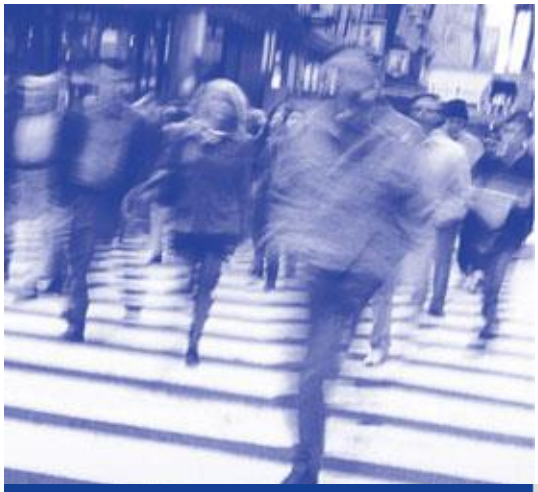

CiViTAS
Cleaner and better transport in cities

DYN@MO
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P1.1 Implementation status report

Executive summary of Palma's final SUMP

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Abstract

This deliverable contains the English translation of the executive summary of Palma's Sustainable Urban Mobility Plan (SUMP). The SUMP and its measures, which jointly form the action plan, strive towards achieving a mobility system that allows for a more competitive, friendly, sustainable, accessible and safe city by 2020. In order to achieve these goals, the SUMP defines 10 strategic lines which aim to reduce the use of private vehicles, promote the most sustainable modes (public transport, walking and cycling) and integrates essential motorised mobility into the urban environment by means of the use of cleaner technologies, urban planning and mobility management. The action plans proposes 72 concrete measures. The latest complete version of the SUMP is available online, in Catalan and Spanish, since the 6th of November 2014. During 2015 a monitoring process involving stakeholders and individual citizens is organised.

Project Partners

Organization	Country	Abbreviation
Ajuntament de Palma	ES	City of Palma

Document History

Date	Person	Action	Status	Diss. Level
15-10-14	DOYMO	Final version of SUMP in Catalan		PUBLIC
09-12-14	Miquel Femenía	Summary in English	Draft	SC
31-12-14	Maarten van Bemmelen	Final editing, language check and formatting	Final draft	PC
19-01-15	Marcel Braun	Proof-reading and final formatting	Final	EC
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Status: Draft, Final, Approved, and Submitted (to European Commission).

Dissemination Level: PC = Project Coordinator, SC=Site Coordinator, TC=Technical Coordinator, EM=Evaluation Manager.

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1 Introduction

The main goal of the Sustainable Urban Mobility Plan (SUMP) of Palma de Mallorca is to establish strategic lines of actions, which make it possible to achieve a sustainable mobility system that is aligned with the future vision we have for our city. The SUMP builds on the mobility policies of recent years. The objectives are to improve road safety; to increase the city's competitiveness and to achieve a more balanced and fairer distribution of public space among modes of transport.

Many of our citizens acknowledge that the presence of private cars in the streets of Palma has been gradually decreased during the last two decades. The access regulations in the city centre introduced in the 1990s; the introduction of pedestrian areas, both outside and inside the inner-city ring road (Avingudes); the incipient network of bicycle lanes; the reinforcements in public transport supply; and demand management through pricing strategies for on-street parking; have all contributed to a more balanced spatial and functional distribution.

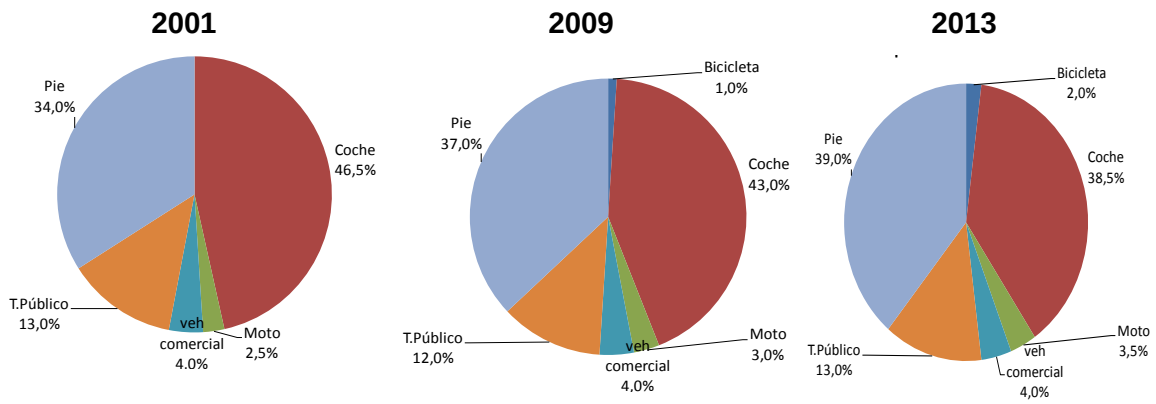


Figure 1: Modal split for Palma residents (%)[1]

Despite the progress made, there is still a long way to go and there are many pending actions. Some of these actions have been in the minds of the municipal authorities for some time, but require changes of behavioural habits. The implementation of these measures depends on a changing mobility culture, for the public to perceive them as a part of the process of improving the city. The prioritisation of these actions has to be coherent with the city vision, as well as with the possibilities of municipal investment and with the philosophy of urban planning and land use planning on the island of Mallorca.

Palma de Mallorca, in contrast with other Mediterranean cities, has always lived facing the sea, but it is also true that while many of those cities have made an effort to integrate their seafront, in recent years Palma has not carried out many actions in this respect. Thus, its seafront does not fulfil the requirements of quality and homogeneity proper to a tourist city. The eastern part of the city is poorly connected with the coast and the main coastal road, the

[1] Pie= Walking; Bicicleta=Bicycle; Coche=Car; Moto=Motorbike; Veh comercial=Commercial vehicle; T. público = Public transport

Passeig Marítim, represents an important barrier between the city and the sea. If Palma's urban planning contemplates actions to stimulate this area of the city (New Conference Centre, Port Master Plan), the urban design will also have to incorporate this transformation.

Besides the seafront there are other axes, both principal and secondary, which must also be modified to provide improved continuity for non-motorised mobility. 20% of the population live in streets that still maintain functional characteristics of interurban roads (for example: certain sections of Carrers Aragó and Manacor, Avingudes and Eusebi Estada), or that give priority to motorised trips over pedestrian movements.

The improvement of public transport, mainly along the Llevant (eastern) corridor where the current configuration of the supply is insufficient in summer, is one more of the goals pursued by the SUMP.

Another aspect to be integrated and regulated is the use of bicycles, which in recent years has changed from being a practically negligible mode of transport to having a certain importance. Its growth potential is enormous due to its competitiveness with the car in terms of savings in time and money, for which reason it can reach levels of modal distribution similar to those of other Spanish and European cities with the same characteristics.

It would be a serious mistake to overlook the importance of tourist mobility for the city, which can affect the quality of life of residents (traffic jams, crowded buses, etc.) but is also the source of income for the local economy. The huge numbers of tourists who visit the island represent an opportunity for the city. Better management and full use of the current resources ("we need all the modes of transport") must enable us to reduce this level of pressure and make our visitors' stays more pleasant.

The SUMP of Palma de Mallorca is committed, in addition to the aforesaid pedestrian transformation of the city, to the use of the new technological applications (ICT) to manage more efficiently the various modes of mobility in the peak scenarios of tourist demand. Urban mobility can benefit greatly from the application of the ICT and ITS, mainly by means of improving traveller information (variable signposting, waiting times at bus stops, etc.).

In this respect, Palma's participation in the CIVITAS DYN@MO project is a firm commitment as well as an opportunity. Along with the cities of Aachen (Germany), Gdynia (Poland) and Koprivnica (Croatia), Palma is working in this European project with direct exchange of experiences in matters of mobility and the launch of new innovative measures such as the introduction of electric vehicles and innovative payment systems.

The Spanish version of the complete document can be downloaded from the website of the city of Palma:

http://www.palmademallorca.es/portal/PALMA/RecursosWeb/DOCUMENTOS/1/1_81316_2.pdf

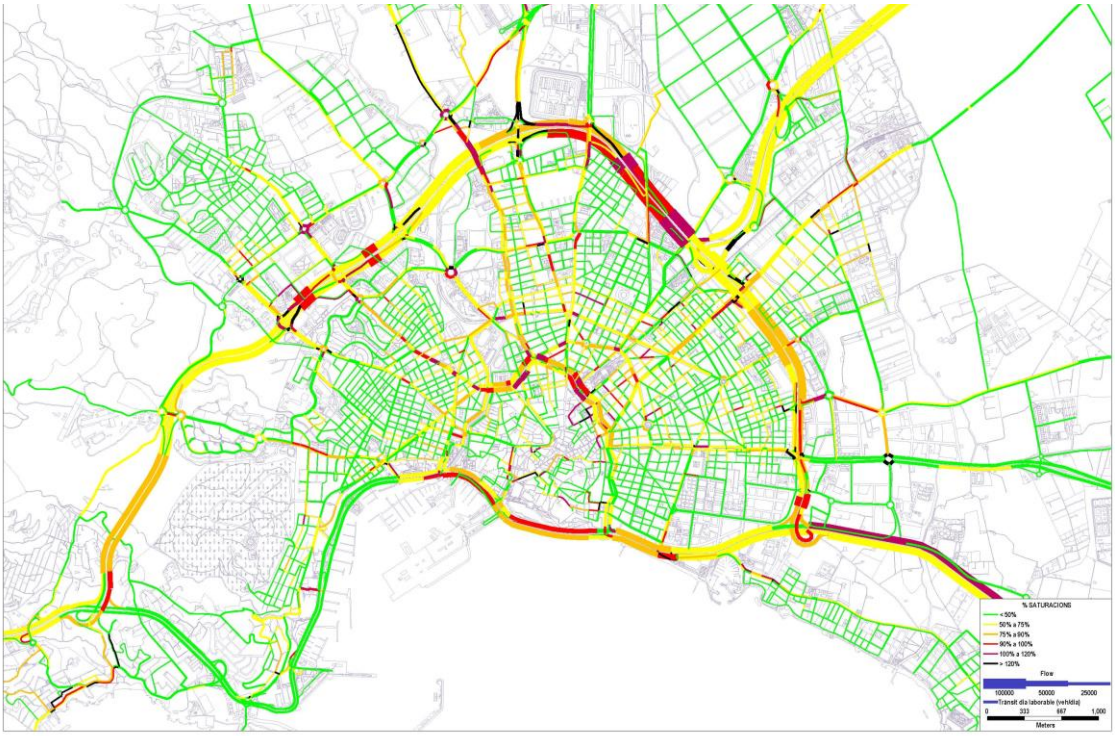
2 Main goals

The main goals of Palma's SUMP emerge from the strategic framework described in the introduction and are in line with the objectives set out by the Sustainable Economy Act with regard to sustainable mobility. The SUMP and its measures, which jointly form the action plan, strive towards achieving a mobility system that allows for a more Competitive, Friendly, Sustainable, Accessible and Safe city.

2.1 A more competitive city

We need to have a competitive mobility system because mobility, among other things, forms part of the city's productive process and contributes to its economic and social dynamics. The congestion levels, understood as time lost in travel due to excessive demand of motorised mobility on a limited road network, entails enormous individual and societal costs. Reducing travel times and, more in general, the operational costs of the system will be a priority objective, particularly for the essential motorised mobility.

The starting point is the challenge of not increasing the current congestion levels during the school year up by 2020. Essential activities such as goods distribution would be seriously affected if these levels were to rise significantly.



Map 1: Congestion levels in the city of Palma (2014)[2]

The goal for public transport is to increase its speed by 8%, which is an extrapolation to 2020 of the increase contemplated in the public transport study for the year 2016. Thus, it is

[2] Number of vehicles compared to the capacity of the road section. Based on calculations with the Palma traffic model for a working day.

planned to increase public transport speed from 16.55 km/h in 2012 to 17.20 km/h in 2016. This implies raising the commercial speed by almost 4%. The intention is for this tendency to continue in the remaining four years of the Plan to reach 17.8 km/h by 2020.

Finally, tourist mobility is also an essential factor for the city, with a significant economic impact. With this in mind, it is planned to reduce by 10% the congestion levels in the Passeig Marítim during the summer peak periods.

2.2 A friendlier city

The mobility requirements of individuals should not condition the quality of life of Mallorca's citizens. In this respect, the occupancy of public space and the disturbances caused by motorised mobility must be radically reduced, especially in relation to air quality and acoustic contamination. Palma strives towards universal accessibility for its citizens, particularly for those walking, the transport mode that is common to all. To achieve a friendlier city, the following points are required:

2.2.1 Reduce air and noise pollution to levels below EU requirements

For two consecutive years, Palma has marginally complied with the threshold levels defined by the European Union in Royal Decree nº 102/2011 relating to the improvement of air quality. With regard to NO_2, the established limits are as follows: Hourly limit value: 200 µg/m^3 of NO_2, which may not be exceeded on more than 18 occasions per calendar year.

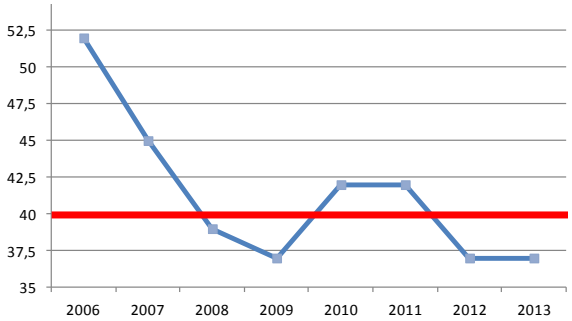
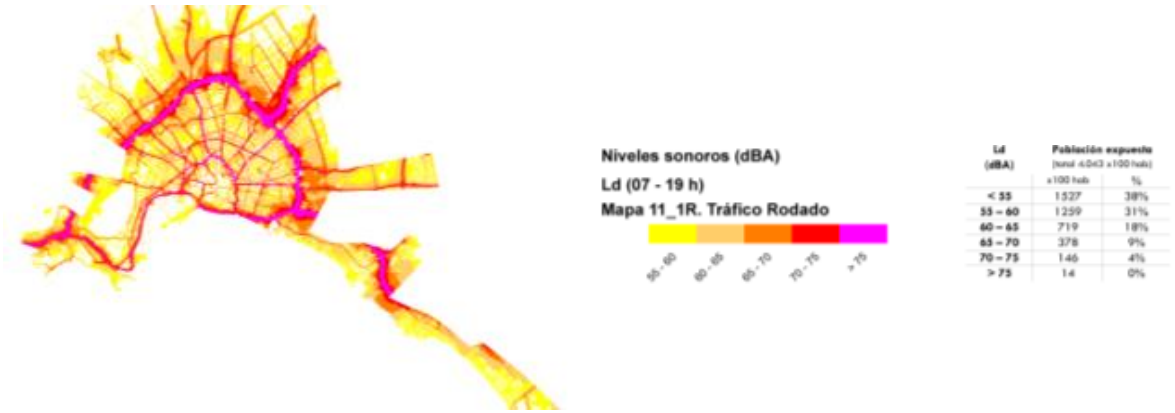


Figure 2: Evolution of annual daily average of NO_2 at Palma Foners station (µg/m^3)

It is planned, as a basic objective, not to exceed these limits again due to an increase in motorised mobility, attempting not to exceed 36 µg/m^3 of NO_2, in order to improve the city's air quality conditions. This represents a reduction of 10% with regard to the thresholds established by the European Union.

In relation with acoustic contamination, the strategic noise map for 2008 indicates that 13% of the population was exposed to noise levels of over 65 dBA. The noise level is intrinsically linked to the volumes of road traffic.



Map 2: Noise map for road traffic, City of Palma (2008)

Consequently, it is planned that 85% of the population will reside in streets in which fewer than 5,000 circulating vehicles per day, or which, in case of higher traffic volumes, have been duly conditioned in terms of urban planning (e.g. noise-reducing road surfaces and vegetation screens).

2.2.2 Better adapt the city to citizens with reduced mobility

One of the goals of the SUMP is to move towards a system that improves the mobility conditions of older people, children and citizens suffering some degree of physical or mental disability, which reduces their mobility.

The city now has an Accessibility Plan, which incorporates very ambitious goals of urban transformation. One of the goals of the Plan will be to achieve its level of compliance in relation with accessibility actions (ramps) and elimination of architectural barriers.

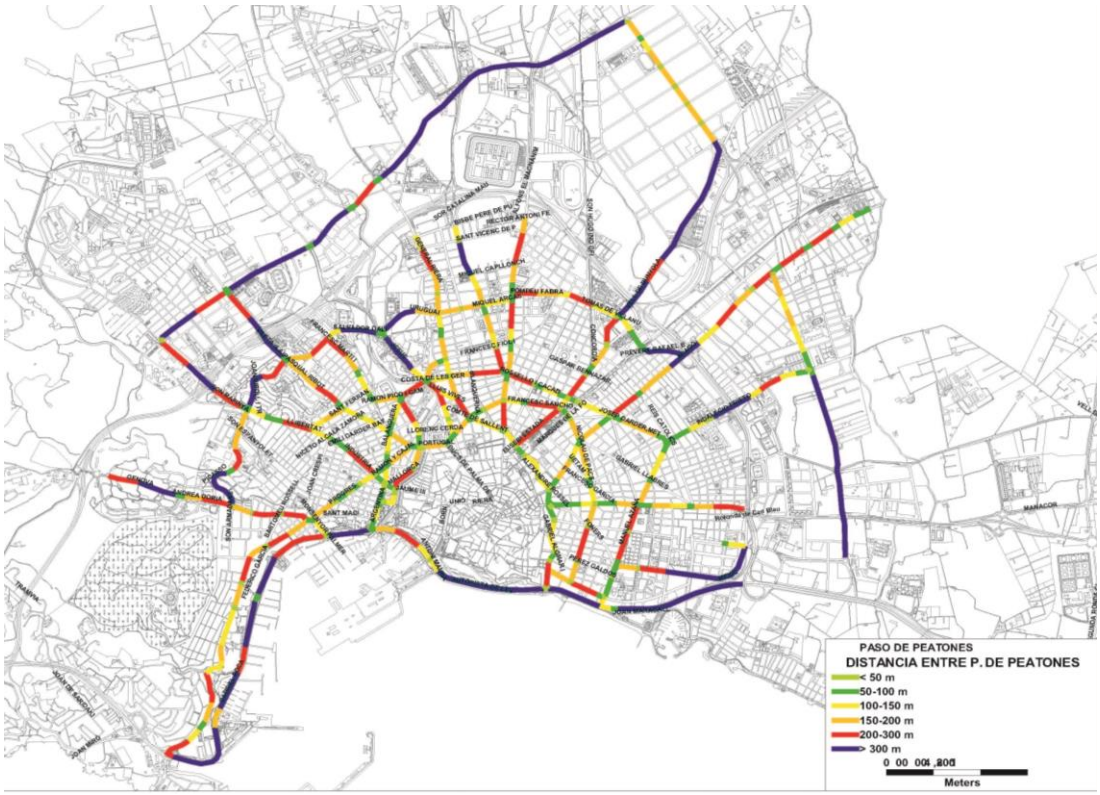
2.2.3 Create more public spaces for social interaction

This entails conceiving public spaces as shared areas for use by different social groups with different realities and degrees of vulnerability.

2.2.4 Ensure that the road network no longer constitutes a barrier

Another goal is greater permeability of the basic road network, in a way that is does not any longer constitutes a barrier between the various parts of the city. To this purpose, the proposed objective is to have one pedestrian crossing at every 300 metres and, as far as possible, for a person to be able to cross the street in a single traffic light phase.

Currently, along approximately 17 kilometres of the basic road network the average distance between pedestrian crossings is more than 300 metres, and along 13.6 kilometres it is between 200 and 300 metres, thus impeding the pedestrian permeability. However, increasing this permeability by raising the number of pedestrian crossings in two-way streets entails interrupting the coordination of traffic lights, which affects the fluidity of both private vehicle traffic and public transport.



Map 3: Permeability of basic road network (distance between pedestrian crossings), 2014

2.3 A safer city

Establishing a safer mobility system requires starting from an essential priority, the respect for human life and consequently the prevention of road casualties. This entails applying the necessary measures to guarantee conditions in which the possibility of serious accidents is reduced to a minimum. This safety target therefore requires the implementation of transformations of both morphologies and behavioural habits with the aim of reducing accidents causing death or serious injuries and improving the degree of respect between the various users of the transport modes.

The safety targets of the city of Palma de Mallorca follow the dictates of the *Road Safety Plan 2012-2020* of the Directorate-General of Traffic, adapting them in some cases to the characteristics of the city:

- 30% reduction of the number of casualties.
- 30% reduction of the number of run overs.
- 35% reduction of the number of serious casualties and deaths.

The year of reference is 2010, in accordance with the terms of the national and European objectives in the matter. It must be pointed out that the city of Palma does not currently have a Local Road Safety Plan.

2.4 A more accessible city

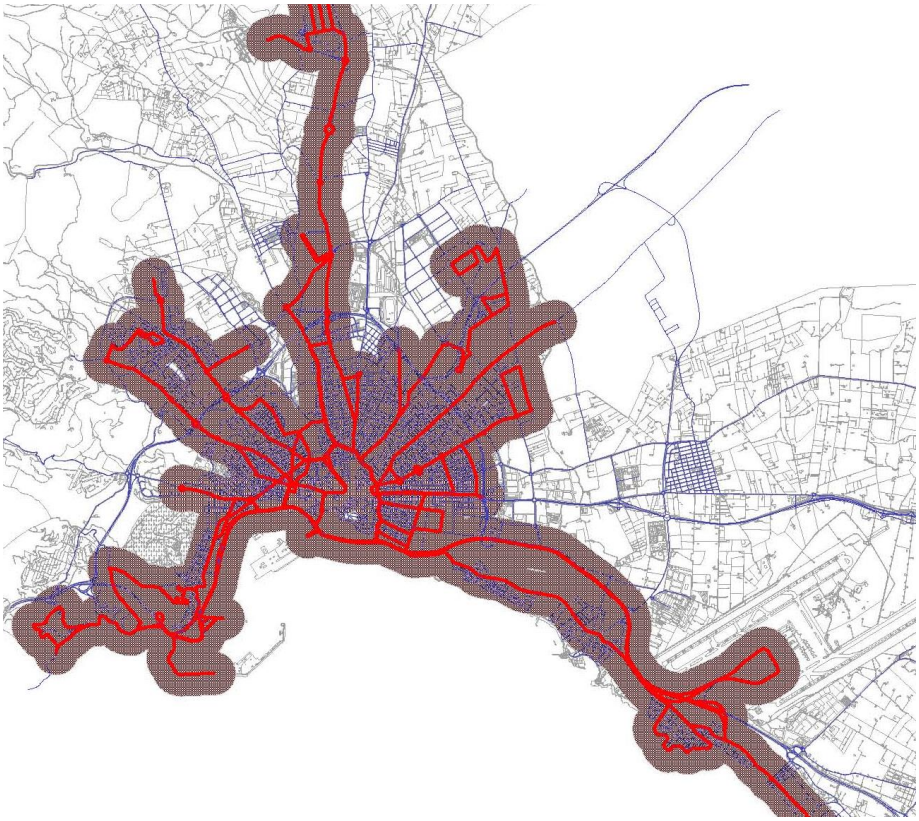
The inhabitants of Palma de Mallorca travel continuously to access the various services offered by the city, such as work, healthcare, education, shopping or leisure. Access to these services has to be possible for all the city's various social groups, and in acceptable conditions of time, price, comfort, safety, environmental respect, and so on. In view of these principal challenges, this SUMP focuses on two primary aspects:

2.4.1 Safe and comfortable pedestrian and cycling network

The Plan offers Palma's citizens and visitors a pedestrian and cycling network with the highest levels of safety and comfort. In this respect, it proposes that at least 80% of the citizens live less than 350 metres from one of these basic networks. At present there is no defined pedestrian network, and the cycle lanes serve only 62% of the city's population.

2.4.2 High quality public transport network

It is planned that 90% of the population will live on streets, which have a public transport service at least every 15 minutes on average or have on-demand transport. This figure is currently 87%.



Map 4: Coverage of urban bus lines with frequencies of 15 minutes (350 m), 2014

2.5 A more sustainable city

A model of sustainable mobility involves minimising the negative impacts of mobility on the future of the planet: the emission of greenhouse gases and the consumption of non-renewable energies, like fossil fuels.

In accordance with the European Directive 20/20/20, the objectives marked out by the Palma SUMP are the following:

- Reduction by the year 2020 of 30% of the total greenhouse gas emissions of the municipality of Palma de Mallorca compared with the base year 2009.
- Reduction by the year 2020 of 20% of the final energy consumption compared with 2010.

The directives 406/2009/EC and 2013/162/EU establish an emissions reduction target of 10% between 2005 and 2020 for diffuse sectors such as transport in Spain. In this respect, the SUMP aims for a more ambitious reduction, of 30%, compared to 2009 (the last year for which information is available). This ambitious level is in line with the targets of other municipalities and environmentalist associations.

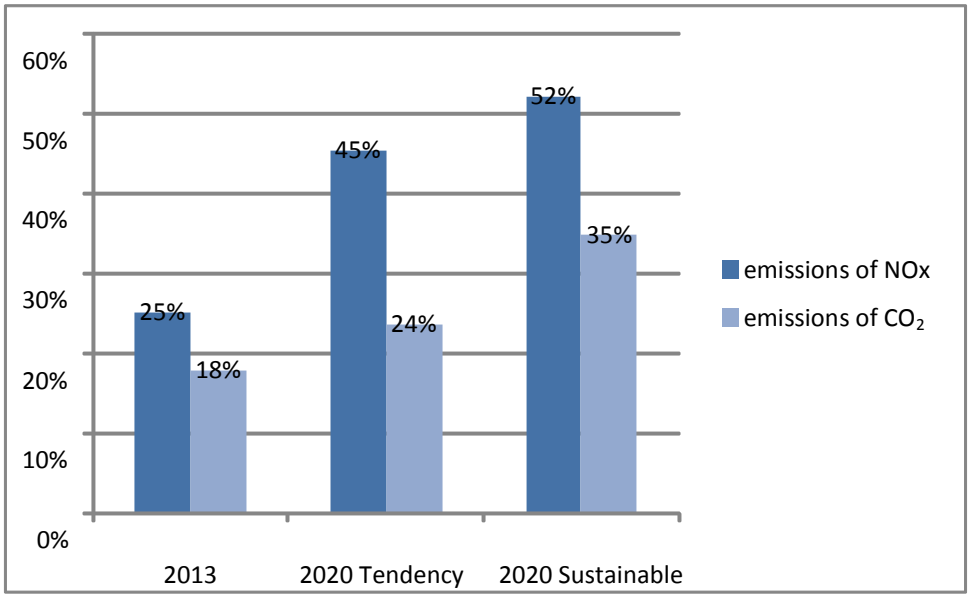


Figure 3: Reduction of CO_2 and NO_x emissions from transport compared to 2009

3 Strategic lines and measures

In order to achieve the above goals, the SUMP of Palma de Mallorca contemplates the development of a series of strategic lines which aim to reduce the use of private vehicles, promote the most sustainable modes (public transport, walking and cycling) and integrates essential motorised mobility into the urban environment by means of the use of cleaner technologies, urban planning and transformation of spaces and the dissemination of more respectful and sustainable driving habits.

In this manner, a total of ten strategic lines are established, covering 72 planned measures.

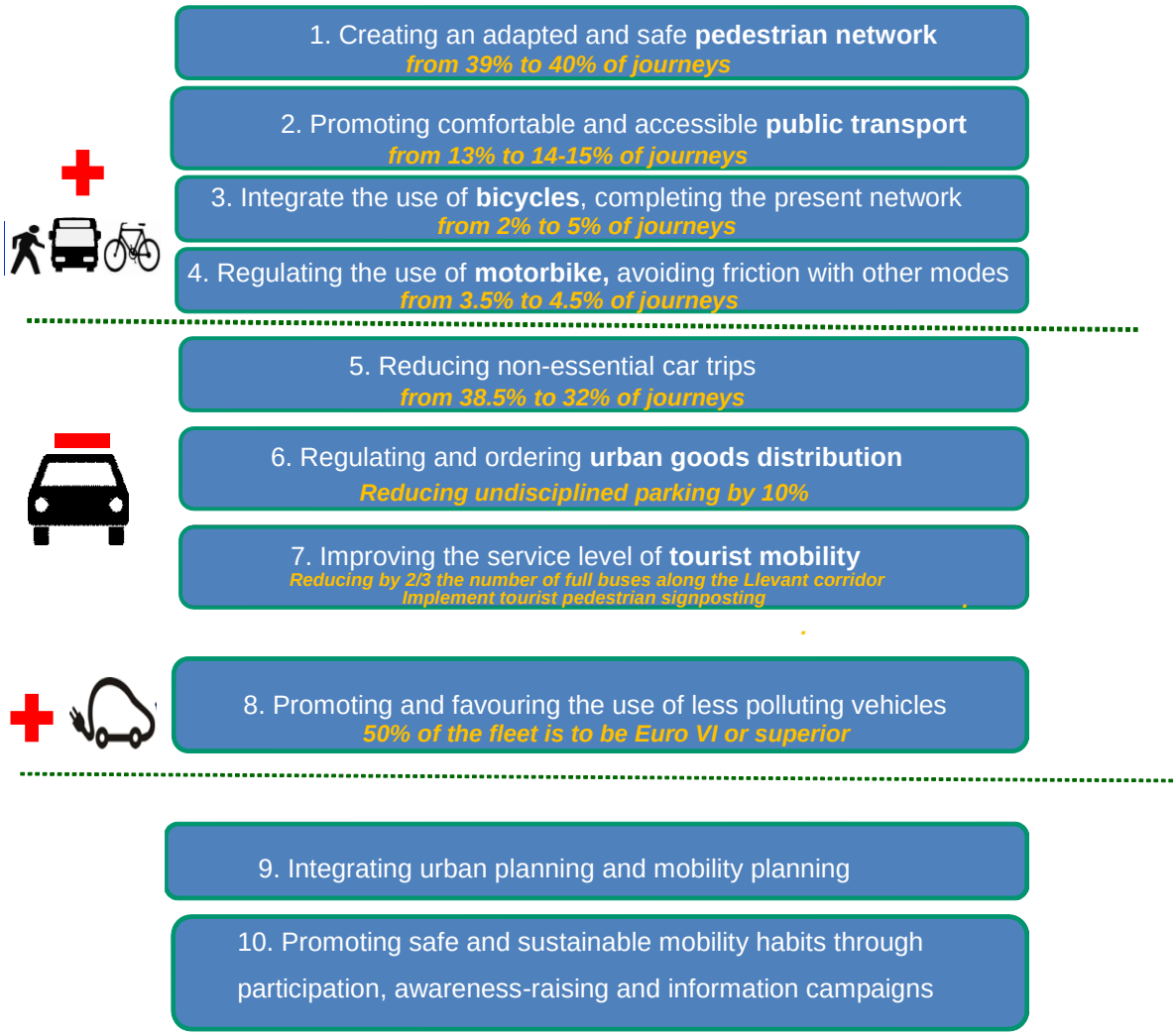


Figure 4: Strategic lines of Palma's SUMP

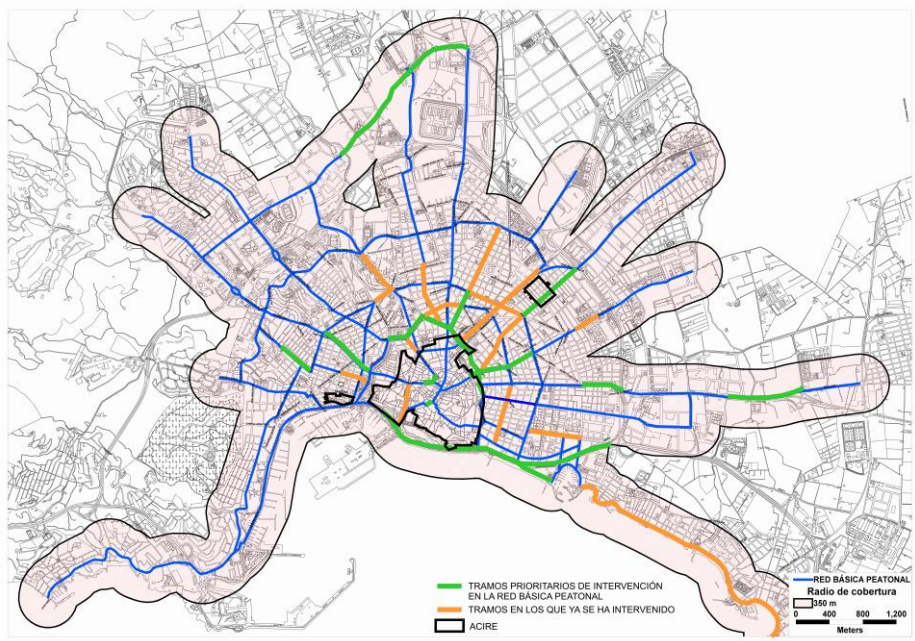
3.1 Creating an adapted and safe pedestrian network

The city of Palma de Mallorca does not yet have a defined basic pedestrian network that allows for an ordered, coherent and definitive intervention based on the most functionally appropriate axes for connecting the various zones of the city on foot. In this respect, the

present SUMP proposes a possible basic pedestrian network and indicates the sections that, within the horizon of the Plan, should be the subject of intervention. These are, for example, the Passeig Marítim, some sections of Avingudes, the end sections of Carrers Manacor and Aragó and other axes of the Eixample area such as the Nuredduna street. There was a majority agreement among the members of the Committee to improve pedestrian mobility along these routes, the urban reform of the seafront (Passeig Marítim) obtaining a score higher than 9 (from a scale of 1 to 10 with 10 being the highest score) confirming it as one of the highest-priority measures of the SUMP. This intervention is proposed along at least 5 km of this basic pedestrian network.

The actions to improve the pedestrian offer take into account both the improvement of the longitudinal routes and the transversal movements to cross streets (more pedestrian crossings and more green-light time). The SUMP incorporates a series of requirements to be met by this basic pedestrian network.

In addition, the SUMP contemplates solutions, which are functional and efficient and that, at an affordable cost, will enable a large part of the local network (approximately 10 km) to be transformed into priority pedestrian routes. The SUMP also proposes criteria of occupancy of public thoroughfares to prevent the "contamination" produced by street furniture.



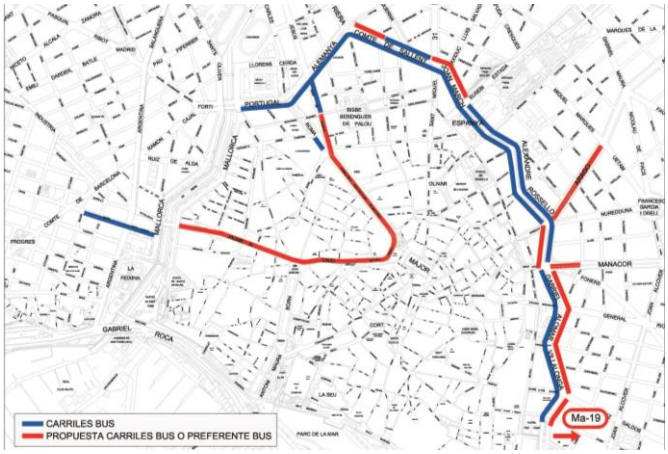
Map 5: Basic pedestrian network and priority sections for intervention[3]

3.2 Promoting comfortable and accessible public transport

In general terms, Palma's public transport offers a good level of service, with the exception of the connections to peripheral journey destinations (Hospital and University) and the Llevant corridor during the summer period.

[3] Blue= Basic pedestrian network. Orange: sections with already realized interventions. Green: Priority sections for interventions. ACIRE: areas with access regulations for private cars.

In relation to the former, a restructuring of lines is proposed to permit optimisation of the service. In reference to the Llevant corridor, the city proposes to increase the direct services between Platja de Palma and the city centre. To do this, it is essential to avoid mixing the service with general traffic, because of the congestion suffered by these services in summer. To avoid this congestion, a dedicated bus lane along the Ma-19 motorway is proposed. More dedicated bus lanes are proposed for the end sections of the Aragó and Manacor streets, for Jaume III, Unió and Rambla, as well as for several sections of the Avingudes. For the principal bus lines (those with a frequency of 15 minutes or higher), PT priority at traffic lights is proposed.



Map 6: Dedicated bus lanes (existing in blue, proposed in red), 2014

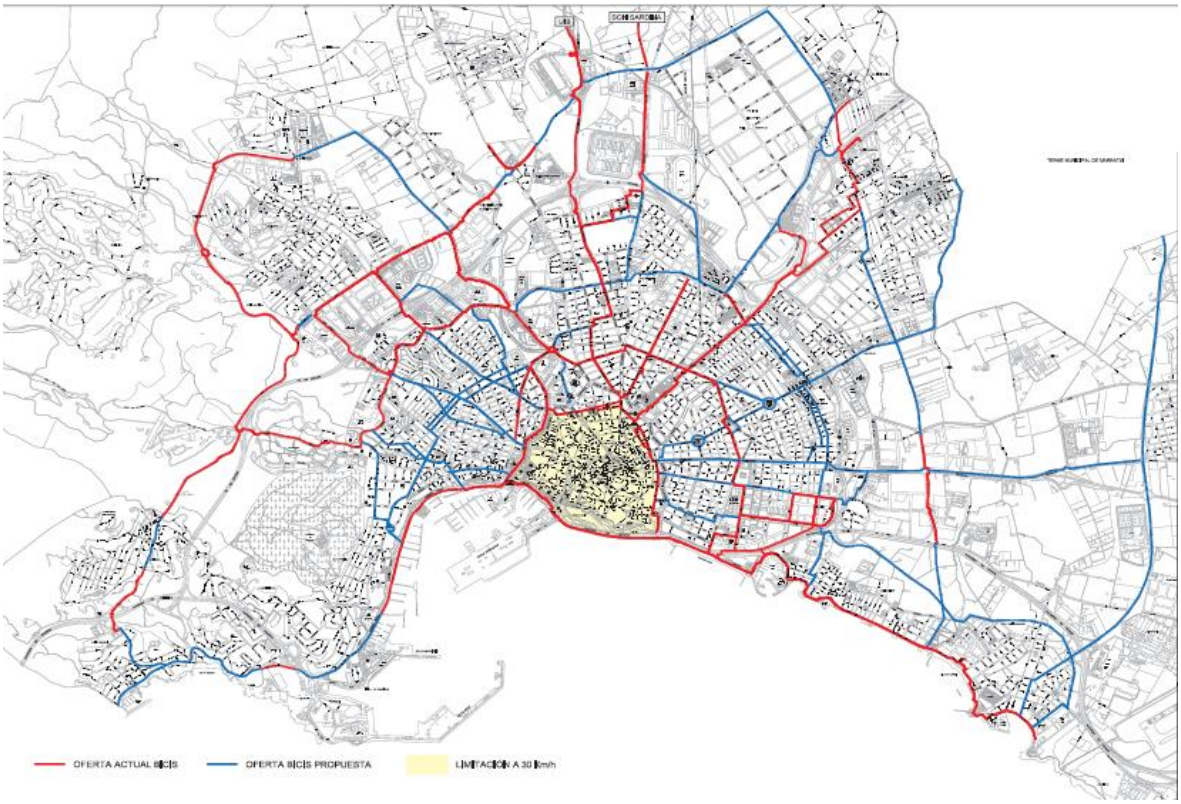
All of this will result in an increase of commercial speed and punctuality of the urban bus service, which, combined with new management measures, will reduce the actual share of overcrowded buses. If in parallel the policy of increasing the accessibility of bus stops is continued, the service level offered to users will improve notably.

The SUMP proposes to increase the on-demand services in low-density neighbourhoods. This way, the public transport company can reorganise and concentrate resources on the principal public transport corridors.

Finally, one of the primary actions to stimulate public transport for interurban journeys involves the intermodal integration of fares, an action that is already foreseen in the Balearic Islands Sectorial Transport Master Plan. In any case, this action must be carried out progressively, beginning with the most frequently used transport tickets, while users would also have to assume a small part of the additional costs.

3.3 Integrate the use of bicycles, completing the network

With regard to the use of bicycles, the SUMP proposes to complete the present network to cover most of the city's territory. The Stakeholder Round Table considers axes like Nuredduna and Joan Miró-Cala Major to be priority routes. Similarly, an ample majority is in favour of using road space for the creation of these axes, even if this means eliminating parking spaces. The present network will be practically doubled, generating 63 new kilometres of cycle lanes. The network should be completed with targeted improvements for the access to schools.



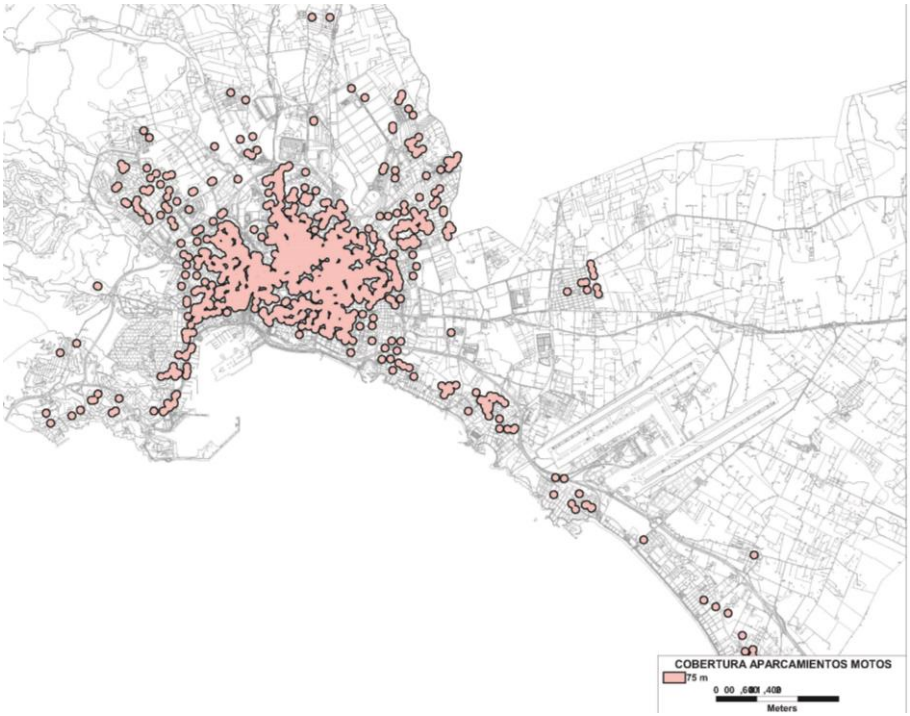
Map 7: Cycling network (red=existing lanes, blue: proposed lanes)

One barrier to the use of bicycles is the lack of safe parking places. In this respect, it is proposed to increase the number of places both on and off street. Another proposal is a selective expansion of the public bike system (10 stations), always in accordance with criteria of economic and environmental sustainability. Finally, it is proposed to improve the signposting of the cycle itineraries as well as general information on cycling.

3.4 Regulating the use of motorbikes

The SUMP proposes to increase the number of on-street parking places for motorbikes, as well as to establish reduced-fee places for motorcycles in municipal car parks.

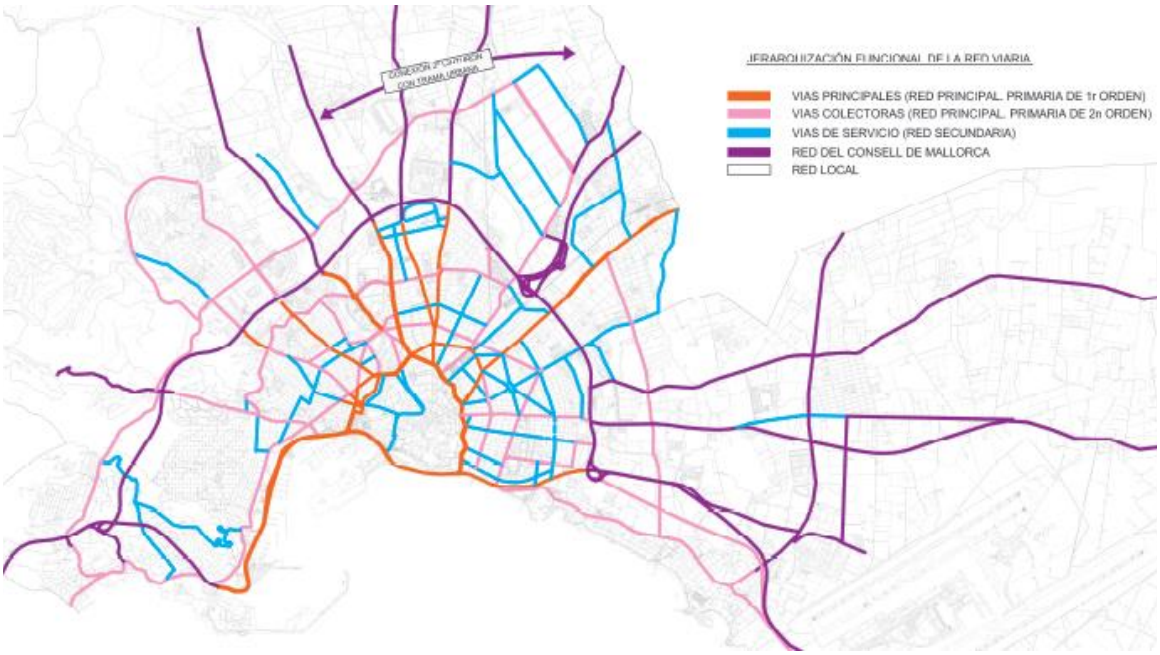
Finally, the SUMP proposes a strategic review of the current advantages of motorbike use (access to Areas Restricted to Car Access (ACIRE), use of the bus lane, free use of the ORA zones, etc.) and its review in relation with the frictions it creates with other modes of transport.



Map 8: Coverage of motorbike parking places (75 meters)

3.5 Reducing non-essential car trips

The SUMP proposes a review of the present road hierarchy to promote a greater concentration of routes. In compensation, it is proposed to establish morphological and functional criteria (a minimum of two traffic lanes, prohibition of left turns, limitation of parking spaces, non-existence of road humps, etc.) to ensure optimal management and use of the main routes.



Map 9: Proposed road hierarchy

Due to its importance, particular attention is drawn to the transformation of the seafront into an urban route, limiting the traffic speed to 50 km/h and introducing additional traffic lights. The SUMP also includes other proposals for calming traffic along other axes, which currently have a road morphology.

In spite of the notable success of the ACIRE regulation (Areas Restricted to Car Access), there is a lack of uniformity in criteria and technological elements between the different areas. There are zones in the city centre, which could also be regulated under the ACIRE system. Specifically, the SUMP proposes to extend the ACIRE system to the Sindicat and Missió districts. The SUMP also proposes to develop technological elements to make the enforcement of the regulations more efficient.

Map 10: Existing areas with access regulations and proposed enlargements (the latter in yellow)

With regard to regulating car parking, the ORA system for paid on-street parking in the city centre has been configured as the main element of demand management in the city. Even so, the ORA system has been showing symptoms of exhaustion in recent years (saturation with occupancies close to 100% in the city centre and use by drivers who park for more than two hours: 26% of the space provided).

On the other hand, neither the fees nor the maximum parking stays are currently correlated to the off-street parking supply (public car parks), nor with the level of pressure on on-street parking in each area of the city. For this reason, both scenarios are reconsidered on the basis of criteria of mobility and public space.

The SUMP proposes a selective enlargement of the ORA system, implanting rotation zones only along routes with a significant level of undisciplined parking and/ or a high level of tertiary activity.

Although the volume of undisciplined parking has been effectively reduced, primarily within the scope of the ORA system, it continues to be high in certain areas of the Eixample. To reduce illegal parking, the SUMP proposes to use automated reporting vehicles for the basic routes with more than one traffic lane. On local routes with a single traffic lane the possibilities of illegal parking are notably decreased.

Finally, there is currently a lack of significant signposting to the existing Park & Ride (P&R) sites at the entrances to the city, especially in the Llevant corridor. The SUMP proposes to improve signposting, to promote the use of existing P&R sites and to create new locations for P&R.

Map 11: Proposal for Park & Ride sites

3.6 Regulating and ordering urban goods distribution

The locations and timetables of loading and unloading zones are not fully adapted to the specific demand of urban goods distribution. For this reason, the SUMP proposes to optimise their use, adapting their location and functioning to the requirements of the distribution sector, always guaranteeing a minimum of accessibility. In the same way, to avoid long stays in these zones, automated control mechanisms will be established to guarantee compliance with the maximum parking time.

Technological developments should also facilitate, in collaboration with the sector, the optimisation of the logistics of urban distribution, increasing the loading factor of each vehicle and minimising the itineraries covered.

In order to increase the level of compliance with the regulations at loading and unloading zones located outside the ORA areas, where a much higher level of non-compliance has been detected, increased enforcement is under consideration.

From the point of view of environmental effects, energy consumption and occupancy of space, there seems to be no doubt that urban goods distribution would have less impact if it

were carried out with larger vehicles. However, these vehicles coexist badly in the urban setting with pedestrians, bicycles and motorbikes. The large size of the vehicles can have a negative effect on the fluidity of traffic. In this respect, the SUMP recommends that these larger vehicles carry out their tasks, following rigorous procedures of low acoustic impact, primarily during the night.

As for the city centre, the SUMP contemplates an integrated approach combining the use of electric vehicles, with the introduction of entry codes, perimeter location of loading and unloading zones, among other measures.

Map 12: Location and coverage (75 m) of loading and unloading zones

3.7 Improving the service level for tourist mobility

For tourist mobility, a series of diverse interventions is proposed, which affect all the modes of transport and the way of informing visitors about them.

To provide better attention to cruise tourists, the SUMP proposes to create shuttle lines that connect the cruise terminal with the city centre.

To further improve special means of collective transport, it is also proposed to enlarge the tourist bus service to cover the hotel zone. Also, the City aims to enlarge the parking space for private transport buses, either at the hotels or in the centre, with the aim of reducing congesting at the Moll Vell parking area. The old Eusebi Estada bus station could be used for this purpose.

The improvement of tourist information for both pedestrians and car drivers is another basic measure within this strategic line. The Plan proposes a parking guidance system with VMS, which can redirect drivers in real time. This measure is included in the CIVITAS DYN@MO project.

Information is also fundamental in the case of taxis. The SUMP proposes improving the location of taxi stations, primarily those least used, to achieve greater equilibrium in their use.

In addition, tourist information must be better coordinated with information on mobility, both through the City Council's various tourism communication channels (website, brochures, etc.) and by introducing a tourist pass that includes visits to places of interest and the use of public transport.

Finally, an immediate action is to open up the use of the public bicycle system to visitors, especially tourists.

3.8 Promoting the use of less polluting vehicles

This strategic line focuses on accelerating the technological change towards cleaner energies, especially for the essential mobility of the city: urban goods distribution and the public bus service. In relation with the bus service, a plan is proposed to renew the fleet of the public transport provide, EMT, by the year 2020 with the incorporation of 90 new vehicles with Euro VI technology.

It is also proposed to adopt environmental criteria in the renewal of the municipal taxi fleet and to establish emission limits in the new models of vehicles.

In order to stimulate the renewal of other vehicle fleets, fiscal measures (environmental tariff fixing in the ORA zones) are combined with actions of information and agreement with the transport sector. Specifically, functional and economic incentives will be proposed to stimulate the change of vehicles for urban goods distribution.

A specific measure will be designed to promote electric-powered mobility by means of the regulation and increase of the number of EV charging points.

Finally, the Plan will focus not only on air quality but also on acoustic contamination, proposing the implantation of noise-reducing road surfaces along all basic vehicle routes of the city.

3.9 Integrating urban planning and mobility planning

This strategic line incorporates the measures that integrate mobility with urban planning and which should therefore be integrated into the review of the General Urban Development Plan (PGOU) of the city of Palma, which is currently being carried out.

The legislation most needed is the urgent establishment of regulations implementing the obligation laid down in the Land Use Act related to mobility management studies for large trip generators. Specifically, the contents and scope of these studies need to be defined.

In the same way, it is proposed that the General Urban Development Plan (PGOU) requires that all large commercial establishments have loading and unloading bays. It is also proposed to increase the provision of residential parking in areas with greater parking problems. In addition, the SUMP proposes to incorporate the obligation of allocating spaces in residential buildings for bicycle parking.

Finally, the Plan also considers the various networks proposed (for motor vehicles, bicycles and pedestrians) and the foreseen reservations of land for the interurban routes.

3.10 Promoting safer and more sustainable mobility habits

The SUMP proposes to promote the Mobility Committee (Mobility Stakeholder Roundtable) as the principal instrument of participation in matters of mobility in the city of Palma de Mallorca. An annual progress report should enable the Committee to monitor the SUMP process.

It is essential to involve large trip generators such as the city's hospitals, the University and the various areas of economic activity. To this purpose, collaboration agreements need to be established to start drafting company mobility management plans.

The city administration itself has to serve as an example of mobility management to inspire private companies and other public bodies.

For the dissemination and promotion of sustainable mobility habits, in addition to existing campaigns (Mobility Week, promotion of the bicycle, respect for the traffic regulations, etc.), the City will develop Way-to-School processes at the city's 126 schools. The mobility management actions directed at pupils and students will be combined with hard measures like infrastructural improvements to increase safety and new collective transport services.

Finally, the SUMP proposes the drafting of a Local Road Safety Plan in accordance with the directives of the Directorate-General for Traffic. This plan will include all types of measures: education, information, monitoring of offences, infrastructure actions and assistance for accident victims.

3.11 List of planned measures

1. CREATING AN ADAPTED AND SAFE PEDESTRIAN NETWORK

(1) Define and develop the basic pedestrian network: define morphological and management criteria.
(2) Increase the number of pedestrian streets.
(3) Review the criteria of occupancy of public space.
(4) Define functionally the various pedestrian areas.
(5) Reducing the barrier effect the basic road network implies for pedestrians.
(6) Apply the accessibility plan.

2. PROMOTING COMFORTABLE AND ACCESSIBLE PUBLIC TRANSPORT

(7) Enlarge the public transport service to adapt to the demand.
(8) Restructuring of the lines to the main Hospitals: Son Espases and Son Llatzer.
(9) Reorganise the public transport service to the University.
(10) Improve the public transport service of the Llevant corridor.
(11) Increase the network of dedicated bus lanes.
(12) Develop the PT priority system for urban buses.
(13) Improve intermodality through, functional and tariff integration of urban and interurban public transport.
(14) Improve the information applications for bus users.
(15) Improve the accessibility and equipment of bus stops.

3. INTEGRATING THE USE OF BICYCLES, COMPLETING THE NETWORK

(16) Define and develop the network of cycle routes.
(17) Improve the informative signposting of the cycle routes.
(18) Improve the intermodality of the bicycle with other modes of transport.
(19) Implant bike parks in centres of tertiary activity and amenities.
(20) Reserve spaces for bicycles in the municipal car parks.
(21) Enlarge the public bike system.
(22) Promote the bicycle as a mode of transport associated with access to schools.

4. REGULATING THE USE OF MOTORBIKES

(23) Signpost new motorbike parking areas.
(24) Provide reduced-fee places for motorbikes in municipal car parks.
(25) Increase the number of "motorbikes first" zones.
(26) Draw up strategic measures of motorbike management.

5. REDUCEING NON-ESSENTIAL CAR TRIPS

(27) Define and develop the basic vehicle network.
(28) Transform the seafront (Passeig Marítim) into an urban route.
(29) Study traffic calming for certain routes of the main traffic network.
(30) Stimulate and promote collective school transport.
(31) Promote carpooling and carsharing.
(32) Enlarge and improve the management systems of the Access Regulations Area (ACIRE).
(33) Redefine the system of tariff zones, maximum parking stays and operating times of the paid on street parking.
(34) Control fraud in residents' permits and non-compliance with maximum parking stays in paid parking areas.
(35) Enlarge the paid on street parking to zones with significant tertiary activity.
(36) Study new off-street car parks on public land.
(37) Apply new technologies for the enforcement of parking discipline.
(38) Create new Park & Ride sites.
(39) Implant variable signposting for on-street car parks as well as mobile phone applications.

6. REGULATING AND ORDERING URBAN GOODS DISTRIBUTION

(40) Optimise the organisation and use of loading and unloading zones.
(41) Study the implementation of technological instruments to monitor the maximum parking stay in loading and unloading zones, the occupancy status, etc.
(42) Study the establishment of a specific permit for self-employed workers and traders.
(43) Establish a specific surveillance system of the loading and unloading zones not included in the ORA system (paid parking: on-street).
(44) Promote silent night delivery for urban goods distribution.
(45) Optimise loading and unloading in the city centre: distribution with electric vehicles in the city centre, entry codes, perimetric loading and unloading zones, etc.

7. IMPROVING THE SERVICE LEVEL OF TOURIST MOBILITY

(46) Implement a shuttle bus service connecting the port with the city centre.
(47) Restructure the tourist bus service to cover the hotel area.
(48) Review the reservation system for parking of tourist and private buses.

(49) Improve the orientation signposting of the basic vehicle network.
(50) Improve the orientation signposting for pedestrians (including directions to transport modes like buses or taxis).
(51) Link tourist information to mobility information.
(52) Implement a tourist card that includes access to public transport.
(53) Allow tourists to use the public bike system.
(54) Promote the taxi-tour.
(55) Adapt the location of taxi stations to the leisure/ tourist demand and improve their signposting.

8. PROMOTING AND FAVOURING THE USE OF LESS POLLUTING VEHICLES

(56) Promote the use of ecological vehicles in urban public transport.
(57) Consider ecological criteria in the renewal of the municipal fleet of municipal vehicles and award companies with service contracts.
(58) Establish environmental criteria for authorising new models of taxis.
(59) Stimulate the use of low emission vehicles for goods distribution.
(60) Fix on street parking tariffs based on environmental criteria.
(61) Enlarge and regulate the location of electrical charging points.
(62) Install noise-reducing road surfaces on the basic road network.

9. INTEGRATING URBAN PLANNING WITH MOBILITY REQUIREMENTS

(63) Develop the legislation regulating mobility management studies for large trip generators.
(64) Establish storage/ parking spaces for bicycles in new buildings.
(65) Establish provisions of non-residential parking on the basis of the public transport supply.
(66) Increase the provision of residential parking in zones of the city with less off-street parking supply.

10. PROMOTING SAFER AND MORE SUSTAINABLE MOBILITY HABITS.

(67) Give continuity to the Mobility Committee as an instrument of participation and monitoring of the SUMP.
(68) Execute processes of Way-to-School for all the city's schools.
(69) Make sustainable mobility a priority goal in all the spheres of the administration.
(70) Conduct promotional campaigns on sustainable mobility habits.
(71) Promote agreements with companies and large trip generators to promote sustainable mobility.
(72) Draw up and apply the Local Road Safety Plan.

4 Economic viability of the Plan

4.1 Economic resources

The estimation of municipal public expenditure allocated to the measures included in the SUMP is at least that assigned in the various contracts for services related with mobility, especially those of the ORA (paid on street parking), traffic light installations and vertical and horizontal signposting. To this figure we must add the City Council's own resources for managing mobility (EMT, SMAP, Municipal Police, Mobility Department, Infrastructures Department, etc.) which will be allocated to the execution of the Plan. It must be pointed out that some of the measures proposed in the present SUMP entail little or no cost.

However, there are actions that, due to their dimensions (renewal of the fleet of the EMT and improvement of the basic pedestrian network and, to a lesser extent, the cycle lane network, etc.), would require an extraordinary effort of investment. This additional investment is estimated at approximately €51.78M, which, spread over the years of the duration of the Plan, leads to annual cost between 8 and 9 million euros. It must be pointed out that the intangible profits, as will be seen below, amount to over €17M/year.

If we distinguish between strategic lines, it is observed that more than 50% of the budget corresponds to the reduction of pollution generated by vehicles, basically as a result of the renewal of the bus fleet. In addition to generating less environmental pollution, the new vehicles will improve the users' comfort and increase the capacity in corridors like that of Llevant.

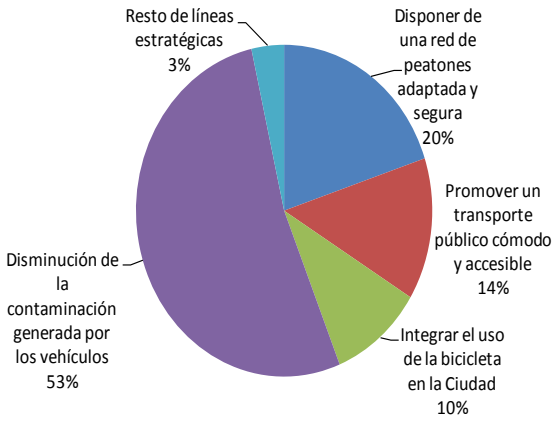


Figure 5: Budget shares of the strategic lines of the SUMP[4]

The strategic line with the second highest budget (20%) is "improving the conditions of pedestrians", deriving from the firm commitment set out in the Plan for conducting processes of pedestrianisation and widening of sidewalks along the main streets. With about half of the amount allocated to the pedestrian network, it is proposed to make an important investment

[4] Having an adapted and safe pedestrian network 20%, Promoting comfortable and accessible public transport 14%, Integrating the use of bicycles into the city 10%, Reducing the pollution generated by vehicles 53%. Rest of strategic lines 3%.

addressed to completing the planned cycle lane network. Finally, significant resources are also assigned to promoting public transport, the principal item of this strategic line being fare integration.

Finally, the Plan contains measures which fall under the competence, totally or partially, of other administrations such as the Government of Mallorca (second ring road, urban conversion of the final section of the Ma-19, etc.), the Mallorca/ Government Transport Consortium (functional and fare intermodality), or the Port Authority (remodelling of the seafront), which will be the entities which will have to allocate the budget, completely or in part, for the execution of these measures.

4.2 Benefits of the SUMP

The intangible benefits of the Plan have been quantified. This type of evaluation is a very useful instrument for determining the positive impact which the Plan will have, at both the public level (society as a whole obtains benefits, for example due to the reduction of pollutant emissions) and the private level (for example, a certain collective of persons benefits from the reduction of the journey time in a particular means of transport).

Three positive externalities are considered in this analysis: improvement of health, reduction of consumption of non-renewable energies and social cohesion. It must be pointed out that within each one of these externalities not all the possible benefits of the Plan have been monetised. Consequently, the figures set out below must not be understood as a systematic and integral analysis but only as an order of magnitude which, in summary, indicates that the measures contemplated here addressed to improving mobility conditions signify a gain for society which amply exceeds the foreseen investment.

4.2.1 Improvement of health

The Plan's commitment to non-motorised travel (walking and cycling) contributes to the promotion of healthier living habits among the population. The WHO indicates that physical inactivity constitutes the fourth largest risk factor of mortality throughout the world (6% of deaths worldwide). Consequently, active travel can also reduce the number of 3.2 million deaths per year caused by physical inactivity.

Less use of cars also means less noise and air pollution, with the ensuing benefits for people's health and wellbeing. The emissions of particles and pollutants like NO_x are largely responsible for respiratory and cardiovascular complaints of inhabitants of large cities. Thus, if we focus on the reduction of emissions of pollutant agents (especially NO_x and $PM_{2.5}$) and greenhouse gases (CO_2), it is expected that the Plan would lead to a reduction of emissions of 20,000 t of CO_2, 62 of NO_x and 4 of $PM_{2.5}$ as a consequence of the 480,000 kilometres per day which would not be covered by private cars compared with the do-nothing scenario, generating annual savings of €0.24M.

4.2.2 Reduction of fuel consumption

Petroleum is a scarce resource. Reducing our level of dependence on oil is a strategy not only at the national level but also in the local setting, since urban traffic is largely responsible for its consumption. In this respect, the Plan foresees 118 million less kilometres per year travelled by car in 2020 compared with the do-nothing scenario, which would generate annual savings of €11.85M.

4.2.3 Improvement of quality of life

If there is one benefit that is difficult to monetise, it is that referring to the positive impact of the Plan on people's quality of life. Having a safe and comfortable pedestrian and cycle network notably improves the quality of life of the city's residents and visitors, permitting greater enjoyment of public spaces and a more pleasant local environment.

In the same way, providing public transport with information on waiting times constitutes a guarantee of service that benefits the citizens by eliminating uncertainties. As for private transport, restricting the levels of traffic congestion also improves the working conditions of essential mobility by private vehicles, such as loading and unloading goods, thus limiting the inconveniences and situations of stress suffered by delivery personnel.

Similarly, it was not attempted to monetise the economic advantage represented by having a friendly city that is well communicated by all the modes of transport with a view to stimulating tertiary activity and attracting tourism.

In summary, the accessibility to the territory, the quality of public spaces and the information provided to users, among others, are aspects that are difficult to quantify because they cannot be reflected directly in a monetary value, although this does not mean that they do not generate a manifest benefit for society.

The only aspect that has been monetised is the improvement represented for the citizens by the reduction of journey times on public transport. To be specific, it has been considered that there will be an average saving of 1.6 minutes in the 138,000 daily journeys that will be made by public transport in the horizon 2020, which signifies a saving of approximately €5.54M/year.

In this way, overall, and for the year 2020, the benefits of the Plan would amount at least, and without considering aspects that are difficult to quantify, to approximately €17.3M/year.

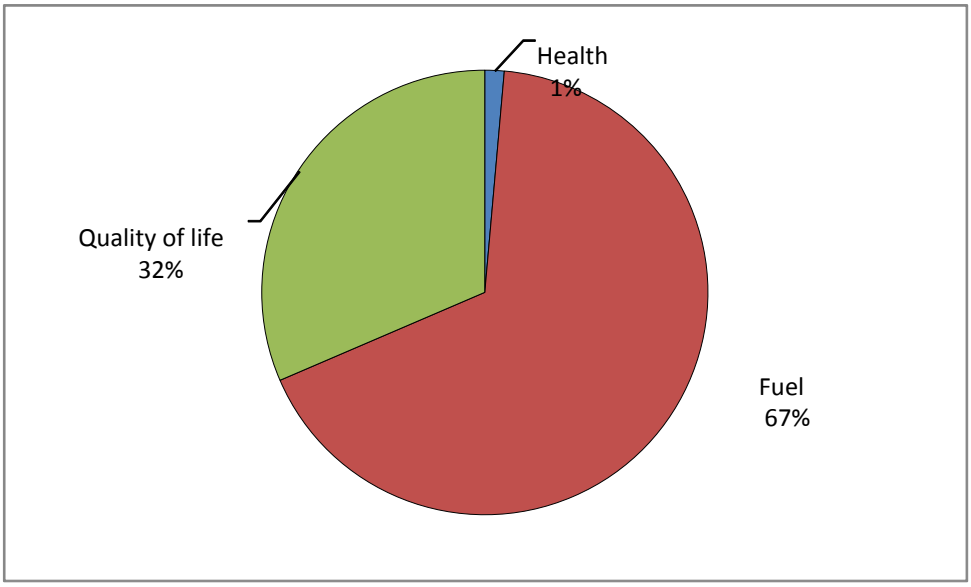


Figure 6: Estimation of benefits of the Plan in 2020 (€17.3M/year)

5 Conclusions

A Sustainable Urban Mobility Plan, as defined by the ELTIS guidelines[5], is a strategic plan designed to meet the mobility needs of persons and companies in cities and outskirts for a better quality of life. It is based on the present planning and must take the principles of integration, participation and evaluation into consideration.

The IDAE guidelines[6] were published in 2006, by the Spanish Ministry of Industry, Tourism and Trade and refer to a SUMP as an ensemble of actions with the goal to reach more sustainable journeys in a city (walking, cycling and public transport). Sustainable transport modes can contribute to ensuring a better quality of life for citizens since their implementation combines economic growth, social cohesion and environmental protection.

Finally, on the level of the Balearic Islands, the *Ley de transportes terrestres y movilidad de las Illes Balears* defines the contents of a SUMP:

a) The diagnosis of the actual mobility situation.
b) The specific goals at medium and long term in the field of mobility.
c) The specific sustainable mobility measures to achieve the proposed objectives.
d) An analysis of the feasibility of the proposed measures regarding economic, social and environmental criteria.
e) An economic and financial study to assess the proposed actions and establish appropriate funding mechanisms.
f) The procedures for monitoring, evaluation and review.

The Palma SUMP was prepared following the guidance of these three main references. Based on a diagnostics phase, an integrated set of strategic lines and concrete measures was defined, calling for a coordinated approach.

Because of the Plan's strong strategic nature, it defines priorities and actions, establishes future scenarios and shows the necessary considerations for its implementation, which allows reaching the goals in the desired time frame.

The commitment to sustainable modes established within the IDAE guidelines is reflected in the objective of modal split for the year 2020, in which the share of sustainable modes (walking, cycling and public transport) should increase by 5 percentage points (from 54% to 59%).

The requirement of participation and integration existing in the ELTIS Guidelines was largely fulfilled. The participation process began in September 2013 with a round of interviews between the stakeholders that would later form the Mobility Roundtable (created on the 19th of September 2013). This process was completed with the undertaking of more than 800 citizen surveys during the months of October and November 2013. The surveys provided information on the characteristics of trips within the city, but also included qualitative observations of citizens, on different aspects relating to mobility. Throughout the development process of the SUMP, information and suggestions were also collected through a specific email account.

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[5] Developing and Implementing a Sustainable Urban Mobility Plan (Eltis Project, 2011. http://www.mobilityplans.eu)

[6] Practical guide for the elaboration and implementation of Sustainable Urban Mobility Plans (Institute for diversification and energy saving –IDEA-, 2006)

During the month of April 2014 the Mobility Roundtable initiated a series of six thematic workshops on various aspects: the road network of Palma: Palma's seafront, cycling mobility, mobility in the city centre, mobility of tourists, way-to-school and urban freight distribution.

The conclusions of these workshops provided guidance for the formulation of the strategic lines and the measures of the Plan. Hence at the beginning of May 2014 the SUMP diagnosis, including both quantitative and qualitative data, and the proposal of strategic goals were presented to the Mobility Roundtable.

At the end of May 2014 a first draft document of the Plan was put forth to the Mobility Roundtable to allow stakeholders to make relevant observations by having individualized interviews with a selection of its members. At the end of June 2014, a final proposal was presented to the Mobility Roundtable for adoption by the City Council on the 26th of June 2014.

During the summer of 2014, a public information process, where different claims were collected, was opened. The amended document, containing the revised text incorporating some of the proposals, was finally approved by the City Council in October 2014.

The contents of the Plan are in line with the *Ley de transportes terrestres y movilidad de las Illes Balears.* The SUMP contains 10 strategic lines and 72 measurements to achieve the planned goals. The estimated total cost of these measures is approximately 52M€ (8,6M€/ year). Also some of the environmental benefits of the Plan have been monetized in the order of 17M€/ year.

As regards follow-up mechanisms and monitoring, an annual report is foreseen to contain indicators on both the compliance with established goals and the progress within the different strategic lines and measures. To support this process, the City Council contracted an external expert company to prepare these reports for the years 2014 and 2015. For this process a new series of 6 stakeholder participation workshops on priority measures is planned.

During the 2015 Sustainable Mobility Week, the SUMP and its progress is presented to the citizens of Palma in a public event. Individual citizens will be invited to contribute with their comments at the Sustainable Mobility Stand that will be available on a central public square during the seven days of the sustainable mobility week.

At the mid-term of the SUMP period, in 2017, the plan will be revised. Based on the progress in reaching its objectives, there will be a possibility to correct for changes and reformulate measures to allow for adapting to the dynamic city context.