

EXECUTIVE SUMMARY

Boosting zero emission mobility

A great opportunity to decarbonise transport and generate economic activity and jobs

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Introduction

In the obligatory and essential process of decarbonisation of transport and mobility in Spain, a decisive commitment is needed to give greater impetus to a set of more sustainable zero-emission mobility modes and services. All this in a context of innovation, digitalisation and greening of the economy and employment in line with the objectives set by the European Green Pact and its manifestation in Spain. But also, within a process of just transition in which the disappearance of employment in the most polluting sectors of transport is compensated and surpassed, if possible, by the generation of employment in other sectors, both in the manufacture of vehicles and in the provision of transport services.

With this double challenge of decarbonising transport and generating new employment in Spain, it is necessary to give greater impetus to new sustainable mobility policies, in environmental, social and economic terms, in order to achieve these objectives. It is therefore necessary to give greater value and visibility to the development potential of these transport sectors in our country.

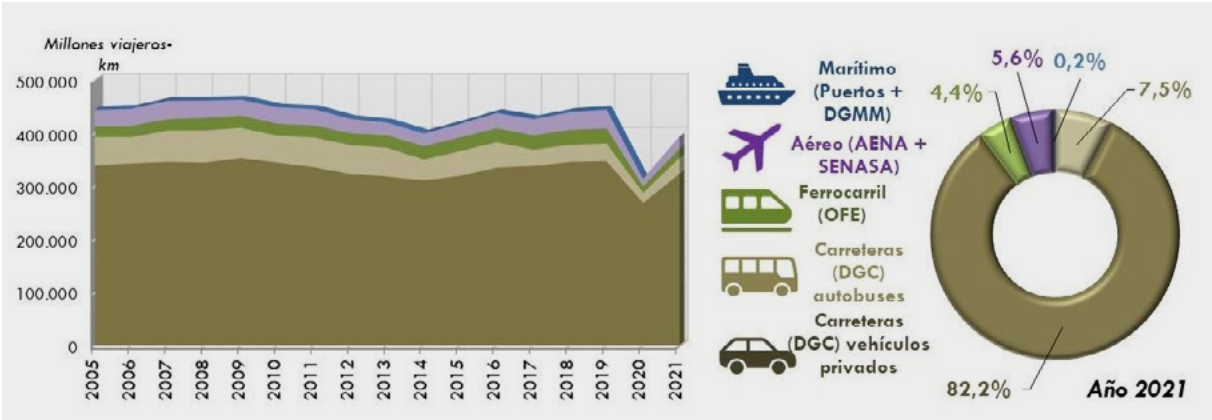
These transport sectors constitute an endless number of companies that represent a multitude of productive sectors and services, both public and private, which are already highly relevant in the current Spanish business fabric. These are activities which, due to their great potential for growth, should be strongly supported, both in terms of industry and services. In general, we are referring to the manufacture of railways, buses and bicycles, the provision of public and occasional transport services and the new mobility services, such as public bicycle lending services and car sharing, among many others.



The modal shares of passenger transport

The private car continues to be the dominant mode of interurban passenger travel, rising from 78.0% of total passenger-km in 2019, before the pandemic, to 85.6% in 2020 and 82.2% in 2021. Thus we see a downward trend between the last two years for which we have observatory data, approaching the pre-pandemic figures, although it continues to be clearly hegemonic.

**Modal shares of national passenger transport (million passenger-km).
Year 2021 and evolution 2005-2021**



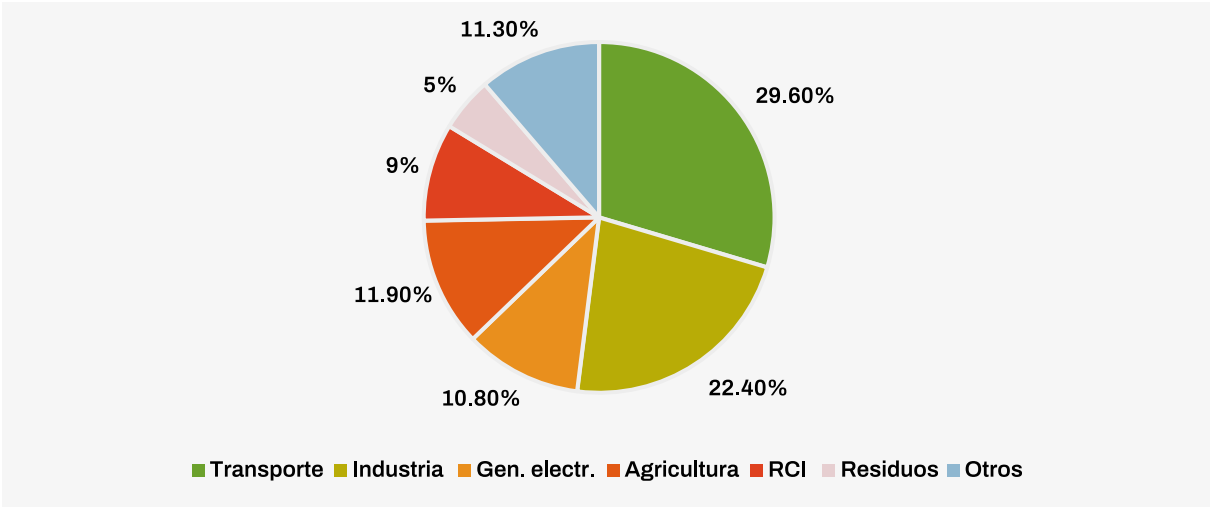
Source: Transport and logistics observatory in Spain. Annual report 2022. Ministry of Transport, Mobility and Urban Agenda 2023.



Greenhouse gas emissions from transport

As can be seen in the graph below, the sector with the greatest weight in overall GHG emissions in 2021 continues to be, as in previous years, transport with 29.6%, a percentage similar to that of 2019, before the effects of the pandemic on mobility.

Distribution of gross GHG emissions by sector 2021

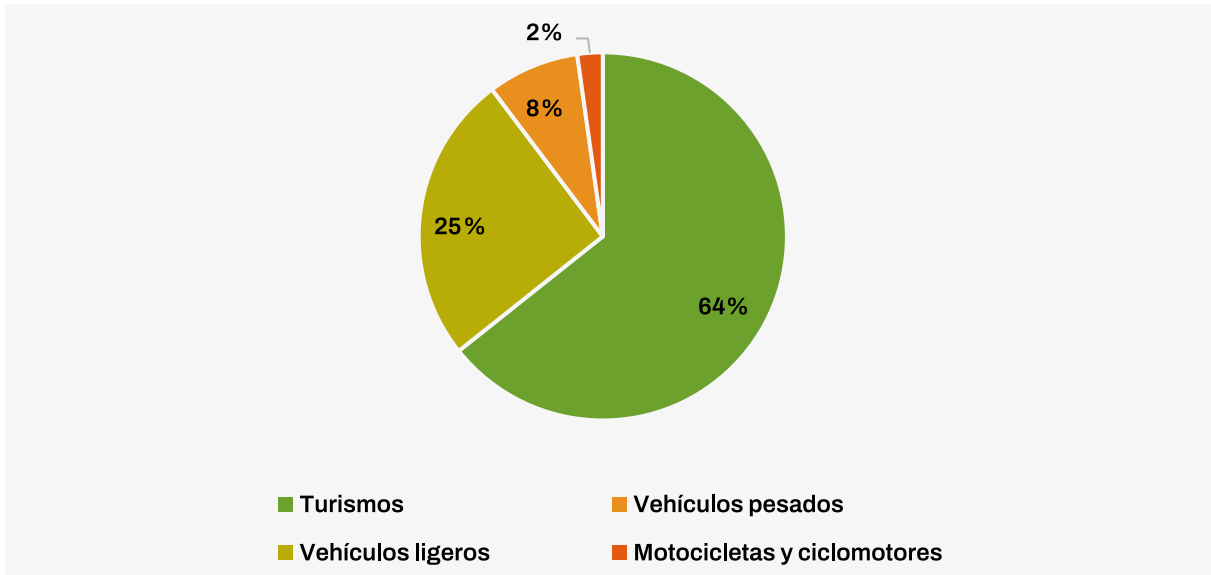


Source: National Greenhouse Gas Inventory Report 1990 -2021 Ministry for Ecological Transition and Demographic Challenge. March 2023.

In 2021, transport showed an increase of 15.7% of emissions compared to 2020, mainly due to road transport, which alone accounts for 27.8% of total GHG emissions, with the remaining transports only accounting for the remaining 1.8% (domestic air traffic, rail transport, domestic maritime transport and pipeline transport). If we look at road transport in more detail, the share of passenger cars was 64.3% in 2021.



CO₂-eq emissions from road transport category by vehicle category 2021 (kt)



Source: National Greenhouse Gas Inventory Report 1990 - 2021 Ministry for Ecological Transition and Demographic Challenge. March 2023.

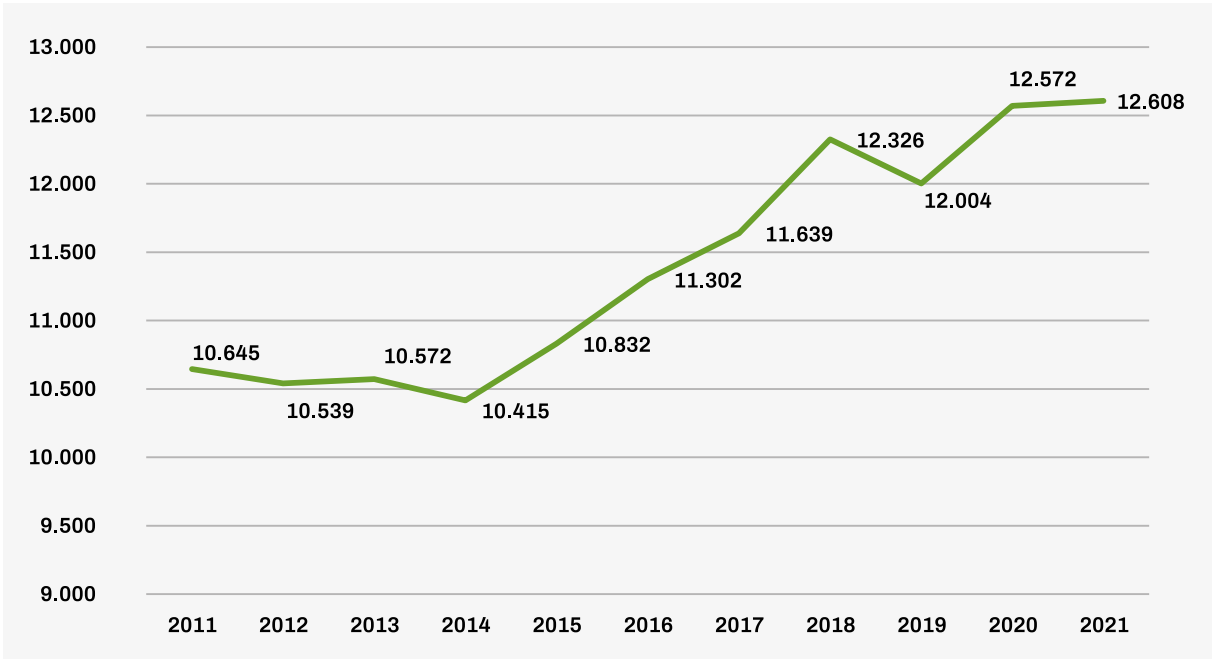


Employment in sustainable transport manufacturing

Railway manufacturing

As we can see from the figures of the National Classification of Economic Activities (CNAE) corresponding to CNAE 302 of the National Statistics Institute (INE), which covers the manufacture of locomotives and railway equipment, between 2010 and 2021 employment has been gradually increasing. In percentage terms, we are talking about an increase of 15% in just over a decade, which in absolute terms means a growth of 1,661 people employed in the sector. If we go back a little further, 10 years earlier, in 2000, there were 7,548 people working in the sector, that is to say, in 20 years the number of people employed has increased by 5,060 people, which is equivalent to 67%.

Manufacture of locomotives and rolling stock 2010 - 2021



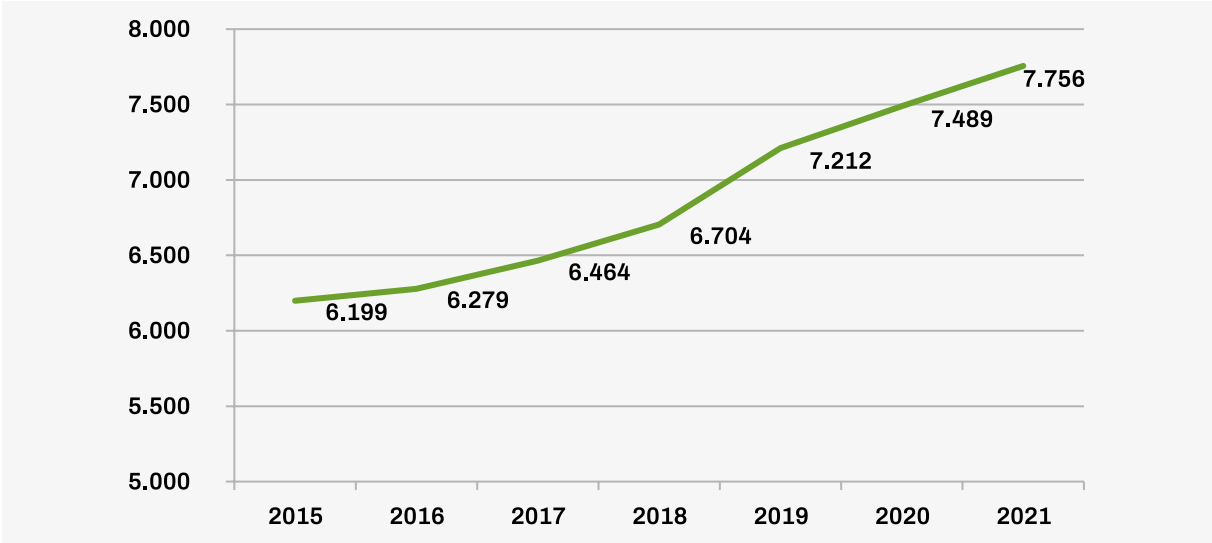
Source: INE. CNAE 302 Manufacture of locomotives and railway stock.



It is also worth mentioning that these companies not only manufacture trains, but also have other fields of activity related to railways (signalling, infrastructure, electrification, components, engineering, etc.).

Although it is not exclusive to the railway sector, but it does include it, we also have CNAE 3317 Repair and maintenance of other transport equipment, which has also experienced growth that is undoubtedly related to the expansion of the railway sector. The number of workers in 2015 was 6,199 and in 2021 it had reached 7,756. In other words, a growth of 1,557 jobs, representing a 25% increase in five years.

Repair and maintenance of other transport equipment 2015-2021



Source: INE. CNAE 3317 Repair and maintenance of other transport equipment.



The manufacture of buses and coaches

Another industry with a strong presence in the state is the manufacture of buses and coaches. As it does not have its own CNAE that identifies it, it is difficult to count its employment, as it belongs to the overall group of motor vehicle manufacturing together with automobiles and other vehicles.

However, through the information provided by the different companies in the sector, but also as a result of different news provided by the companies themselves or through the media, we have calculated that the bus manufacturing sector currently employs around 2,790 workers. It is important to note that this figure refers primarily to the manufacture of vehicles and does not include the manufacture of equipment and components necessary for the manufacture and spare parts of buses and coaches.

On the other hand, in line with the electrification of transport, electric buses are increasingly being produced in Spanish factories.

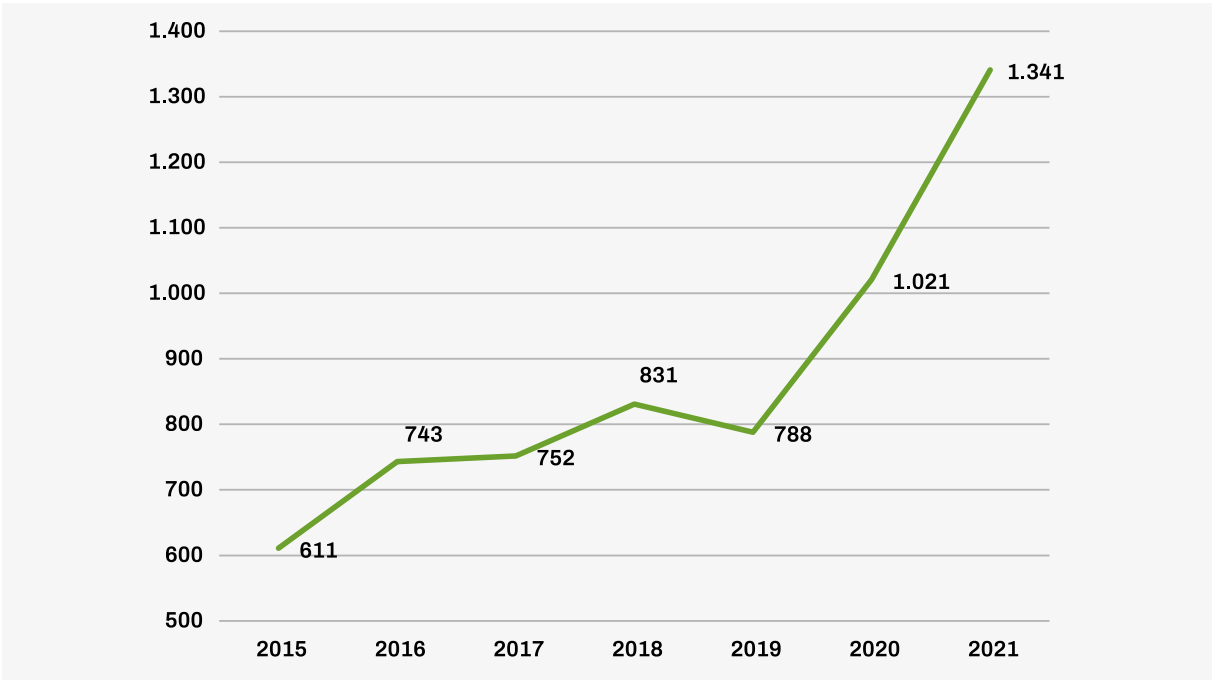


Bicycle manufacturing

The use of bicycles is booming and this obviously has a positive impact on the local bicycle manufacturing industry. CNAE heading 3092, which refers to the manufacture of bicycles, excludes the manufacture of bicycles with auxiliary engines. In other words, the manufacture of electric bicycles is not included, which is an anomaly that should be corrected because this is a type of bicycle that is clearly on the rise in terms of sales and therefore production, as indicated by the data provided by the Spanish Association of Bicycles and Bicycle Brands (AMBE). A total of 236,183 electric bicycles were marketed in 2022, 5.7% more than the previous year.

In any case, although the employment of CNAE 3092 underestimates the employment of the sector, these have been growing in such a way that in 2015 employment was 611 workers and in 2021 it was 1,341. Thus, the increase has been 730 workers, more than doubling employment in this short period of time.

Manufacture of bicycles and vehicles for people with disabilities



Source: INE. CNAE 3092 Manufacture of bicycles and vehicles for the disabled

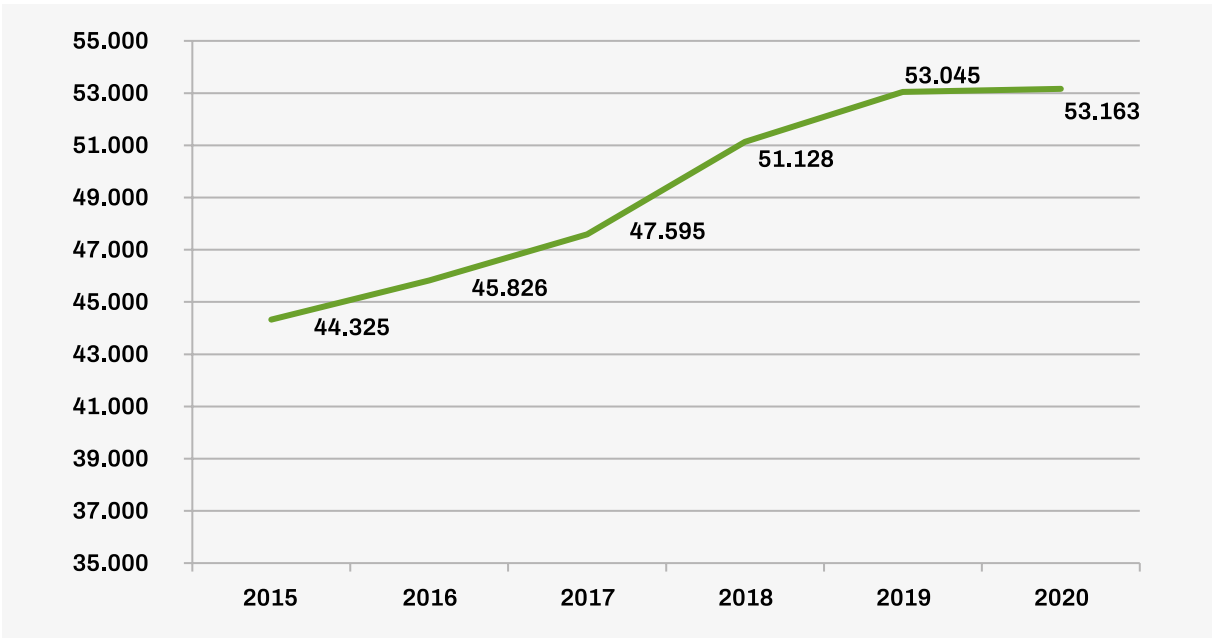
If we look at the bicycle sector as a whole and not just the manufacture of bicycles and components, we can see its great magnitude, as AMBE provides us with the number of people employed in the overall number of companies in the bicycle sector. Those producing, importing and distributing bicycles employed 10,202 people in 2022. In the bicycle trade and workshops the number of employees was 14,254. If we add the two types together, the figure rises to 24,456 people employed in the bicycle sector.



Urban and suburban public transport employment

Another group of companies to which we would like to refer is the provision of public transport services and occasional services. Following the classification criteria used by the CNAE 4931, we will focus on urban and suburban land passenger transport. This class includes both buses and railways in their different modalities. The evolution of the number of staff employed in the five-year period between 2015 and 2020 has been positive. Specifically, there has been an increase of 8,838 employees, which represents a 32% increase.

Urban and suburban land passenger transport employment

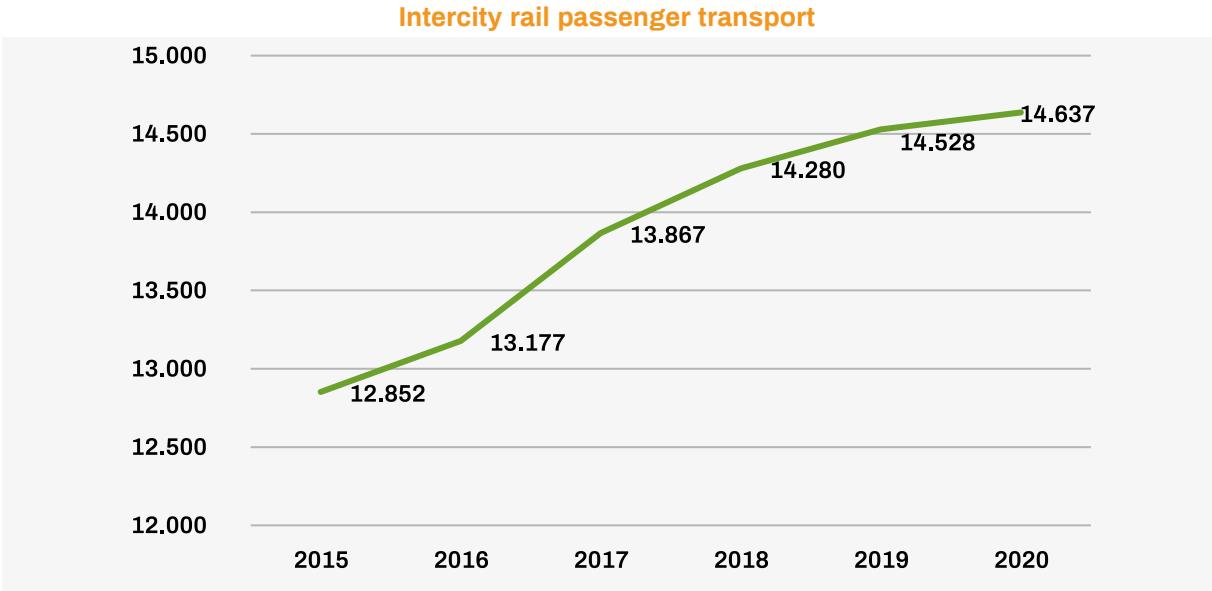


Source: INE: CNAE 4931 Urban and suburban land transport of passengers.



Employment in intercity rail passenger transport

The INE provides information on the number of staff employed in another transport category, CNAE 491, which covers interurban passenger transport by rail. Once again, we note a growth in the evolution of employment in the provision of public transport services. Specifically of 1,785 people, between 2015 and 2020, which is equivalent to a percentage increase of 14%.



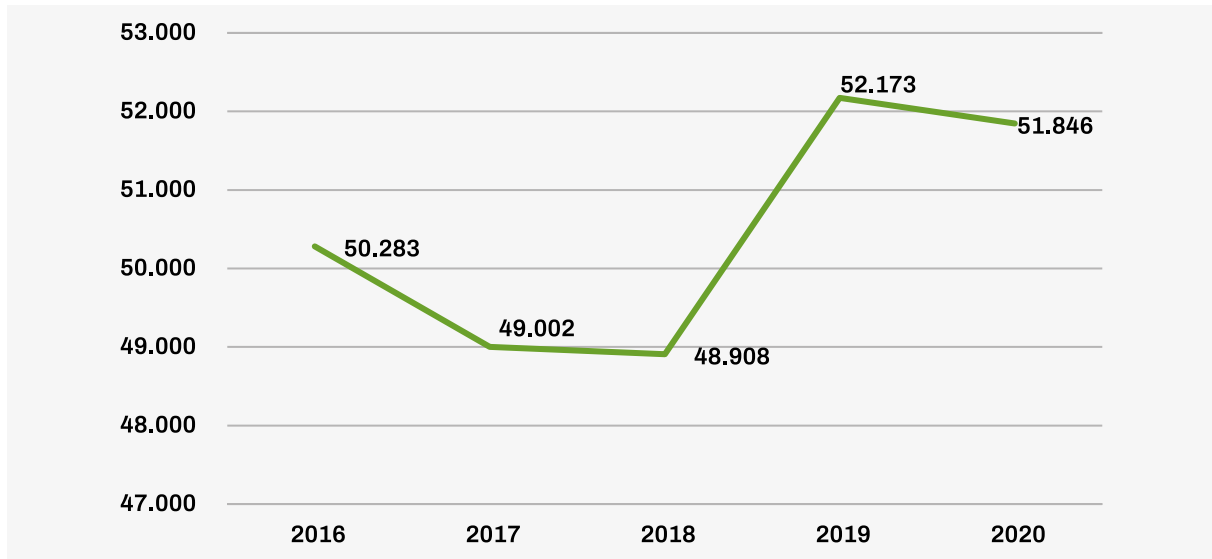
Source: INE: CNAE 491 Interurban passenger rail transport.

We have other activities related to railways grouped under CNAE 5251 Activities allied to land transport. This heading is quite heterogeneous, and is not exclusive to passenger transport.

In the following table we see that the behaviour of employment is very irregular, with constant oscillations, highlighting the increase of 3,265 employed persons that occurs between 2018 and 2019, the year prior to the pandemic in which the highest level of employment was reached.



Activities allied to land transport



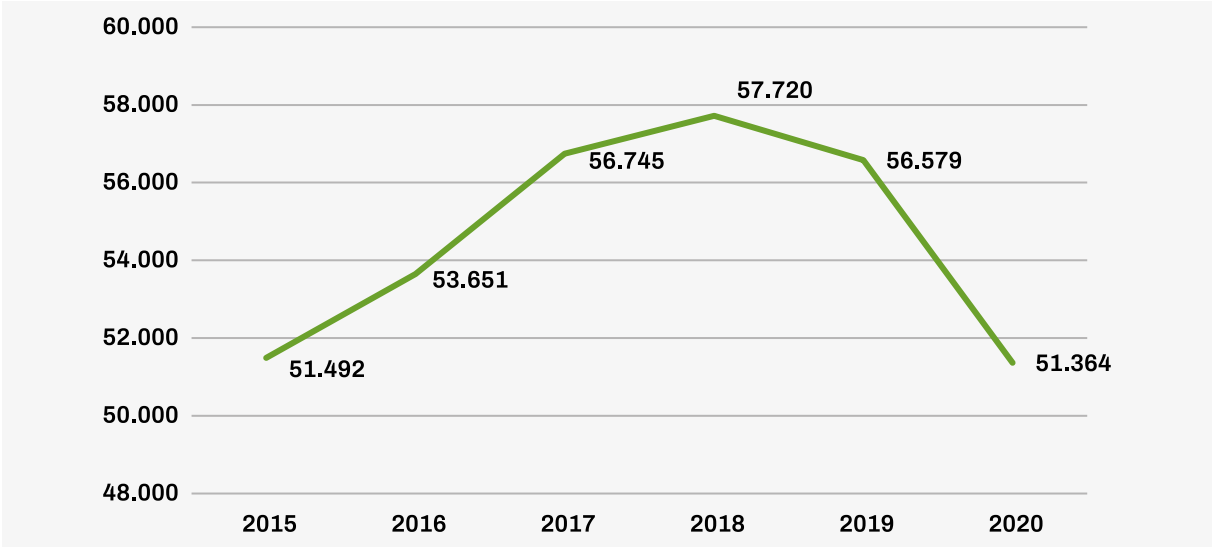
Source: INE: CNAE 5251 Activities allied to land transport.



Employment in inter-urban road transport

Another heading that refers to collective transport mainly by road, although it is somewhat diverse, is CNAE 4939 Other land passenger transport. It basically refers to regular inter-city bus services and occasional or repetitive occasional bus and coach services. This type of transport breaks with the general trend in both the manufacture and provision of transport and sustainable mobility services, since in this case, although at the end of the period analysed 2015-2020 employment has been maintained, in reality between the zenith year 2018, with 57,720 workers, and the last year for which we have data for 2020, employment has decreased significantly by 6,356 people, -11%.

Development of other land passenger transport 2015 - 2020



Source: INE: CNAE 4939 Other passenger land transport n.e.c.

According to the survey carried out in October 2020 by the Spanish Confederation of Bus Transport (CONFEBUS) this decrease was due to the impact of the pandemic. In addition, the number of active workers fell in almost all companies in the sector, with nearly a quarter (23%) with a reduction in employment of between 75 and 100%.

However, these effects must be qualified, as all the indicators (increase in tourism, rising demand...) suggest that this sector has already recovered and by 2023 there will have been a recovery in employment.

Taxi employment

Unlike the rest of the employment data that we have been extracting from the INE, and given that there is a CNAE that corresponds to taxis, specifically CNAE 4932 "taxi transport", the INE does not offer employment data until 2021. The volume of employment shown in the statistics for the year 2021 amounts to 79,965 workers.



Employment in new sustainable mobility services

In this third group, which closes the whole range of what we have come to call zero- emission mobility, we include what we can call the “New sustainable mobility services”. This is a heterogeneous group made up of a wide constellation of companies and activities that are relatively new, although many of them are already consolidated in the market.

Generally, their activity is based on a paradigm shift from vehicle ownership to vehicle use. In other words, it is no longer about owning but, generally, about sharing the use of the vehicle between different users.

On the other hand, their emergence and management is inevitably sustained by the irruption of digitalisation. Information and communication technologies have made this type of service possible.

In any case, sticking to our task in this section, which is none other than to know the employment generated by zero-emission mobility, it must be said that unlike most of the sectors that we have analysed so far, in this case we do not have defined and more or less concrete statistics.

Consequently, by way of example, we have focused on a few services from which we can draw conclusions regarding the volume of employment they generate, bearing in mind that they represent only a small portion of these very diverse mobility services.



Employment in public bicycle hire services

These are public bicycle lending services, which are generally publically owned at the local level, although they may be supra-municipal.

In order to determine approximately how much employment they generate, we will take as a reference for its calculation what is currently the largest company providing this type of service in Spain, i.e. biking in the city of Barcelona.

The service has 7,000 bicycles, of which 3,000 are mechanical and the rest 4,000 are electric, and began operating in 2007, which means that it has been in operation for 16 years without interruption.

If we move on to the employment generated by this mode of shared transport in Barcelona, we have 15 jobs at Barcelona Serveis Municipals (BSM), which is the public company belonging to Barcelona City Council that promotes, supervises, plans and manages the service.

The concessionary company that actually provides the service is Pedalem. This company has staff who are mainly in charge of the distribution of the bicycles to the stations and the mechanics. In total there are 160 employees. In total, therefore, the direct employment generated by Barcelona's public bicycle lending service is 175 people.

Although we know that directly transferring the employment of biking to the rest of the Spanish systems is only a simulation exercise and, therefore, cannot be taken as definitive, we do so only to have an approximation of the total employment that can be generated. First of all, we will refer to a report carried out by the Observatorio de la bicicleta pública en España (Observatory of public bicycles in Spain) for the year 2019. Taking into account that at that time there were 43 services in operation with 23,919 bicycles available, biking represented 29% of the total.

To calculate the approximate number of direct jobs generated by all public bicycle lending services, we have calculated how much employment is generated per bicycle in biking and, subsequently, we have transferred it to all bicycles. This operation gives us the result of around 600 people employed in the state as a whole.



Employment in carsharing services

Carsharing or carsahring is based on a fleet of vehicles at the disposal of its users and managed by a company. These are cars that are used by several people and are paid for their use by time and/or distance travelled.

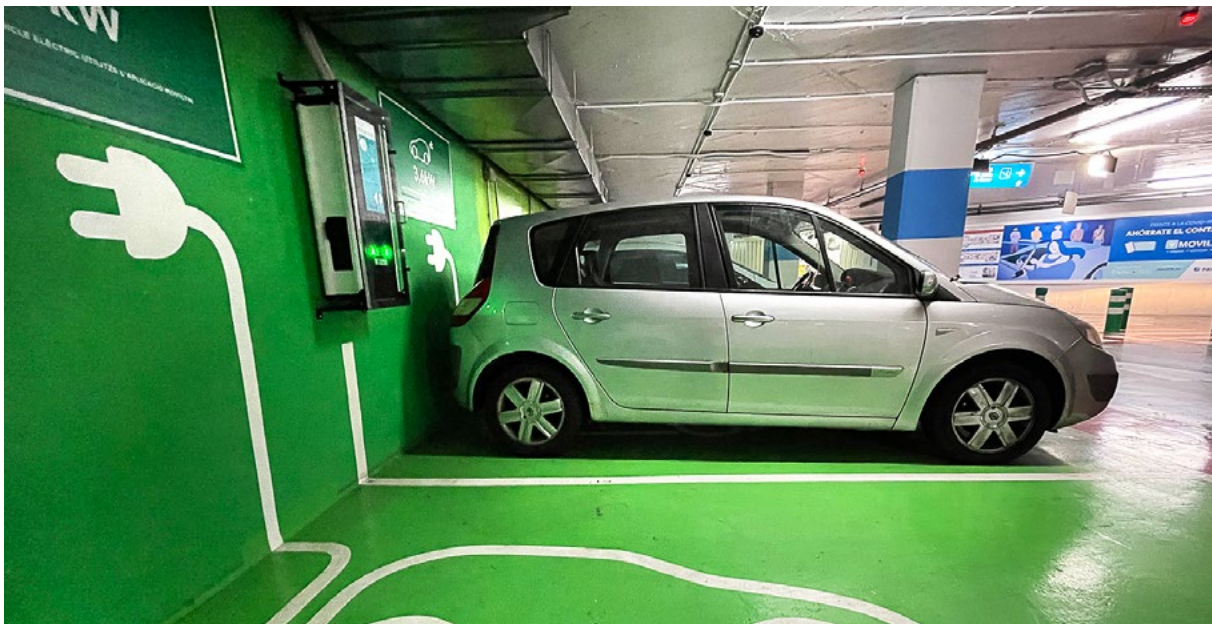
To assess the impact of this type of service, we are going to analyse a specific case, we will refer to Free2move, which comes from the first car sharing company that was implemented in Madrid at the end of 2015. The company landed with 350 vehicles, all electric, and at the time it was said to be the largest fleet of electric vehicles in Spain.

To get an idea of its magnitude and the increasingly important role of this sector in the mobility system, this carsharing company is currently present in 17 cities in 8 European countries with 13,000 vehicles and 4,000,000 users.

In the case of Spain, the company is only present in Madrid, and currently has 700 vehicles, of which 610 are pure battery electric and 90 are plug-in hybrids.

In terms of employment, Free2move employs around 800 people across Europe and around 60 in Spain.

In Spain, according to the Metropolitan Mobility Observatory, in 2020 there were around twenty carsharing companies. If we calculate the total number of carsharing vehicles, we estimate that there are around 4,150 vehicles in Spain. Likewise, as we know the employees of one of the main carsharing companies and the number of vehicles in their fleet, if we establish a ratio of employment generated per vehicle, we can deduce that there are around 360 workers directly employed in the carsharing sector.



Employment in shared corporate transport

With this denomination we refer to bus service management companies, which manage on-demand services according to demand. Specifically, we refer to companies that do not have their own fleet of buses, but manage buses belonging to third parties.

Corporate transport can serve exclusively one company or be shared by several companies. They are usually known as corporate transport. A transport model that has existed for a long time, now the novelty is that with digitalisation new technological companies have appeared that act as intermediaries between the company that makes the service available to its employees and the transport operator.

One of the companies offering this shared corporate transport service is busup, which started in 2015 in Barcelona, initially with four people.

It manages a bus system in which potential users design the route and stops according to their requests by means of a questionnaire available on the internet that asks where the workers live and what their schedules are.

Busup is headquartered in Spain and has offices in Portugal, Brazil, Mexico, Peru and the USA. It currently employs 120 people worldwide, 50 of whom work in Spain.

To know the dimensions of their service, according to their website, they currently have 1,400 active routes, adding those of all the countries where they operate and they have 39,800 passengers belonging to 110 different companies. They also work with 150 bus operators.



Total employment in sustainable zero-emission transport

The employment figures presented in this section are based on the data we have collected, mainly published by the INE, although we have used other sources, mainly company reports. We have also extrapolated from the overall employment in their sector when this was not defined. Due to the diversity of sources, the figures we have been compiling by sector do not always correspond to the same year, so we present them within a range of four consecutive years from 2020 to 2023.

Although we have tried to be rigorous and we are convinced that the numbers are in line with reality, we want to be cautious and warn that in the end it is an estimate. This does not detract from the fact that we believe it is valid and illustrative of the employment generated in the sustainable transport sector, which was one of our objectives with this study.

In all, we have achieved an employment volume of around 300,000 employees.

Employment generated in various sectors of sustainable zero-emission transport

Sustainable transport sectors	2020	2021	2022	2023
Railway manufacturing		20.364		
Bus manufacturing				2.790
Bicycle manufacturing, distribution, trade and workshops			24.456	
Urban and suburban land transport	53.163			
Intercity rail transport	66.483			
Intercity bus transport	51.364			
Taxis		79.965		
Public bicycle loan services				600
Carsharing				360
Shared corporate transport				50
Subtotal	171.010	100.329	24.456	3.800
Total		299.595		

Source: own elaboration.



Sustainable transport supply

There is an intrinsic relationship between the supply and demand of sustainable transport, as they are inseparable and the evolution of both supply and demand go hand in hand, thus both feed back, generating activity in the industry and in the provision of mobility services. In other words, if we increase the quantity and quality of mobility services, we attract more people and, at the same time, if the number of passengers increases, more transport is needed to satisfy them.

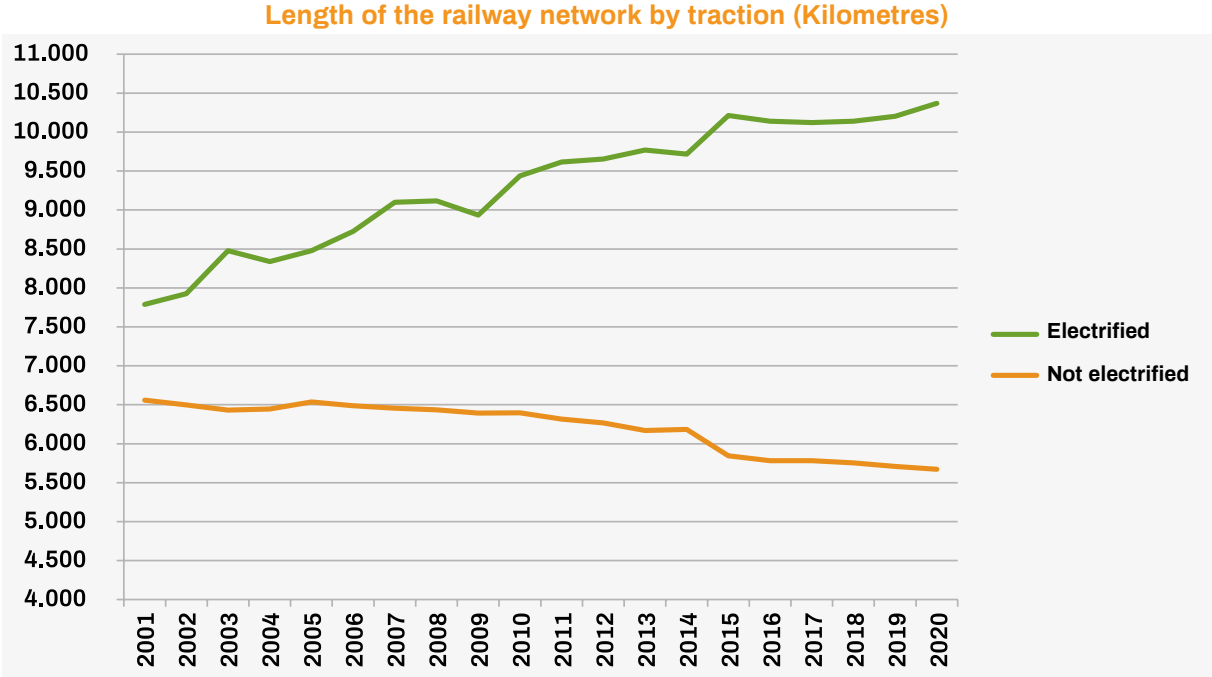
Therefore, in the following we want to show this mutual dependence in which the evolution of supply and demand are both cause and effect of the evolution of activity and, consequently, of employment that we have analysed.

But not only that, with the premise of decarbonising transport which, as we have already said, is no longer an option but an obligation that requires a shared commitment, in this section of the study we are going to pay special attention to the electrification process that allows the expansion and intensification of sustainable transport modes.



The offer of the Railway

From 2000 to 2020, the Spanish rail network has grown by 1,694 kilometres. However, if we look closely, we can see that in reality there has been a differential behaviour, in which the non-electrified network has decreased and, on the other hand, the electrified infrastructure has grown by 2,581 kilometres. This means that, at the beginning of the century, in 2000, the weight of the electrified network in Spain as a whole was 54% and in 2020 it had risen to 65%.



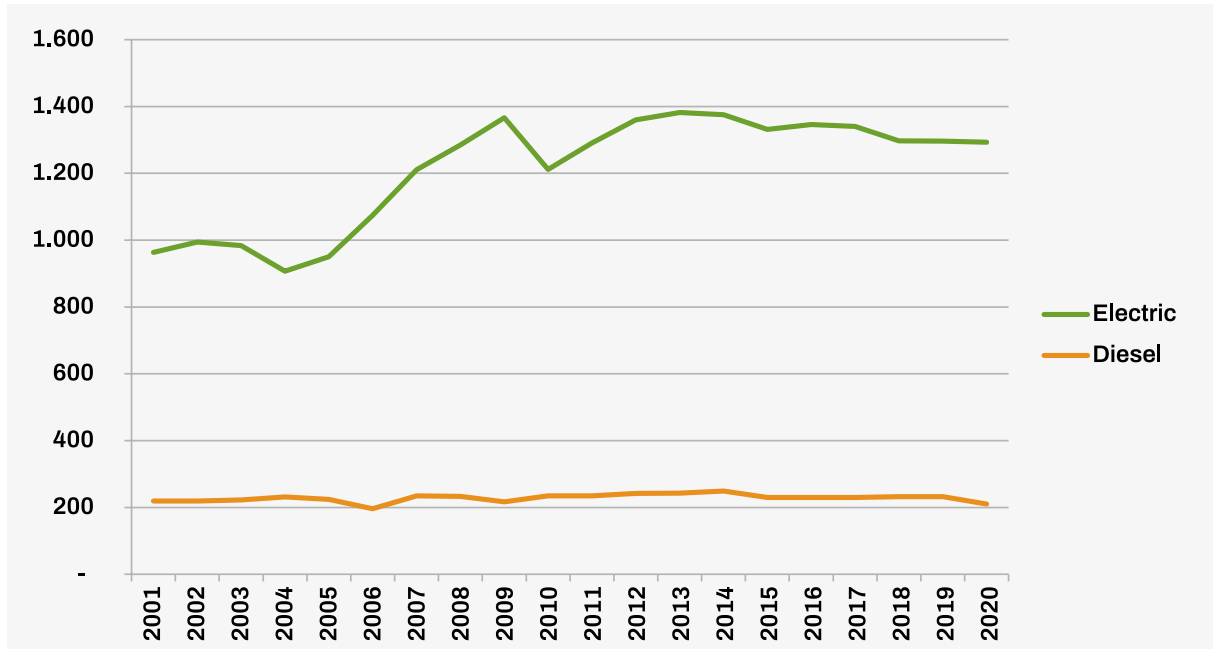
Source: Statistical Yearbook 2020. Ministry of Transport, Mobility and Urban Agenda 2023.

When we talk about vehicles, we are talking specifically about the railway rolling stock of self-propelled units that do not require a locomotive outside the composition, as they have their own engines and other traction systems included.

The evolution of these railway units shows that the number of units has increased from 2000 to 2020 by 346 units and that the vast majority of the increase has been in electric traction units. For this reason, their relative weight has gone from 81% to 85% of the total in this period of time. Specifically, it has gone from 1,172 units in 2000 to 1,518 in 2020.



Rail transport Railway rolling stock. Self-propelled units



Source: Statistical Yearbook 2020. Ministry of Transport, Mobility and Urban Agenda 2023.

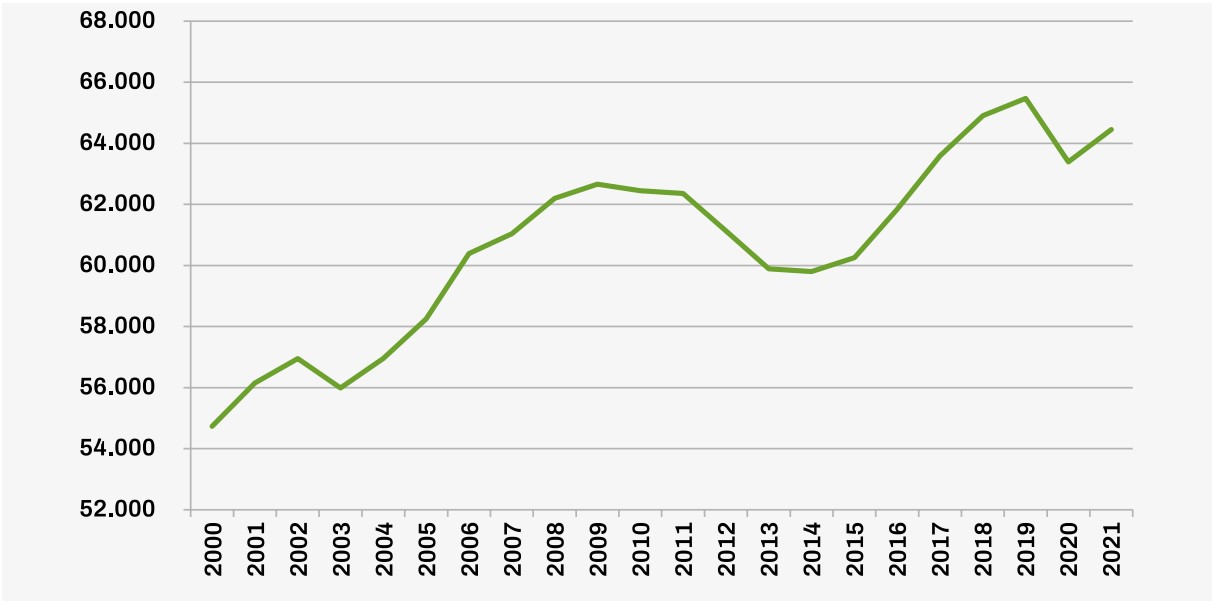


The bus offer

The bus fleet in Spain has experienced a considerable increase. From 2000 to 2019, growth has been gradual with some small fluctuations, specifically it has grown by 10,738 vehicles, but with the outbreak of the coronavirus pandemic in 2020, more than 2,000 buses were eliminated in relation to the previous pre-pandemic year.

However, since then, the numbers have recovered and are now almost the same as in 2019, the year with the highest number of buses in the whole of the 21st century. Specifically, in 2022 the fleet stood at 65,337 buses when in 2000 there were 54,732.

Bus park



Source: Statistical Yearbook 2020. Ministry of Transport, Mobility and Urban Agenda.



The metropolitan transport offer

Another territorial scale we want to talk about is the metropolitan areas, where the main metro, tramway, urban and interurban bus networks are located.

To begin with, we will look at the rail supply of metro, tram and light rail up to 2019, because, although we have data for 2020, these are anomalous as they reflect a fall in supply as a result of the pandemic, which has been recovering in subsequent years.

The final result, both in terms of seat-kilometres and vehicle-kilometres in circulation, in the comparison between 2015 and 2019 it is clear that there has been a quantitative improvement. In other words, at least in the large metropolitan areas, rail transport is increasingly being used, which makes public transport more attractive and, consequently, increases its use.

Supply of seats and urban rail vehicles in metropolitan areas

Unit	2015				2019			
	Million seat kilometres		Million vehicle kilometres		Million seat kilometres		Million vehicle kilometres	
Type of transport	Metro	Tram/light rail	Metro	Tram/light rail	Metro	Tram/light rail	Metro	Tram/light rail
Total	47.750,00	1.512,00	267,90	18,60	55.204,00	2.658,00	288,45	21,68

Source: Transport and Logistics Observatory. Ministry of Transport, Mobility and Urban Agenda.

In the case of the supply of bus seat kilometres and vehicle kilometres in metropolitan areas, there has also been an increase in the final count over the period of time shown in the two tables below.

Oferta de plazas y vehículos autobuses urbanos en áreas metropolitanas 2015

Unit	2015					
	Million seat kilometres			Million vehicle kilometres		
Type of transport	Capital city bus	Other city buses	Metropolitan bus	Capital city bus	Other city buses	Metropolitan bus
Total	20.175,90	4.573,00	20.445,75	254,15	55,39	286,20

Source: Transport and Logistics Observatory. Ministry of Transport, Mobility and Urban Agenda.

City buses and vehicles available in metropolitan areas 2019

Unit	2019					
	Million seat kilometres			Million vehicle kilometres		
	Capital city bus	Other city buses	Metropolitan bus	Capital city bus	Other city buses	Metropolitan bus
Total	24.754,16	5.260,00	21.573,22	266,40	63,32	344,51

Source: Transport and Logistics Observatory. Ministry of Transport, Mobility and Urban Agenda.

Bus fuel

In the decarbonisation process, the electrification of the bus fleet is key. Until recently, diesel was the main fuel. On the one hand, however, diesel buses are now being replaced by electric or hybrid buses.

The table below refers to the registration of alternative traction vehicles to diesel, together with natural gas, and shows the low share of electric vehicles in the registration. However, we see a positive development in many respects. First of all, we see how non-plug-in hybrids have become the most registered in 2021 and the percentage of total bus registrations has been rising every year. In the case of pure electrics, even with very modest numbers, they have gone from 18 buses registered in 2017 to 130 in 2021.

If we add the percentages of electric buses and plug-in hybrids or non-plug-in hybrids registered in 2021, the result is 28.5% of the total number of buses registered that year, almost a third. In contrast, in 2017 they accounted for only 4.7%, i.e. there has been significant progress in this type of technology over the last five years.

Bus registrations according to alternative traction energy 2017-2021

Year	Electrical	% of total	Diesel plug-in hybrids	% of total	Diesel hybrids	% of total	Hydrogen	% of total	CNG	% of total
2017	18,0	0,45	-	0	172	4,26	-	0	316	7,8
2018	22,0	2,13	8	0,2	260	6,76	-	0	407	10,6
2019	82,0	2,25	22	0,6	427	11,70	-	0	457	12,5
2020	40,0	1,76	11	0,5	294	12,96	-	0	524	23,1
2021	130,0	6,21	16	0,8	449	21,46	2	0,1	300	14,3

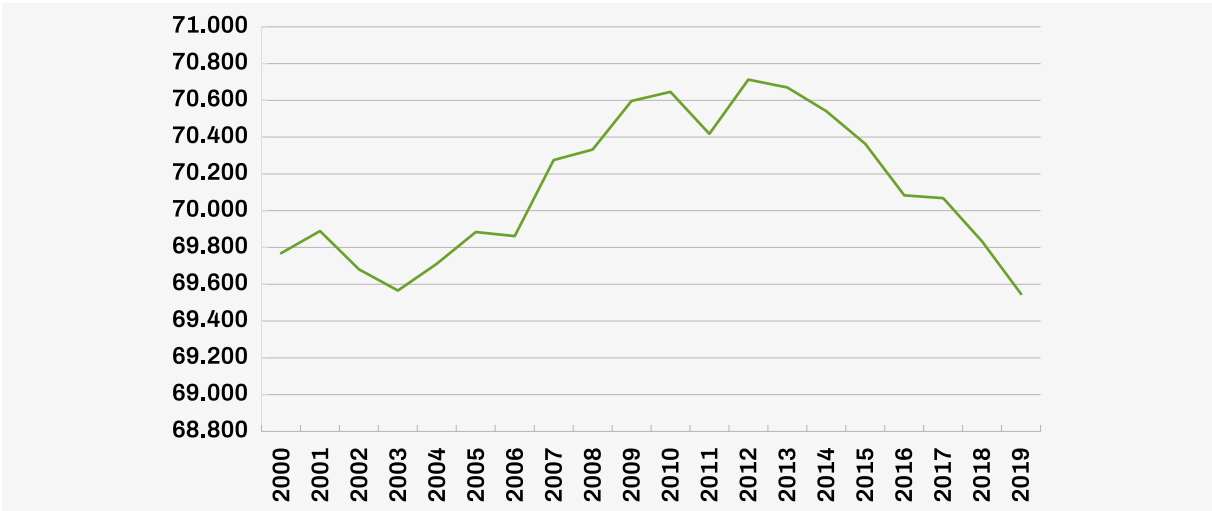
Source: Anfac and Dirección General de Tráfico.



The supply of taxis

As can be seen in the table and graph below, the evolution of taxi vehicles in Spain experienced a continuous rise with some fluctuations between 2000 and 2012, from then until 2019. Specifically, in 2000 there were a total of 69,769 taxis, in 2012 the maximum of the period was reached with 70,713 and, on the other hand, until 2019 the figure fell to 69,547 taxis, the lowest of the whole period. So between 2000 and 2019 there has been a decrease of 222 taxis.

Evolution of the number of taxis between 2000 and 2019



Source: INE.



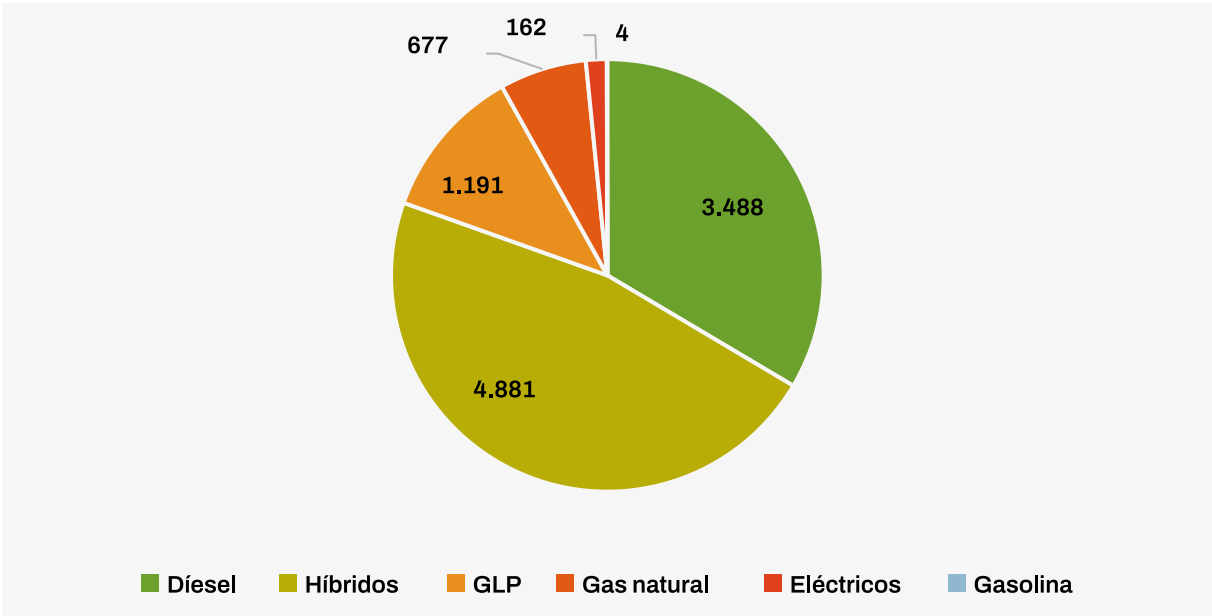
Taxi fuel

In relation to the fuels used by taxis, we will refer to the situation in the metropolitan area of Barcelona, which is where we have the most information. Although this information is incomplete, as it does not cover the entire national fleet, it is significant as this area has 16% of the taxis in the whole of Spain.

The most notable variation is the very significant loss of weight in the use of diesel. Specifically, in the Barcelona area, the relative weight of diesel vehicles has gone from a majority in 2012, with 83% of the total, to 33% in 2022. The type of vehicle that has grown the most are hybrids, which have increased fourfold and will be the dominant system in 2022. In this regard, it should be noted that the first electric taxi to circulate on the streets of Barcelona did not arrive until 2014, so its arrival is relatively recent.

In 2022, electric taxis in Barcelona accounted for 1.6% of the total, while the overall fleet of electric cars in Spain was 0.9%. We therefore conclude that the taxi sector is somewhat more advanced in the electrification of the fleet, and even more so with hybrids, which only represented 3.6% of the total number of cars in Spain in 2022, while among taxis in Barcelona they accounted for 47%¹.

Fuel for taxis in the Barcelona Metropolitan Area 2022



Source: Barcelona Metropolitan Taxi Institute.

1. Electrified vehicle. Report 2022. Anfac 2023.



The supply of bicycles

In this section we will refer to private bicycles, for which we will use the data provided by the Spanish Bicycle Barometer 2022.

If we look at bicycle ownership among individuals we see that the number of people owning a bicycle has increased significantly between the two reference years, 2019 and 2020.

People who own a bicycle 2019 - 2020

	2019	2020
They have bicycles	62,6%	70,3%
They do not have a bicycle	37,3%	29,7%

Source: Bicycle Barometer in Spain 2022.

The supply of public bicycle loan services

In 2011, there were 147 public bicycle systems in 197 municipalities. However, since then, the number of public bicycle systems has decreased. Today, around 53 systems remain active, representing 36% of those in 2011, and the rest have closed down. However, new ones have been introduced recently and others have been expanded.

The following table shows the figures for existing services, loan points and the number of bicycles available in two different years, 2015 and 2020. If we make the total calculation, we can see that in 2020 there were 9 fewer services, but the number of loan points had increased by 44, so the territorial distribution was greater and the number of bicycles available also grew by 739.

	Bicycle loan services	Loan points	Number of Bicycles
2015	41	1.581	19.133
2020	32	2.023	19.872

Source. Metropolitan Mobility Observatory. Reports 2015, 2020 and advance 2021. TRANSyT, Centro de Investigación del Transporte Universidad Politécnica de Madrid 2017 and 2022.



The offer of carsharing services

Carsharing services have developed strongly in recent years, and there are currently around twenty proposals.

Although in some cases we do not have information on the numbers of vehicles in the fleets, according to the data we have been able to collect, there are about 4,150 vehicles, the vast majority of which (about 80%) are electric drive vehicles.

Car sharing services (carsharing) 2023

	Name	Service	Engine type	Number of vehicles
Fixed parking	Ibilkari	Bizkaia	Petrol	-
	Ubeeqo	Madrid, Barcelona	Various types	800
	Muvon	Mallorca	Electric	7
	Ukanauto	Bizkaia	Petrol	-
	Auzokar	Bizkaia	Diesel	-
	Goto	Madrid	Electric	300
	Ecotxe	Mallorca	Electric	-
	Ekiwi	Valladolid	Electric	4
	Electric way	Madrid	Electric	5
	Alterna.coop	Valencia	Electric	7
Flexible parking	Guppy	Asturias	Electric	180
	Zity	Madrid	Electric	800
	Wible	Madrid	Electric	500
	Som Mobilitat	Barcelona, Camp de Tarragona, Girona	Electric	100
	Alma	Zaragoza	Electric	70
	Free2move	Madrid	Electric	700
	Himobility	Asturias	Electric	110
	Mec	Barcelona	Electric	13
	Minits	Badajoz	Electric	50
	Voltio	Madrid	Electric	500
TOTAL				4.146

Source: Metropolitan Mobility Observatory. Report 2020 and progress 2021. TRANSyT, Centro de Investigación del Transporte Universidad Politécnica de Madrid 2022 and other sources for the number of vehicles (websites, media, etc.).



Total demand by type and mode of public and occasional transport

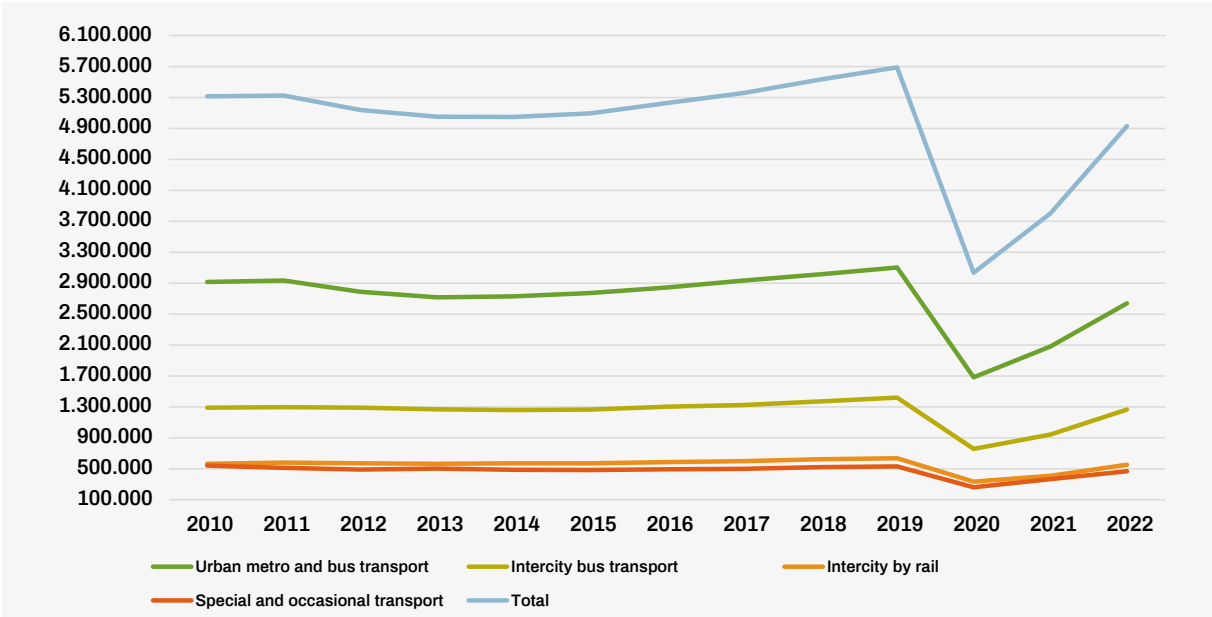
In this section we analyse the demand for sustainable transport in recent years, covering the period from 2010 to 2022. We refer to the volume of passengers using rail and bus transport, both urban and interurban.

In turn, we will analyse demand between January and April 2023, the last period for which we have data at the moment, and compare it with the figures for the same four-month period in 2019 before the pandemic. We add this last inter-monthly stage because, as is well known, the covid-19 pandemic that broke out in 2020 had a very strong impact on people's mobility, especially affecting public transport.

The graph shows a pattern in which the total number of travellers grows with some fluctuations until reaching a peak in 2019. In 2020, as a result of the pandemic, the figures plummet to reach the minimum of the period analysed. From this point onwards and after the pandemic, a clear recovery begins, which, however, has not yet reached the number of travellers in 2019.

On the other hand, this graph shows the differential weight between the different types and modes of transport, with considerable differences between them. With an absolute predominance of urban transport by metro and bus, followed by interurban transport by bus, although this is half that of urban transport; and then with similar numbers, but far behind the previous modes, interurban transport by rail and special and occasional transport.

Passengers by type and mode of public and occasional transport 2010 - 2022
Units thousands of travellers



Source: INE



The table below shows that while in 2020 only 53.3% of passengers were carried in 2020 compared to 2019, in 2022 the figure was 86.6%, only 13 points lower than in 2019.

The comparison between the number of passengers between January and April 2019 and 2023 leaves no room for doubt: in 2023, the number of passengers has already reached 99% of the cumulative number of passengers in the same months of 2019.

Travellers by type and mode of transport in relation to 2019 between 2020 and 2022. Units thousands of travellers

Type and mode of transport	2019	2020	%	2021	%	2022	%
Urban metro and bus transport	3.102.006	1.682.494	54,2	2.081.740	67,1	2.639.504	85,1
Intercity bus transport	1.420.276	757.193	53,3	944.400	66,5	1.265.779	89,1
Intercity by rail	636.340	333.786	52,5	409.838	64,4	553.354	87,0
Special and occasional transport	530.184	261.109	49,2	367.034	69,2	470.018	88,7
Total	5.688.806	3.034.582	53,3	3.803.012	66,9	4.928.655	86,6

Source: INE.

Travellers by type and mode of transport between January and April 2019 and 2023 Units thousands of travellers

Type and mode of transport	January - April 2019	January - April 2023	%	%
Urban metro and bus transport	1.050.379	1.034.682	98,5	-1,5
Intercity bus transport	467.556	479.620	102,6	2,6
Intercity by rail	216.153	216.486	100,2	0,2
Special and occasional transport	184.511	169.473	91,8	-8,2
Total	1.918.599	1.900.261	99,0	-1,0

Source: INE.



Demand for bicycles

Barómetro de la bicicleta 11 million Spaniards use bicycles on a weekly basis, 6 million use them occasionally and 2 million use them daily for work or study purposes. These are very significant figures which show a very high level of use, representing, in the case of daily use, 6.5% of the total population of Spain.

Bicycle use	Persons	%
Mandatory daily mobility	2.000.000	6,5%
Mobility ever required	6.000.000	17,5%
Use the bicycle on a weekly basis**.	11.000.000	32,5%

Source: Barómetro de la bicicleta en España. Ministry of Transport, Mobility and Urban Agenda. Network of cities for cycling. 2022.

* Use the bike daily to commute to work or study
 ** Not counting those who use it only at weekends



Final considerations

To summarise the above, we can say from the outset that in order for transport, which is now the main emitter of greenhouse gases and therefore the cause of climate change, to drastically reduce its emissions, a process of replacing the combustion engine with electromobility must be boosted. In other words, a shift from fossil fuel traction to electric vehicles as the final destination on the road we have already embarked on.

In any case, beyond electrification, all these modes and types of transport and the services they provide are by definition sustainable, as they are intended to replace private vehicles, mainly combustion engines, which is an effective way of reducing their presence and, consequently, the emissions they produce. On the one hand, because collective transport can be equivalent to several less vehicles of this type circulating, on the other hand, as in the case of cycling, it is obvious, and in the case of shared vehicles, also because they are precisely based on changing the concept of ownership for that of use, replacing private vehicles.

Furthermore, what we have tried to show is that an increase in the use of sustainable transport is both a cause and an effect of an increase in supply and, conversely, an increase in supply attracts more demand, as long as this demand is of high quality. Likewise, obviously, the greater the use of this mode of mobility, the lower the greenhouse gas emissions, which, after all, is the ultimate objective for an efficient fight against climate change. But this increase in supply also inevitably requires more vehicles and services. It therefore acts as a driving force for our vehicle manufacturing industry to increase the workload and thus create more jobs.

Thus, the promotion of sustainable transport, in all its variants, is, as the title of our study states, a boost to zero-emission mobility and a great opportunity to decarbonise transport and generate economic activity and employment.

Of course, increasing the role of zero-emission transport is not without its difficulties, which we must overcome and which will require political and economic measures:



Pact to boost the sustainable transport industry.

Give more decisive support to the zero-emission transport industry sector by public administrations. To this end, a pact for the sustainable transport industry should be drawn up with the participation and collaboration of all social agents, public administrations and research centres, which supports the entire value chain of the rail, bus and bicycle manufacturing sectors. Strategic planning of the sector with a medium- and long-term scenario approach.

Facilitate and prepare for the incorporation of skilled labour within the framework of a just transition.

There are sectors with various difficulties, such as in the railway industry, where it will be necessary to plan the supply of jobs with very specific professions, such as welders, or in bus and coach driving, where there is a growing demand that is not always met. This will require the design of training plans and at the same time the provision of fair working conditions to attract new labour. This also forms the main axes to achieve a just transition, and to offer employment opportunities for those working in threatened sectors, so that they can re-qualify and move into these more sought-after jobs.

Continue the process of electrification of passenger transport.

Evitar una paralización del proceso de electrificación del transporte de pasajeros una vez finalicen los fondos Next Generation. Para ello, una vez finalicen las ayudas, que han dado el primer gran impulso a la incorporación de autobuses eléctricos tendrá que haber un cambio en la política de subvenciones que los sustituya para que así, las entidades locales, prosigan la adquisición de autobuses eléctricos y la instalación de cargadores.

Promote the acquisition and use of bicycles.

Facilitate the purchase or rental of bicycles by individuals and companies. To encourage the purchase of bicycles, offer tax incentives, such as VAT reductions or direct aid from public administrations. Bearing in mind that the main reason we travel is to get to and from work, and that this is also when private vehicles are most used, it is necessary to study tax measures to provide incentives for companies to buy fleets of bicycles for their employees and, likewise, to provide subsidies per kilometre travelled for workers, as is already being done in neighbouring countries.

Guarantee the financing of public transport by the State and the Autonomous Communities.

Establish criteria for municipalities or supra-municipal areas to receive this funding, at least in terms of population served, economic capacity and territorial extension to cover the financing needs of public transport. Likewise, to demand a minimum level of service provision and to promote the integration of fares for all public transport services that serve a territory, whether urban or rural, so that transfers are not penalised. Similarly, technical support should be given to municipalities or metropolitan entities with less capacity to plan transport services in accordance with the needs of citizens.



Adoption and implementation of the State Sustainable Mobility Act.

A framework law is needed to provide legal protection and set out the basic principles that should govern this absolute prioritisation of modes and types of transport that guarantee sustainable mobility. The regulations must be a tool that aims to achieve a mobility model based on transport that is one hundred percent decarbonised, energy efficient, healthy by eradicating air and noise pollution, socially equitable and safe by avoiding road accidents.

Implement planning and management measures that support sustainable transport.

Based on three basic principles:

- Compact, dense, mixed-use urban planning.
- Promoting sustainable mobility.
- Deterrence of private vehicles with combustion engines.

In order to offer efficient transport and mobility services and encourage the use of active modes, it is necessary to have a crowded and continuous urban space, with average population and activity densities and a mix of land uses and urban functions: housing, productive activities, commerce, school and health facilities, etc. Promote sustainable transport types and modes by improving supply in terms of quantity and quality. Promoting sustainable transport is necessary, but not sufficient. At the same time, there must be measures to dissuade the use of private modes of transport that run on fossil fuels, for which measures such as restrictions on traffic such as Low Emission Zones (LEZs) must be implemented as soon as possible.

Green and progressive taxation.

Under the polluter pays principle, combined with the principle that those who have more pay more should apply taxation to raise funds to apply the aid and subsidy measures for zero-emission transport that we have been proposing. Thus, by means of the necessary figures, it is necessary to tax vehicles according to how much they pollute and the intensity of their use and, at the same time, apply income correction mechanisms by means of territorial or personal redistribution of the funds collected. So that those territories and people with lower incomes can offer and have access, respectively, to sufficient and quality sustainable transport.

Undoubtedly, the list of proposals could be much more specific and detailed for each mode or sector of activity that we have considered in this report, but there is an even-handed proposal that encompasses everything and that is that there must be a firm commitment without hesitation to sustainable mobility with zero emissions in all its environmental and social dimensions, including the generation of employment. To this end, there must be a shared consensus, an agreement between public administrations, companies, trade unions, other agents in the transport sector and groups representing the general public in order to make firm progress in this task.



Bibliography

- Análisis de los sistemas de bicicletas compartidas en España Sistemas públicos – Informe extendido. Observatorio de la Bicicleta Pública en España. 2019
- Anaya, E. y Castro, A: Balance general de la bicicleta pública en España. 2011
- Anuario estadístico 2019, 2020. Ministerio de transportes, movilidad y agenda urbana 2022 y 2023
- Anuario 2022 -2023 de la movilidad eléctrica. La voz de la cadena de valor. Asociación Empresarial para el Desarrollo e Impulso de la Movilidad Eléctrica. 2023
- Ayudas a la Compra de Bicicletas en España. Impacto económico y en la reducción de Emisiones de CO₂. Asociación de marcas y bicicletas de España (AMBE) 2023
- Barómetro de la Bicicleta en España 2022. Gesop. Ministerio de Transportes, Movilidad y Agenda Urbana y Red de Ciudades por la Bicicleta. 2022
- Barómetro IV Impacto COVID-19 en empresas de transporte. Confibus 2020
- Barómetro V Impacto COVID-19 en empresas de transporte Perspectivas 2021. Confibus 2020
- Estrategia estatal por la bicicleta. Ministerio de Transporte, Movilidad y Agenda Urbana. 2021
- Estrategia de transición Justa. Ministerio para la Transición Ecológica y el Reto Demográfico. 2020
- Estudio sobre el sector de fabricación y mantenimiento del material ferroviario en España 2015-2019. Confemetal, UGT y CCOO. 2021
- Estudio del servicio del Taxi. Vectio. Ayuntamiento de Madrid 2017
- European Shared Mobility Index 2022. Fluctuo 2023
- European Shared Mobility Index Q1 2023. Fluctuo 2023
- Hacia un nuevo país industrial. La industria de la movilidad como motor de recuperación tras la covid- 19. Fundación 1º de Mayo. 2020
- Informe de Inventario Nacional de Emisiones de Gases de Efecto Invernadero 1990 -2021 Ministerio para la Transición Ecológica y el Reto Demográfico. 2023
- Introducción al Mobility as a Service. Una movilidad más libre, conectada y sostenible para tu ciudad. Meep 2021
- Instrucción 20/V-140. Vehículos destinados al uso compartido (sharing). DGT 2020
- Ley 16/1987, de 30 de julio, de Ordenación de los Transportes Terrestres
- Ley 38/2015, de 29 de septiembre, del sector ferroviario
- Observatorio de la Movilidad Metropolitana. Informes 2015, 2020 y avance 2021. TRANSyT, Centro de Investigación del Transporte Universidad Politécnica de Madrid 2017 y 2022
- Observatorio del transporte y la logística en España. Informe anual 2020 y 2022. Ministerio de Transportes, Movilidad y agenda Urbana 2021 y2023
- Observatorio del Transporte de Viajeros por Carretera Oferta y Demanda. Ministerio de Transportes, Movilidad y Agenda Urbana 2022
- Plan Nacional Integrado de energía y Clima 2021-2030. Ministerio para la Transición Ecológica y el Reto Demográfico. Enero 2020
- PERTE para el desarrollo del vehículo eléctrico y conectado. Plan de Recuperación y Resiliencia. Gobierno de España 2021



- Proyecto de Ley de Movilidad Sostenible. Boletín Oficial de las Cortes Generales. Enero 2023
- El sector de la bicicleta en cifras 2015 y 2022. Asociación de marcas y bicicletas de España (AMBE)
- Shared Mobility Index France. 2020 State of the Industry. Fluctuo 2021
- Smart Vision: Retrofit Oportunidades de negocio y desafíos en la Movilidad Sostenible. AEMES SMART 2022
- The Economic Impact of Bike Sharing in European Cities. IESE Bussines School University of Navarra. 2019
- UE Estrategia de movilidad sostenible e inteligente: encauzar el transporte europeo de cara al futuro 2020
- Urban Mobility Next #4 Integrated and safe: how innovation can increase micromobility end user adoption. EIT Urban Mobility. 2021
- Vehículo electrificado. Informe 2022. Anfac 2023

Publicaciones:

- Carril bus. Editbus. Número 198 septiembre 2022 y número 201 enero - febrero 2023
- Confebus. Revista de información sobre el transporte de viajeros por carretera. Confederación Española de Transporte en Autobús. Número 31 marzo 2023 y número 32 junio 2023
- Trenvista. Grupo Ferromedia. Número 1 abril 2023
- Viajeros de transporte público en España y Portugal. Editec Grupo editorial. Número 292 mayo 2023
- Vía Libre. Fundación de los Ferrocarriles Españoles. Especial formación para el ferrocarril. Número 685 junio 2023

Informes i planes de empresas:

- ADIF. Informe de Gestión 2016, 2017, 2018, 2019, 2020, 2021 y 2022
- ADIF. Plan de Lucha Contra el Cambio Climático 2018 - 2030
- Alsa. Estado de Información No Financiera 2021
- Barcelona de Serveis Municipals. Memòria de Sostenibilitat 2021
- CAF. Informe anual 2022.
- CAF. Plan Estratégico 2026
- Castrosua. Memoria de los Estados de la Información no financiera 2021 y 2022
- Empresa Malagueña de Transporte. Informe de Auditoría 2015 y Memoria de Sostenibilidad 2021
- EMT Madrid. Informe de Gestión 2015 e Informe de Gestión Estado de la Información no Financiera 2021
- EMT Madrid. Plan Estratégico de la Empresa Municipal de Transportes de Madrid 2021-2025
- EMT València. Memoria 2015 y Memoria Informe de Gestión 2021
- Euskotren. Memoria 2015 e Informe de Gestión 2021
- FGC. Memoria 2015 y 2021



- FGC. Pla d'Actuació 2022 – 2026
- FGV. Informe de Gestió de Comptes Anuals i Memòria de Sostenibilitat 2020 y 2021
- Irizar. Memoria de Sostenibilidad 2015 y Memoria Anual 2020
- Logirail. Cuentas Anuales y Memoria de Gestión 2020 y 2021
- Metro Bilbao. Memoria Anual 2015, 2020 y 2021
- Metro Madrid. Informe Anual y RSC 2015, Informe Corporativo 2020 y 2021
- Moventia. Memòria de Responsabilitat Social Corporativa 2021
- Renfe. Informe Anual Responsabilidad Empresarial 2015 e Informe de Responsabilidad Social y Gobierno Corporativo 2021
- Talgo. Memoria de sostenibilidad Corporativa 2022
- TMB. Informe de Gestió 2015 y Memòria de Sostenibilitat 2021
- TMB. Pla Estratègic 2025
- TUSSAM. Memoria anual 2015 y 2021

