Low Carbon Transport Plan – Lisbon

LOCATIONS - Low Carbon Transport in Cruise Destination Cities

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Index

Table Index

Interreg Mediterranean
LOCATIONS

Figure Index

Executive summary

The Low Carbon Transport Plan (LCTP) of Lisbon aims to reduce the carbon impact on the mobility of cruise tourists in the city of Lisbon and, simultaneously, to protect and increase the quality of life of their inhabitants. These objectives are embedded in the vision envisaged by the LTCP which states that *"Lisbon should become a destination of excellence where the available options of mobility have a reduced impact on the environment and on the city residents' quality of life, contributing to potentiate opportunities and balance the coexistence between residents and tourists."*

The LCTP of Lisbon is fully aligned with the European and National policies that traces the routes for the decarbonization of the economy by 2050. The LCTP of Lisbon is a planning tool that contributes for the city government programme – *Grandes Opções do Plano para a Cidade de Lisbon*- (2018-2021). In this context the LCTP emphases the need for promoting the clean mobility, the development of shared services and the improvement of public transport, favouring intermodal transport and, when possible, active modes such as walking and cycling. Lisbon has been at the forefront of efforts to decrease CO_2 emissions, placing Climate and Energy concerns at the center of its agenda. Lisbon´s administration created a cross-cutting program to mitigate and adapt to climate change and recently Lisbon was the first European Capital to subscribe the new Covenant of Mayors for Energy and Climate.

The city of Lisbon is facing several challenges regarding the ageing and loss of their residents, the decrease on public transport demand, the increased number of vacant dwellings, the rise of renting and real estate market prices, the increasing number of tourists and the high number of daily commuters.

Notwithstanding the current implementation of an integrated package of local policies regarding urban planning, climate change and transport, the city of Lisbon remains high dependent on individual transport (48% modal share for inner trips and 54% modal share for trips with origin on other councils of the metropolitan area, in 2011) with more than 370 000 vehicles coming into the city and getting out every day (2016).

The tourism in Lisbon has been intensified during the last decade, representing a prosperous and crucial sector for the local economy but also bringing new challenges. From 2001 to 2016, the number of nights spent by tourists in Lisbon increased 63% reaching the number of 11 million-night stays. With the increase of tourism and attractiveness of the city, also the cruise tourism business grew. The increasing demand of cruise tourism and the number of cruise ship calls, combined with the need to receive ships with large size, triggered the construction of a new cruise terminal in the city centre that is operating since September 2017. In this context, new challenges should be tackled to overcome the negative impact of the growing cruise tourism that due to its characteristics (short stays, touristic buses excursions, seasonality of cruises and easily changeable routes) and its location in a congested historic area of the city, will require the implementation of specific measures.

The LCTP of Lisbon was developed following a participatory methodology in order to diagnosis the current situation regarding the mobility of cruise tourists. In this context several meetings and interviews were conducted with key stakeholders with different roles as regulators and operators in the cruise tourism industry.

The main results of the participatory process were analysed according the CAME[1] matrix that systematises measures already existent but require to be corrected or maintained and identifies new measures that need to be explored or adapted. The CAME matrix assessement allowed the identification of critical challenges that lead to the design of the four main strategies proposed in the LCTP:

1- To promote the exploration of the city by active modes of transport;
2- To promote the use of public transport when distance and mobility conditions of tourists justify;
3- To balance the number of tourists at points of interest, reducing impact, enhancing their experience, and spreading opportunities;
4- To reduce touristic transports impact on historical centre and main touristic areas;

In order to support the implementation of the LCTP, the strategies designed are disaggregated into eleven actions and thirty-four activities that will be monitoring by specific indicators.

A fifth crosscutting strategy was considered to promote the integration and dissemination of the foreseen activities and actions.

The successful implementation of LCTP of Lisbon will require the creation of synergies across different sectors and policies in the city. This approach will assure the articulation with the main ongoing programmes oriented to public spaces: Uma *Praça Em Cada Bairro* (One Plaza in Each Neighbourhood), *Pavimentar Lisbon 2015-2020* (Paving Lisbon 2015-2020) and *Plano Geral de Intervenções da Frente Ribeirinha de Lisbon* (Lisbon River Front General Intervention Plan, as well as with other planning tools as it is the case of the recently approved Municipal Strategy for Climate Change Adaptation of Lisbon (November 2017).

The LCTP of Lisbon will contribute for the operationalization of the current city government programme (2017-2021) and for the local implementation of European Urban mobility policy. Therefore, it is expectable that strategies and actions proposed in the LCTP of Lisbon would be integrated in the Sustainable Urban Mobility Plan (SUMP) of Lisbon, that is currently being developed by the Lisbon city council.

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[1] CAME: Correct, Adapt, Maintain and Explore

Introduction

The Low Carbon Transport Plan in cruise destination cities (LCTP) is very well framed by the Europe's objectives for the next 30 years regarding the climate change goal of reducing the greenhouse gas emissions (GHG) by 80-95% compared to 1990 levels. The current LCTP aims to support the low carbon energy transition of Lisbon and it is aligned with the efforts of the global Paris agreement of keeping a global temperature rise well below 2 degrees Celsius above pre-industrial levels.

Regarding the transport sector the European Commission states that by 2050 a 60% reduction of GHG emissions compared to 1990 levels is necessary to reach the declared goals. By 2030 the objective is to reduce the emission 20% below the 2008 levels. The challenge will be "to break the transport system's dependence on oil without sacrificing its efficiency and compromising mobility". [1]

Portugal follows the ambitions of the European Commission with the current govern declaring that the main objective (relating climate change) is the decarbonisation of the economy with the objective of having a country independent of fossil fuels by 2050. It also states the need for promoting, with a focus on cities, clean mobility, shared services, more attractive public transport, favouring intermodal transport and, when possible, active modes such as walking and cycling. [2]

As its biggest metropolis and capital city, Lisbon has taken actions to contribute to Portugal's ambitions. In 2016 it was the first European capital to join the Covenant of Mayors for Climate & Energy pledging therefore to reduce its CO_2 emissions by 40% until 2030.

Lisbon has been at the forefront of efforts to decrease CO_2 emissions, placing Climate and Energy concerns at the center of its agenda. Lisbon´s administration created a cross-cutting agenda to fight climate change and recently Lisbon was the first European Capital to subscribe the new Covenant of Mayors for Energy and Climate. Lisbon's GHG targets currently go beyond those set at the national level and the city aims to lead by example, actively contributing for successful delivery of the Energy Union objectives and its interface with the National Integrated Energy and Climate Plan. The main city challenge is to mobilize the private sector to further continuing to reduce emissions.

In 2010 a Baseline Emission Inventory was prepared for 2020 and included in Lisbon's Sustainable Energy Action Plan (SEAP). Meanwhile, the primary energy consumption in Lisbon decreased considerably between 2002 and 2014.This decrease, of 35% (from 1.294.280 tep in 2002 to 844.740 tep in 2014), was due to reductions in the consumption of Diesel (43%), Gasoline (69%) and Electricity (49%). Consumption of LPG and other forms of energy decreased over 80%, while natural gas increased 28%. This decrease was mainly due to the transport sector, which reduced its consumption by 36% between 2008-14. This general downturn is seen regardless of the period between 2008-12, when the transport sector showed an increase in consumption. However, this growth is due only to differences in the breakdown of consumption attributable to the municipality of Lisbon compared to the consumption recorded in the district during this period. [3]

In the context of the new covenant of Mayors agreement that includes a mitigation and adaptation approach, the Sustainable Energy Climate Adaptation (SECAP), Lisbon has set targets to fully deliver the climate and energy package by 2030. The SECAP 2030 report for Lisbon is on submission up to June 2018 under the agreements defined in the Covenant of Mayors for Climate and Energy. From a global perspective, Lisbon intends to save 60% of CO_2 emissions until 2030 and to be carbon neutral in 2050,

making use of its four pillars - Energy Efficiency, Renewable Energy, Smart and Clean Mobility and Circular Economy.

The city of Lisbon is facing several challenges such as an ageing population, a reduction of public transport demand, bigger share of empty dwellings, rise of renting and real estate market prices, increasing number of tourists, reduction of resident population, high number of people with pendular movements from outside the city. On the other hand, there are positive aspects that can accelerate and contribute to overcome these challenges such as the economic benefits of tourism, an innovative and entrepreneurship ecosystem and a recent decrease on the concentration of pollutants.

In the transport sector the city aims at promoting a modal shift from individual transport to walking, cycling and public transport to achieve the necessary GHG emission reduction of this sector. [4] The Lisbon's Sustainable Urban Mobility Action Plan (PAMUS – *Plano de Ação Mobilidade Urbana Sustentável do Município de Lisbon*) states this ambition and lists 14 actions to be implemented which cover cycling and pedestrian infrastructure, accessible and inclusive infrastructure, integrated ticket system, information platforms and others.

Other city council programs that promote urban regeneration - such as Uma *Praça Em Cada Bairro* (One Plaza in Each Neighbourhood), *Pavimentar Lisbon 2015-2020* (Paving Lisbon 2015-2020), *Plano Geral de Intervenções da Frente Ribeirinha de Lisbon* (Lisbon River Front General Intervention Plan) or *Plano de Acessibilidade Suave e Assistida à Colina do Castelo* (Plan for Soft and Assisted Accessibility to the Castle Hill), also aim to create safe pedestrian networks and accessible routes.

Along with these measures and benefiting from some of the referred programs, there is a strong commitment on the increase of the cycling network (from 90km in 2018 to 200km in 2021), and the recent launch of GIRA - Lisbon Bike Sharing System (with 1420 bicycles, 2/3 electric) is contributing to integrate the bike as a mode of transport.

At the same time, an innovative and entrepreneurship ecosystem is contributing for a more flexible and sustainable urban mobility, with the implementation of an electric scooter-share system and several private car-share systems (partially electric).

Nevertheless this sector is highly dependent on individual transport (48% modal share for inner trips and 54% modal share for trips with origin on other councils of the metropolitan area, in 2011) with more than 370 000 vehicles coming into the city and getting out every day. [5] [6] The last available data shows that Lisbon present population increases, every day, by 70% (from 547 733 to 926 000) with people from other Municipalities of the metropolitan area that come into the city to work or study. [5]

Since 2012 Portugal and Lisbon have seen an increase in terms of tourists visiting the country and the city. In Lisbon from 2001 to 2012 there was a 51% increase in nights spent by tourists while in the next 4 years, until 2016, there was 63% increase making it 11 million-night stays in the latter. [7] With the increase of tourism and attractiveness of the city also the cruise tourism business grew. From 2002 until 2011 it grew 200% surpassing the 500 thousand passengers mark and sustaining this value, approximately, until now. [8] The increase of the number of cruise tourist and cruise ship calls, with the increase of the size of ships, pressed for the construction of a dedicated terminal for this line of business. It was opened in September 2017, located in the city centre of Lisbon in front of one of its oldest and traditional neighbourhoods, Alfama. New challenges will arise with the expected increase in the number calls, with the

location of the terminal in an already congested area and with the characteristics of this sector of tourism (e.g. short stays, touristic buses excursions, seasonality of cruises and easily changeable routes).

The Low Carbon Transport Plan (LCTP) aims to tackle these challenges with the objective of lowering its carbon footprint while also ensuring a better coexistence between locals and cruise passengers. Through gathering of data, both from studies and official sources and from participatory processes, a diagnosis of the situation was elaborated and actions to tackle identified challenges were built on the top of it. It is the objective of this plan that cases like Venice and Barcelona, where the resident population has been targeting cruise tourism (and tourism in general), due to its negative effects on the city (e.g. congestion, pollution, rise of the cost of life or decrease of quality of life), don't repeat themselves in Lisbon.

1. Context

1.1. Current cruise-related flows

Global tourism has grown steadily for the past two decades. The estimated total number of visitors in the world grew from 563 million in 1996 to 1322 million in 2017, a 135% increase. [9] Regarding global cruise tourism the increase has also been stable and continuous with the number of individual passengers increasing 62% from 2005 until 2015. In the case of Europe, the increase has been more visible with the number of passengers embarking in its ports more than doubling in the same period (Table 1).

Within Europe different regions can be identified namely the Mediterranean (Med), Northern Europe and Atlantic Islands. In 2015 the Mediterranean was the most active area, with a demand of 3,71 million individual passengers while in the Atlantic Islands it was 0,55 million and Northern Europe with 1,6 million passengers.

Table 1 – Global demand for cruise tourism (in million passengers) [10]

	2005	2010	2011	2012	2013	2014	2015	10-Year Growth
North America	9,96%	11%	11,44%	11,64%	11,82%	12,16%	12,08%	12%
Europe	3,19%	5,67%	6,15%	6,23%	6,39%	6,39%	6,59%	109%
Subtotal	13,15%	16,67%	17,58%	17,87%	18,21%	18,55%	18,77%	43%
Rest of the World	1,21%	2,40%	2,91%	3,03%	3,09%	3,49%	4,33%	266%
Total	14,36%	19,07%	20,49%	20,90%	21,30%	22,04%	23,10%	62%

Within the Med, the area with most volume of cruise passengers is the West Med. It has been increasing its share of passengers for the past 6 years, from 69% in 2012 to 76% in 2017 of the total in the Med area, as depicted in the graph of Figure 1. As for the absolute number of passenger movements[2] in the West Med it increased steadily until 2016 reaching a peak of 20 million and then having a slight decrease in 2017 (-2%). On the other hand, the rest of the Med areas (East Med, Adriatic and Black Sea) decreased their number of passenger movements by 25% in the same 6 years period (2012-2017).

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[2] One individual passenger times the number of ports visited, e.g. one passenger that visits 4 ports counts as 5 passengers movements.
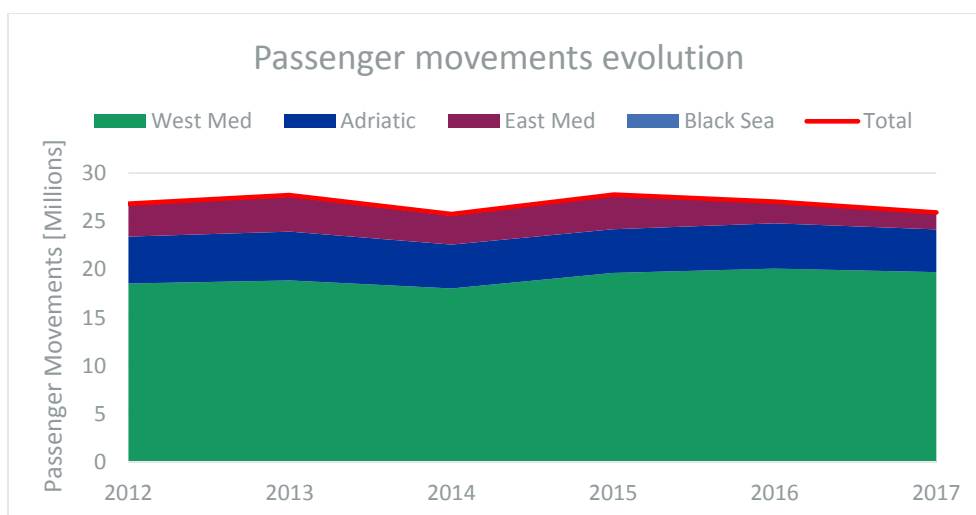
Figure 1 – Evolution of passenger movement in the different areas of the Mediterranean Sea. [11]

Portuguese Atlantic ports (Lisbon, Porto and Portimão) are included in the West Mediterranean area which puts them in the most relevant area of the Mediterranean Sea. This is crucial since many important cruise routes pass through Portugal or make call in ports close-by.
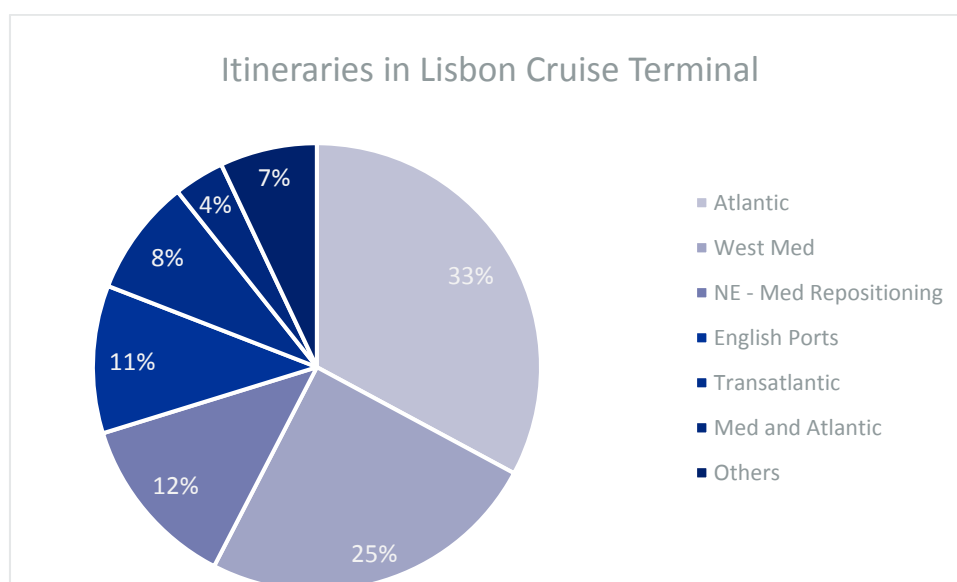
Figure 2 – Itineraries in Lisbon Cruise Terminal [8]

In the case of Lisbon, in 2015, as shown in the diagram of Figure 2, the most important route (accounting for 1/3rd of the calls) was the Atlantic Route which includes calls at Atlantic Islands (Canary and Madeira Islands), Gibraltar Strait, North of Africa, North of Spain and British Islands. The routes on the Balearic Sea (referred as West Med in the diagram), including calls at Barcelona, Cote d'Azur, Civitavecchia or Palma de Mallorca, among others, accounted for 25% of the calls. Other import routes passing through Lisbon are the England-Mediterranean routes (English Ports in the diagram), which includes cruises from Southampton or Dover to the Med area, and the transatlantic routes, which accounts for ships repositioning from the United States or Brazilian ports to Europe in the spring and going back in the fall. [8]

Like in rest of Europe there was a sharp increase in the number of passengers passing through Lisbon terminal as patent in the diagram of Figure 3. 2013 was the peak year with 560 000 passengers and from there onward the number of passengers (and ships) has stabilized near the 500 000 mark (always above it).

As previously stated, only in September 2017 was a dedicated cruise terminal opened to operations. This new terminal gives Lisbon Port new capabilities mainly in terms of handling cruise ships in turnaround operations, meaning that more (and bigger) cruises can now start and finish their trips in Lisbon. Because of the new terminal the importance of turnaround operations might increase whereas in the past transit operations, where Lisbon is just a stop in the middle of the cruise trip, have been predominant. Looking at the graph of Figure 3 it's evident that turnaround operations have always had a small share; though in 2017 it was the first time it surpassed the 10% share of total passengers (with 11%), has the New Cruise Terminal opened in November.
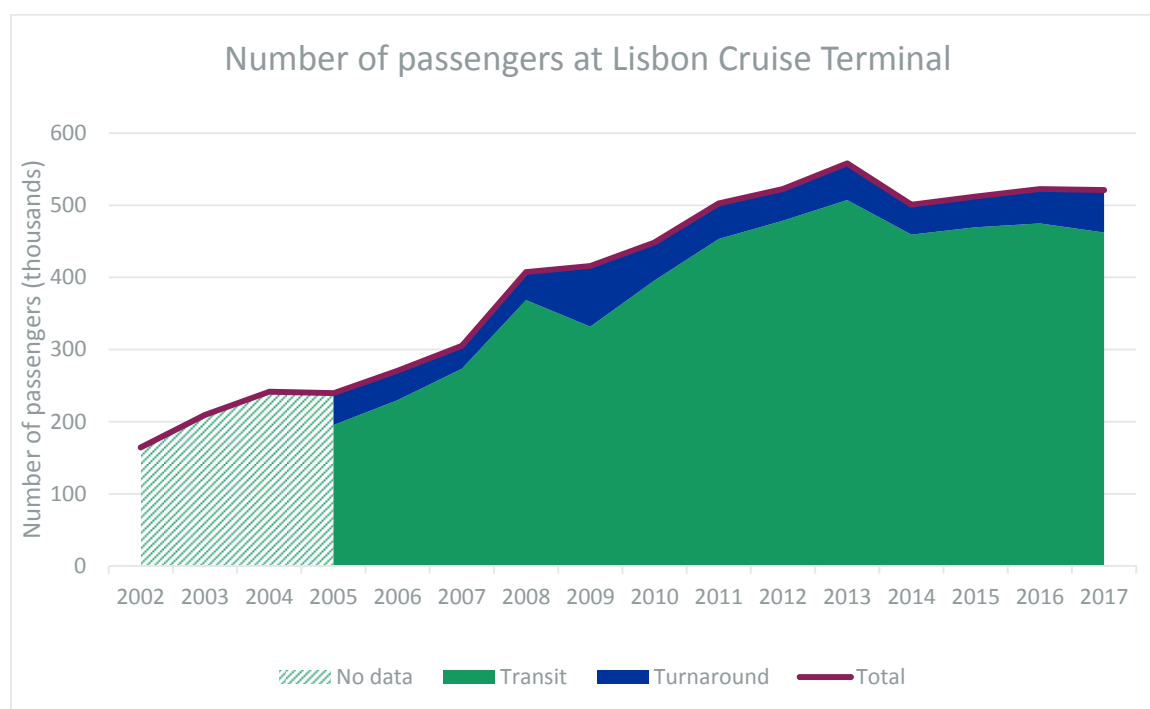
Figure 3 – Total passengers in Lisbon port and share of turnaround and transit operations. [8]

Lisbon's high season is traditionally in April/May and September/October as the graph of Figure 4 shows. This behaviour can be explained by the repositioning of ships to the Caribbean and United States, in the winter, and to the North of Europe in the summer months (only time when it's possible to cruise there). When relocating from the Med to these regions many of the cruise ships stop in Lisbon. The Med region also has a seasonal profile but with a longer high season, from April/May to October/November and with a low season in the rest of the months. It is evident that Lisbon has a lot of potential to increase its summer months passenger flow, especially in June, July and August.

As in other cruise cities the average time that cruise tourist spend in the city is less than a day. In 2016 the average stay was 11 hours and 21 minutes, an increase from the 10 hours and 12 min from 2014. [12] This is because the share of cruise passengers that spend the night in Lisbon increased a consequence of the increase in the share of turnaround cruises. The short amount of time that the passengers stay in the city means they'll only have time to visit the main attractions which results in big concentrations of people in these areas as later will be described. It also means that tourists must move fast from one place to another, meaning that walking and public transport may not be so convenient.
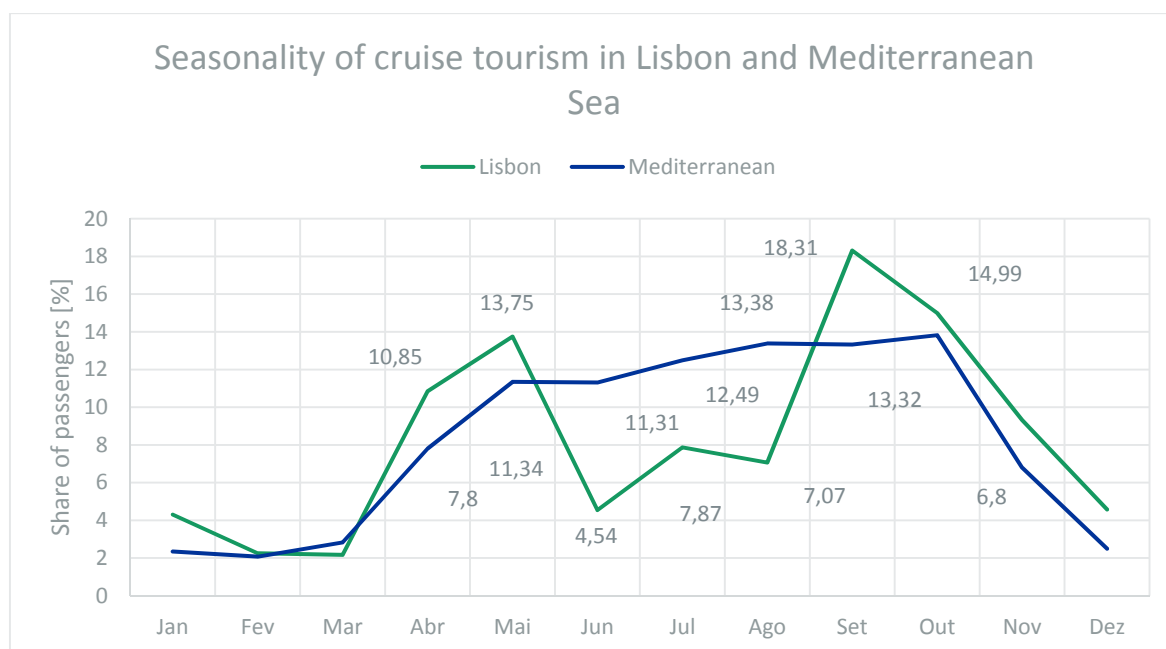
Figure 4 – Cruise passenger flow in Lisbon and Med area. [8] [11]

Furthermore, the ships typically arrive in the morning and depart in the end of the afternoon as shown by the graph of Figure 5. In this graph it is represented the arrival time and departure time of all the ships passing through Lisbon's terminal, in 2015. Quantitatively 73% of all ships arrive between 06:00 and 09:00 and 61% depart between 17:00 and 20:00. These times coincide with road traffic peak hour in Lisbon which normally affects traffic flow downtown. The overlap of both events can produce additional congestion in city traffic with resulting increased emissions due to movements of passengers from the cruise terminal to the touristic spots.

Figure 5 – Arrival and departure hours of cruise ships in 2015 in Lisbon. [8]

Knowing that turnaround cruises (which begin or end in Lisbon) should be much more significant in the future, as the New Cruise Terminal makes this possible, it is expect that part of the visitors spend more time

in the city, meaning better economic revenues, a spread of the positive impacts of tourism to areas that now are not so visited and tourists less rush in visiting and moving around.

Besides cruise ships operational features and statistics, it's relevant to know "who" are the cruise tourist that visit Lisbon. The Port Authority of Lisbon in association with the Lisbon's Tourism Association has conducted several enquires to the cruise passengers to determine their profile. The last one was published in 2018 with the data reporting to 2017. A sample of 1003 foreign passengers were enquired from 49 ships that stopped at Lisbon between April and November 2017. [12]

The most represented nationality was British, 41 %, followed by Spanish, 22% and Germans, 13%. This has been the trend of the last years with the British always being the most represented and the Germans gaining representatively in the recent years. In terms of age the passengers are younger when compared to the last years. While in 2011, 29 % of the passengers were over 65 years old, in 2017 this share decreased to 18% (and 15% in 2016).

The changes in the tourist cruise profile is also disclosed when analysed the people with whom they travel. In this context, married passengers (or with partner) have increased their share with 83 % in 2011 and 89 % in 2017. On this line, the data also shows that, of the married/partners passengers, 45% travel only in couple and 6% only with friends. Of the total amount of passengers 45% are accompanied by friends (not exclusively). 2% of people reported being accompanied by children.

A relevant information is that, in 2017, 9% of the passengers said they would not have taken the cruise if Lisbon was not part of the itinerary (38% in 2016). Furthermore, 89% of the cruise tourist enquired reported having visited Lisbon in the past which is an opportunity to explore destinations alternative to the traditional ones (in 2016 about half reported the same). This may help to counterbalance the fact that ships spend limited time in port helping to balance tourists fluxes in the city centre.

1.2. Mid to long-term cruise flows

According to CLIA 2017 Cruise Industry Outlook, it is expected that in 2018, 15 ocean cruise ships will enter service while in 2019 this number rises to 20. Moreover, in the period 2020-2026 a further 32 ocean cruise ships will be added to the global fleet. This accounts for 200 782 berths to be added increasing the capacity to respond to the growing demand. In the report 'End of the beginning for Cruising' by Tony Peisley it was estimated that in 2018 the 25 million cruise passengers mark would be surpassed while in 2024 this number would be as high as 30 million. Cruise Market Watch projects that in 2020 Europe demands for cruise tourism would reach 1 million passengers meaning a 7% increase from 2015. This puts Lisbon in a growing market and the belief is that Lisbon will also grow in terms of passengers. For 2018 a 18% increase in terms of passengers is expected bringing 617 000 passengers and 361 cruise ships to Lisbon terminal. [13] For longer projections it is difficult to make accurate projections, but it is a clear objective (declared by the Portuguese government) to increase passenger volume by 55% in the next 10 years (until 2027). [14]

1.3. City context

Population and mobility

Lisbon is a city located at the mouth of Tejo river with an administrative area of 100 km2 and about 500 thousand residents. [15] It's incorporated in the wider Metropolitan Area of Lisbon which has a population of almost 3 million people. While Lisbon city population has been decreasing (-10% between 2001 and 2016) the metropolitan area population is increasing (+6% in the same period). The location of Lisbon within the metropolitan area can be seen in Figure 6.
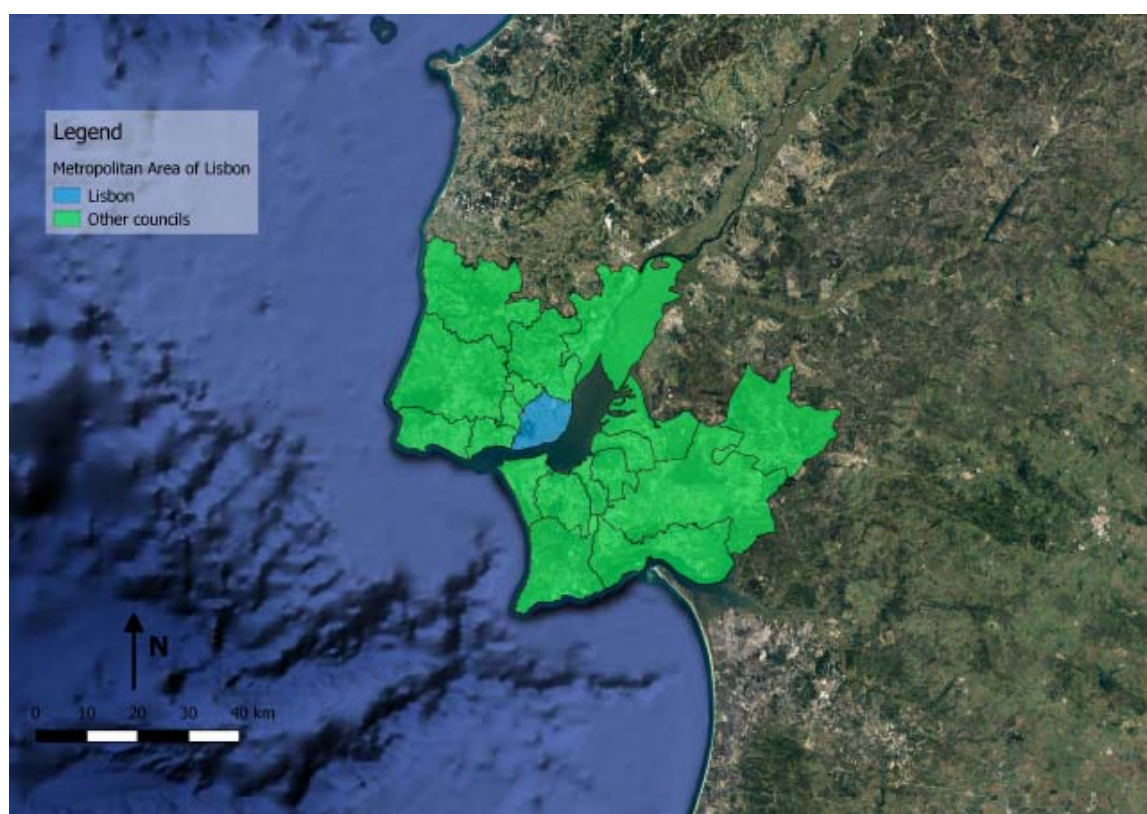
Figure 6 – Metropolitan Area of Lisbon (green) and Lisbon administrative limits (blue).

Lisbon, as the centre of the metropolitan area, concentrates many of the jobs available in the area and attracts an important share of the population in the area to go work there. From the 2011 census it is known that Lisbon had 548 thousand residents and that, every day, 425 thousand people entered the city and 47 thousand would got out. [16]This means that, every day, the population would rise to 926 thousand people. Furthermore, the census pointed out that 55% of the people in the region of Lisbon would use a personal vehicle for their pendular movements, an increase from the 43% of 2001.

A mobility study from 2015 [17] mentioned that, every day, 711 thousand vehicles would get in or get out of the city. Looking at the data it is possible to understand that Lisbon mobility system is highly dependent on personal vehicle though, although during the crisis period (2010-2014), its use has decreased slightly. Despite of this effect, the number of cars sold started to increase again (Figure 7) which points out to an increase of the use of the personal vehicles. This also happens because there was a relevant disinvestment on public transport during the crisis, and all the services have seen its offer and quality being reduced, while prices have raised.
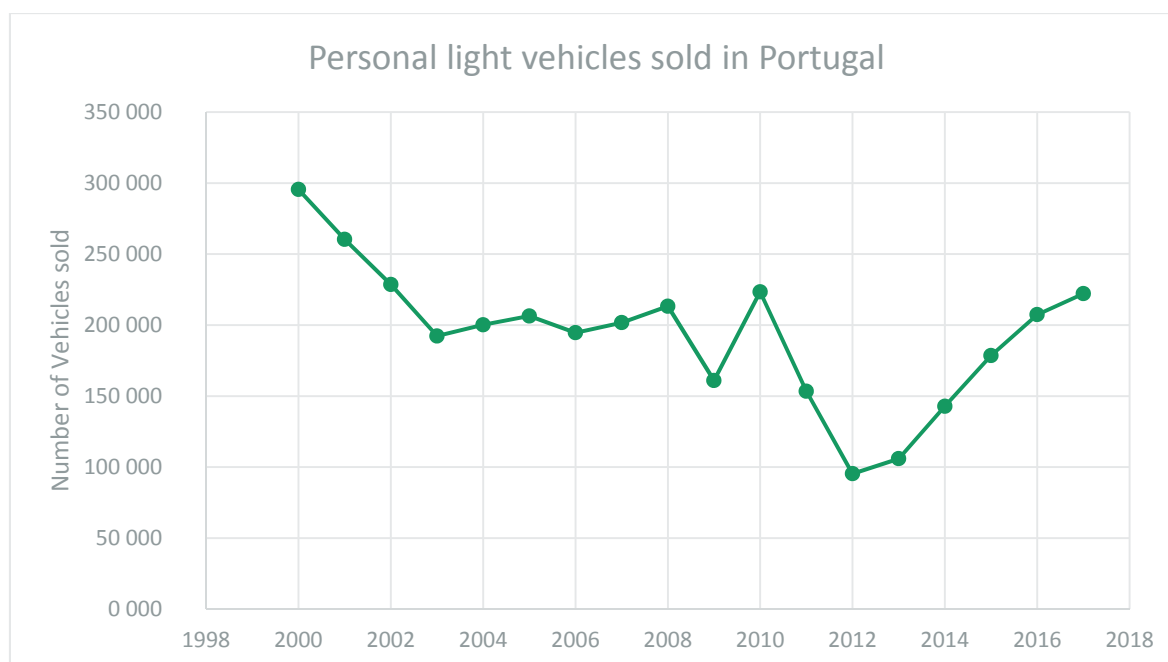
Figure 7 – Yearly number of light personal vehicles sold in Portugal. [18]

Therefore, public transport in Lisbon (mainly public bus) has seen a decrease of the number of users in recent years. As shown by Figure 8 from 2010 onwards the number of passengers transported by each of the three companies represented, CARRIS, Metropolitano de Lisbon and Comboios de Portugal (public bus, subway and train respectively), started to decrease. In the case of Carris the decrease was significant losing about 40% of the passenger transported between 2010 and 2014 and if we go further back to the 1980s, Carris would transport annually about 500 million passengers. Many of these passengers shifted to the subway since it has large expansions in the 1980s and 1990s. Despite this and as it as been shown (increase of the modal share of personal vehicle from 2001 to 2011) many have also shifted to the individual transport. The number of passenger transported by the subway (Metropolitano de Lisbon) and by the train lines (Comboios de Portugal) has also decrease although not so significanlyt as in the case of the bus. It has been argued that the disinvestment in the public (collective) transports during the crisis years is the reason for the decrease in their respective demand. The same argue that the decrease in regularity and quality have been the main reason for the loss of attractiveness of those means of transport. [19] [20]

Public transport demand in Lisbon
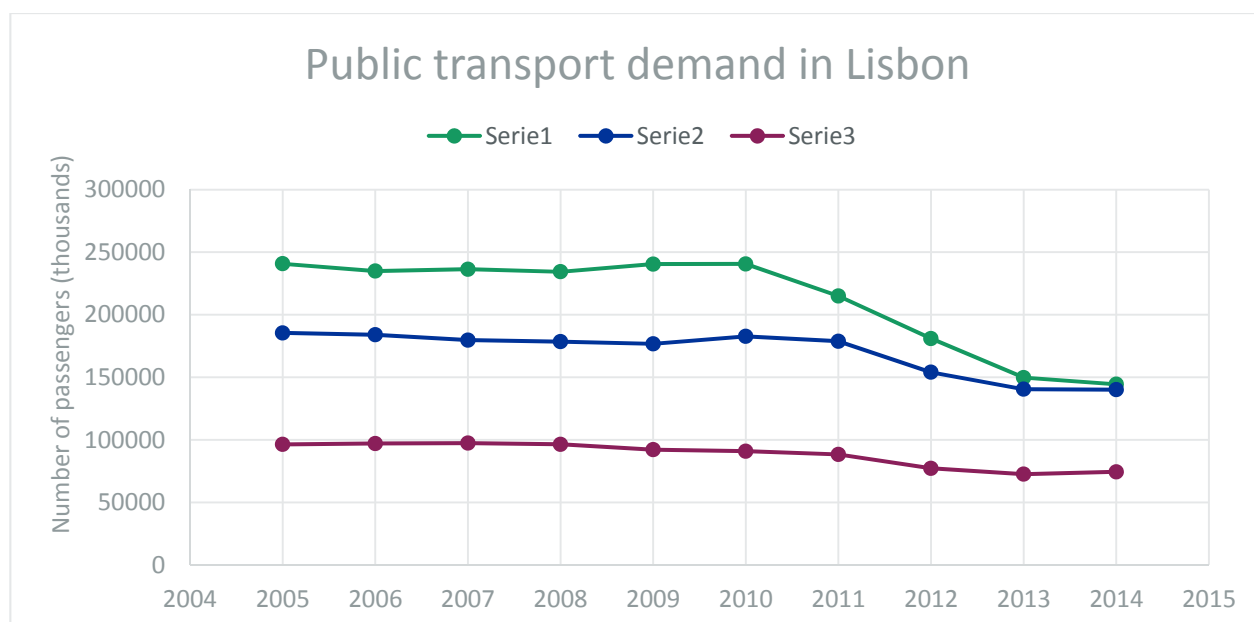
Figure 8 – Public transport demand in Lisbon. [21] [22] [23]

The current administration of the Lisbon City Council, elected in October 2017, has declared some objectives and strategies to try to invert this trend [24]. For example, regarding train lines, it intends to modernize one of the major lines which connects to municipalities to the west of Lisbon. Regarding the bus, dedicated road lanes for the bus are planned with the introduction of priority to the public transport at key intersections. Also, the extensions of both the tram and subway lines is being studied. Regarding soft modes, a relevant extension of the cycling network is underway (from 90 to 200km in 2021), the increase of parking spots for bikes is being implemented, the public bike sharing system is successfully nearing its full launch and the pedestrian infrastructures are being improved with the focus on an accessible and inclusive network. Lastly, there's a focus on the integration of all the services making it easier for multimodal connections.

City Policy

The Lisbon City Council has put into place various actions plans that intend to improve aspects of the city such as, quality of life, quality air, mobility, public space and many others. This path shows a clear ambition to transform Lisbon into a modern and sustainable city that meets the European standers and goals.

This effort is being recognized outdoors: Lisbon was one the three finalists of the European Mobility Week in 2015 and 2015. Lisbon has been twice shortlisted as one of the three finalists for the European Green Capital for 2019 and 2020 - the most important European award for green city policies – being the only country from south Europe that achieved the podium. The winner for 2020 will be known during June 2018.

Figure 9 – Lisbon is currently one of the three finalists for the 2020 European Green Capital Award 2020. [25]

In what concerns the public space, three action plans stand out: Uma *Praça Em Cada Bairro* (One Plaza in Each Neighbourhood), *Pavimentar Lisbon 2015-2020* (Paving Lisbon 2015-2020) and *Plano Geral de Intervenções da Frente Ribeirinha de Lisbon* (Lisbon River Front General Intervention Plan. The first one, aims at creating meeting points for the population where employment and other activities are concentrated, where public space is prioritized and where active modes (walking and cycling) and public transport are the primary means of transportation. Among the originally 33 locations where renovations where going to happen, 17 have been concluded with the other 15 in progress or in project phase. The second plan, Paving Lisbon 2015-2020, aims at repaving the streets of the city to improve the infrastructures of both roads and sidewalks. The objectives of this plan are to create conditions that promote safety, comfort and better mobility. The projections were for 100 streets to be improved in the first two years of the plan.

On the third plan, interventions in several locations along the riverfront of Lisbon (19 km) are planned, including the area around the new cruise terminal of Lisbon. The objective is to eliminate the physical barriers that jeopardize the access of the population to the riverfront. The plan, partially implemented, contemplates new uses for that area of the city other than commercial activities (mainly related the harbour of Lisbon) including continuous pedestrian and cycle paths as well as green areas.

Figure 10 – Saldanha square current layout (image computed prior to intervention).

Figure 11 – Ribeira da Naus, downtown Lisbon with cruise terminal in the background.

Another important plan is the *Plano de Acessibilidade Suave e Assistida à Colina do Castelo* (Plan for Soft and Assisted Accessibility to the Castle Hill), which contains a series of proposals to improve the connection between the downtown of the city (where public transport can be found) and the top of the Castle hill. It includes five routes which have along the way mechanical equipment (i.e. lifts and escalators) that help climb the sections with largest slopes.

Figure 12 – Computerized image of the planned intervention regarding pedestrian accessibility (Mouraria, Lisbon).

Two of the routes have been concluded with the others in execution. Still on pedestrian accessibility, a plan was approved in 2013 with the objective of making Lisbon an accessible city. The plan, *Plano de Acessibilidade Pedonal de Lisbon* (Plan for Pedestrian Accessibility of Lisbon), proposes more than 100 actions to prevent the creation of new barriers to the pedestrian accessibility, to adapt the current infrastructure and to mobilize the population for the creation of a city for all.

Still with regard the improvement of walking and safety, there's a plan that is just starting to be scheduled: *Plano de Mobilidade para as Escolas* (Plan for safe and sustainable mobility to school). This plan will be made side by side with another one that is now gaining a new breath: *Plano de Zonas 30 para a Cidade de Lisbon* (Plan for the implementation of 30 Zones among the City of Lisbon). Although there are several 30 Zones already implemented, this issue has received less attention on the last years and is now again on the political agenda, has the compromise for a better environment and for safety streets becomes a priority.

Also relevant is the city government commitment in promoting cycling has a way of transport. As so, an ambitious cycling network is planned, and new cycle lanes are being built every day. The compromise is to pass from the current 90km of cycle paths to 200km by 2021. As a result, cycling is effectively becoming an alternative – and the launch of Lisbon electric bike sharing system GIRA (140 stations / 1420 bikes) has surely contributed to this new paradigm.
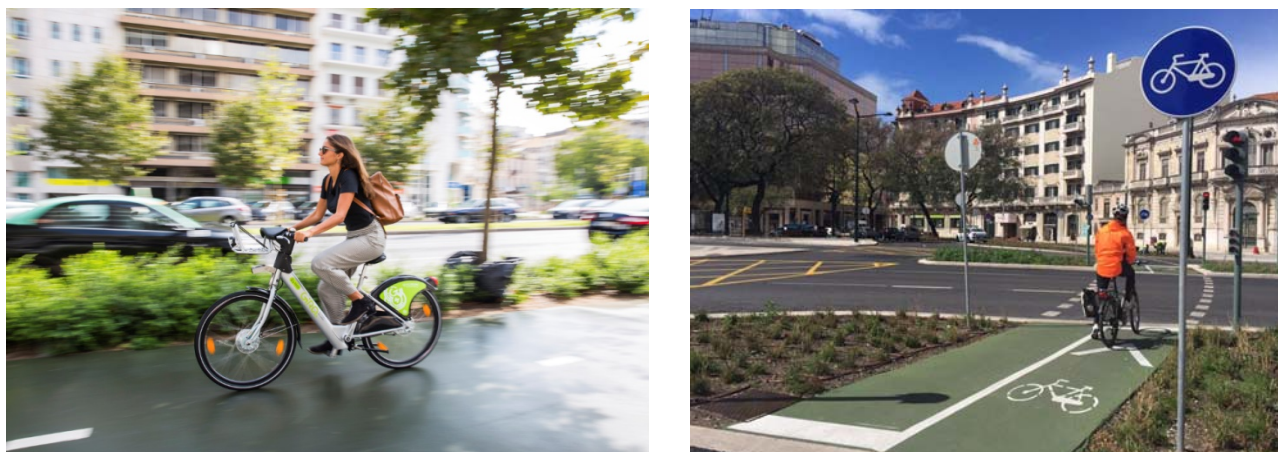
Figure 13 – Cycling initiatives in Lisbon.

Finally, Lisbon is involved in the European project PROSPERITY, which aims to bridge the gap between the local needs and demands of the cities that should develop and implement Sustainable Urban Mobility Plans (SUMP). As so, Lisbon will soon find all policies mentioned above and several others integrated and better developed in its Sustainable Urban Mobility Plan.

Cruise tourism in Lisbon

Since September 2017 that cruise passengers arrive at Lisbon only through the Lisbon Cruise Terminal (LCT). Before the opening of this new terminal, other, in distinct locations of the city, were used occasionally. Since they are no longer used the analysis is based on the arrival of all passengers through the LCT. As shown in Figure 14 the LCT sits close to the city historical centre bringing therefore both advantages and disadvantages. On one hand, it enables people to visit the closer areas using active modes (mostly walking) and, on the other, for touristic bus tours it is necessary to go to downtown to pick up people which can contribute to increase congestion in those areas. This is aggravated by the matching of local traffic peak hour and the arrival and departure times of the cruises.

The terminal itself brings new capabilities that enable the handling of bigger ships in turnaround operations, a higher capacity of cruises and passengers and a variety of shore services. There is dedicated car, bus and cab parking, and easy access to terminal by those. Also, the terminal has a commercial area where touristic packages can be sold and information about the city can be given.[3] The terminal has a direct walking connection to Alfama neighbourhood (one of the most visited) and a new cycle path that passes alongside it and connects to the cycling network of Lisbon. Further ahead the public transport services available close to the terminal, that enable easy access to the city, will be listed in detail. Before, the locations where cruise tourist go and how they go there will be explored.

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[3] Information gathered during participatory process
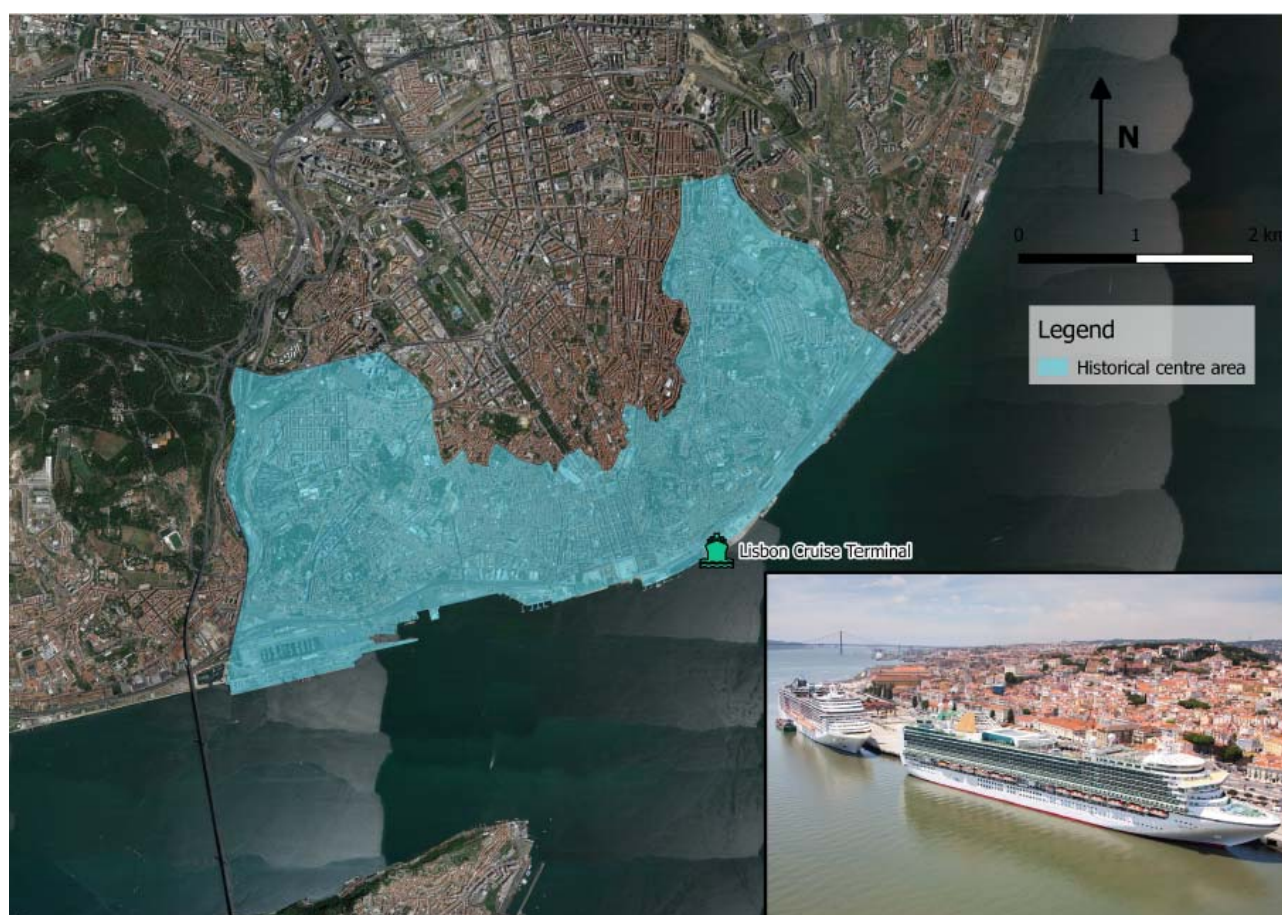
Figure 14 – Location of cruise terminal relative to city centre

From the previously mentioned enquiry to the cruise passengers [12] it is possible to have a clear idea of their habits when arriving at Lisbon. In Table 2 the transport modes most used by the passengers are presented. To assed this the enquiry asked which transport modes were used by the passengers and they could pick more than one transport mode. Touristic bus, walking and cab are the modes that have highest share while public transport option seems to be of less importance for the tourists. Nevertheless, it is important to notice that the use of public transport has been consistently growing since 2015 in all modes of transport (subway, train, tram, regular bus); cab users have significantly decreased but this may be a result of the implementation of serviced vehicles like Uber and not necessarily good news; the number of people walking has drastically dropped in 2017 while the use of touristic buses have grown; cycling hasn´t even been considered an option on this statistic and other options has *tuktuk* vehicles aren't represent either. It is relevant to observe that the mobility patterns have changed a lot between 2015/2016 and 2017.

Since 70%, in 2017, (41% in 2016) of the people buy their excursions on board and 6,4% (14% in 2016) buy them locally it is natural that the touristic bus has such a big share since it normally sold onboard and a significant share of the cruise operator's revenue[4]. On the other hand, 13,2% of passengers affirm having visited the city by their own means (38% in 2016). This group of passengers is an important one to consider since there is the potential to influence them towards sustainable transport options.

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[4] Confirmed during participatory process

Table 2 – Modes of transport used by cruise passengers [%] [12]

Mode	2015	2016	2017
Touristic bus	54,8	56,0	78,5
Walking	54,1	53,4	14,2
Cab	48,9	48,4	15,4
Carris (public bus company)	6,1	8,2	11,3
Subway	4	9,6	11,4
Train	2,5	2,7	5,5
Tram	1,1	1,7	2,6

There are several locations that attract the cruise passengers, though most of them are inside the city of Lisbon, and close to the terminal, due to the limited time that the ships remain in port. Outside of Lisbon there are 3 major locations that passengers visited, as shown by Figure 15. Fátima, up north, (approximately one hour and half from Lisbon), was visited by 11% of the passengers and consists of religiously motivated trips to the sanctuary present there. The other two are Sintra (28 % of people reported going there) and Cascais (18 %), which are historical villages, the first one surrounded by a natural park and the other close to the sea. Trips to these places are traditionally done by touristic bus even though Sintra and Cascais are accessible by train as seen in Figure 17. The train lines connect directly to Lisbon downtown and in both cases, Lisbon is the first stop and Sintra or Cascais the last. Also, one can go from Cascais to Sintra and vice-versa by bus being thus able to make a circular route using only colective transport (e.g. take train to Sintra, then bus to Cascais and then train back to Lisbon) although the time spent in transport, in this case, may not be attractive (more than two hours). Since the train takes a long time to reach both destinations it makes sense that tourist prefer to embark on an excursion. Furthermore, the tourist might not be informed that the train connection exists and therefore don't even have the option to take it. Also, attractions in Sintra are quite spread and touristic buses may be helpful to reach them in a comfortable and uncomplicated way.

Figure 15 –Touristic destinations outside the city of Lisbon

Table 3 – Share of passengers that reported having passed through the indicated touristic areas in 2017. [12]

Destination	Share
Bairro Alto	91%
Baixa/Chiado	90%
Alfama/Castelo	90%
Belém	93%
Parque das Nações	85%
Sintra	28%
Cascais	18%
Fátima	11%

Within Lisbon, traditionally, the historical neighbourhoods near the river and around downtown are the most visited (about 90% of people report going there) with Belém (93%) and Parque das Nações (85%) attracting a lot of visitors as well. This last two are in the limits of the city one to the west and other to the northeast as shown in Figure 16. All the mentioned locations are easily accessible by public transport and even by foot (downtown area) or bike. Ensuring that the passengers, that stay exclusively in these areas, choose sustainable transport options is one step closer to reducing greenhouse gases and pollutants emissions.

For the two areas further away from the terminal, Belém and Parque das Nações, many options of public transport exist has shown by Figure 17. Regarding Parque das Nações subway, bus and train are options, though bus seems to be the most attractive one since it is the faster and the one closer to the terminal. Belém will soon be connected to the terminal by a tram line that runs along the river though there is no timeframe for when this will happen. Currently one can reach Belém, from the terminal or downtown, either by bus, by train or by the referred tram which currently stops about 1 km away from the terminal. By train it takes 7 minutes to get there while the other transport takes a bit longer but depart from locations closer to the terminal.

Between these two areas there is about 19 km of riverfront but, nevertheless, both will soon be connected by a cycle path which currently is only missing 2 km right in the city centre. The public bike sharing of Lisbon system will cover both this areas with the terminal in the middle. Here, close to the terminal, there will be three bike stations (one with capacity for twelve bicycles, another for twenty-seven and a third one for nine). The station that sits right in front of the terminal is the one with less capacity.

When fully deployed (during 2018) the system will consist of 1410 bicycles (with 2/3rd electric) and 140 stations.

Although the system may be used by tourists, it has not been planned to have them has a target. As so, the number of shared bikes available near the Terminal and other relevant touristic spots won't be able to respond the potential demand by cruise passengers.

Figure 16 – Location of touristic destinations within the city of Lisbon (1). [12]

Figure 17 -Public transport connections in Lisbon.

Regarding the areas closer to the terminal, three distinct ones can be identified (as defined by Tourism of Lisbon). [26] The three areas, identified in Figure 18, are: Bairro Alto/Bica/Príncipe Real (in red and hereinafter Bairro Alto), Castelo/Alfama/São Vicente/Graça/Mouraria (in dark blue and hereinafter Castelo/Alfama) and Chiado/Baixa/Carmo (in yellow and hereinafter Baixa). The first two areas are in two distinct hills where steep streets need to be climbed to reach the main attractions of the referred areas. The last one is placed in the valley between the previous and is mostly flat except for the west limit of it which includes a bit of Bairro Alto hill. The share of passengers that reported visiting these three areas are also reported on Table 3 and the high share demonstrate the importance of these in the touristic scenario.

The Castelo/Alfama area is the older one and typically has narrow streets which make it difficult for public transport to reach there and traffic is often chaotic, especially when there's a high concentration of tourists. This is the touristic area that is closest to terminal (as seen in Figure 18) although it is not the easiest to get to due to its orography. It has been mentioned that a plan (*Plano de Acessibilidade Suave e Assistida à Colina do Castelo*), for making it easier to move around the hill, is being implemented. The green arrows in Figure 19 represent the places where lifts and funiculars already exist. In terms of public transport only three routes (bus and tram) pass through there and none connects directly to the terminal. Nevertheless, it is possible to reach the referred routes walking (1 km) or by bus (4 lines). The area has some zones that are of vehicle restricted access (only to residents, shop owners, logistics and emergency services).

Bairro Alto area is also an old area, with streets not as narrow as Alfama and an urban orthogonal mesh, but also steep and of difficult access. Like Castelo/Alfama congestion is normally observed when there's a high density of tourists in the area. Here two funiculars and one lift bring people up to the hill. Unlike the lifts in Castelo/Alfama, those are, nowadays, mostly directed towards tourists since capacity is low and demand high. This area can be reached by bus or walking (1,7 km).

The third area, Baixa, is characterized by orthogonal and wide streets. Here there are some pedestrian streets which, during the day, normally get crowed due to touristic affluence. From the terminal it is reachable walking (1km) and it gives access to the other two areas. To go to the higher part of this area there's a lift which also takes people close to the top of Bairro Alto hill. The downside of this lift is that most of the time is crowed and takes a long time to be able to climb on it.

Figure 18 - Distribution of touristic destinations within the city of Lisbon (2) (Red circle: Bairro Alto; Yellow circle: Baixa; Blue circle: Alfama/Castelo)

Figure 19 – Public transport connection in historic centre. [27]

These three areas are a continuum with historical interest, being the Cruise Terminal in the centre of it, which means that, in fact, it doesn't make much sense to think about going from place to place in public transport. The more convenient way of exploring this part of the city will be walking and using lifts and funiculars. Also, bikes may be a good option, once the cycling network is well developed – something that

it's not easy on this part of the city, where streets are narrow, and slopes are sharp. By other hand, touristic vehicles (as tuk-tuks, side cars, h-on-hop-off buses and old converted cars) may seem attractive for tourists that want to see Lisbon in a glance, but those are, naturally, the less desirable modes of transportation for the city and its residents has they have a massive impact on the environment and congestion.

It is then advisable that active and colective modes of transport are promoted here in detriment of touristic or individual transport. The city council has taken some steps here by prohibiting the circulation of touristic buses in the two main arteries of the Bairro Alto and Castelo/Alfama hills. [28]

1.4. SWOT analysis

Based on the information gathered and the opinion of the stakeholders interviewed a SWOT matrix was developed. This is a valuable tool to help with the later planning stage since it enables the identification of *Strengths, Weaknesses, Opportunities and Threats*. The analysis will focus on the cruise passengers' mobility in the city with the objective of the plan in mind: decrease the negative impacts on environment and local population and potentiate the social and economic benefits.

The topics listed in the SWOT matrix, Table 4 – SWOT Matrix, are all related to the information presented in previous topics. It is built on that data but organised in a way that allows for better understanding of the context. A brief explanation and reasoning of the topics is also presented to put them in context.

Furthermore, a CAME analysis was made following the SWOT. CAME analysis is useful to help defining the strategy and actions after the SWOT analysis results. To the *Strengths, Weaknesses, Opportunities and Threats* correspond a strategy, respectively: *Maintain Change, Explore and Adapt.* This matrix is presented in Table 5.

The main strengths are related with public transport accessibility and infrastructure. Departing from the new cruise terminal walking, a passenger can reach any means of public transport in a 10-minute walk (subway, train, bus or tram) and from these ones, it is possible to reach the most important touristic spots in the city and even Cascais and Sintra. If we consider the public bike sharing service, it's even another means of transport that is available right outside the terminal with two close-by stations. Furthermore, the location of the terminal is close enough to three of the most visited areas of Lisbon for the passenger to simply walk there. Of course, this is also a threat since, for touristic excursions, the transports (bus, tuk-tuk and others) must come right to the city centre to pick-up the passengers. Regarding city policy, the current program aims for more sustainable transport and less GHG emissions to comply with European goals. This plan can, therefore, take advantage of these city goals to implement its actions and achieve its goals.

Despite all the public transport connections available, Lisbon has seen a disinvestment in public transport over the recent years, as shown before (a weakness). Furthermore, due to the limited amount of time that passengers spend in the city they tend to go only to the main attractions which are concentrated in the historical centre and in Belém. This causes high concentrations of people and buses in the referred areas. The less central touristic location that are accessible by train, such as Sintra an Cascais, are normally reached by bus since the train is not attractive due to the time it takes to get there.

Several opportunities have been identified regarding the cruise terminal itself being one of them its capabilities to influence the tourists that have not bought the excursions on board. These passengers account for about 50% of the total and can be led to choose sustainable transport option. Since many of them have already visited Lisbon in the past it might be positive to inform them of new alternative locations which will help to decongest the traditional ones. Another factor from which the plan can benefit

is from the municipal touristic Fund which is an available fund for the improvement of the quality of life of locals and of the tourists' experience.

The observed increase of tourists (from cruises and others) will rise the pressure on local quality of life and this could be a threat if measures and actions (some included in this plan) would not be taken to counteract the negative side associated to the tourism. The size and capacity of the ships is also increasing, and this will rise the number of tourists arriving simultaneously to the city. When planning and drafting the actions this factor must be considered. Has referred before, the information passed to the passengers at the terminal can be adjusted according to the city's (and operator's) objectives but before arriving to the terminal many of the passenger (about 40%) have already bought excursions on board and been given information about the city.

Table 4 – SWOT Matrix

Strengths	Weaknesses
➢ Public bus connecting to main touristic attractions in front of terminal. ➢ Future tram line passing in front of terminal which takes you to main touristic attraction. ➢ Subway station 400 m from terminal. ➢ Train station reachable by bus/subway. ➢ Main airport 5 km and reachable by public transport. ➢ Possibility to know, months in advance, which cruises will be in port. ➢ Cruise Terminal located in city centre and with dedicated capabilities. ➢ New bike sharing system with two stations close to terminal. ➢ City Policy aligned with the increase of green and collective transport modal share.	➢ Disinvestment on public transport sector in recent years (less capacity). ➢ Limited amount of time to visit Lisbon. ➢ Tourists desire to visit the only main attractions. ➢ Arrival and departure times coincident with rush hour. ➢ High share of locals use car for commuting causing traffic congestions. ➢ Lack of touristic buses parking regulation. ➢ Centralized touristic destinations. ➢ Decentralized destinations accessible by train but not viable due to time constraint. ➢ Low quality pedestrian network. (lack of accessible infrastructure and touristic pedestrian routes). ➢ Increase of the number of non-sustainable touristic options (e.g. tuk-tuks and increase in the share of touristic buses excursions).
Opportunities	**Threats**
➢ Possible to influence tourists before they enter the city through the terminal capabilities. ➢ Increase of turnaround cruises from 2018 forward. ➢ Profile of cruise tourist changing (younger and more diversified). ➢ High education level which allows for ICTs. ➢ Ongoing intervention in the areas around the new terminal. ➢ Multiple municipality programs from which the plan can beneficiate. ➢ Existence of a touristic fund from touristic tax. ➢ 50-60 % of cruise passengers don't buy excursions inside the cruise. ➢ Cruise high season does not match the touristic high season. ➢ Half of the cruise passengers have already visited Lisbon in the past. ➢ Cruise Tourism might become less seasonal (with increasing turnaround share).	➢ Cruise terminal located in city centre. ➢ Number of tourists increasing (cruise and otherwise). ➢ Size and capacity of ships increasing. ➢ Loss of identity and residents in the city centre. ➢ Lack of an integrated PT authority. ➢ Seasonal activity with 4 busy months (April, May, September and October) and the other eight quiet. ➢ Cruise operators and port agents possible defensive attitude. ➢ Change of cruise routes with resulting reduced flow. ➢ Climate change and natural disaster. ➢ Global economic-political instability. ➢ Unable to "control" information passed to the tourist before arrival to Lisbon.

Interreg
Mediterranean
LOCATIONS

Table 5 – CAME Matrix

Maintain	Correct
➢ Keep public transport options in the proximity of the terminal connecting to touristic areas. ➢ Use the foreseen number of cruise passengers to predict impact on specific days. ➢ Continue with active modes and public transport promotion to operate a modal shift from individual transport	➢ Invest in public transport capacity and quality ➢ Diversify touristic attractions location and promote new ones. ➢ Develop touristic transport regulation ➢ Improve pedestrian network quality and accessibility. ➢ Promote sustainable mode of transport for cruise passengers.
Explore	**Adapt**
➢ Make use of cruise terminal facilities to promote plan's actions. ➢ Explore longer stay of turnaround passengers ➢ Explore technological solutions such as web platforms and mobile apps ➢ Align plan's actions with city council policy and plans. ➢ Study funding through touristic tax funds ➢ Influence the passengers that don't buy excursions inside the cruise to use more sustainable transport options ➢ Promote alternative touristic locations among passengers that have already visited Lisbon	➢ Actions must consider that passenger will always arrive right in the city centre ➢ Increasing number of passengers and tourists in Lisbon must be considered when drafting actions and their expected impact. ➢ The plan's strategy must protect the identity of the city and its residents ➢ Many actions might have to consider that the activity is seasonal with quite busy months and other with few passengers. ➢ Cruise and touristic transport operators must be informed of actions to be implemented beforehand to increase likelihood of cooperation

Interreg Mediterranean
LOCATIONS

2. Participatory process

As part of the diagnosis of the current situation regarding the mobility of cruise passengers a participatory process was carried out. The aim was to involve stakeholders that have a role in this industry both from the regulator side and from the operator.

2.1. Stakeholders identification

The project team was able to contact both sides of the cruise tourism business which enabled a broader view of the challenges at stake. The Lisbon City Council, a fundamental stakeholder for this project, participated as associated member of the project. Several meetings were held (described below) with all levels of the structure, from technicians to policy makers. This approach allowed for a glance at the vision and strategy of the city and for a practical view from the technicians who deal with the everyday challenges of the city life.

Furthermore, the public bus company of Lisbon was involved in the diagnosis phase to help the team understand how the cruise passengers affect their operations and how they could better profit from the business. Still from operators' side, the private company that runs the terminal gave their view on the challenges at stake and on their expectations towards this plan.

The Port Authority of Lisbon, gave a significant contribution in helping understand how the cruise industry works, their expectations and possible barriers towards the objective of the plan itself.

Bellow, in Table 6, all the stakeholders involved in the project are presented together with the project's team understanding of their main interest towards the cruise tourism and its relation to this project.

Table 6 – Stakeholders identification and categorization

Stakeholder	Potential Impact on the project	Main interest related to cruise
Lisbon City Council	High	➢ Increase number of tourists; ➢ Increase income through taxes; ➢ Improve local economy; ➢ Improve quality of life; ➢ Sustainability assurance; ➢ Increase city attractiveness (for citizens and visitors).
Porto de Lisbon (*Port Authority of Lisbon)*	High	➢ Increasing revenue (due to increasing number of passengers and ships); ➢ Better corporate image; ➢ Increasing competitiveness importance.
Lisbon Cruise Terminal	High	➢ Increase of revenue; ➢ Improve opinion of public towards cruise tourism; ➢ Improve accessibility do the terminal.

Stakeholder	Potential Impact on the project	Main interest related to cruise
Turismo de Portugal (*National Tourism Authority)*	Medium	➢ Foster development of tourism; ➢ The Strategy for Tourism 2027 clearly aims at sustainable tourism, and LOCATIONS can contribute to this.
Turismo de Lisbon (*Lisbon's Tourism Association)*	Medium	➢ Improve Lisbon's image as a sustainable touristic destination of excellence.
Public transport Operators	Medium	➢ Increased revenue; ➢ Better service offer for both tourist and citizens; ➢ More daily customers.

2.2. Participatory process design and implementation

To involve all relevant stakeholders in the entire process, two moments for participation were planned, an initial presentation of the project and a second one for gathering of information. In the first phase the objective was to present the project to potential partners and gather their support. In these meetings some information was gathered; other relevant partners were identified, and invitations were made for partners to participate in the next phase. The second phase consisted of individual interviews to key people within the organizations that were considered to have relevant information. These interviews intended to deepen the knowledge of the current situation and gather actions and measures that the interviewees found necessary to be included in the plan.

First Meetings with stakeholders

Stakeholders were first engaged though cell phone calls or email from which meetings where arranged. At these meeting the project was present and the expect role and contributions from the stakeholders laid out. Information about the target organizations had been previously gathered to know what could be expected from them and what kind of information they would have available. This preparation was useful since it allowed the meetings to go beyond the presentation of the project to collection of resources that were used in the diagnosis of the situation. Table 7 summarizes the meetings that took place and the main outcomes.

Table 7 – Description of meetings with stakeholders

Participants	Main conclusions
Port Authority of Lisbon (Porto de Lisbon) – 2 representatives Lisbon Cruise Terminal – 1 representative LCTP Team – 4 Representatives	Identification of studies about cruise tourism activities in the Port of Lisbon. Clarification of typology of cruise tourism in Lisbon, the scale of the it, the area of influence of the terminal, the main season. The strategy of the Port of Lisbon for the cruises was presented to the LCTP team. Impacts of the new cruise terminal were discussed. Identification of further stakeholders to be involved.
Tourism of Portugal (Turismo de Portugal) – 3 representatives LCTP Team – 4 representatives	Identification of studies made my Tourism of Portugal relevant to the plan. Identification of areas of common interest between the LCTP and the Strategy for Tourism 2027 and how the LCTP can contribute to reach its goals. Identification of further stakeholders to be involved.
Lisbon Cruise Terminal – 3 representatives LCT Team – 3 representatives	It was a guided visit to the new terminal which allowed the team to understand better the project at its features. Clarification of data regarding cruise tourism and future scenarios. Better understanding of how the industry works, what are its

Participants	Main conclusions
Lisbon Tourism Association (Turismo de Lisbon) – 1 representative LCT Team – 3 representatives	Explanation of purpose of the Association. Strategic Plan for the region of Lisbon explained. Identification of potential financial instrument of implementation of LCTP actions.
Lisbon City Council (Câmara Municipal de Lisbon) – 1 representative from Urban Planning Department LCTP Team – 4 representatives	Detailed description of the new cruise terminal of Lisbon and the neighbouring area was given. Mobility related features of the new cruise terminal project were clearly identified. Important stakeholders to consider were identified.
Lisbon City Council (Câmara Municipal de Lisbon) – 7 representatives from Mobility Management department LCTP Team – 4 representatives	This meeting was to present the project to the people that work directly on the "ground" and have more practical knowledge of the city. Many gaps were identified mainly related to touristic coaches. Gaps in the information and sources to fill them were identified.
Lisbon City Council (Câmara Municipal de Lisbon) – 2 representatives from Pedestrian accessibility team LCTP Team – 3 representatives	Relevant studies made by this department were identified. Layers of information were request regarding pedestrian mode. Articulation with other projects being carried by this team was also discussed.

Interviews with key people of stakeholder's organizations

The interviews were intended to deepen the LCTP's understanding of the impacts, positive or negative, that the cruise tourism has in Lisbon. Since the LCTP is a mobility plan, the interviews were focused mainly, but not exclusively, on this subject. Before preparing the questions for the interview, and after the first round of meetings, information regarding cruise tourism in Lisbon was gathered from published studies, surveys and resources made available by stakeholders. From here information gaps were identified and the questions for the interviews tried to cover these gaps. The number of participants in these interviews and the organizations which they represent are listed below:

- ➢ 8 people from different departments of the Municipal Directorate of Mobility and Transport.
- ➢ 1 person from the Institute for Mobility and Transports
- ➢ 1 person from Lisbon's public bus company – CARRIS
- ➢ 1 person from Lisbon Cruise Terminal
- ➢ 1 person from Tourism of Portugal

The interviews were conducted in an informal manner where the question planned served as the script for the talk but always allowing for the talk to follow its natural course. The ideas generated by the interviews where sorted out depending on topic to which they corresponded and are described in Table 8. To preserve the anonymity of the people interviewed the ideas are presented in an aggregated way in

Table 8 - Outputs from interviews

Topic	Remark
Cruise Tourism	Typology of operation doesn't imply accommodation (95% transit) Tourist arrive in large numbers in narrow window of time Seasonal activity for which seasonal measures should answer. Substantial changes in the industry foreseen for next 5 years Limited time (from dawn to dusk)
Cruise Tourist	No longer only the typical, low mobility, old user. The absolute number of this users has not decrease but been diluted in other user profiles. Normally wants to go directly to the highlights of the city (related with limited stay).
New Cruise Terminal of Lisbon	Gives the possibility to influence the tourists' choices before they enter the city. It's uncertain the impact it will have on the cruise tourist flux but: ➤ It's expected turnaround will increase ➤ Number of cruises and tourists excepted to rise Cruise tourism might become less seasonal
Areas of interest for cruise passengers	Lisbon: ➤ Downtown and historical neighbourhoods on the hills: Alfama, Castelo, S. Vicente and Bairro Alto, ➤ Belém, ➤ Parque das Nações. Lisbon Metropolitan Area: ➤ Cascais and Sintra. Fátima
Other potential areas	The concentration of tourist in the typical areas can be alleviated by potentiating other areas: ➤ Sintra and Cascais (even further) ➤ Palmela (wine area) ➤ Area around Fátima (Alcobaça e Batalha) ➤ Monsanto This can be successful if aimed mainly at second time comers (about 50%)
Information	Most of the people interview believed that a crucial element is the information that reaches the tourist. How to inform them, where and when, will be crucial to influence their choices of transportation in the city
Mobility Constraints	Main constraints caused by touristic coaches are due to lack of regulated parking mainly in: ➤ Praça do Comércio ➤ Rossio ➤ Sé ➤ Belém (Torre de Belém, Padrão dos Descobrimentos, Mosteiro dos Jerónimos)
Modes of transport	Pedestrian ➤ Improve walkability conditions ➤ Create and publicize urban touristic routes ➤ Complement this mode with Touristic Coached and public transport Public Transport ➤ Facilitate the access to tickets and have dedicated ones Touristic Coach ➤ Use this mode for longer trips to out of Lisbon ➤ Regulate parking and routes Create mobility packages that include all these modes of transport

3. Low Carbon Transport Plan

3.1. Current scenario and challenges

On the first chapter a comprehensive analysis of Lisbon mobility paradigm and its relationship with cruise tourism has been carried out. On this topic the aim is to summarize that information as an introduction for the strategies and actions proposed to tackle the challenges that are laid out on Table 9. Furthermore, the data gathered from trusted sources was crossed with the opinions and experiences from the people interviewed to have a broader understating of the situation.

Four main challenges were identified, each of them with causes and consequences associated. This structure allows for better understanding of the challenges and what can be done to tackle them. The first two are directly related to the transport mode used by the tourists to move around the city while the third one relates to touristic attraction's location and the last with touristic transports.

The first one deals with the areas closer to the terminal (therefore in the city centre) and how the tourists use non-sustainable transport options, such as taxis, light vehicles, touristic couches, non-electric tuk-tuks and minivans, to discover these areas.

The second case deals with medium distance destinations, such as Belém and Parque das Nações, which can be reached by public transport but, as the above case, the preferred modes of transport are less sustainable ones. Both cases have similar probable causes and clear consequences. Both challenges imply more taxis, light vehicles, touristic buses, non-electric tuk-tuks and minivans on the streets which cause more traffic. It was reported that these vehicles often stop improperly and travel at too reduced speeds to allow passengers to enjoy the view and observe distinct touristic attractions. Besides causing delays on the traffic, these behaviours cause perturbations to the circulation of public buses and trams. The case of the public bus is peculiar since when this transport is used by many tourists it causes further delays since the tickets are often bought on-board to the driver. While receiving payment, emitting ticket and giving back change the driver cannot resume march. The more tourists that use the public bus, the larger the delay will be. The causes of these challenges relate deeply with the information that is provided to the passengers beforehand which might induce them to choose non-sustainable transport options if no other choice/mode is presented to them. Also, despite being less preponderant nowadays, a considerable number of tourist are elderly or of low mobility which makes active modes and public transport less attractive. This also relates with big parts of the city not having inclusive sidewalks, though a big effort is being made in that direction. Lastly, the limited time to visit the city might lead the passengers to choose what they consider to be the safer choice instead of going out "independently".

Another major challenge is the concentration of people (tourists) in certain areas which are considered as the touristic highlights. Since passengers have limited time to visit the city they will opt to visit only these highlights (many times through touristic tours), leaving out "secondary" points of interest. This will result in many people (and the transport modes chosen by them) heading to the same attractions adding traffic volume, at normally at local rush hour, and exhausting the parking capabilities near these attractions. Some places are critical in what this phenomenon is concerned and parking in the road itself is often seen (near *Torre de Belém* or *Padrão dos Descobrimentos*, and until recently near *Sé* and *Castelo de São Jorge* or in the axis *Cais do Sodré - Rato*). Obvious consequences are the decrease in the tourists' experience quality (due to big lines to attractions and loss of authenticity) and the decrease of the quality of life of inhabitants. On the other side, the probable causes relate, as in the first two challenges, with the information provided to the passengers: if only the traditional locations are promoted among them then they will tend to go to

those. Moreover, there is a lack of effort to potentiate other locations among cruise passengers aggravated by the fact that excursions offered on-board are concentrated in the same traditional spots.

The last challenge is the excessive use of non-sustainable transport options, by cruise passengers, with special attention for the high concentration of touristic buses. The added traffic volume aggravates the traffic in the touristic areas (mostly on the historical urban area) and the lack of regulated parking spots creates further congestion. Places like Belém and the city centre have a deficit of parking spots for buses which leads them to park in deficient conditions many times stopping traffic for several minutes. The consequences are not exclusively related to these challenges but also contribute to increase greenhouse gases (GHG) and pollutants emissions, noise pollution and worse quality of air.

Table 9 – Identified challenges and associated causes and consequences

Probable causes	Challenges	Consequences
Low quality of pedestrian network. Low density of cycling network and facilities. Insufficient offer of bike renting and bike sharing services. Limited time to visit the city. People with low mobility. Economic interest of touristic buses Operators in selling excursions. Lack of information regarding alternative options.	Tourists use of non-sustainable transport modes (coaches, taxi, tuk-tuk, minivan, etc) for **short distances** (Baixa, Alfama, Castelo, Bairro Alto, etc).	Higher number of coaches circulating in the city centre and Belém area. Increased congestion in road traffic.
Low use (offer) of public transport options. Only possible to buy tickets inside the buses (no office inside the terminal). Limited time to visit the city. People with low mobility. Economic interest of touristic buses Operators in selling excursions. Lack of information regarding alternative options.	Tourists use of non-sustainable transport modes (coaches, taxi, tuk-tuk, minivan, etc) for **medium distances** (Belém, Parque das Nações, etc).	Buses (when used) get delayed due to ticket being sold by the driver. Higher number of coaches circulating in the city centre and Belém area. Increased congestion in road traffic.
Few touristic attractions besides Belém and historical neighbourhoods. Insufficient effort to potentiate alternative attractions and redirect fluxes (of cruise passengers) there. Touristic tours offered at cruises concentrate in those areas.	**Excessive concentration** of people at touristic attractions.	Quality of tourists' experience decreasing. Quality of inhabitants' life decreased due excessive density of tourists. Congestion in road traffic in city centre and touristic attractions areas due to touristic coaches (circulating and parking).
Lack of parking capacity for touristic buses. High number of buses departing from cruise terminal and heading to same places. Arrival and departure hour of cruise coincides with rush hour.	**Congestion in road traffic** in city centre and touristic attractions areas due to touristic coaches.	Increase GHG and pollutants emissions. Lower velocity of circulation. Noise pollution.

All these challenges contribute to the increased touristic pressure on the city which has known consequences that must be tackled. The public space taken by tourists, the rise of prices in the touristic areas, the exodus from residents to suburbs, the degradation of air quality, the GHG and pollutants emissions, the noise pollutions, and the dominance of local commerce by gift shops (with consequent closure of traditional or craft shops) are among some of the most significant consequences.

3.2. Vision

"Lisbon should become a destination of excellence where the available options of mobility have a reduced impact on the environment and on the city residents' quality of life, contributing to potentiate opportunities and balance the coexistence between residents and tourists."

This vision is built on the specific objectives of the project and on the vision and ambitions that the current city administration (2017-2021) has for the city. This alignment is fundamental since the objectives and actions here included must contribute to the legislators' goals and help achieve their vision of the city. The Lisbon City Council ambition is then to "seize the moment in which we now live to make Lisbon one of the best cities in world to live in."

For Lisbon to achieve this it is imperative that tourism has a positive impact on the city and that its potential dangers and undesirable effects are minimized and possibly eliminated. The coexistence between locals and tourists is a must and sustainable and smart mobility options can help with this, always without neglecting the economic aspect of the issue. The plan's actions are not intended to sacrifice the economic benefits of cruise tourism in favour of sustainable or social ones. The objective is the balance between all, to reach a true sustainable paradigm where all stakeholders, that are affected by this industry (including citizens), can prosper with it and, most importantly, not feel threatened by it.

Mobility options that contemplate sustainable transport modes, smart fluxes management, use of information technologies and many other novel ideas can contribute to achieve what we propose ourselves to do. They can contribute to a better quality of air, less traffic congestions, less time waiting to enjoy a touristic attraction, less crowd on some streets and public spaces, fostering of local businesses and an overall increased quality of life. The citizens of Lisbon will, therefore, look at this industry with a renewed positive vision encouraging in turn the further sustainable development of the cruise tourism industry with all the benefits it brings.

3.3. Strategy

From the Vision we established, the main objective of the project can be laid out. The plan aims at reducing the carbon impact of the mobility of the cruise passengers on the city of Lisbon. Furthermore, the plan must contribute to protect and increase the quality of life of inhabitants, potentiate economic and social opportunities and optimize the passengers' experience. This general objective relates to all the challenges previously describe but to achieve it, distinct strategies must be carried out.

Therefore, for each of the four main challenges a strategy has been defined to tackle it. These strategies will be further developed into goals, necessary actions to achieve these goals and indicators that access the success (or unsuccess) of the followed strategy. Furthermore, one cross-cutting strategy has been defined which will act on the information aspect and on the integration of different services.

Since the causes associated with each of the challenge have been accessed it will directly reflect on the actions included in the respective strategy. On the other hand, the indicators will be associated with the

"visible" effects of the challenges, previously referred as consequences. Below, Figure 20, lays out the strategy that will be followed with the corresponding challenges to be tackled.

The first two strategies match the already described path that is being followed by the Lisbon City Council, by putting the focus on active modes and public transport. These strategies are intended to free the areas closer to the terminal, i.e. city centre, and the other two main touristic areas, Belém and Parque das Nações, from road traffic generated by the terminal. The actions should be focused on the offer side of the deal, providing infrastructure and suitable conditions for these modes to be attractive.

Encouraging the cruise passenger to choose those modes of transport will not only reduce carbon emissions and reduce road traffic congestions but also stimulate local commerce with more people walking on the streets. For the touristic bus tours associated with cruise tourism not to be economically affected the destinations further away from Lisbon should be left for these modes. The result would be that Lisbon should primarily be "discovered" by public transport and active modes while the other destinations should be explored by the touristic buses operators. Here we are already dealing with the third strategy by promoting alternative destinations to balance the fluxes evenly between distinct locations. This strategy aims at improving the passengers experience by reducing waiting times at attractions, reducing impacts on local's quality of life by minimizing the interference of tourism and lastly allow these alternative locations to also profit economically from cruise tourism.

Figure 20 – Diagram laying out the challenges and the strategy to be followed.
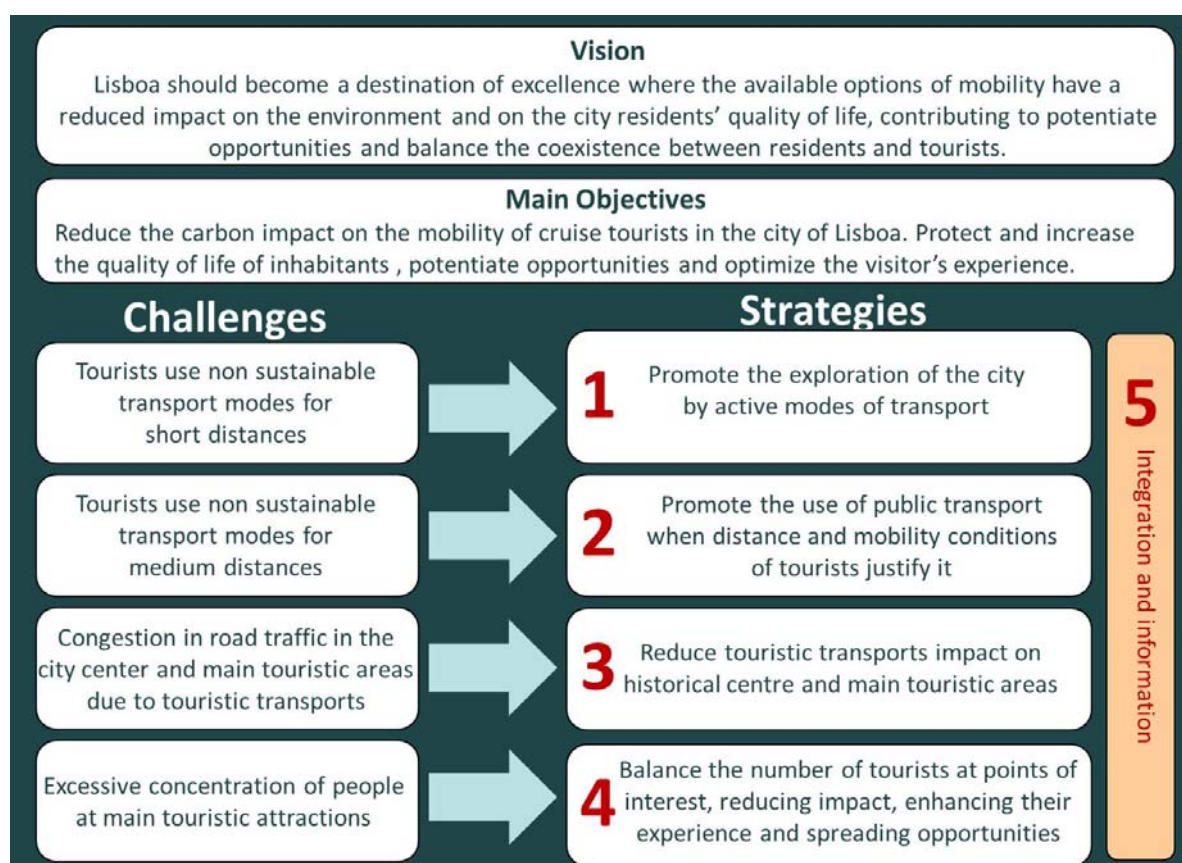
The last strategy will mainly deal with the regulation aspect of touristic buses business. The objective is not to decrease the share of market or economic benefits but to reduce the negative impact on the city and introduce measures that will contribute to the economic, social and environmental sustainability of the business.

The information and integration strategy will support the other four strategies. On one hand it deals with promotion among passengers and information provided to them and on the other it pushes for integration of different services as means to boost more sustainable transport options.

3.4. Actions and indicators

For each challenge, a strategy has been determined. To prosecute each, several actions have been planned, responding to specific objectives. Activities were planned to achieve that objectives and the indicators that will ensure the monitoring of the actions and how successful they are. The quantifiable indicators have their target value set to be achieve in the year 2021. Furthermore, related actions will also be listed since none of it are isolated.

"Information and integration" was established as a **transverse strategy** (n.5), essential to guarantee that the other **four complementary strategies** (n.1 to 4) will be succeeded. This logic may easily be understood on the table below.

Figure 16 – Diagram laying out the strategy and related actions.

Once this strategy was established, the objectives, activities, indicators and targets of each action have been defined. The information sheet of each action may be seen below.

Complementary STRATEGY N.1

Promote the exploration of the city by active modes of transport.

Table 10 – Action 1 information sheet

Action 1 ➢ **Creation of accessible and signalled pedestrian routes that connect distinct touristic attraction areas between each other and with the terminal.**
Objective ➢ Increase the number of people exploring the city by foot.
Activities ➢ Map existing and planned accessible pedestrian routes. ➢ Identify gaps in existing pedestrian network in terms on missing connection and lack of accessibility. ➢ Identify touristic routes to be promoted / intervened. ➢ Development of solutions that tackle these gaps. ➢ Development of dedicated pedestrian signs. ➢ Propose mechanical equipment to aid pedestrians in hilly areas of the city (if not already in development through the Plan for Soft and Assisted Accessibility to the Castle Hill ➢ Improve connection with public transport
Related actions: ➢ Action 2: Promote the creation of project with electrical wheelchairs ➢ Action 5: Improve public transport supply ➢ Action 6: Integrate the access of tourists to sustainable mobility options and cultural attractions ➢ Action 9: Develop intelligent systems for flux management

Indicators and target:
o Share of cruise passengers walking and/or using public transport:
   o Currently: 14% for walking and 3-14% public transport (depending on the mode)
   o Objective: 50% walking and/or using public Transport
o Kms of pedestrian touristic routes connected to the terminal (directly or through accessible PT):
   o Currently: 0
   o Objective: 12

Description:

The first action concerns with the walking aspect of the strategy aiming at the creation of pedestrian routes with accessible and inclusive sidewalks that facilitate the discovery of the city by the cruise passengers. These routes must be design as a network and should be connect to the terminal: directly in the city centre, or through accessible public transport when implemented in Belém or Parque das Nações. Touristic paths must be signalled in an easy and comprehensive way with destination, time, distance and attractions' information. The first task should be mapping existent routes already suitable for the purpose and identify new ones to be implemented. If the existing ones have gaps in terms of accessibility and need improvements, they should be addressed. After this work is done, new routes should be implemented and dedicated signalling installed. The routes should consider other plans already being implemented (e.g. Plan for Soft and Assisted Accessibility to the Castle Hill[5]). The connection with public transport (addressed in Action 5) should not be overlooked since both modes work better if in line with one another. Furthermore, transverse Action 11, which relates with the information aspect, should be implemented in the same timeframe.

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[5] *Plano de Acessibilidade Suave e Assistida à Colina do Castelo*

Table 11 – Action 2 information sheet

Action 2
o **Promote the creation of project with electrical wheelchairs**
Objective o Facilitate the inclusion of passengers with low mobility
Activities o Business model o Choose locations where to implement in coordination with Action 1.
Related actions: ➢ Action 1: Creation of accessible and signalled pedestrian routes that connect distinct touristic attraction areas between each other and with the terminal. ➢ Action 6: Integrate the access of tourists to sustainable mobility options and cultural attractions ➢ Action 8: Regulate parking of touristic transports.
Indicators and target: ➢ Existence of an electrical wheelchair project.

Description:

   As previously reported there is a considerable number of tourist that have low mobility. To cope with this, shared wheelchairs (Action 2) can be placed in strategic points of the city to allow passengers to visit the area surrounding the place with minimal effort. The wheelchairs can work together with the touristic buses since they can be placed in a dedicated parking allowing the buses to stop away from the congested areas around popular attractions. This parking spaces should be close enough to allow the passengers to move there independently (for more details refer to Action 10). It will be important to define a business model to allow the project to be financially sustainable and to carefully choose the locations where it will be implemented.

Table 12 – Action 3 information sheet

Action 3
➢ **Continue with the implementation of the cycling network, considering the development of paths that are favourable to tourism.**
Objective ➢ Increase number of passengers cycling.
Activities ➢ Map current cycling network. ➢ Identify touristic routes to promote. ➢ Identify gaps in the network (with attention to previously identified routes). ➢ Develop solutions to bridge these gaps. ➢ Development of dedicated cycling signs.
Related actions: ➢ Action 4: Promotion of bike sharing schemes for tourists. ➢ Action 6: Integrate the access of tourists to sustainable mobility options and cultural attractions ➢ Action 9: Develop intelligent systems for flux management

Indicators and target:
➢ Share of passengers cycling:
  o Currently: 0%
  o Objective: 5%
➢ Kms of cycling infrastructure implemented on touristic areas and linked to the terminal:
  o Currently: 0
  o Objective: 18

Interreg
Mediterranean
LOCATIONS

Description:

   This action aims at creating the necessary infrastructure to promote cycling among cruise passengers. The city council is currently building several new cycle paths and the objective of this plan is to evaluate the construction of new cycle paths that can also benefit cruise tourism. Starting by mapping the current and planned cycling network and by identifying desirable routes that are favourable to cruise tourism (or tourism in general), new routes can then be planned and proposed. Dedicated signs should be implemented with relevant touristic information like what is proposed in the case of the pedestrian routes (Action 1): destination, time, distance and attractions' information. Again, it is fundamental to coordinate with Action 11 to promote this mode among passengers.

<div align="center">Table 13 – Action 4 information sheet</div>

Action 4
➢ **Promotion of the use of bike sharing schemes by tourists**
Objective
➢ Increase number of passengers cycling.
Activities
➢ Study the expansion of the public bike sharing system with cruise tourist in mind. ➢ Promote the creation of bike sharing schemes dedicated to tourist. ➢ Consider the expansion of the cycle paths network and the touristic hotspots when carrying out these activities.
Related actions:
➢ Action 3: Continue with the implementation of the cycling network, considering developing paths that are favourable to tourism. ➢ Action 6: Integrate the access of tourists to sustainable mobility options and cultural attractions ➢ Action 9: Develop intelligent systems for flux management
Indicators and target:

➢ Share of passengers cycling:
    o Currently: 0%
    o Objective: 5%

Description:

   With the same objective as Action 3, Action 4 aims at fostering the use of bike sharing services. The current public bike sharing system contemplates three stations close to the terminal but here it is proposed the study of incrementing the capacity (the closest station has capacity for nine bicycles) to accommodate the cruise passengers demand not only in the terminal but in the primary areas that they visit (city centre, Belém and Parque das Nações). Also, alternative bike sharing systems dedicated to tourism should be considered for them (the passengers of cruise ships) not to interfere with the use of the public bike sharing systems by the locals. For this action to be successful it is important to coordinate it with the current and future cycling network (Action 3), the touristic attraction locations and the promotion of this service among cruise passengers (Action 11).

Complementary STRATEGY N.2

Promote the use of public transport when distance and mobility conditions of tourists justify it.

Table 14 – Action 5 information sheet

Action 5
➤ **Improve public transport supply**
Objective ➤ Increase the number of people using public transport options when some transport is need.
Activities ➤ Enable the selling of tickets of public transport at the cruise terminal. ➤ Increase capacity of bus and tram lines that are overcrowded due to touristic interest of the location they connect.
Related actions: ➤ Action 1: Creation of accessible and signalled pedestrian routes that connect distinct touristic attraction areas between each other and with the terminal. ➤ Action 6: Integrate the access of tourists to sustainable mobility options and cultural attractions ➤ Action 9: Develop intelligent systems for flux management

Indicators and target:
o Share of cruise passengers using public transport:
    o Currently: 3-12% public transport (depending on the mode); touristic buses: 79%
    o Objective: 20% using public transport; touristic buses: 50%
o Availability of public transport tickets at the terminal

Description:

Naturally this action cannot be disassociated with Action 1, which concerns itself with promotion of walking. Here the objective is to increase the attractiveness of public transport either by increasing its capacity on the more important routes (important for cruise passengers in this case) or by simplifying the access to it. To achieve the latter, two actions seem to play a key role: enabling simple information and the selling of tickets inside the terminal thus bringing the public transport "closer" to the cruise ship and the integration of all the public transport modes, other mobility services and entrance in specific attractions into a single ticket (Action 11). Furthermore, the increase of capacity of the tram line number 15 should be considered along with the already planned expansion of the line itself. This action needs to be coordinate with Action 11, as most of the others, due to the need of informing the tourists about these options and convince them of it to be the best way to visit the city (at least the areas close to the terminal).

Table 15 – Action 6 information sheet

Action 6
➤ **Integration of sustainable transport options and cultural attractions ticketing**
Objective ➤ Increase the number of cruise passengers using sustainable transport options
Activities ➤ Create an advantageous package that includes mobility and cultural services. ➤ Study the integration of mobility and access to cultural attractions though ticketing and smart systems.
Related actions: ➤ Action 1: Creation of accessible and signalled pedestrian routes that connect distinct touristic attraction areas between each other and with the terminal. ➤ Action 2: Promote the creation of project with electrical wheelchairs ➤ Action 3: Continue with the implementation of the cycling network, considering developing

Interreg Mediterranean
LOCATIONS

Action 6
➢ **Integration of sustainable transport options and cultural attractions ticketing**
paths that are favourable to tourism. ➢ Action 4: Promotion of the use of bike sharing schemes by tourists. ➢ Action 5: Improve public transport supply ➢ Action 9: Develop intelligent systems for flux management ➢ Action 10: Diversify the touristic hotspots
Indicators and target: ➢ The main indicator will be if the related actions are successful or not (therefore, indicators of related actions are measure) ➢ Existence of the described package

Description:

This action is intended to foster the creation of a multi modal package that includes distinct mobility services along with entrances to cultural attractions. Services here include can be bike sharing, touristic transport, public transport, walking apps (such as the one proposed in Action 6) and even access to monuments and museums. Touristic transports can play a key role here since they might help fill gaps in the mobility network of the city (e.g. a passenger uses public transport in the city centre and then takes a touristic transport to a location outside the city such as Sintra or Cascais). Coordinated with Action 12, this package should be promoted among tourists and made available at the cruise terminal for maximum success.

Complementary STRATEGY N.3

Reduce touristic transports impact on historical centre and main touristic areas

Table 16 – Action 7 information sheet

Action 7
Regulate flow and fleet of touristic transports
Objective ➢ Minimize impact of touristic transports on traffic flow, noise, air pollution and CO_2 emissions.

Activities
➢ Update regulation:
   o Evaluate the existing routes and propose necessary modifications.
   o Study where the ban of circulation of touristic transport should be imposed.
   o Promote the replacement of fossil fuel by electric powered vehicles or other low carbon solution
   o Provide necessary infrastructure
➢ Reinforce oversight to the flow of touristic transport considering regulation.

Related actions: ➢ Action 8: Regulate parking of touristic transports. ➢ Action 9: Develop intelligent systems for flux management ➢ Action 10: Diversify the touristic hotspots.

Indicators and target:
➢ Number of buses crossing downtown.
   o Objective: 0.
o Share of touristic fleet powered by electricity
   o Currently: unknown
   o Objective: 50%

Description:

Prohibition of the circulation of touristic transports on certain areas of the city is already being enforced in the city. A study of where it would be more advantageous to extend this prohibition is necessary. The objective is to minimize the impact that the touristic transports have on the traffic flow of the city by defining alternative routes. One of the proposals is to find an alternative route around the historic centre for the buses that want to go from the cruise terminal, on the east side of historic centre, to the areas at west of it. This should be done in coordination with the touristic transports operators to find the best solution for all parties. When the final solution is put into practice it is important to enforce it through oversight by municipal police force. The preferred routes to be used by the touristic transport should consider the locations where the attractions are, the capacity of those locations to receive tourists and the parking space location and availability.

Of all the touristic transports present in the city of Lisbon, the tuk-tuks are the only that are moving towards an electric powered fleet. It is important to encourage this trend to be accepted by the other touristic transport operators to cut down emissions. The shift in the technology should be phased (e.g. 5 years until mandatory) to allow operators to adjust to the new reality and not arm their financial sustainability. This should be done through regulation and financial incentives can be considered to promote a faster change. Dedicated infrastructure to support an electric flees (i.e. charging stations) needs to be considered. The cruise terminal and the touristic bus parking spaces around the city (in coordination with Action 9) should be optimum places to install charging stations.

Table 17 – Action 8 information sheet

Action 8
➢ **Regulate parking of touristic transports**
Objective
➢ Decrease congestion caused by the drop off and pick up of passengers at touristic locations
Activities
➢ Update regulation
o Create short stay areas for pick up and drop off close enough to attractions (museums, monuments, etc.) for people with reduced mobility to access them.
o Create prolonged stay parking areas for buses to wait after dropping off passengers.
➢ Reinforce oversight of parking regulations.
Related actions:
➢ Action 2: Promote the creation of project with electrical wheelchairs
➢ Action 7: Regulate the flow and fleet of touristic transports
➢ Action 9: Develop intelligent systems for flux management and access to attractions
Indicators and target:
➢ Number of parking areas dedicated for buses
o Currently:
▪ 0 prolonged stay parks
▪ 49 parking areas for drop off and pick up of passengers (not exclusively dedicated to tourism)
▪ 23 parking areas for tuk-tuks
o Objective: At least two prolonged stay parks (Belém and City Centre)

Description:

To regulate parking of touristic transports it is necessary to create a strategy that meets their needs and minimizes their impact on traffic flow. Regarding touristic buses, a system of short stay parking spaces, only for drop-off and pick-up of passengers, associated with prolonged-stay parking spaces can meet those requirements. The short-stay parking spaces should be close enough to attractions so that even passengers with low mobility can reach them easily. After dropping off the passengers, buses can park at the prolonged-stay spaces, which should serve strategic touristic areas (e.g. Belém, historic centre and Parque das Nações), and return to pick-up the passengers when they finish visiting the area. Action 2 can be associated with this one since electric wheelchairs can be provided to the passengers that require them at the target areas. The wheelchairs can be provided either at the prolonged stay area, in which case the bus drops off those passengers in that area, or at the short stay parking area. The flux management system proposed in Action 6 must take the parking capacities into consideration and both need to be coordinated so that the right amount of parking spaces is made available. If Action 9 is to go forward, then charging stations for electric buses must be installed at the prolonged-stay parking spaces.

Table 18 – Action 9 information sheet

Action 9
o **Develop intelligent systems for flux management**
Objective
o Balance the number of tourist at each touristic location
Activities
o Create an integrated system used by operators of touristic buses and by touristic attractions which regulated the access of buses to distinct parking areas according to the capacity of the public space around.
o Create a mobile app which facilitates the "discovery" of the city through active transport modes
Related actions:
➢ Action 1: Creation of accessible and signalled pedestrian routes that connect distinct touristic attraction areas between each other and with the terminal.
➢ Action 3: Continue with the implementation of the cycling network, considering developing paths that are favourable to tourism.
➢ Action 4: Promotion of the use of bike sharing schemes by tourists.
➢ Action 5: Improve public transport supply
➢ Action 6: Integrate access to sustainable modes of transport and cultural attractions ticketing
➢ Action 7: Regulate the flow and fleet of touristic transports
➢ Action 8: Regulate parking of touristic transports
➢ Action 10: Diversify the touristic hotspots
Indicators and target:
➢ Existence of the described platform
➢ Existence of the described mobile app

Description:

It has been referred that the cruise passengers mostly visited the same touristic areas which are also visited by tourists in general. The objective here is to create a balance in the number of tourists in each area to allow a better experience by them and decrease the impact on the residents' quality of life. The first activity is a system that regulates the access of touristic buses to certain touristic areas based on the capacity of the latter. The capacity should be determined based on the number of attractions, mobility services available, public space area, number of restaurants and other relevant parameters. After this capacity is defined, a limited number of parking spots (based on the capacity of the area) for touristic buses should be made available and the operators would be able to book their spot through a common platform.

To complement, an app, directed at passengers that discover the city by their own means (i.e. public transport or active modes), should be created. This app should encourage the "discovery" of the city by their own means by suggesting routes according to the profile of the user and considering the current fluxes of tourists, waiting times at attractions and current occupation of touristic areas. Options such as access to public transport, shared services and attractions' tickets or services should be included also (Coordinated with Action 10).

<p style="text-align:center"><u>Complementary STRATEGY N.4:</u></p>

<p style="text-align:center">Balance the number of tourists at points of interest, reducing tourists' impact on the places and, enhancing their experience and spreading opportunities.</p>

<p style="text-align:center">Table 19 – Action 10 information sheet</p>

Action 10
➢ **Diversify the touristic hotspots.**
Objective
➢ Balance the number of tourists in each place.
➢ Promote economic benefits in other parts of the city.
Activities
➢ Promote alternative spots inside the city of Lisbon: Paço do Lumiar, Feira Popular, Monsanto, and others.
➢ Promote alternative spots outside the city: Sintra, Cascais, Palmela
➢ Consider the passengers that are visiting Lisbon for the second time.
Related actions:
➢ Action 6: Integrate access to sustainable modes of transport and cultural attractions ticketing
➢ Action 7: Regulate flow and fleet of touristic transports
➢ Action 9: Develop intelligent systems for flux management
Indicators and target:
➢ Share of tourists that visit locations outside Lisbon: 　o Currently: 18% Cascais and 28% Sintra 　o Objective: 30% for both and 10% for new locations
➢ Share of tourists that visits alternative locations inside Lisbon: 　o Currently: n/a (very few) 　o Objective: 15-20%
➢ Share of tourist that visit traditional locations inside Lisbon: 　o Currently: 85-93% depending on location 　o Objective: 75-80% depending on location

Description:

If many passengers start visiting Lisbon by their own means it could mean less revenue for touristic bus operators and in turn for cruise operators which could lead to an economically less attractive city at their eyes. This would reduce the number of ships and spoil the economic sustainability of the industry. Therefore, it's important to provide alternative locations and the proposal here is that touristic bus operators focus on alternative locations outside Lisbon, such as Cascais, Sintra, Palmela or Fátima. Due to the considerable number (89% in 2017 and 49% in 2016) of passengers that report having visited Lisbon before it is possible to explore these locations among those passengers that might want to visited alternative sites to the ones visited before. Furthermore, inside the city alternative locations should be potentiated such as Paço do Lumiar, Feira Popular or even Monsanto. This will always be more effective

among the referred passengers that have already visited the city since they've probably already been to the highlights of Lisbon.

Transverse STRATEGY N.5:

Integration and information

Table 20 – Action 11 information sheet

Action 11
➢ **Provide relevant information to tourists**
Objective
➢ Ensure the successful outcome of related actions
Activities
➢ Enable easy access to information regarding active modes network through maps, apps, on street signs, etc. ➢ Promotion and awareness rising towards active modes and public transport. ➢ Coordinate with cruise operators to promote alternative destinations reachable by coach to leave city centre to public transport and active modes. ➢ Use the terminal capabilities to inform tourists of where to go and how to get there.
Related actions:
All complementary actions
Indicators and target:
➢ The main indicator will be if all the complementary actions are successful or not (therefore, indicators of related actions are the measure)

Description:

Most of the actions presented before will only be successful with an effective promotional strategy among cruise passengers. Here it is included promotion and information before and after the passenger arrives to Lisbon. Dedicated apps to cruise passengers and coordination with cruise and touristic buses operators will be key activities. The full strategy of the plan should be shared with the latter and adapted if necessary to encompass their needs. Special attention should be given to the strategy of focusing touristic transport in destinations outside the city to free the city centre of associated road traffic. The terminal itself will be a key asset to influence the passengers by making information and mobility services available. Therefore, the cruise terminal operator must be involved in this action together with the Lisbon Tourism Association.

3.5. Development of future scenarios

As described in the diagnosis chapter, Lisbon is a city where tourism is prospering and each year more tourists visit it, either arriving by plane, by car or by cruise ship. The future scenarios account therefore for the expected increase in the number of tourists. Since the actions described before have a focus not only on low carbon transport but also on the peaceful coexistence of tourists and inhabitants this analysis will focus on those two paradigms. On one hand, the effect on pollutants and greenhouse gases emissions will be predicted and, on the other hand, the effect on the pressure put on the locals' quality of life. The analysis will be qualitative to avoid making predication that are too uncertain to be reliable since these, are fast changing scenarios, that depend on external events, such has tourist and cruise fluxes, and on internal politics, that can support the actions or put a halt to it.

To account for possible deviations from the plan in terms of objectives, ambitions or duration three potential scenarios where developed: Worst-case scenario, best-case scenario and most likely scenario.

In the worst-case scenario none of the LCTP's actions are implemented and tourism continues its steady growth. No modal shift will take place and passengers will maintain their current preference for non-sustainable transport options. No balance on the number of tourists at each location will be reached, increasing therefore the pressure on the touristic locations and consequently on the quality of life of the locals. The image that the latter have of tourism (and cruise tourism) will decrease with probable negative economic consequences on the cruise business. Emissions of greenhouse gases (and pollutants) and the coexistence between locals and tourists are expected to worsen due to the described outcome.

If all the LCTP's measures are implemented, then we face ourselves with the best-case scenario. A modal shift will take place with passengers opting for more sustainable ways to move around the city. New transport options will be developed with integrated solutions that account for the passengers', the operators' and the locals' needs. A balance of the number of tourists will be reached easing the pressure on the touristic locations with the expected improvement of cruise tourism reputation. Furthermore, new locations will be explored enabling an economic profit from those and better distributions of profits. Since more passengers will choose active modes as their means of transportation, local commerce will prosper as it has been demonstrated. [29] Emissions of greenhouse gases (and pollutants) and the coexistence between locals and tourists are expected to improve due to the described outcome.

Midway between the two described scenarios lies the most-likely scenario where some of the actions are implemented and other are not. The most likely to be implemented are Actions 1, 3, 7, 8, 10 and 11 since they don't require private funding or support being under the sole authority of the city council. Obviously, these actions will be much more successful with the support of the operators and probably are the ones they will most easily support. Despite a likely modal-shift and better balance of touristic fluxes the increase in the number of tourist will counteract the improvements that the former would bring. Furthermore, actions that would have significant impact such as the change of technology on the touristic transport fleets would not contribute to the objectives. If this scenario is achieved there should be some degree of improvement in the greenhouse gases and pollutants emission and on the coexistence between locals and tourists but no as high as in the best-case scenario.

It's also predictable that some actions (ex: 1, 3) are only partially implemented and/or its targets only partially achieved. This hypothesis would configure a midway scenario and we should say that it's the most likely one.

Table 21 summarizes the information regarding the three presented scenarios enabling an easy comparison between each scenario.

Table 21 – Different scenarios and foreseen impacts

Scenario	Pollutants and Greenhouse Gases	Coexistence between locals and cruise passengers
Worst-case scenario	With increasing number of cruise passengers and with current modal share, the number of touristic couches will increase and with it GHG and pollutants emissions	As the cases of Venice and Barcelona show if no measures are implemented the locals will start to question the benefits of tourism over the negatives. Normally cruise tourism is one of the main targets since its characteristics make it more visible (e.g. big packs of people and size of cruise ships)
Best-case scenario	Despite the increase of cruise passengers, there will be more tourists using more sustainable option (e.g. public bus, walking, cycling and others). This means that less GHG and pollutants will be released.	Touristic sites will not be overcrowded since there will be a balance between the different touristic areas. Also, local commerce will prosper with more people cycling and walking in the streets. This will benefit the image that the local population has of the cruise passengers.
Most likely scenario	The modal shift to low carbon options might not be enough to reduce the GHG and pollutants emissions (due to increase of total number of tourists) but could be enough to maintain the current levels.	There might be some decongestions of touristic sites with the creation of alternative ones and better balance between the touristic areas. Despite this and with increased number of tourists if the results are not visible to the locals, their image of cruise passengers will unavoidably worsen.

4. Monitoring and Implementation

The successful implementation of the actions will contribute to define the future scenario for the city of Lisbon along with all the external and internal factor that affect it. To access how successful the measures are a monitoring strategy is also necessary based on the indicators previously presented. Important aspect to consider are the timeframe, actors involved, responsibility for monitoring and funding all of which will be covered in the following sections.

All the actions were elaborated with the period 2019-2021 in mind to account for the political cycles (the current one ends at end of 2021) and to have time from the conception of the Low Carbon Transport Plan until political actors support it and promote its strategy. Therefore, actions are to start being implemented in the beginning of 2019 with the first visible effects expected to be felt during 2021.

Monitoring the implementation of the actions will be a key aspect since only this away the success of the plan can be accessed. Furthermore, only these way corrective actions can be design in case of a lack of success in the originally planned actions. As in all plans the process is a continuous one that should follow the plan, do, check, act cycle.

To keep the same format as in previous sections, this one will also be structured according to the developed strategies.

Beside from that, it was concluded that it would be important to establish a global indicator, pointing the main objective of the project, which is, as known, the reduction of CO_2 emissions.

4.1. Strategy 1 – Promote the exploration of the city by active modes of transport.

Interreg
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The first action of this strategy deals with public space and its conception. Therefore, the Lisbon City Council should be the key actor since it falls under its responsibilities. More specifically this action meets the competences found in the EPAP (Team of the Plan for Pedestrian Accessibility) department which has extensive experience in this field. This action even crosses some of the proposed measures of the plan conceived by this team and several common aspects can be found [30]. Lisbon Tourism Association should also be involved since the routes to be implemented should have touristic interest and be promoted among tourists. Since the Association already does a yearly enquire that accesses the modal share of people walking there's no need to put into place a specific monitoring strategy since that data can be used to do just that. Nevertheless, it is proposed that the Lisbon City Council accesses the implantation of the routes mid-way which would be June 2020. These way corrective actions can be implemented, or a different path taken depending on the situation found at that moment.

Regarding the second action it is clearly a business idea proposition that can be embraced by private companies or start-ups. Currently in Lisbon there are several start-up competitions that can boost a project like this of which Smart Open Lisbon (SOL) is an example. Here, the start-up's, are challenged to develop a business idea that can contribute positively to the city with a focus on open and shared data. Another option is for touristic bus operators to implement it as a complementary service to the one they already provide. Furthermore, the Lisbon City Council should be involved in the definition of the spots were the project will be implemented. It would also fall under its responsibilities to access the state of the action in June 2020 to check if the different approach should be considered.

Like Action 1, Action 3, deals with public space and both are very similar in its essential conception. What changes is the transport mode which in this case is the bicycle. The city council is already pursuing a strategy of expansion of the cycling network and this action can contribute to this by considering the touristic flows from the cruise terminal. Again, the Lisbon Tourism Association can help with definition of the routes, promotion of them and with the monitoring through the same enquiry.

Dealing with the current public bike sharing services, it is proposed that this action fall on Lisbon City Council, has we shouldn't expect that Lisbon's bike sharing system operated by EMEL to be the solution. It may be only a small part of it.

Other private sharing systems exclusively dedicated to tourism may be under EMEL (Mobility and Parking Municipal Company of Lisbon) since the system is operated by them. Lisbon Tourism Association must also be involved in the promotion of the system among cruise passengers. Monitoring can be done through the enquire to cruise tourists. Table 22 summarizes the proposed implementation and monitoring of the actions included in this strategy.

Table 22 – Implementation and monitoring summary of actions 1 to 4

Promote the exploration of the city by active modes of transport.				
Action	Actors	Indicators	Responsibility for monitoring	Monitoring schedule
1	Lisbon City Council Lisbon Tourism Association	Share of cruise passengers walking and/or public transport.	Lisbon Tourism Association	Yearly through the enquiry already done.
		Number of touristic routes starting and finishing at the terminal.	Lisbon City Council	Access mid-way: June 2020.

Promote the exploration of the city by active modes of transport.				
Action	Actors	Indicators	Responsibility for monitoring	Monitoring schedule
2	Privates/Start-ups Lisbon City Council	Existence of an electrical wheelchair project.	Lisbon City Council	Access mid-way: June 2020.
3	Lisbon City Council Lisbon Tourism Association	Share of passengers cycling.	Lisbon Tourism Association	Access mid-way: June 2020.
		Number of touristic routes starting at finishing at the terminal.	Lisbon City Council	Yearly through the enquiry already done.
4	Lisbon City Council EMEL Privates/Start-ups Lisbon Tourism Association	Share of passengers cycling.	Lisbon Tourism Association	Access mid-way: June 2020.
		Capacity of station close to the terminal.	Lisbon City Council	Yearly through the enquiry already done.

4.2. Strategy 2 – Promote the use of public transport when distance and mobility conditions of tourists justify it.

It is proposed that Action 5 should be the responsibility of CARRIS and Lisbon City Council since it focuses on public transport. The increase in the capacity of public transport is already a strategy being followed by the City Council alongside CARRIS and here it is proposed that cruise passengers' fluxes are taken in consideration when doing so. Nevertheless, cooperation with the Lisbon Cruise Terminal operator is essential since one of the activities is enabling the selling of tickets inside the terminal itself. Furthermore, Lisbon Tourism Association can play a fundamental role in promoting this transport mode among cruise passengers, at the terminal itself or through internet platforms. The enquiry that the Lisbon Tourism Association performs every year should serve as the tool to monitor Action 5 alongside a verification by CARRIS (or Lisbon City Council) of the tickets being available inside the terminal in June 2020. Bellow, Table 23, presents the summary regarding this action.

Action 6 proposes the creation of a mobility package with the integration of public transport, shared mobility services, touristic transports and cultural attractions entry fees, and must involve the most relevant actors. This means that all the actors of the listed fields must be involved, including all transport operators (touristic and otherwise), EMEL, Cultural attractions operators and others. Lisbon City Council would have the responsibility of pushing this idea forward enabling the cooperation of all the parties. For promotion of the package, Lisbon Tourism Association would have a key role along with the cruise and cruise terminal operators. Lisboa E-Nova would assume the responsibility of overseeing the successfulness of the action (in coordination with partners that monitor individual actions) and report back to Lisbon City Council. Of course, this action will benefit many of the previous such as the increase of public transport and active modes modal share.

Table 23 – Implementation and monitoring summary of actions 5 and 6.

Promote the use of public transport when distance and mobility conditions of tourists justify it.				
Action	**Actors**	**Indicators**	**Responsibility for monitoring**	**Monitoring schedule**
5	Lisbon City Council CARRIS Lisbon Cruise Terminal Lisbon Tourism Association	Share of cruise passengers walking and/or public transport.	Lisbon Tourism Association	Yearly through the enquiry already done.
		Availability of public transport tickets at the terminal.	CARRIS	Access mid-way: June 2020.
6	Lisbon City Council EMEL All transport operators Cultural attractions	Related actions are successful.	Lisbon E-Nova	Access mid-way: June 2020.
		Existence of the described package.	Lisbon City Council	Access mid-way: June 2020.

4.3. Strategy 3 – Reduce touristic transports impact on historical centre and main touristic areas.

All the actions contained in this strategy concern the touristic buses operators which means they should always be involved. Furthermore, all actions propose changes in regulation which is the responsibility of Lisbon City Council meaning that there should be cooperation between both parties to attend to the needs of the city and of the operators. Action 7 concerns with the routes and the technology used by the buses while Action 8 concerns with the parking aspect and so municipal police will be a key actor to enforce both regulations. On both cases Lisbon City Council, with feedback from touristic buses operators, should elaborate the routes and choose the locations for the parking areas.

Flux management is a responsibility of the Lisbon City Council and, as such, it makes sense that it overseas the follow-up of Action 9. The platform that regulates the access to touristic areas should be managed by the City Council but cooperation to define its parameters is necessary. Entities to be involved are the tourism operators (touristic transports, cruises, attractions), Lisbon Tourism Association and EMEL. For the mobile app, as in the case of the electric chairs project, private entities or start-ups can develop and explore it with the support of city council, of Lisbon Tourism Association or through competitions such as the already referred SOL. Monitoring should be the sole responsibility of Lisbon City Council as the main beneficiary of this action.

Table 24 – Implementation and monitoring summary of actions 7 to 9

Promote the exploration of the city by active modes of transport.				
Action	**Actors**	**Indicators**	**Responsibility for monitoring**	**Monitoring schedule**
7	Lisbon City Council Touristic Buses Operators Municipal Police	Number of buses crossing downtown.	Lisbon City Council	Periodic counts in loco or through sensors.
		Share of touristic fleet powered by electricity	Lisbon City Council	Access mid-way: June 2020.
8	Lisbon City Council Touristic Buses Operators Municipal Police	Number of parking areas dedicated for buses.	Lisbon City Council	Access mid-way: June 2020.
9	Lisbon City Council Tourism Operators Privates/Start-ups Lisbon Tourism Association EMEL	Existence of the described platform.	Lisbon City Council	Access mid-way: June 2020.
		Existence of the described mobile app.	Lisbon City Council	Access mid-way: June 2020.

4.4. Strategy 4 – Balance the number of tourists at points of interest, reducing, enhancing their experience and spreading opportunities.

Regarding action 10, the Lisbon City Council along the Lisbon Tourism Association must cooperate with cruise, terminal and touristic buses operators for it to be successful. Promotion of new destination needs to be on-board of the cruises or through internet platforms while bus operators must develop these new locations and provide the necessary connection to it. New destinations inside the city should be of interest to Lisbon City Council while outside Lisbon, the Cascais and Sintra City Councils should coordinate with the operators to gather interest. The enquiry done by the Lisbon Tourism Association should be enough to evaluate the successfulness of this action. As before, bellow, in Table 25, the summary of these actions is presented.

Table 25 – Implementation and monitoring summary of action 10.

Balance the number of tourists at points of interest, reducing tourists impact on the places and, simultaneously enhancing their experience				
Action	**Actors**	**Indicators**	**Responsibility for monitoring**	**Monitoring schedule**
10	Lisbon City Council Lisbon Tourism Association Cruise Operators Lisbon Cruise Terminal Touristic Buses Operators Other city councils	Share of tourists that visit locations outside Lisbon.	Lisbon Tourism Association	Yearly through the enquiry already done.
		Share of tourists that visit alternative locations inside Lisbon.		
		Share of tourist that visit traditional locations inside Lisbon:		

4.5. Strategy 5 – Information and integration

Action 11 focuses is a transverse one and focuses on the information and promotion level of the previous action contributing to the awareness by cruise passengers of the novel solutions proposed on the 10 complementary actions. As so, it must involve most of the actors relevant for the previous actions.

Lisbon City Council and Lisbon Tourism Association are the main drivers of promotion and information campaigns but in this case coordination with operators is paramount for a single message to exist increasing, therefore, the effectiveness of an information campaign. Like Action 6, this one will be successful if the ones it supports are also, and Lisboa E-Nova can, again, be responsible for aggregating the monitoring information from the individual actions to access this one. Table 26 presents the summary of the last two actions.

Table 26 – Implementation and monitoring summary of transverse action 11.

Action	Actors	Indicators	Responsibility for monitoring	Monitoring schedule
11	All previously mentioned actors	Related actions are successful.	Lisbon E-Nova	Access mid-way: June 2020.

4.6. Global Monitoring

Assuming, as dictated by all the predictions, that the number of cruises and passengers will continue to grow significantly, the plan success can't be measured having absolute CO_2 values as a reference. Also, because there will always be other factors influencing the results.

As so, a global indicator should be built, considering:

- Medium number of Km made by each cruise passenger in Lisbon
- Modes of transport used
- CO_2 emissions of each mode by Km, by passenger
- Number of cruise passengers per year

Since, currently the information regarding the distance that the passengers travel when in Lisbon is not available. Furthermore, one cannot associate a specific mode of transport with the destination of the passengers. (e.g. it is known that 28% of the passengers go to Sintra but it is not known if they go by bus or train or other transport mode). Nevertheless, efforts should be made to bridge this gap of information to evaluate the true impact of cruise tourism in CO_2 emissions. The success of the plan should then be measured having this indicator has a reference.

5. Funding

As seen in the previous sections, responsibility for the actions lies in the public and in the private sphere. Funds for concretization of the actions can therefore come from public or private investments. Furthermore, European funds (i.e. co-financing) should also be considered since many of the actions may fit in open or forthcoming calls.

Public funds can come from direct investment by the city council on infrastructure and promotional activities or from the touristic fund. The latter is created with the revenues that come from the touristic tax, which is charged to the tourists for every night a tourist spends in the city (until a maximum of 7

consecutive nights). Until 2019 a total of 33.7 million euros are planned be invest in the city. The strategy for this fund is to invigorate the touristic offer through fluxes management and themes diversification, which contribute to improve the quality of life of the residents. Actions included in the present plan like the creation and improvement of touristic pedestrian routes (Action 1), electric wheelchairs project (Action 2) and creation of mobile apps (part of Actions 9 and 11) can apply for this fund. Other actions like creation and improvement of cycle paths (Action 3), promotion of the use of bike sharing schemes (action 4), improve public transport supply (Action 5), diversify the touristic hotspots (Action 10) and the three actions related with touristic transport regulation (Actions 7 and 8) can all be funded by City Council funds since they are in line with the City Council strategy and therefore can contribute to its objectives for this term.

The main responsibility of the Lisbon Tourism Association is the promotion of Lisbon as a touristic destination. Therefore Action 12 can be incorporated in the Associations objectives and be funded with its budget which originates primarily from the Lisbon City Council.

Some of the actions may require private initiative and can generate revenue by themselves, possible being attractive projects for private organizations or start-ups. Action 2 with the electric chairs project fills these requirements with the touristic buses operators being a possible interested party. Bike sharing services focused on tourists like the one described in Action 4 can also be carried out by private initiative just like the mobile app included on Action 11 or the mobility package of Action 6. All these actions can be promoted by the City Council but carried out by private entities in collaboration with the relevant stakeholders.

The last, but also important source of funding can be the European funds that have several topics aiming at sustainable mobility. As example bellow is a list with some of the forthcoming topics for H2020 programme for the year 2019 that are potential matches to the strategy here devised:

1. Upgrading transport infrastructure to monitor noise and emissions
2. Innovative approaches to urban and regional development through cultural tourism
3. EGNSS applications fostering green, safe and smart mobility
4. An inclusive digitally interconnected transport system meeting citizens' needs

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