

Let's Turn

# Barcelona

Into a Mobility Benchmark



**RACC**

We are here  
to help





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Into a Mobility Benchmark



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An aerial photograph of Barcelona, Spain, taken during the 'blue hour' of sunset. The city's dense urban fabric is visible, with numerous buildings featuring terracotta roofs. In the foreground, a large, modern apartment complex with a grid-like facade and many balconies is prominent. In the background, the distinctive, bullet-shaped Torre Agbar stands out against the sky. The Mediterranean Sea is visible on the horizon, with a few sailboats in the distance. A yellow-to-green gradient bar is positioned on the left side of the image, containing the word 'Editorial' in white text.

# Editorial



Josep Mateu  
RACC President

Never before had there been so much talk about mobility. We are immersed in a true revolution that transforms, day after day, our cities, our way to live and, consequently, our way to move. Digital transformation and the search for an environmentally sustainable model are the two big axes that are marking the political and social agenda around mobility.

And a large part of these changes is due to technological innovations that are transforming the vehicles, making them cleaner and smarter, autonomous, connected, shared and environment-friendly, plotting the path for an increasingly intermodal future that will provide people with the chance to combine the use of different modes of transport to move from one place to another in a more comfortable and agile way, thanks to platforms and mobile applications.

In this scenario, Barcelona is facing the challenge to adapt the urban space in order to introduce innovation and to continue moving towards a collective mobility model that will have in mind, above all, the quality of life of the citizens, and, at the same time, the competitiveness of the city and its attractiveness for future investments. Success will depend on how easy, safe and sustainable it is to move around the city and its access roads, as well as on the technological progress and the necessary adaptation to the regulations that will have to rule the correct implementation.

Although in recent years, the city has evolved in certain aspects, it is necessary to double our efforts and review some of the approaches from the past, reflect on the urban model and propose new strategies that will allow us to continue progressing at the same speed as the society is

transforming. It is time to reconsider the urban mobility model from an economic, social and political perspective, to let Barcelona position itself at the top of the leading cities in terms of urban mobility, and to become a global benchmark.

Our target cannot be any other than continue moving towards a sustainable mobility that will give priority to energy-efficiency and safety. But, to do this, it is essential to encourage a smart mobility in the years to come, that will take us closer to the challenge of reducing the number of fatalities to zero, improve the quality of the air we breathe, giving priority to cleaner technologies and allowing for a more fluid circulation in the city and the metropolitan area.

Staying true to our origins, the RACC wants to continue contributing to this change of paradigm and place



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the people into the centre of mobility, regardless of whether they move on foot, by bike, skate, their private vehicle or public transport. As a consequence, and based on the experience and scientific rigour that back our entity, the RACC launches 45 proposals, which are gathered in this publication.

The intention of all of them is to contribute to a better diagnosis of the current situation, and to find the best suited solutions to let people from all ages and conditions enjoy a better quality of life, without having to pay any kind of toll in terms of loss of time, opportunities, health or money, and which will also provide the city and its metropolitan area with the necessary tools to lead the new mobility and to generate and attract talent and investments.

With this overall reflection, our aim is to contribute to debate with a constructive spirit, because mobility is everyone's responsibility, i.e. of the citizens, of all entities involved in mobility, of the business sectors related to transport, and of the administrations.

Barcelona has the chance to look up, turn on the headlights, make plans past electoral mandates and build a better mobility.

**Josep Mateu**  
RACC President





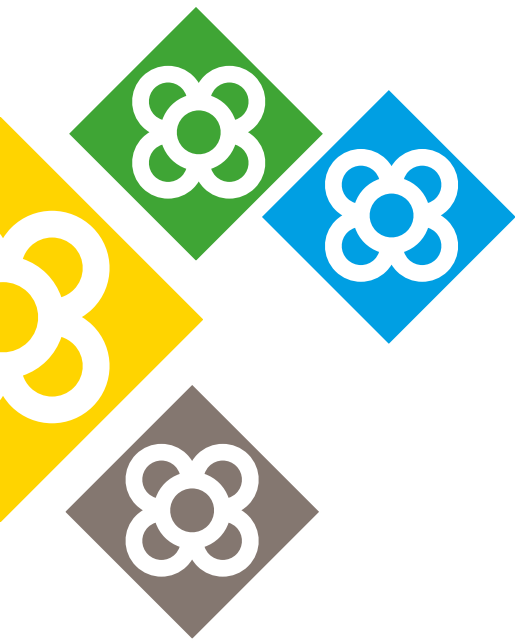






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# Urban Mobility: The Challenge for 21st Century Cities

**The competitiveness of cities depends more and more on mobility.** Today, a large part of the trips starts or ends in cities. Therefore, designing efficient mobility plans is key to make these trips easier and to rationalise them.

Due to the environmental impact of mobility, the main European metropolis are planning how to reduce polluting emissions due to their growing consequences for the health of citizens and the ecosystem. But they are also encouraging a more agile urbanism that will make a **strategic use of the new technologies** to update the best way to move, based on concepts like the Walkable City or Vision Zero, a strategy that was implemented for the first time in Sweden in order to get rid of all fatalities and serious injuries that are caused by road accidents.

It is, in short, about making the cities more “liveable”, promoting political, economic, social and technical solutions to have a better quality of life, starting from the premise that **73% of the European citizens live currently in urban areas** (a percentage that, according to European Urban Mobility, an observatory supported by the European Commission, may grow to 80% by 2050).

The biggest challenge continues to be how to **guarantee mobility, reducing at the same time traffic congestion, road accidents and pollution.** In this sense, although every European country applies a different strategy according to their specific features, they all agree on the fact that what makes a transport system sustainable is the use that the citizens make of it, the way in which it influences their lives, its environmental footprint and its economic profitability.

Some of the measures that are being implemented by the cities that are at the forefront in this field (Paris, Helsinki, Munich, Vienna, Oslo, Copenhagen...) include the **review of the car-focussed model**, which was giving privileges to this means of transport. In Paris, for example, since July 2016, the most polluting vehicles cannot drive in the French capital on working days from 8 o'clock in the morning to 8 o'clock in the evening. But this measure included a pack of economic supporting measures for all those citizens who decide to give up using their private car, such as a 50% discount when using shared electric vehicles, a grant of up to €400 for the purchase of a pedal-assisted bicycles and grants of €3,000 to €5,000 for the purchase of a non-polluting car, as well as an increase of the frequency of buses, underground trains

and other means of public transport.

Changing the city model in order to **give priority**

**25%**  
of the trips  
made in Barcelona  
are made by  
car and motorcycle

**to ways of mobility that are active** (walking, riding bicycle) and clean (electric vehicles) requires also the creation of cross-relationships between the different means of transport that link the different districts, the metropolitan area and the second crown of the city. This new digital paradigm is

mobility as a service (MaaS), and it demands for solutions for new challenges, such as the governance of data or the integration of public and private regulations.

Speaking about a **new, safe, sustainable, connected, affordable and intermodal mobility** is also speaking about traffic calming and about redrawing the cities in order to integrate the business models that coming up and the incipient ways to travel that are used especially by young people. **The transformation we are experiencing is technological, but also sociological:** in the last decade, the number of driving licenses that have been issued to young people in Spain has halved, since getting the license as soon as they turn 18 years is no longer a priority for them.



Another large social phenomenon that is arising in Europe in general and in Barcelona in particular, is the ageing of the population that will increase from the current 21% of citizens aged 65 or older to 30% by 2040. Any strategy for the future must understand the needs of elderly people and foresee the incidence of this scenario on mobility, for example, adapting the times to cross a pedestrian crossing or strengthening the funding of public transport.

One of the problems of the constant increase of the population recorded by the large cities in the Old Continent is the increasing number of trips. For this reason and in order to make the cities more habitable, it becomes more and more important to have an **efficient public transport network**

in terms of coverage, frequency, comfort, fees and affordability, as happens in Paris and Vienna. But also a road safety system that will reduce the accident rate and protect the most vulnerable road users (pedestrians, bicycle and motorcycle riders, schoolchildren, the elderly...), that will look after the air quality according to the directives of the WHO and the EU, following the example of Oslo with the electric car, and that will report efficiently on the **different options that citizens have to using the car**, such as moto sharing, bike sharing, carpooling, etc. like it is done in Vienna.

Barcelona is obviously not unaware of these debates. Today, almost 25% of the trips made in the city, are made by **car and motorcycle, which are means of transport that cover 60% of the public**

**space.** It is not surprising therefore, that it is necessary to turn the screw further with some of the approaches of the past to make the urban mobility strategy more effective.

Barcelona is located on a plain, limited by the sea and the Collserola mountain range, as well as by the deltas of the rivers Besòs and Llobregat.

**Every day, around 900,000 trips are made with the private vehicle** (car and motorcycle) between the metropolitan area and the city, which have to be added to another 650,000 trips made inside of Barcelona. Moreover, there are thousands of vans moving constantly around the metropolitan area, many of them performing “last mile” delivery services, largely due to the boom of electronic commerce.



Precisely because the city is surrounded by the sea and the mountains, and due to the high density, an efficient traffic management is essential to tackle pollution and to face the challenges brought up by the future.

The purpose of having a calmed and connected Barcelona that encourages an accessible, safe and friendly mobility for the citizens must have as a strategic horizon, to continue moving towards an integrating approach that takes into consideration the specific needs, placing the citizens in the centre.

The increasing number of means of transport is one of the challenges. Good proof of it is the emergence of **new vehicles for personal mobility** (electric scooters, monocycles, etc.) that do also claim their place, considering that the car is not always the fastest way to move around Barcelona. But in order to

achieve a perfect fit, urgent specific measures are needed to avoid affecting civility and road safety.

The Urban Mobility Plan 2013-2018 was characterised by establishing targets that

**Barcelona  
does not reach  
the air quality  
parameters  
established  
by the EU**

were only able to be achieved partially. Consequently, time has come **to reflect on the urban model and to propose new strategies** that will allow us to go beyond everything that has been achieved so far.

Although the Urban Mobility Plan 2013-2018 proposed,

among others, to reduce the number of trips with the private vehicle in Barcelona to 20%, and to increase travels with public transport to 41% by the end of the mandate, it was not possible to achieve any of these targets.

It was not possible either to reach the European parameters in terms of air quality: 3 of the 11 stations that measure the quality of air in the city are still providing values above the maximum levels established by the European Union. Something similar happened with the TMB bus network, the commercial speed of which is actually of 12.1 km/h, which is less than the figure of 2013, when the target for the year 2018 had been set at 13 km/h. Last but not least, although there are more examples, there has not been a sufficient improvement in the **reduction of the number of fatalities and serious injuries** caused by road accidents.





Selfies a l'iPhone X

AMB Taxi 5934

99 HRY

di AMB 3187

TOLEDO





**Walking**  
**Riding a bicycle**  
**Using an electric scooter**  
**Using shared vehicles**

...

However, the biggest challenge faced by the cities is securing urban mobility on a daily basis.

The current challenge is to change course in a coordinated way in order to give priority to other mobility modes that will focus on the well-being and the quality of life of the people, and not of their vehicles. In short, it is about **moving more people with less private vehicles**. In this sense, the public transport system must make a qualitative leap in terms of capacity, in addition to promoting multiple mobility options (walking, riding a bicycle, using an electric scooter, using shared vehicles, etc.). At the same time, it is necessary to **keep a realistic approach that, as regards the private vehicle**, will focus its efforts on increasing the occupation rate, which is currently a poor 1.2 passengers per car.

According to the RACC barometer, carried out in January 2019, the congestion affecting Barcelona and its accesses, **the increasingly**

**higher cost of mobility** and the deterioration of the air quality are the aspects that generate the highest dissatisfaction among the citizens of Barcelona, with rejection percentages of between 58.5% and 69.4%, followed by the lack of road safety and the (precarious) co-existence of different modes of transport.

However, and beyond any specific aspects, if there is something needed by Barcelona right now, it is an agreed-on city model that will reach further than any short-term plan. A model that will give an answer to the question of whether or not Barcelona wants to continue being a Mediterranean city, with its doors wide open to enjoy the good weather, and at the same time offering a response to the dysfunctions shown currently by large cities: those related to sustainability and the introduction of the society of information and knowledge. In short, a more cultural, rather than political model, pursuing a **healthier,**

**friendlier, more human and affordable city.**

The RACC wants to join this debate with the proposals that are described in detail below, so that the next Urban Mobility Plan 2019-2024 for Barcelona, is not limited to setting targets for the following five years, but is lifted in order to **turn urban mobility into the distinctive feature** of the Barcelona of the future.



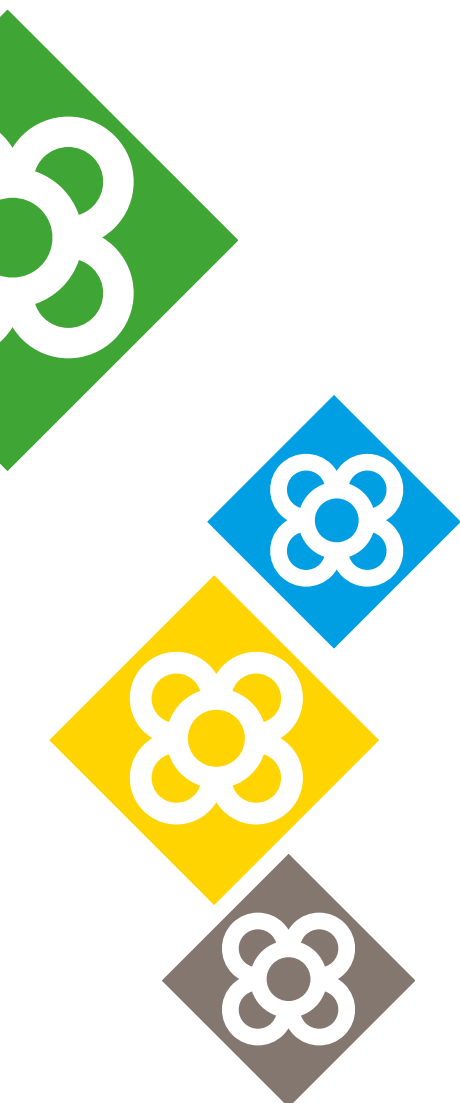


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# The International Mobility Benchmarks for Barcelona and Catalonia



Starting from the fact that there are neither equal cities nor identical mobility models, the drawing-up of an own strategy that will make the most of the strengths of the city (weather, compaction, orography...) and improve the deficits, implies having a look abroad with the aim of finding benchmarks.

As regards mobility on foot or on a motorcycle, Barcelona is on top of the medium and large cities, so that the city will have to innovate on its own.

**More than 2.5 million trips per day are made on foot,** which equals 45% of the inner-city travels. The improvement of public spaces and the accessibility for pedestrians (to the underground, too), as well as the creation of large traffic calming areas, such as the

districts of Ciutat Vella or Gràcia, allows distinguishing Barcelona as a best practice at European level. On the other hand, almost **50% of the inner-city travels using the private vehicle are made by motorcycle.** This means of transport, with low CO2 emissions and low road occupation helps to avoid much worse congestion rates in Barcelona.

However, Barcelona can and must learn from the best in other fields:

**BICYCLE: Copenhagen**  
Copenhagen has a large network of segregated bicycle lanes, including the so-called “bicycle highways” and exclusive bridges for bicycles to connect the districts that are separated by the maritime front. This project has led to **41% of the**

**trips in the Danish capital being made by bicycle**, with the target of reaching 50% by 2025, the date on which the city wants to be carbon neutral.

Moreover, with the aim of making the bicycle more attractive for daily mobility, Copenhagen facilitates the intermodality between bicycle and public transport and has introduced a system of smart traffic lights that detect shapes and give priority to the speed of cyclists over other means of transport, so that the bicycle becomes the best alternative in terms of costs and travelling time.

The Danish capital has also given the name to the *Copenhagenize Index*, a

ranking of cities that assesses the design of the cycling infrastructure.

**INTERMODALITY: Munich**  
The metropolitan area of Munich has **38 Park&Ride facilities and a total of 14,000 parking spaces**

available at public transport stations (underground, bus or tram) managed by the company P+R GmbH. These car parks facilitate the intermodality between private and public transport, and the fees are included in the transport ticket for all those wishing to travel to the city. In order to control the good use of these car parks, Munich charges high fees to those who park their vehicles without the intention of using public transport later, and

prohibits to park there for more than 24 hours.

Despite them being used by a small percentage of vehicles that actually enter and leave the city every day, these infrastructures free the city from high congestion, emissions and intense traffic caused by those who are looking for a parking space.

**PUBLIC TRANSPORT: Paris**

The French capital stands out due to its **almost universal public transport coverage**, that allows any citizen to access a network of more than 350 underground and train stations covering a short distance on foot.



A blue tram is traveling on a cobblestone street in Munich. The tram is modern and has a large front window. The destination sign above the window displays the number 21 and the text "Stachus". The tram is connected to overhead power lines. In the background, there are historic buildings with many windows and balconies. A yellow banner with the word "Munich" is overlaid on the right side of the image.

# Munich





Oslo

On the other hand, the city has introduced the contactless card Navigo, which allows for monthly payment through the bank account; it is not nominative and can be used for different modes of transport with a cost per trip that equals the cost of a pass with a discount. For the 12 million daily users, 10% of them tourists, the public transport rates turn it into the most competitive means of transport, and they even provide the chance for employees to get a 50% refund from their employer. At the same time, the transport authority has real-time mobility data available; and accessibility, as well as free WIFI connectivity are moving forward in all of the stations.

#### **ELECTRIC VEHICLE: Oslo**

Knowing that electrification is one of the essential targets for the next decade, there are only a few cities that have prepared themselves as much as Oslo. Although more than 60% of the inhabitants of the city live in apartments without parking space, and therefore without their own recharging point, **there are more than 400 recharging stations for electric vehicles** distributed around the city.

The percentage of new electric vehicles is already higher than the number of vehicles with a combustion engine, thanks to the incentives offered in different aspects: circulation on the bus lane, electric energy five to six times cheaper than

fossil fuels, exemption of the circulation tax and the VAT when purchasing an electric vehicle, and a long-term subvention of the purchase.

On the other hand, Oslo offers other advantages that are also offered in Barcelona, such as free 'blue' parking areas and tolls. Moreover, the Norwegian capital promotes the electric car sharing, as well as other modes of transport, such as the bus and the ferry.

#### **MOBILITY AS A SERVICE: Vienna and Helsinki**

Vienna has developed the application WienMobil, the first and clearest example of what the **paradigm of mobility as a service (MaaS)**



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represents, as it allows users to plan, book, validate and pay for their travels from door to door through a single digital access point. With this mobile access point, citizens get access to the complete public and private transport offer, such as the bus, the tram or the underground, as well as the chance to book parking spaces, taxis, bicycle sharing, car sharing or car rentals.

By means of the concentration and digitalisation of the complete mobility offer and demand,

you have access to real-time information —that can be customised—, you promote a better traffic management, and you can adjust the demand by means of dynamic prices.

This concentration of information and service necessarily leads to the development of a data governance model that will allow for competition, and, in the last instance, to provide users with the best service, as established by the new Finnish law on transport (*Act on Transport Services*).



Copenhagen





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# Our Pillars for a New Mobility Culture



The end of the previous Urban Mobility Plan 2013-2018 has led the RACC to reflect on what has been achieved and not achieved so far, and to propose a pack of proposals to continue moving progressively towards targets established by consensus. The proposals are 45 specific measures based on five **five pillars that the RACC considers as essential for a mobility model** to make sense and benefit society: safety, sustainability, affordability, connectivity and intermodality. For the RACC, these are the pillars that must act as a support for the mobility culture:

## Safe Mobility:

every mobility action must add towards **Vision Zero**, that understands fatalities caused by road accidents as something unacceptable.

## Sustainable Mobility:

the two major environmental externalities affect the two “Ps”, **planet and people**. We have to develop a mobility that is free of fossil fuels, which are the cause of global warming, and that maximises energy-efficiency by transported passenger, at the same time eliminating air pollutants like nitrogen oxides and particulate matter that affect the health of human beings.



### Affordable Mobility:

the tax contribution of users is not often compensated to the same extent by the necessary investments in transport. As a catalyst of economic progress, mobility must be kept at a **competitive cost** for the people.

### Connected Mobility:

we must **take advantage of all possibilities offered by the digital disruption** to users, such as the new ways to move or the conveniences that provide for more independent and efficient lifestyles as opposed to the traditional owned private vehicle.

### Intermodal Mobility:

for the sake of the maximum possible optimization of the capacity offered by the different modes of transport, it is necessary to **offer a barrier-free experience** to users, that will allow for

a fluent connection of the different modes.

Beyond the achievements made by Barcelona, the RACC encourages the discussion about those pillars which have still a margin for improvement, in order to find the policies that should be reformulated to continue progressing significantly in terms of urban mobility culture.

The development of this culture according to values that have been established by consensus, includes substantial changes that affect both the citizens of Barcelona and the people who access the city for different reasons (work, study, leisure, tourism, shopping...).

**Consequently, the RACC proposes a set of actions that will serve to update the current urban mobility model** based on what has

happened in the past five years. A period that has led to ways of urban mobility that did not exist and that, thanks to new technologies, are starting to change the way to understand public and private transport in large cities. At the same time, the social concern about the environmental impact of mobility is growing, and this is starting to imply traffic restrictions that demand compensatory solutions and to reformulate old schemes in order to adapt to this scenario that eventually demands for a more agile, affordable and safe mobility that does not lead to additional costs for users.

**On the other hand, the RACC draws-up a series of measures that are essential to tackle with assurance, a future that will be very different to the present,** starting from the fact that the urban mobility encouraged

by Barcelona will determine its future as a city, due to the impact it will have on growth, on labour and on the ability to attract investment and talent. Boosting the model change, making that the use of the private vehicle becomes the less attractive option thanks to the development of other truly attractive options; implementing “clean” transport systems; boosting connectivity or introducing mobility as a service (MaaS) to favour the purse and the environment, are only some of the measures proposed to face the disruptive change, as it breaks-up with the past, which mobility is going through.

Likewise, the RACC wants to remind the **significance that the decisions eventually taken about large actions that are still pending, will have on the future mobility model:** finishing the central section of line 9 of the

underground; deciding whether or not the connection of the two tram networks will be made in an alternative route and not on the Diagonal Avenue —in order to find a solution for the congestion in the Eixample district, avoiding at the same time a worsening of the air quality in the district—, and reflecting on the future of the La Sagrera and Sants stations, the extension of the Port and of the Airport, the investment and management of the commuter train service, the saturation of the ring roads... These are all hot topics that have to be analysed meticulously **based on rigorous and independent studies** so that these pending actions do not become chronic and end-up conditioning the future urban mobility plans drawn-up by Barcelona.

The spirit of all of the proposals that are detailed below, is included in our

motto “We are here to help”. In a time, in which mobility is undergoing major changes, year after year, the RACC believes that it is possible to improve some of the aspects included in the previous plan, in order to continue moving towards the future.





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# RACC Proposals: The Continuous Improvement of the Current Model

## Safe Mobility for People

An inalienable target of mobility must be not to lose lives. However, the measures that allowed the reduction of the road accident rate, are no longer enough to continue moving forward in the fight against road accidents. There are still too many fatalities and serious injuries, especially among the most vulnerable users. To be precise, since 2010, **88% of the fatalities recorded in the urban network of Barcelona, correspond to riders (48%) and pedestrians (40%)**.

Likewise, the number of fatalities and serious injuries -those who have to be taken to hospital at least during 24 hours- has increased from 226 people in 2015 to 253 people in 2017.

The larger concentration of accidents happens in the district of Eixample (up to one third of the total), although the accident rate is three times higher on secondary roads than on the main avenues of the city.

On the other hand, despite the most affected users being riders and pedestrians, in most of the cases there is some other vehicle involved. In this sense, the motorcycles travelling on the access roads to Barcelona, have a risk of having a serious or fatal accident that is five times higher than that of cars.

The increase of mobility, distractions —according to a study of the RACC, 42% percent of drivers admit that they use the mobile while driving to send text messages and make calls— and the consumption of alcohol



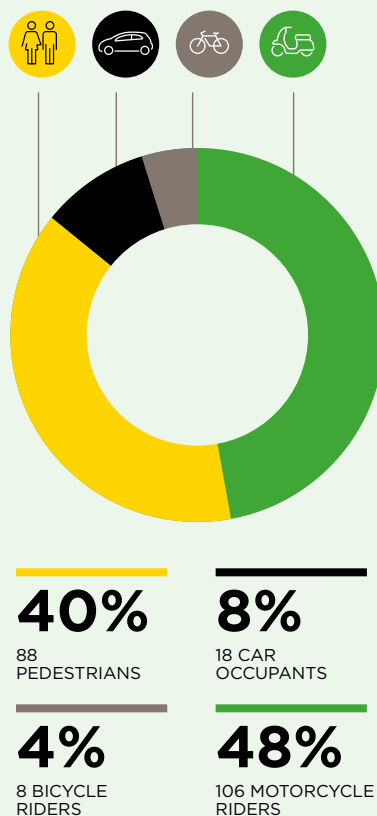


and drugs are still key factors involved in the accident rate of people.

The target is to place Barcelona among the most advanced European cities in terms of road safety, which, and according to the OECD Safer City Streets index are Stockholm, Berlin and Dublin. To achieve this, the number of fatalities and serious injuries that are still being recorded in the city and the access roads has to be reduced drastically.

Although road safety in Barcelona has improved drastically in the past 25 years, there is still a lot left to do. In order to continue moving forward, it is necessary to regulate a framework for the co-existence of the different means of transport that includes the new personal mobility actors:

#### FATALITIES BETWEEN 2010 AND 2017 IN BARCELONA



bicycles, electric scooters, monocycles, etc.

According to studies carried out by the RACC, the risk of dying in a road accident either as a driver, a passenger or a pedestrian, tends to increase with age, especially from 74 years onwards. At the other end, the risk rate of young people, especially if they are riders, is still too high with respect to the number of kilometres covered by their vehicles, which makes it necessary to adapt the infrastructures and to encourage training instead of sanctioning. The target is that accidents tend to zero stressing on attitude and aptitudes.

**In the light of the above, the RACC proposes:**

### **1 To develop the Motorcycle Plan.**

In Barcelona, **almost one out of every four vehicles are motorcycles or mopeds**, turning the city into one of the European metropolis with the most number of motorcycles per inhabitant. Considering that the riders suffer the highest accident rate, it is urgent to introduce a road safety plan for this group which includes **exclusive lanes on the access roads to Barcelona** —since 2008, the trips on motorcycle between Barcelona and the metropolitan area has increased by 41%—, as well as **better maintenance of the road network and more public space to park**.

Moreover, we have to continue stressing on the compulsory exchange of fines for training courses and the introduction of an ability test for new “B+3” drivers, who are allowed to drive motorcycles of up to 125cc because they are holding a grade B licence for more than three years.

### **2 To promote a better co-existence between road users.**

It is necessary **to promote a higher mutual understanding between the users of the different means of urban transport** to avoid accidents —in most of the tragic cases there is always more than one group involved—, but also the unpleasant situations arising out of the traffic and the daily stress, such as verbal

confrontations or reckless behaviours. In particular, it is necessary to improve the interactions between bicycle and motorcycle riders, pedestrians and bicycle riders, pedestrian and scooter riders and, last but not least, between bicycle riders and drivers, based on mutual respect and the knowledge of the rights and rules to be followed, especially out of the basic network of the city.

### **3 To control secondary roads.**

**The road accident rate and the breach of regulations are multiplied by 3 on secondary roads and on 30 km/h roads**, due to a lesser clarity of the legislation or a lesser strict enforcement, despite there being a greater interaction between pedestrians and the rest of



the means of transport due to their smaller size.

#### 4 To protect the elderly.

In a context of progressive ageing of the population, **the group with the largest risk of being run over are the elderly**, increasing their safety implies designing safer crossings, providing enough time to cross at traffic lights on large avenues and controlling speed. More than 40% of the people who are older than 60 years of age and are run over and survive, have serious injuries that take 12 months in average to cure.

#### 5 To calm school surroundings.

It is necessary to **guarantee a larger safety perimeter on the streets leading to schools**, reducing the speed,

reinforcing the signs and restricting the car parking. Moreover, we have to continue with the project “School Path, Friendly Space” and extend it to secondary schools to make it easier for pupils older than twelve years of age to have an autonomous, safe and sustainable mobility.

#### 6 To strengthen control.

It is imperative to activate **new measures to better control distractions, speeding, the consumption of alcohol and drugs** for all public road users (drivers, riders, scooter and bicycle riders, etc.) regardless of the means of transport they are using, as self-management is not always efficient or safe.

### Sustainable Mobility to Have Healthier Air

The air quality in Barcelona, as in many other cities, has not improved enough due to a series of pollutants that worsen the illnesses of some people and cause new ones. Many of these polluting particulate matters (PM) are released by the exhaust pipes of motor vehicles. It is estimated that **60% of the nitrogen dioxide emissions and 21% of PM in the city are the consequence of road traffic**. However, during the past ten years, the quality of the air has improved gradually in Europe, partly due to the economic deceleration of 2008 as a consequence of the global financial crisis. Even so, Barcelona continues to record nitrogen dioxide (NO<sub>2</sub>) concentrations that are slightly above the values accepted by the EU.

Although every pollutant has a different effect on the health of people, it is known that on days with a higher air pollution in Barcelona, there are more hospital admissions and a higher number of deaths. All of this deteriorates the quality of life offered by the city and, therefore, its competitiveness in the global

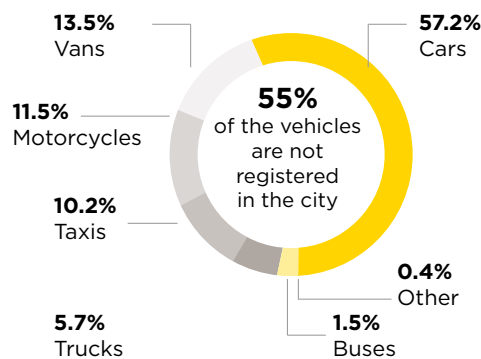
scenario.

Currently, **diesel is the most commonly used fuel (64.6%) by the vehicles travelling in Barcelona.** On the other hand, around 55% of the vehicles that travel in the city are not registered in the city. As a consequence, from 1 December 2017, around **150,000 users of cars**

**and 25,000 motorcycles** that are not fitted with the environmental level **are not allowed to travel on those days that are declared as having a high air pollution.** These measures will be permanent from 1 January 2020 onwards. The restrictions imposed on the most polluting vehicles will be applicable on all

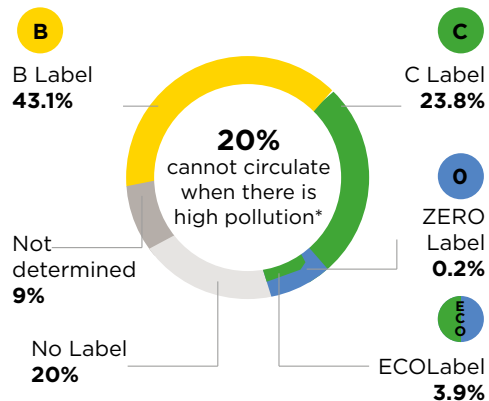
## CIRCULATION IN THE METROPOLITAN AREA OF BARCELONA

### MORE THAN HALF OF THE VEHICLES ARE CARS



Source: RACC, Barcelona City Council, AMB

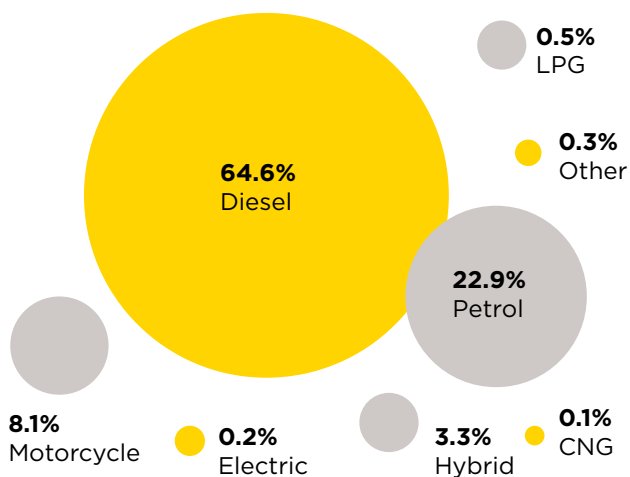
### MORE THAN 130,000 VEHICLES DO NOT HAVE THE ENVIRONMENTAL LABEL



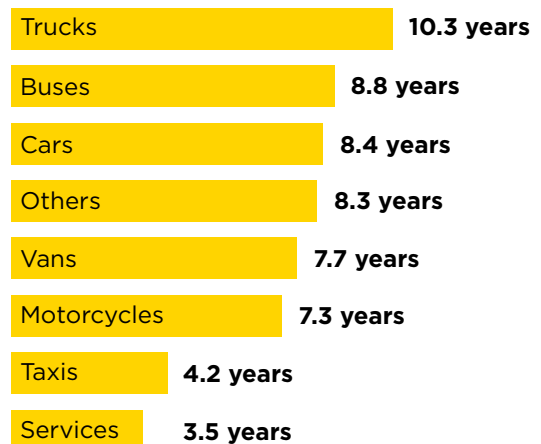
\*From 2020, the restrictions will be permanent on all working days from 7h to 20h.



### DIESEL, MOSTLY USED FUEL



### HEAVY VEHICLES, THE OLDEST



Source: RACC, Barcelona City Council, AMB

working days from 07.00h to 20.00h.

The RACC advocates for **removing the most polluting vehicles in a progressive and coordinated way**. The final target is to achieve a balance between the environment and mobility.

To avoid that anyone is left behind, it is necessary to provide for financial help to

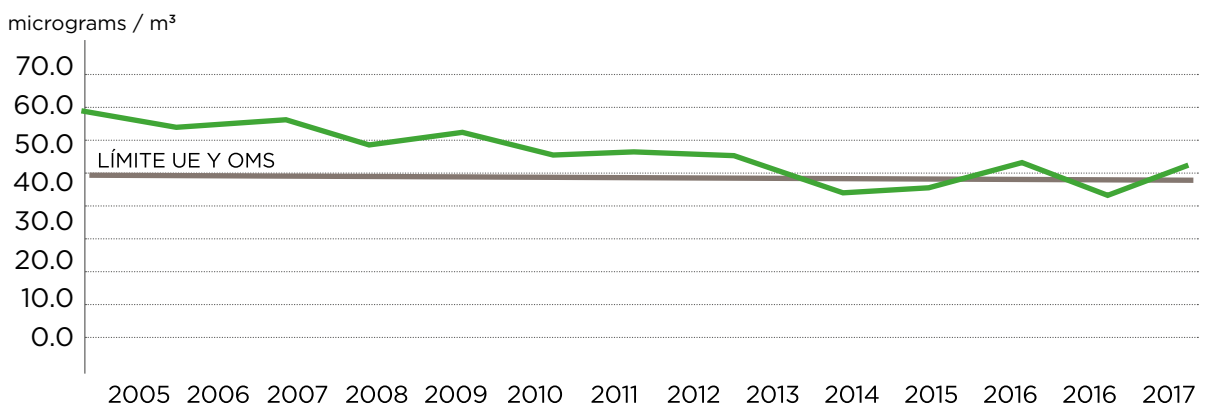
all users who are affected by the restrictions so that they are able to change their old vehicles for cleaner vehicles as has been made in Paris or London.

On the other hand, although the former Urban Mobility Plan proposed that all permanent air quality surveillance stations in Barcelona should comply with

the regulations, there are still three of the existing eleven that (as it was back in 2013, at the beginning of the plan) are not yet adapted to the thresholds established by the EU to reach a yearly average value below 40 micrograms per cubic metre.

The congestion of the access corridors to Barcelona coming from other places

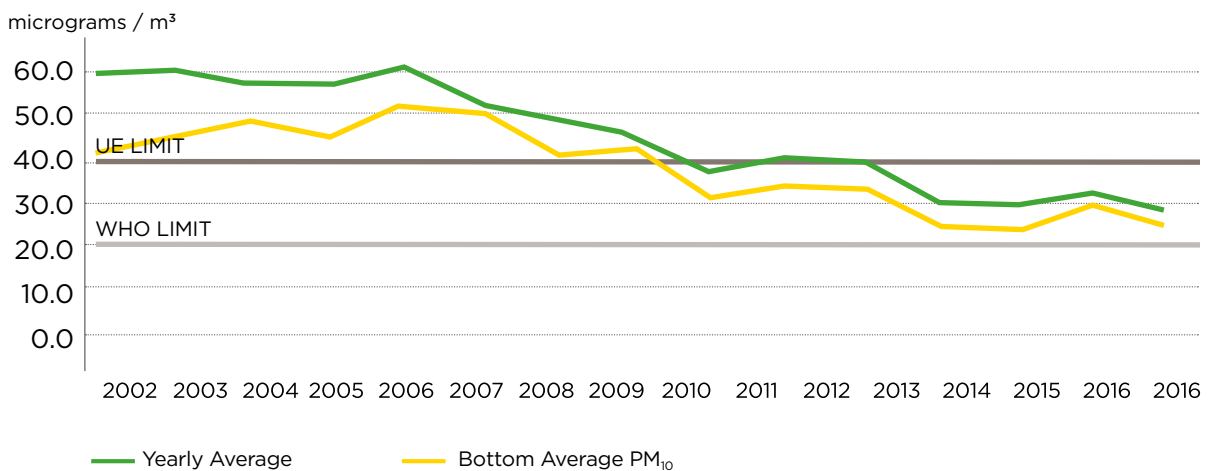
## EVOLUTION OF THE NO<sub>2</sub> EMISSIONS



Source: Barcelona City Council

— Yearly Average NO<sub>2</sub>

## EVOLUTION OF THE PARTICULATE MATTER EMISSIONS



Source: Barcelona City Council

— Yearly Average — Bottom Average PM<sub>10</sub>



within the metropolitan area of Barcelona does also have a major contribution to the decline of the air quality. The travels made between Barcelona and the metropolitan area are mostly made with the private vehicle, due to a lack of competitiveness of public transport, which is obviously a clear focus for improvement.

**Due to all of the above, the RACC proposes:**

### **7 To promote the renewal of the car fleet.**

The idea is to **apply a stable system of economic incentives to modernise the car fleet.** Another measure is to establish the parking fees in regulated areas according to the polluting potential of the vehicle, so that cleaner vehicles pay less. As regards the circulation tax, we propose a change in taxation that allows linking the tax to the emissions of nitrogen oxide (NOX) and particulate matter (PM). Last but not least, the RACC suggests some exceptions to the the restrictions for high occupancy vehicles (HOV), in case of specific reasons (for example MOT) and on Fridays, proposing to end the restrictions on Friday at 15.00h coinciding with the start of the weekend.

### **8 To relaunch the Corporate Travel Plans (CTP).**

**Companies with more than 50 employees should be forced to draw up a CTP every five years** to reduce the carbon footprint. Some proposals that should be generalised at corporate level are changing the fleet to electricity, encouraging teleworking, providing bicycles to employees and guarantee parking spaces for HOVs with three or more occupants.

### **9 To increase hicle occupation.**

The current occupation rates are so low (1,2 persons per vehicle) that they multiply the energy consumption, the congestion and the emissions per passenger. In the light of this, we propose to **to introduce low cost bus-HOV lanes on the B-23 and the**

**C-31 north roads**, as well as to remove the restrictions on HOVs (with three or more occupants) within the low emission zones. We also suggest granting a bonus on the parking fee for HOVs in coordination with the digital carpooling platforms.

## 10 To improve public transport.

It is essential to **increase capacity and reliability**, both as regards frequencies and travel time, of the **Commuter Train network** to turn it into an agile and fast alternative to travelling with the private vehicle. In the city, once the orthogonal bus network has been finished, the targets have to be reviewed in order to increase the competitiveness offered at commercial speed. To this end, smart transport systems and new validation options, such as mobile ticketing, may be decisive. Last but not least, it is urgent to introduce a conditioning

plan with SCR (Selective Catalytic Reduction) in all diesel powered taxis that include particle filters complying with the Euro 4, 5 and 6 standards to reduce their NOX emissions to up to 70%.

## 11 To make urban goods logistics greener.

It is urgent to move towards **low emission logistics within the inner perimeter of the ring roads**, and to introduce the compulsory use of vehicles with a blue (0 emissions), ECO (hybrids, natural gas, liquid petroleum gas) or green (Euro 6) label before 2025.

## Sustainable Mobility: Bicycles are for Summer, Autumn, Winter and Spring.

**The number of bicycle travels in the city has increased by 70% between 2010 and 2017** which is good news for the increase of active mobility, as it is healthy and contributes to the decarbonisation of transport. However, and although it is the mode that records the biggest increase **the bicycle does only represent 3% of the trips inside the city of Barcelona**, clearly below the trips made by pedestrians (47% of the trips with origin and destination Barcelona) or those made using public transport (34%), car (9.1%) and motorcycle (6.1%).



In total, around **60,000 people move on a bicycle every day in Barcelona.**

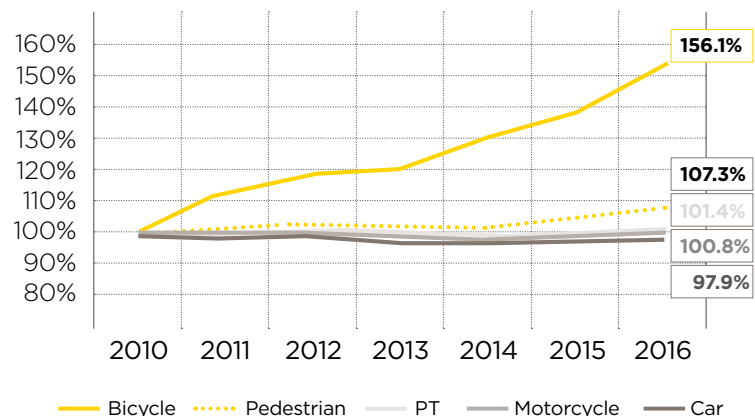
The introduction of the shared bicycle service called Bicing in 2007 and the later extension of the bicycle lane network facilitated the introduction and consolidation of a new mode of transport in the city that is, however, yet a minority. The main reasons for this group to move around on a bicycle are comfort and not polluting.

**80% of the bicycle riders already used sustainable transport modes before,**

(public transport and walking), while 18% used the car or a motorcycle. The use made of the bicycle is to go to work or study (57% of the riders) and an additional 26% use it also for leisure activities.

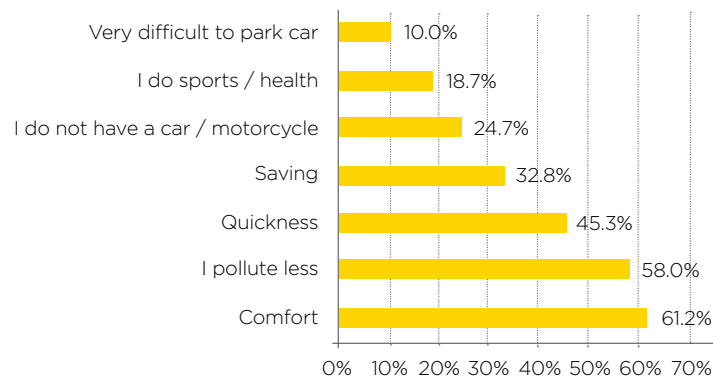
According to the studies made by the RACC, 5% of urban bicycle riders admits to ride on narrow pavements and 29% on broad pavements, while riding, 10% talk on the

EVOLUTION OF BICYCLE TRAVELS IN BARCELONA 2010-2016



Source: Barcelona City Council

WHY DO YOU USE THE BICYCLE AS A TRANSPORT MODE?



Source: RACC Barometer on Urban Bicycle Riders in Barcelona (2018)

mobile phone, 65% do not use a helmet and 46% are not familiar with the regulations (municipal by-laws).

Although the infrastructure for bicycles has increased in recent years, it has not been possible to reach the 300 km of bicycle lanes initially planned for the year 2018. The use of this infrastructure is widely varying, with highly used sections and other rather residual areas. In fact, **in certain cases, the way in which the bicycle lane was introduced caused more congestion** and, consequently, more pollution. In general, the parking spaces were reduced, as well as the loading and unloading areas, causing some vehicles to stop on the bicycle lane or increase the traffic volume. In other cases, the proliferation of personal mobility vehicles (bicycles, electric scooters, monocycles, segways, etc.) has led to an increase of conflict episodes with pedestrians, as the pavements

are occupied by all kinds of vehicles. In fact, almost one out of every two bicycle riders declares to be unaware of the municipal by-laws.

Therefore, before giving priority to the extension of the network, it would be necessary to solve the specific problems that are generated, which, despite being understandable as a consequence of the arrival of a new actor in a city with little urban space, may develop an adverse feeling towards cycling mobility.

As opposed to what happens in other countries, there is **no compulsory civil liability system for bicycle users**. Likewise, it has become urgent to introduce co-existence campaigns for the different modes of transport that have appeared in the city —especially referring to electric scooters—, as well as informative campaigns about the rights and duties of bicycle riders.

**In the light of the above, the RACC proposes:**

## **12 To promote the co-existence of bicycle riders and the rest of means of transport.**

The larger number of bicycles recorded since 2010 has led to an increase of the number of accidents involving bicycles by 109.8% since that year. Although bicycle riders have rights, they do also have duties that they have to know. Therefore, it is important to **promote a better co-existence** of pedestrians, bicycle riders, motorcycle riders, motorists and users of personal mobility vehicles, following the example of benchmark countries like the Netherlands and Denmark.

### 13 To increase protection.

45% of the bicycle riders declare to have been just about to have an accident in the last year. The intersections are especially dangerous for bicycle riders, when a heavy vehicle making a turn is involved. Although in 22% of the cases there was a motor vehicle involved, a pedestrian was involved in an almost similar percentage (19%).

Therefore, the **use of helmets has to be encouraged among riders aged 16 years or older, and a compulsory civil liability insurance has to be introduced.**

As regards the other vehicles, the inclusion of technologies to detect the dead angle should be encouraged.

### 14 To improve the quality of the bicycle lane network.

**It is necessary to give priority to the improvement and the regulation of the existing bicycle lanes, instead of giving priority to the building of new ones,** to make them wider, separated and have the same direction as the traffic, to form part of an interconnected and well-kept network.

### 15 More bicycles at work.

The Corporate Travel Plans (CTP) must **promote and credit the use of the bicycle to go to work** and guarantee enough and safe parking spaces.

### 16 Safer parking spaces.

The bicycle of 7% of the riders has been stolen in the past five years. In fact, the main worry of the users and the main hindrance of non-users is the lack of security at bicycle parkings.

It is necessary to provide the existing houses and the newly built with accessible and safe parking spaces, as well as to **create massive and safe parking spaces in the large mobility hub**, such as the Sants station, for example.



## Affordable Mobility: The Cost of Congestion

On those days, on which the traffic in Barcelona is congested, the average travel time increases by around 25% compared to a fluid traffic situation.

**The average of hours lost at the metropolitan access roads** is of about 33.8 hours per year, according to the congestion index Inrix, and **can reach 120 hours per year**, although **this price difference**, which is equal to 15 work days, for the most affected users of the ring roads. All of this contributes to an even higher air pollution and a higher accident risk.

The time lost by people at the wheel becomes an **economic cost of almost**

### **137 million euros per year.**

The cost for the time lost is an externality, but not for the rest of the society. It is a cost that is almost completely taken over by those who are waiting during a congestion, losing their own time.

However, the road congestion in Barcelona does generate other externalities to society, such as the public health and environmental problems arising out of a higher consumption of fuel.

Although Barcelona does not stand out negatively in this sense—it is the eighteenth most congested city in Europe—, it is noteworthy that the recorded trend is negative, with a year-on-year increase of 3%.

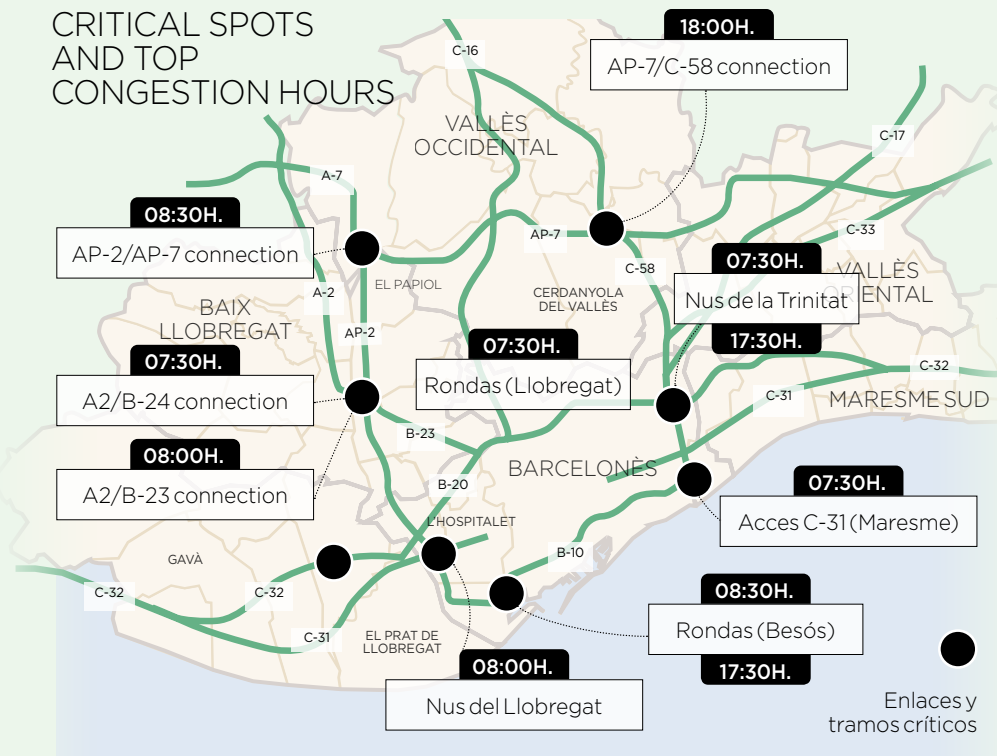
To be precise, **the C-58 and B-23 roads and the ring roads gather 50% of the congestion in the Barcelona area**. Those who are mostly

affected by road congestion are car users (around 156,000 people per day, 78% of the total) and interurban bus passengers (44,000 people per day, 22% of the total).

Considering that there is a negative trend, many of the solutions involve the improvement of the accesses to the city and the increase of the capacity of public transport in order to avoid having to limit the demand.

**Traffic congestion has turned into an endemic problem** that every city has to solve taking into account their specific geographical, social and urban features. However, since it is a global problem, there are several examples of actions that are carried out to tackle congestion. In some American and European cities, there are roads with several lanes, one of which is reserved for high occupancy vehicles (with

## CRITICAL SPOTS AND TOP CONGESTION HOURS



**Almost 200,000 people** driving to Barcelona every day in their private vehicle or by bus have to endure congestion when entering the city during peak hours. 22% are bus passengers and the remaining 78% are users of private vehicles.

**4 lanes** gather 50% of the congestion del at the Barcelona area: B-23, C-58 and both ring roads of Barcelona.

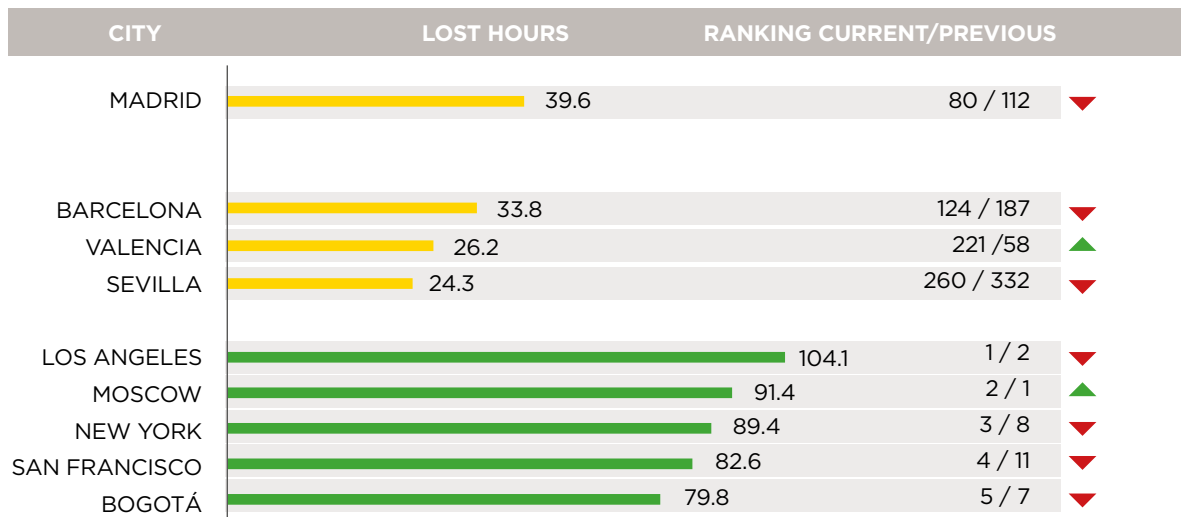
**137,000,000€**  
(0.1% of the Catalan GDP) is the yearly loss caused by congestions in Barcelona.

**Around 52,000 hours**  
are lost every day on the access roads to Barcelona.

**3,860,000 people** live in the metropolitan area, in an approx. radius of 30 km from Barcelona.

Source: Analysis on the congestion levels in Barcelona (RACC, 2015)

## HOURS LOST DUE TO CONGESTION ACCESSING THE CITY BY DRIVER AND YEAR



Source: INRIX Scorecard 2017

three or more passengers) in peak hours. Singapore and London pioneered with the implementation of congestion taxes in a restricted area in the city centre. Other cities, usually high-income areas, have followed this example, such as Stockholm or Milan.

More and more European cities have introduced permanent access restrictions for the most polluting vehicles, as will do Barcelona in 2020, for environmental reasons. But these restrictions do also influence the number of travelling cars.

Other less effective examples that are only used on high pollution days in cities like Buenos Aires or Mexico, prohibit the access to the city centre to half of the vehicles, depending on whether the last digit of their number plate is even or odd.



Barcelona cannot consider that traffic congestion has turned into an endemic problem that cannot be solved. It has to reorient the traffic flows and promote a series of measures so that the accesses to the city are not close to collapsing, and it becomes possible to revert the negative trend of recent years.

**Due to all of the above, the RACC proposes:**

### **17 An action plan to boost Park&Ride facilities.**

It is urgent to **invest in park & ride facilities at train stations**, in order to face the circulation restrictions that will affect 130,000 vehicles every day in the metropolitan area of Barcelona from 2020 onwards. It seems to be advisable that the Metropolitan Area of Barcelona (AMB) takes the initiative to increase the number of spaces available, improves the signposting and offers real-time information of their occupation, so that they turn into an attractive option. At the same time, it is necessary to introduce modern payment schemes, for example using mobile apps, integrating

the price of parking at a Park & Ride in the ATM payment system, making a difference between users and non-users of the train, and offering passes for recurring users.

### **18 Fast tow trucks on the main roads.**

Their target should be to minimise the incidences happening every day on the metropolitan access roads.

**Taking away the vehicles that have had a breakdown or an accident as fast as possible** is one of the most cost-effective measures to reduce the growing loss of time caused by traffic jams in Barcelona.

### 19 To improve the accesses to the ring roads in Barcelona.

Citizens using the ring roads are forced to stand every day delays that can be longer than 30 minutes.

In order to improve this situation, it is necessary to improve the traffic management by means of an **extension of the variable sign-posting of speed limits** to more corridors **and the implementation of smart traffic lights** at the accesses to the ring roads (the so-called ramp metering). Moreover, it is necessary to regulate the parking demand at destination (green and blue parking areas and the public car park network), with fees according to the origin or to the emission of pollutants generated by the vehicle, for example.

### 20 To simulate changing mobility scenarios.

The structural urban changes that are being planned in the city, like, for example the extension of the bicycle lane network or the creation of “superblocks”, as well as the technological disruptions (artificial intelligence, autonomous vehicles, MaaS, etc.) lead to deep changes in mobility, and therefore, it is important to give shape to their impact on the city as a whole, in order to **prevent a solution that has been adopted in a certain place from creating unexpected problems.**

### 21 To give priority to high occupancy vehicles (HOV).

It is necessary to **increase the current occupancy ratio of 1.2 persons per vehicle** by means of the implementation of low-cost bus-HOV lanes on the B-23 and C-31 north roads. Another proposal is that high occupancy vehicles (with three or more people) are not subject to the circulation restrictions in low emission zones. At the same time, it has been suggested that Corporate Travel Plans (CTP) only award high occupancy vehicles with parking spaces.

## The Cost of Mobility: When Green Pays Off

Every day, when we get into the streets, we are faced with mobility, we use public means of transport, the car, the bicycle, the electric scooter, or we walk to our usual destinations, our workplace our children's school or any other place, and we share the space with other people who, like us, move around in Barcelona. All of it causes, directly or indirectly, **an economic cost that the citizens have to bear** in many ways: through taxes, through the payment of tolls or by means of the fees that are charged by the parking machines in regulated areas.

Although all of the investment projects for infrastructures produce benefits, this is not the relevant fact, but the magnitude of the said benefits compared to the **opportunity cost of the investment** that has to be made to achieve them.

This means, that it is about improving the contributions made by users to the public purse in order to improve mobility, turn into more or less proportional individual and collective benefits.

The taxation level of private mobility in Catalonia establishes that **every private vehicle pays currently €1,307 every year** for different concepts (VAT for the purchase of the vehicle, VAT for fuel consumption, circulation tax, special tax on hydrocarbons, registration tax, tolls, etc.).

Likewise, Barcelona is the city with the most expensive blue parking areas in Spain and one of the most expensive in Europe, together with Amsterdam, Copenhagen, Helsinki, Paris, Berlin and Zurich, considering the purchasing power of their inhabitants.

Therefore, it is necessary that the introduction of the tax on carbon dioxide emissions generated by motor vehicles is reverted 100% to the improvement of urban mobility. At the same time, users affected by the implementation of low emission zones should receive financial help to change their old vehicles for less polluting cars.



## TAXATION LEVEL ON PRIVATE MOBILITY IN CATALONIA

VAT	
VAT vehicle purchase	446.00 M €
VAT fuel consumption	1,057.45 M €
SPECIFIC TAXES	
Special tax on hydrocarbons	2,157.20 M €
Registration tax	55.43 M €
Circulation tax	398.23 M €
TOLLS	
Catalan tolls	722.60 M €
<b>TOTAL</b>	<b>4,836.91 M €</b>

## HOW MUCH DOES EVERY VEHICLE PAY PER YEAR?

FOR ALL CONCEPTS	FOR SPECIFIC TAXES
1,307.30€	705.60€

Source: RACC

Facing the environmental costs of the use of the private vehicle is an unavoidable duty for the current society. Therefore, **some of the taxes paid by users should be reordered** in order to reflect the produced environmental impact. But it is also about establishing a balance between the taxation level of citizens in order to improve their urban mobility and to make it safer, more sustainable and affordable, and the different actions that are carried out with these financial resources for this specific purpose.

In this context, financial incentives play a key role in any massive consumption change, and therefore, administrations should **introduce support lines to help low-income families renew their vehicles**, and improve the public transport network both in terms of

frequencies and travel times, in order to secure mobility for people who currently have no alternatives to the private vehicle.

Likewise, in addition to getting rid of the most polluting vehicles in a progressive and coordinated way, it is necessary to link the regulated parking fees with the pollution potential of the vehicle and to help users who are affected by the implementation of low-pollution areas.

**Due to all of the above, the RACC proposes:**

## **22 Taxation neutrality.**

The economic outlay made by users of private vehicles to improve their mobility is very high in relation with the investments made, eventually, to improve the transport infrastructures and the services that have a direct influence on mobility. For this reason, any reordering of the existing costs or the future implementation of new taxation figures should not lead to an increase of the overall contribution but to **give priority to the concept “the polluter pays”**, formulated in 1992 at the

Earth Summit organised by the UN in Rio de Janeiro.

## **23 To help those affected by low emission zones (LEZ).**

Most of the affected depend directly on their private vehicle, and therefore, they will have to purchase a new one, due to the lack of capacity and competitiveness of the current public transport network.

Considering that the Law on Climate Change and Energetic Transition establishes the implementation of a **tax on CO2 emissions**

for touring cars and vans -however not for heavy vehicles that will be able to continue travelling regardless of their age, a contradiction-, the revenue of this tax **could be used to renew the touring cars that do not have the environmental label** of the Spanish Traffic Authority (DGT).

## 24 To link the circulation tax to emissio

It is necessary to have a change in taxation in order to **link this tax to the nominal emissions of nitrogen oxide (NOX) and particulate matter (PM)**, instead of

to the taxable power. The aim has to be the already mentioned aim: to keep a taxation neutrality, but making the most polluting vehicles pay more than the less polluting ones.

## 25 To adjust the regulated parking fees to the pollution potential of the vehicle.

Thus it would be possible to **offer a lower fee to cleaner vehicles** and a higher fee to the most emitting, launching a powerful message to raise awareness about the need to move with clean vehicles.

## 26 To extend the metropolitan flat rate to the municipalities of Zone 2.

The aim has to be to **integrate the municipalities of Zone 2 (Vallès, Maresme, etc.) into the rate map of Zone 1**, so that they would have a “flat rate” for public transport, as it happens in Zone 1, with the respective reduction of the ticket and monthly pass prices (e.g. the T-Month card).





5



# RACC Proposals: The Building of the Future Mobility

## The Electric Vehicle: Leading the Way to Zero Emissions

The steady increase of the carbon dioxide (CO<sub>2</sub>) emissions worldwide is going the opposite way of the fight to revert the climate change and to make cities better to live in. The commitments undertaken at the Climate Summit COP21 in Paris demand for a radical turn as regards the supply of our transport system. The transition to an emission clean economy will force the developed countries to move 100,000 million dollars every year. Within this scenario, we have to be aware of the fact that electric vehicles are an essential solution for the

future, as they eliminate CO<sub>2</sub> emissions, if the origin of the energy is renewable, reduce noise pollution and improve the quality of urban air. **Electrification, together with shared vehicles and travels, are the two main axes for the decarbonisation** of transport pointed out by the International Transport Forum (ITF) of the OECD.

However, the transition to a less polluting mobility faces the problem that **electric vehicles are still more expensive** than diesel or petrol vehicles, although **this price difference**, according to the conclusions of the RACC in the study “The Electric Vehicle and its Growth Potential”, can be compensated during the life span of the vehicle thanks to the lower consumption costs, a favourable taxation and the

payment exemption at some tolls and parking zones.

After years of deceiving data about the penetration of electric vehicles in the car fleet, the investments made by the industry will start bearing fruit with more competitive costs and a larger autonomy of their vehicles. It is thus time to **commit strongly to transport electrification**.

Despite the currently existing incentives, the penetration of electric vehicles in Barcelona is still low, compared to the most advanced countries: Norway, the Netherlands or Germany have a more competitive electric energy price and an excellent network of recharging points. **In Norway and the Netherlands there are 175 and 173 points, respectively, for every 100,000**

**inhabitants, while there are only 30 in Barcelona.**

The aim of progressively giving up fossil fuels involves increasing the fleet of electric vehicles and the number of “electricity stations” with quick recharging facilities, and the implementation in Barcelona of new car sharing operators, following the example of Madrid. One of the targets of this service has to be complementing the public transport network.

On the other hand, the Strategy for the Electric Mobility of Barcelona, considers having an 80% electric municipal car fleet by 2024 (35% in 2018), a date on which it is expected to have 24,000 electric cars driving in the city, as opposed to the 525 that are circulating now. These figures are low if we compare them with the

dimensions of the challenge we are facing, but not even these ones will be reachable if we do not go beyond the natural market trend.

**Barcelona accounts currently for 12% of the total registration of electric cars in Spain**, although this figure is still far behind the penetration reached by electric mobility in the benchmark European cities.

In order to facilitate the access to the electric car to a larger number of people, it is necessary to establish a **stable framework of grants** so that users can benefit the economic saving implied in being able to move towards a cleaner mobility and to favour the introduction of new free floating electric vehicle services.



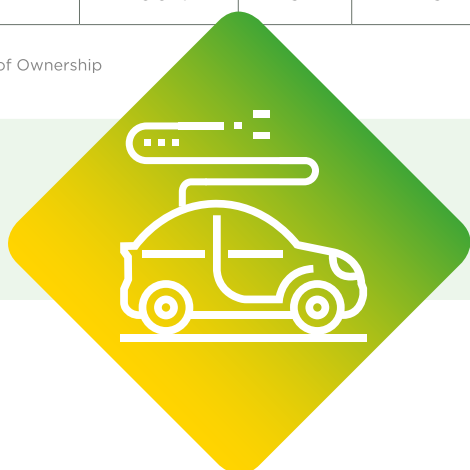
## THE ELECTRIC VEHICLE IN THE CITY OF BARCELONA

### Qualification of the electric vehicle in European cities

	WEIGHT SPECIFIC TAXES	OSLO Norway	AMSTERDAM Netherlands	LONDON UK	PARIS France	STUTTGART Germany	VIENNA Austria	BARCELONA Spain
TCO* electric/ conventional	30%	3	3	2	2	1	1	1
Direct incentives	20%	3	1	2	2	1	2	2
Purchase power	20%	3	2	2	2	2	2	1
Recharging infrastructure	20%	3	3	2	1	2	2	1
Indirect incentives	5%	3	1	1	1	1	1	3
Complementary policies	5%	3	3	3	3	3	3	3
<b>TOTAL</b>	<b>100%</b>	<b>3</b>	<b>2.3</b>	<b>2</b>	<b>1.8</b>	<b>1.5</b>	<b>1.7</b>	<b>1.4</b>

\*Total cost of Ownership

Highest score = 3, lowest = 1



Source: Barcelona City Council + ICVUE

#### STRENGTHS AND WEAKNESSES OF THE ELECTRIC VEHICLE

### STRENGTHS

-  User experience
-  Lower operating costs
-  Local noise and pollution reduction
-  Integration of renewable energy into mobility

### WEAKNESSES

-  Purchase cost
-  Real autonomy of vehicles
-  Culture of “1 car for all uses”
-  Availability of recharging network
-  Promotion at the sales point

Due to all of the above, the RACC proposes:

### 27 To deploy a large recharging network, especially underground.

The city of Barcelona leads the state ranking of recharging points for electric vehicles, but it is still far behind cities like London, Amsterdam, Rotterdam, Berlin, Hamburg or Oslo. We have to continue working in order to be able to triple the current network and to **improve from the 30 existing recharging points to 100 points for every 100,000 inhabitants**, with special emphasis on private underground car parks.

### 28 To boost the shared electric vehicle.

Promoting the free-floating car sharing can make the access to this technology cheaper and help to make electric mobility more popular. To this end, **the urban regulatory framework should be adapted so that shared electric vehicles** could be implemented in the city, as it happened in Madrid.

### 29 To encourage users.

The incentives provided by the current state framework are neither stable nor enough to accelerate the replacement of older, polluting and unsafe vehicles with electric vehicles. In the absence of these incentives, the Barcelona City Council should consider the **total exemption of the circulation tax, as well as direct grants** for the purchase of electric vehicles.

### 30 To extend the advantages of hybrid electric and ECO vehicles.

Although 100% electric vehicles (blue environmental label 0) have free parking in regulated zones it would

be advisable to introduce also some type of discount for vehicles powered by **natural gas, LPG and for hybrid electric plug-in vehicles (ECO label)** for their contribution to a sustainable mobility.

### 31 To introduce low emission vehicles in public services.

The Barcelona City Council is working to encourage electric mobility with the target of having an 80% electric municipal fleet by 2024, as well as to increase the number of electric taxis. The ambition must be to achieve the top level (100%) and it is essential to extend it to all of the services contracted by means of public tender by the City Council. Likewise, it is important to **promote the**

**electric or hybrid transport** among tourist buses and airport transfer buses, as well as at schools and companies that use buses.

### 32 To improve the logistics of urban goods transport.

To reduce the environmental damage caused by this sector, which is booming due to the e-commerce, we have to establish a date and grants so that this **logistic operation is carried out exclusively with vehicles fitted with the 0 emissions or ECO labels** with modern e-freight digital platform systems that maximise loads with as little vehicles as possible.





## Connected Mobility, in Line With the New Times

In recent years, vehicles have been including driving assistance systems and automatisms that make driving easier and safer. The horizon is showing the panorama of a totally automated vehicle that is able to drive autonomously without any human intervention. Until then, what we have currently available are connected cars. Using internal systems connected to satellites, to the Internet or linked to the mobile telephone, more and more models are opening their doors to the confluence of different spheres of life inside

the vehicle. This means, that we are able to continue being connected with friends, work or the family, so that vehicles are not only able to talk to the occupants and think by themselves, but also to interact with other cars and with the infrastructure (V2X connectivity) for a better traffic management.

**The main target of connected mobility is to increase the safety of the driver and of all those surrounding him, to optimise traffic flows and to reinforce sustainability.**

Two simple facts in this sense: in Barcelona, according to data provided by the City Council, 18% of the drivers are looking for a parking space. And a study made by Xerox in 2016 states that Spanish drivers lose an average of 15 minutes every

day looking for a parking space. However, thanks to connected mobility, the traditional car parks will inform about the available spaces, and drivers will be able to book and pre-pay the spaces from their car, thus saving time, money and emissions.

There are many other similar projects promoted by the total connectivity and the Internet of Things (IoT): from services to search for the cheapest service station when needing to refuel, new smart pedestrian crossings, fitted with sensors that light up whenever they notice that there is a pedestrian approaching and indicate drivers that they have to stop, or applications that generate verbal orders and allow to respond e-mails or tweets without having to touch the

screen, but also applications that make a remote diagnosis of breakdowns or make appointments with workshops.

Within this disruptive context, **more and more cutting-edge companies are establishing strategic alliances with car manufacturers** in order to create the hyper-connected car, with the aim of turning vehicles into four-wheeled personal assistants. By then, the automobile will be closer to living up to its name and become a true “self-moving” car, i.e. a privileged space to optimise the travel time thanks to connectivity.

Therefore, **Barcelona must encourage the creation of research clusters** to turn into the capital of new

emerging concepts such as that of “smart cities” or 5G technologies, as well as events like the Mobile World Congress (MWC) or the Knowledge and Innovation Community (KIC) on Urban Mobility, of which the RACC is an associate member.

The challenge is not preventing Barcelona from losing the pace for the future, but to lead it.

But in order to turn Barcelona into a pioneer in this type of initiatives, with all of the advantages this brings, the city has to become one of the European capitals of innovation and create an own urban laboratory model that allows making controlled tests of new services and innovative technologies, with specific work frameworks

that overcome the current regulatory limitations that often hinder the testing of the potential benefits of these technologies.

**Due to all of the above, the RACC proposes:**

### **33 To lead autonomous and connected mobility.**

Barcelona has the chance to make use of its industrial and business network in order **to turn into a worldwide benchmark city in terms of road safety**, and the development of different services related to it.



### 34 To become a technological hub.

The city must make profitable the synergies of the Mobile World Congress -the huge mobile technology trade fair-, or of the KIC Urban Mobility to let leading companies from all over the world test leading technologies in the city, such as 5G or flying robots, in an atmosphere of utmost collaboration and friendliness. To do so, it has to create a physical test environment, which is regulatory and economically stable, and at the same time allows applying new solutions without the administrative and legal stiffness that can reduce the attractiveness of the city.

### 35 To implement on-demand transport.

Torre Baró became recently the first district to introduce an on-demand bus service. A call or a mobile phone app are enough to ask the “district bus” to stop at a certain bus stop at a certain time. This pilot test that will run for two years, may turn into an excellent test bench **to provide users with a better service level in disperse or low-demand areas**, offering at the same time the chance to have a more competitive cost for the Administration, since it is not necessary to implement a complete service with fixed routes and schedules.

### 36 Reajustar el marco regulatorio.

Taking advantage of the fact that some electric minibuses have already been travelling in Catalonia (the first one was introduced in Sant Cugat), other similar projects should be introduced, like for example a **driver-free shuttle service within the controlled area of the Fairground or between the two Airport terminals**, to provide for a better service during congresses and international events, and to showcase Barcelona as a technological and innovation pole.

## Intermodal Mobility: Mobility as a Custom-made Service

An individual arrives at a train station on a bicycle, leaves it there and continues the trip with public transport. After arriving, he/she might decide to rent an electric motorcycle to cover the “last mile” to the workplace. All of this planned, booked, validated and paid with a mobile application.

**Intermodality**, i.e. being able to link more than one means of transport, preferably the most environment-friendly ones, **is becoming an icon of sustainable mobility** in many big European cities, including

Helsinki or Madrid, since it improves the flexibility of the door-to-door transport with an affordable cost for users. Insofar as this process is offered in an integrated, easy and obstacle-free way for users, it may become the definitive lever that many users need to **stop considering car ownership as an unquestionable need**.

The European Commission is promoting the concept of mobility as a service (MaaS) since almost 2014, the year in which it launched the campaign “Do the Right Mix” encouraging European citizens to free themselves from the addiction to cars” and consider other means of transport, especially public means, taking into account that **travelling with the private vehicle in large cities is not always the**

**fastest, safest and greenest way**. All of this, with a digital service, is what allows the leap from intermodality to mobility as a service, even though it is a huge challenge.

The intermodality needed by Barcelona must go one step further and make available intermodal transport cards, **with a trend to the concept of a “single ticket”**, both for different types of transport and between Barcelona and its metropolitan area; not only offering public transport, but also the private offer of shared vehicles.

In this line, **the RACC has developed the application RACC Trips to make available the complete offer to move around the city** in the most comfortable way: moto sharing, car sharing, bike sharing and public

4  
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5  
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transport, so that every user is able to find the most suitable option on each specific occasion.

At the same time, the RACC and ATM launched a pioneering pilot test in November 2018, with combined passes that included a pack of trips with public transport (bus, underground, train, commuter trains and tram) and a pack of minutes to use shared motorcycles in Barcelona.

There is still a lot left to do to change from modal to intermodal, both as regards the collaboration between actors and in terms of legislative reforms to make it possible, as well as education of the final user as regards a new moving culture that implies a major change of habits for most of them.

The key concept that serves as a base for mobility as a service is **placing the user in the centre** as regards transport services, **offering adapted mobility solutions according to the individual needs**.

In practice, it combines all possible modes of transport (public transport, shared transport, taxis, etc.), allowing users to choose the pack that best fits their needs in exchange for a flat rate, which is often applicable to the city and its metropolitan area.

Thanks to the new digital technologies, mobility will be increasingly customizable allowing users to configure their profile, choose different means of transport, access each of them and pay for them according to the use made, with a single application.

To reach this, Barcelona will have to plan mobility as a service well, taking into account that it is not about creating lines or transport services, but **collaboration networks between public and private actors**, with services that sometimes have the risk of cannibalising the users of conventional public transport.

On the other hand, it will be impossible to design a pay-as-you-go payment system without a personal identification of every user, thus involving the collection of sensitive data of the person using the different integrated means of transport, such as location, routes, timetables, etc. in addition to personal data to be used for identification, such as biometric data or the image. Therefore, it will be necessary to **be extremely careful with**

**privacy and develop some type of data governance.**

In this regard, Finland has been ground breaking with their new Act on Transport Services, that forces all mobility service operators to open their services by means of an application programming interface (API), providing for an open and competitive market of MaaS offers.

Several studies made by the International Transport Forum (ITF) in Lisbon and Helsinki amongst others, conclude that with an offer combining mass public transport with taxis and shared shuttles, it would be possible to cover all the urban transport demand with 3% of the vehicles that are circulating today. If there was a greater support of this formula in the future, there would be huge space on the

streets, which could be used for other purposes, such as green areas, cultural and sports equipment, etc.

**For all these reasons, the RACC proposes:**

**37 To readjust the regulatory framework.**

It is therefore worth **regulating the access of new car and scooter sharing operators**, that want to join the already existing moto sharing and bike sharing options, by means of the application of a flexible regulatory framework that will allow for an increase of the current offer, as well to encourage economic activities in line with the new times.

**38 To harmonise the data government policy.**

There must be a **balance between the privacy of users and the information** needed for the implementation of intermodal mobility, so that the system is operative and generates an innovative and attractive offer with an added value.

**39 To have a model.**

In order for this new transport culture to flourish, it is vital that local authorities learn from each other and remove obstacles. An example: the positive synergy of the potential digitalisation of public transport by means of T-Mobilitat —the new system

that will allow calculating the price of public transport in a customised way, according to the transport routines, the covered kilometres and the frequency— should make it possible that an MaaS operator is able to sell public transport tickets within an intermodal mobility pack. To achieve this, the different actors must **find a secure legal framework to access the data**, since this is the decisive factor for competitiveness in the 21st century and it will also be a guarantee for the development of an open and transparent market of mobility as a service.

#### 40 To adjust urban planning to the new ways of mobility.

**The implementation of new urban models**, such as the “superblocks” or the delimitation of the urban space for car parking **must keep a certain coherence with the mobility model** aimed for by Barcelona. We have to value and model, for example, the fact of progressively encouraging the habit of sharing the car (carpooling) and the possible implications if the road space is halved.

#### 41 To transform the taxi and the transport network companies (TNC).

It is necessary to reform the current regulation as it does not allow the taxi to compete on equal terms with the TNC platforms. **To make use of technology and give a better service to users with a larger competition** implies, at the same time, making the rigid taxi regulation more flexible (rates, working areas, etc.) and find a solution for the cost of the purchased licenses. Likewise, new ride-hailing operators must be forced to use vehicles with 0 emissions or ECO labels.

In the light of the above,  
the RACC proposes:

## 42 To facilitate shared PMV.

With the aim of making use of their improvement potential as regards polluting emissions and to optimise the use of public space, we have to **promote the regulation of shared electric scooters**, as it was done previously with bicycles and motorcycles. Nowadays, the obligation of being accompanied by a guide to hire a vehicle for individual use makes no sense and decreases the potential of the sector.

## Micromobility: The New Personal Mobility Vehicles (PMV)

Since 2017, and especially during 2018, the number of PMVs (electric scooters, segways, monocytes, taxi-bikes, hoverboards, etc.) has grown exponentially, although their occupation of public spaces and their undue use have caused very emotional reactions, both negative and positive.

Either because they are easy to transport or because they can be kept almost everywhere, thousands of citizens have started to slide along the streets on their electric scooters, giving

way to **a modality known as “micromobility”**, maybe because in some countries the electric scooters are used to travel the “last mile” from the bus stop or underground station to their destination.

On the other side of the scale, the lack of knowledge and discipline with the specific regulations that regulate this type of vehicles has led to conflicts with pedestrians but also with bicycle riders, with whom they have to share the bicycle lane, as well as with motor vehicles.

Nevertheless, **if used in an adequate way, the new PMV may be an efficient option to decongest the traffic in Barcelona** and to improve the air quality. As they are electric, they do not generate



## PMV Typology

CHARACTERISTICS	PERSONAL MOBILITY VEHICLES		CYCLES WITH MORE THAN TWO WHEELS		
	TYPE A	TYPE B	TYPE C0	C1	C2
Max. speed	20 Km/h	30 Km/h	45 Km/h	45 Km/h	
Mass	< 25 Kg	< 50 Kg	< 500 Kg	< 500 Kg	
Max. capacity (pers.)	1	1	1	3	
Max width.	0,6 m	0,8 m	1,5 m	1,5 m	
Max height.	2,1 m	2,1 m	2,1 m	2,1 m	
Max. lenght	1 m	1,9 m	3,1 m	3,1 m	
Bell	NO	YES	YES	YES	
Braking	NO	YES	YES	YES	
UGD (urban goods distribution)	NO	NO	NO	NO	YES
Traveller transport against payment	NO	NO	NO	YES	NO

Source: Barcelona City Council

TYPE A: wheels, light electric platforms and scooter  
 TYPE B: segways, large electric platforms and scooters  
 TYPE C0: for personal use  
 TYPE C1: for passenger transport  
 TYPE C2: : for goods transport

polluting gases locally and, moreover, they favour the diversion of car and motorcycle users to other, more sustainable mobility modes, and complement public transport, as they can easily be taken in the underground or the bus. But in order to fit in definitively, it is necessary to plan again the old and new types of mobility that are currently co-existing in the city, so that **civility and road safety are not weakened**, and that, in the last instance, pedestrians, the weakest link in the chain, are not adversely affected.

In order to provide for an integration framework for PMVs, **Barcelona has drawn-up a pioneering regulation that has served as an inspiration for other cities** of the Spanish state. The Catalan capital makes a

difference between scooters according to their weight and the speed they can reach and, by virtue of these parameters, they are allowed to travel in certain places. Among other measures, it limits the circulation of these vehicles for economic activities and group activities in the tourist areas of the city. Likewise, it prohibits the use of pavements by electric scooters and segways and forces them to use the bicycle lane or 30 km/h zones. The by-laws that entered into force in July 2017, set the maximum speed of these vehicles at 30 km/h. Moreover, they can only be used by people aged 16 years or older. The use of the helmet is not compulsory, except for the larger vehicles and the segways used for tourist purposes, but it is highly recommended.

Considering that the PMVs seem to have come to stay, it is necessary to **adjust the regulations** in order to extract the whole positive potential they have for a sustainable mobility, as well as to **inform all users about the new regulations** to prevent conflicts and avoid undue uses.

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### 43 To inform citizens.

Although there is no need to have a specific license to use a PMV, they are also immersed in the city traffic, and therefore it is essential that the **users know the regulations that delimit their rights and obligations.**

### 44 To make the regulations evolve.

It is necessary to study the possibility to **equate the circulation rights of PMV to the rights of bicycle riders** on pavements of more than five metres in width when there is no bicycle lane, although always respecting the speed of pedestrians. It is also relevant to keep the restriction to circulate on pavements due to the risk of having an accident. In this sense it is necessary to work closely with the General Traffic Authority in order to establish regulations that allow fitting these vehicles once and for all and to establish a speed limit of 25 km/h for PMV in the city, in those places in which they are allowed to be used.

### 45 To promote safety.

The exponential increase in the number of PMVs and the complaints made by pedestrians make it necessary to control anti-social behaviours. In foresight of accidents and their consequences, it is necessary to **demand for a compulsory civil liability insurance.** Likewise, the **use of helmets for PMVs should be recommended**, as well as the use of reflective pieces and LED lights in order to increase visibility at nights. Last but not least, it is necessary to control non-homologated vehicles that are available in the market








6

# The Big Actions that are Pending on the Horizon



In the past 10 to 15 years, Barcelona has experienced a cycle of infrastructure investment which is much lower than the real needs and accumulates a series of deficits as regards large mobility infrastructures that allow for qualitative leaps.

A quick overview of everything that has been planned or that has been started but not finished, allows identifying railway and road actions that cannot continue to be left aside for a further five years.

## Railway actions:

- The **finish of the central section of L 9** that has to connect the stations of La Sagrera and Zona Universitaria.
- **The intermodal station of La Sagrera**, which is still waiting for the inclusion of the AVE (high speed train) station.
- The splitting of **Line R 3 of the commuter train service**, that connects Barcelona and Vic, which is currently limited and congested because it has only one way.
- The **railway accesses to the Airport** that will connect the terminals with the Sants train station in only 20 minutes.
- The refurbishment of the **Sants station** and the mobility flows in its surroundings.
- The **railway accesses to the Barcelona Port**, which have to decongest the heavy

traffic of the coast ring road (Ronda Litoral) in the port area known as Zona Franca.

- The already mentioned **Park & Ride network** to complement the metropolitan train stations.
- A **study on the connection of trams** that reaches consensus with society, giving value to an integral remodelling of Aragón Street, a more sustainable mobility access that is compatible with the other mobility axes in Besòs-Llobregat.
- The **improvement of the urban tunnels of the commuter train network** to allow for an increase of their timetable capacity.

The priority of these **different actions** must be the solution of bottlenecks rather than the increase of capacities, which, as has been proven, end up attracting a higher demand

for the use of cars and lead to the same level of congestion as before. Following this principle, it is urgent to address:

- The **intelligent management of the ring roads** in Barcelona, with modern ITS systems that mitigate congestion at peak hours and the improvement of the capacities if there are bottlenecks.
- The finish of the tunnel at **Plaza de Les Glòries**.
- The implementation of low cost **bus-HOV lanes** in access roads, such as the B-23 and the C-31 north.

Last but not least, Barcelona has two singular infrastructures, namely **the Port and the Airport**, which act as a worldwide showcase for the city and need to be at the level of the best metropolis in the world. In order for the growth that

they have experienced in the last decade to be sustainable as well and to strengthen the showcasing of Barcelona, we think that it is important to address the following:

- The capacity of the El Prat airport must be planned now, so it does not affect the growth in a short term, as it has already reached the figure of 50 million passengers and its maximum capacity is of 55 million passengers. The **building of a satellite terminal or making a better use of the Girona airport**, which has the potential to connect with the city of Barcelona with the high-speed train (AVE), has become an urgent matter.
- The Barcelona Port, from the perspective of a goods hub for the South of Europe, must have the **railway connection with the Mediterranean**







# Conclusions





**Corridor** that has been demanded for many years. As a primary cruise ship terminal, it must accelerate the electrification and gasification of the docked cruise ships to eliminate the environmental impact on the city.

Among the big challenges that Barcelona is currently facing, mobility is located in the centre. The quality of life of the citizens and the ability to continue being a competitive city in the future, in an extremely changing world, will depend to a large extent on the urban mobility model that the citizens define in the coming years.

The diagnosis of the current situation and the 45 measures described in this publication gather the results of the analysis and research work done by the RACC and the proposals and constructive contribution to improve the current mobility model and to design the mobility of the future; a future that needs a boost that cannot wait any longer

### TO TURN MOBILITY INTO A LEVER OF PROGRESS AND GROWTH.

Nowadays, mobility is a vital factor for the social and economic development of the city. Barcelona must continue to be a benchmark

and competitive city in Spain and Europe and, to do so, it is necessary **to build a more realistic, modern and sustainable urban mobility plan**, which is compatible with an urban and social model, in line with the type of city it intends to and must be.

### TO DEVELOP AN AGREED AND REALISTIC CULTURAL MODEL.

Faced with the transformation of urban mobility as a consequence of digitalisation and the climate change, the appearance of new transport modes and the change of the needs and demands of citizens, it is

necessary to act in a different way if we really intend to have efficient results in the future. It is necessary to reach consensus among all political, social and economic stakeholders in order to boost a new mobility management model together. We need, in short, **a cultural and realistic model**, a plan that will emerge in the short term, **that is not limited to setting targets for the following five years**, but is lifted in order to turn mobility into the distinctive feature of the Barcelona of the future.

## TO LEARN FROM THE BEST.

Barcelona is a worldwide benchmark in terms of mobility on foot or on motorcycles. These are

aspects that, when talking about innovation, the city has to improve by itself. However, there are mobility fields about which **Barcelona can and must learn from the best**, being aware of the fact that there are no two equal cities and that it is necessary to have an own strategy. Barcelona has to, for example, learn from Copenhagen, and their policies around bicycle mobility; from Munich, and their advanced integration of intermodality; from Paris because they are pioneers with the universal access of their public transport; from Oslo, because they have strongly committed to the electric vehicle; or from Vienna and Helsinki, as they have adapted really quickly to the paradigm of mobility as a service.

## TO SOLVE STRUCTURAL QUESTIONS.

We must make a meticulous analysis and take decisions about specific aspects, such as the tram, the La Sagrera and Sants train stations, the investment in and management of the commuter train service or the saturation of the ring roads, the extension of the El Prat airport and the connection by train of the Port and the Mediterranean Corridor, amongst others, in order to be able to **move forward and refloat situations that are stopping the evolution of the city** and conditioning the future scenarios of urban mobility. To do so, it is necessary to gather as much experience and scientific



rigour as possible, to give a response to all of these structural questions and to reach institutional consensus that will place the citizens and their quality of life in the centre.

## TO ACT WITH A METROPOLITAN PERSPECTIVE.

Barcelona is much more than a municipality. It is important that **the new mobility plan includes a metropolitan perspective of the city.** Every day, thousands of trips are made between the metropolitan area and the city centre, which have to be added to another 650,000 trips made inside of Barcelona. It is necessary to take this reality into

account and to establish an improvement plan for connections, both between districts and between the city and its metropolitan area, improving the road and rail road accesses.

## TO ESTABLISH SAFETY, SUSTAINABILITY AND INNOVATION AS PRIORITIES.

It is necessary to continue insisting and working in order to achieve the main targets dealing with mobility in Barcelona. In this sense it is particularly important to focus the plan on **three essential axes for the 2030 horizon: zero fatalities**, by means of a co-existence of

multiple means of transport that will allow for the integration of new mobility actors and the reduction of the accident rate at the same time; **the improvement of the air quality and the decarbonisation of transport**, by means of an ambitious electrification of combustion engine vehicles and the change to sustainable means, as well as a green tax reform; and; **the encouragement of innovation**, by means of the adoption of mobility as a service, opening the city to innovation in terms of autonomous vehicles and new service models for users.


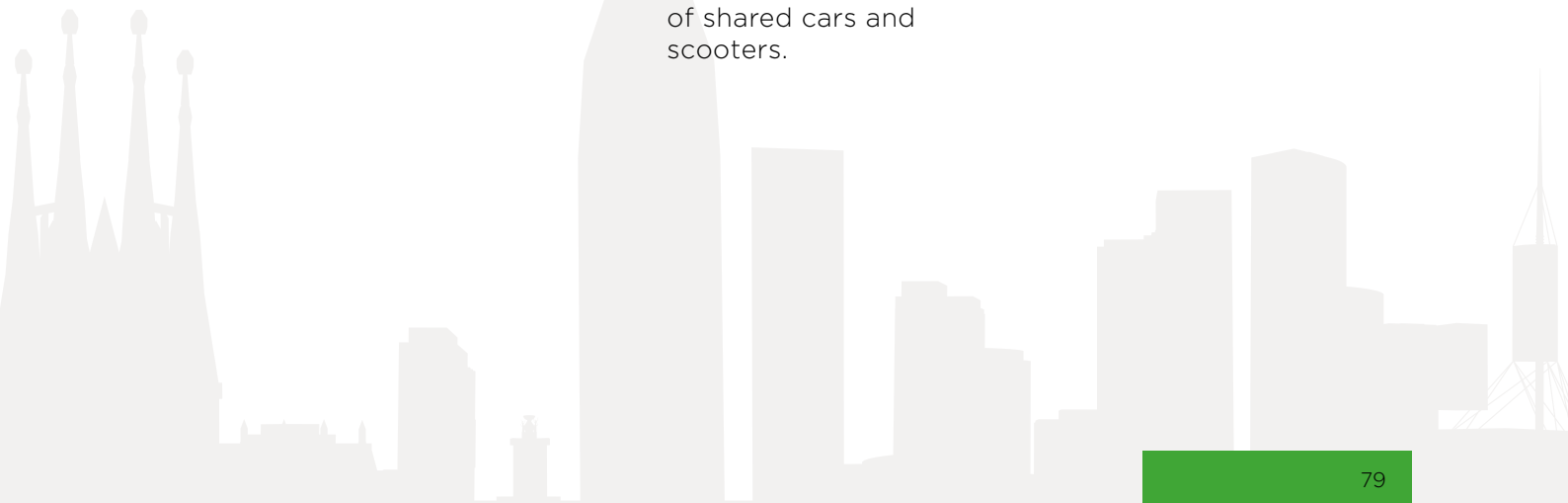
**RACC, we are here to help.**



# The 45 RACC Proposals

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- 1** To develop the Motorcycle Plan.
- 2** To promote a better co-existence between road users.
- 3** To control the compliance with the regulations on secondary streets.
- 4** To protect the elderly from being run over.
- 5** To calm the traffic in school surroundings.
- 6** To reinforce the control of distractions, speeding and alcohol.
- 7** To promote the renewal of the car fleet.
- 8** To relaunch the corporate travel plans.
- 9** To create more BUS-HOV lanes in the accesses.
- 10** To improve the capacity and efficiency of public transport.
- 11** To make urban goods logistics greener.
- 12** To promote the co-existence of bicycle riders and the rest of means of transport.
- 13** To increase the protection of bicycle riders.
- 14** To improve the quality of the bicycle lane network.
- 15** To promote and credit the use of bicycles to go to work.
- 16** To create safer parking areas for bicycles.
- 17** To promote park&ride facilities.
- 18** To have fast tow trucks on the main roads.
- 19** To improve the accesses to the ring roads in Barcelona.
- 20** To simulate the changing mobility scenarios.
- 21** To give priority to high occupancy vehicles (HOV).
- 22** To establish taxation neutrality and the polluter pays.

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- 23** To help those drivers affected by low emission zones (LEZ) to renew their vehicles.
  - 24** To link the circulation tax to emissions.
  - 25** To adjust the regulated parking fees to the pollution potential of the vehicle.
  - 26** To extend the metropolitan flat rate to the municipalities of Zone 2.
  - 27** To deploy a large recharging network for electric vehicles.
  - 28** To boost the shared electric vehicle.
  - 29** To encourage users to buy electric vehicles.
  - 30** To extend parking bonuses to vehicles with ECO label.
  - 31** To introduce low emission vehicles in public services.
  - 32** To improve the logistics of urban goods transport.
  - 33** To lead autonomous and connected mobility.
  - 34** To turn the city into a technological hub.
  - 35** To implement on-demand transport.
  - 36** To introduce autonomous driving.
  - 37** To regulate the access of new operators of shared cars and scooters.
  - 38** To develop the data governance policy.
  - 39** To have a MaaS governance model.
  - 40** To adapt urban planning to the new ways of mobility.
  - 41** To transform the taxi and the transport network companies (TNC).
  - 42** To facilitate shared personal mobility vehicles (PMV).
  - 43** To inform users about the PMV regulations.
  - 44** To evolve the PMV regulations.
  - 45** To promote PMV safety.



All of the data appearing in this publication were provided by the RACC Foundation and other consulted sources. The latest available information was used in all of the cases.

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