic in major cities**, which help lessen the effects of climate change.
- According to the EU, the quadricycle is a category of vehicle that refers to **four-wheel microcars** in two versions:
  - ✓ **Lightweight quadricycles (L6e):** four-wheel motor vehicles, with a laden mass of below 425 kg (not including the battery), a maximum speed limit of 45 km/h, and a maximum nominal continuous rating of less than 4 kW.
  - ✓ **Heavy quadricycles (L7e):** four-wheel motor vehicles, different to the L6e, with a laden mass of below 450 kg (not including the battery) and a maximum net motor rating of less than 15 kW.
- There are several quadricycle alternatives developed and designed in Catalonia:

Minimó, the quadricycle by SEAT

This was presented on 25 February 2019 at the Mobile World Congress and is the brand's first electric quadricycle, with an **autonomy of 100 km**, 2.5 m in length by 1.2 m in width, and **equipped with 5G**.

Tecnovelero and its Virante quadricycle

The Virante is designed as a **multi-purpose vehicle**, for private use and for business use or carsharing to ensure new cleaner, safer, quieter and more sustainable urban mobility.

The e-Miles Company project

This is **driven with a joystick** located between the 2 front seats and has **cameras instead of side mirrors** to show the driving image on the screen. Its length can be expanded by 37 cm to seat 4 people. Its **2 and a half metres** in length mean it can be parked perpendicularly.

The new S04, the quadricycle by Silence

This is an **electric two-seater** with an **autonomy of 125 km**, a maximum speed of 45 km/h, 2.28 m in length by 1.29 m in width, and a removable battery. **Through the "My Silence" app**, it is possible to enter the vehicle, start or stop it, activate the air conditioning, lock the doors, etc.

Source: *ACCIÓ based on EU Regulation 168/2013*

Thank you!

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