3. Sustainable Urban Mobility

3A. Present Situation

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Data</th>
<th>Units</th>
<th>Year of Data Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of population living within 300 metres of an hourly (or more frequent) public transport service</td>
<td>93.3%</td>
<td>%</td>
<td>2016 Source: Carris, Lisbon BUS Transport Operator</td>
</tr>
<tr>
<td>For all journeys under 5 km, proportion of these journeys undertaken by:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) Car</td>
<td>45%</td>
<td>%</td>
<td>No data for under 5km journeys available – presented here is total commuting modal split, independent of length, for Lisbon city in 2011 Source: Census 2011, INE (Statistics National Institute)</td>
</tr>
<tr>
<td>ii) Public transport</td>
<td>35%</td>
<td>%</td>
<td>Source: Census 2011, INE (Statistics National Institute)</td>
</tr>
<tr>
<td>iii) Bicycle</td>
<td>0.2%</td>
<td>%</td>
<td>Source: Census 2011, INE (Statistics National Institute)</td>
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<tr>
<td>iv) Foot</td>
<td>19%</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>v) Other.</td>
<td>0.8%</td>
<td>(motorcycle)</td>
<td></td>
</tr>
<tr>
<td>Proportion of buses operating in the city that are low emission (at least Euro V)</td>
<td>25%</td>
<td>%</td>
<td>2017 Carris, Lisbon BUS Transport Operator</td>
</tr>
</tbody>
</table>

Lisbon, with 550,000 inhabitants, is the center of a 2.8 million inhabitant metropolitan area.

- Lisbon city has 213,000 automobiles (388 cars per 1,000 inhabitants), but every weekday 370,000 other cars enter the city.

- The transport system is responsible for over 31% of city energy consumption and 40% of GHG emissions.

- CARRIS, the BUS company, incorporates 600 BUSES, that use a network of 678km (69km exclusive BUS lanes), 53 electric trams, 6 funniculars and 2 lifts, with 140M passengers in 2016. The company was municipalized in 2017, immediately introduced a free service for children (<13yo) and 15€ monthly tickets for seniors (>65yo). The City has also defined a 3 year strategic plan that includes: 60M€ CAPEX; 250 new buses (mainly natural gas and electric), 220 new drivers; 21 new neighbourhood lines; 7 new B HLS lines; free wi-fi on all buses/trams; new App (already available) with realtime info.

- The underground network, with 44km and 4 lines, 56 stations, had 153M passengers in 2016 (rising trend).
• For commuting, there are 5 mass transit train lines with 14 stations inside the city, and 5 mass transit boat lines that share 3 city interfaces.

• There are 3,500 taxis; Uber, Cabify and other mobile operated services are also widespread.

To better understand actual commuting patterns, a deep survey based mobility study is currently being done for all Lisbon Metropolitan Area. Results in 2018 are set to feed analysis of Lisbon SUMP in development.

However, the municipality has already started working to reduce and rationalize car use:

• increase in charged on-street parking places from 54,000 to 84,000 in 2017
• 4455 new deterrent parking places: 3080 in parking lots under construction, 975 private being negotiated (in stadiums, shopings, etc).

Figure 1 – Dissuasive parking being implemented, while on street charged parking is being extended

• Mobility cross funding strategy – municipal parking receipts being used to promote greener mobility alternatives: bike sharing, bus services, public elevators, management of car restricted neighborhoods.

• 8 Public lifts and escalators recently built, connecting 5 important historic neighbourhoods, improving walking mobility and public transport access.

• Lisbon Plaza Programme renovation and revitalization of 21 squares over the last 2 years, while Pavimentar 2020 is restoring more than 100 streets. The rehabilitation of the river front continues, allowing Lisbon citizens to regain pedestrian and cycling access to the river.

• Sidewalks have been improved with comfortable surfaces and 9400 crosswalks are to be made accessible and levelled (400 done).(Figure2)
Figure 2 – Traffic have been constantly reduced improving green mobility, the joy of public-space and better accessibility

Figure 3 – Bikeshare system has just been launched; cycling network is being implemented to assure bike-commuters’ safety
- **Lisbon Bike Sharing System**: 1410 bikes (2/3 electric) in 140 stations, launched on 19/09/2017. (Figure 3)

- **90km of existing cycle lanes** being renewed and rectified, taking into account best practices.

- **60km of new cycle paths** under construction or about to commence work.

- New cycle lanes resulted in an increase of **785%** (Av Republica) and **612%** (Av Fontes Pereira de Melo) of bikes users (2016 to 2017). From a city with virtually no cyclists in 2011, the bicycle is now part of the commuting scene (from **0.2%** to estimated **1.4% modal split in 2017**).

  ![Figure 4](image)

  **Figure 4** – Some of the cycling infrastructure built during 2017 on main city axis

- **Free bicycle transport** on all public transport networks (except some bus lines).

- Lisbon City Council partner of **H2020 CIVITAS project PROSPERITY** - supporting development of **Lisbon SUMP** - and **LOCATIONS** - design of Low Carbon Transport Plan.

- Lisbon **Municipal fleet**: **54 heavy duty CNG vehicles, 103 eVehicles and 105 eCharging points**.

- Lisbon has **540 public eCharging points** and will have 100 new semi-fast (22kW) and 3 fast (50kW) end 2017.
Private initiatives also contribute to greener mobility:

- There are 3 car sharing services in the city and an eMoto sharing service (170 shared electric scooters, launched in 2017 but already with 25,000 registered customers and more than 1,000 trips/day).

Figure 5 – Shared Systems launched during 2017 have been enthusiastically received by Lisbon population

- Via Verde Boleias App aiming to become the major reference in carpooling.

3B. Past Performance

Despite the historical approach to mobility, focused on providing for road-traffic demand (predict & provide), Lisbon has embraced a new mobility paradigm based on promoting smart pedestrians, cycling and public transport oriented policies while searching for new types of mobility services, reinforcing long term objectives regarding city sustainability and social cohesion (social integration).

Lisbon faces a strong mobility and transport challenge at both local and regional levels.

Nonetheless, the adoption of modern territorial planning instruments (like the Lisbon Green Plan or the awarded Lisbon Master Plan) is starting to significantly change the scenario. The car oriented “predict and provide” transport archetype is on the verge of critical change.

Green mobility (including cycling) is finally in the speech of all candidates of local elections (1st of October).

In 2009, the City of Lisbon published the Lisbon Strategic Charter 2010-2024 where it defines Lisbon as a “City of Neighborhoods”, indicating multifunctional walking neighborhoods as the basic cells of the city, fundamental elements that should be linked by sustainable mobility networks (namely public transport and cycling).
The new Lisbon Master Plan (2012) followed this charter, defines alternative guidelines for transportation and sets the benchmark for the development of much greater use of sustainable mobility.

Current local politics reflect the will of Lisbon users, creating a “Lisbon for people” and no longer for cars, with a set of specific actions that empower walking, cycling and public transport, along with new and innovative mobility services, focusing on sharing and aiming at the reduction of traffic volumes and their negative environmental impacts.

Figure 6: Urban Planning tools working towards a paradigm change

Figure 7– Definition of 230 city neighbourhoods (in blue) and their 150 inner squares (in orange)
Amongst the measures that have been implemented over the last years to promote sustainable mobility in Lisbon, the following deserve notice:

- **Conversion of several streets into pedestrian areas**, promoting and defending walking and local commerce;
- **Creation of pedestrian routes** linking historical neighborhoods, including mechanical apparatus (several vertical lifts and funiculars) in hilly historical areas where car circulation is difficult and cars were mainly parked on sidewalks;
- Development of the **Pedestrian Access Plan** defining guidelines and actions to promote walking and citizen inclusion;
- Creation of the “**One Square in each Neighborhood**” plaza program, defining 150 city squares for public space requalification, mostly for pedestrian use, 21 of which have already been implemented;
- Implementation of **school mobility programs**, such as safety projects, **Pedibus** and **Bike to School**;
- Promotion of **walking and cycling events**, and cultural street actions involving public transport;
- Creation of a **cycle infrastructure network**, with 90km of dedicated bicycle paths and protected lanes linking important urban areas of the city, including 6 **pedestrian-cycle bridges** to overcome important physical barriers (freeways, arterial roads, railways, and deep valleys) and metal ramps on stairs;
- **Integration of bicycles with public transport**, with the implementation of rules that allow bicycles to travel **free of charge on all** urban, suburban and regional trains, subway, boats and several bus lines, and the installation of bike racks onboard and on PT interfaces;
- Dissemination of large amounts of public equipment for safe **bike parking** throughout the city;
- Creation of **partnerships with local cycling associations** to promote bicycle use and private company involvement in the **dissemination of bicycle** mobility support infrastructure;
- Creation of 4 **car restricted areas** (with physical remote controlled barriers) in historic neighborhoods, only allowing access to residents and local shop owners;
- Creation of **Low Emission Zones** (approximately 30% of Lisbon territory) centered in the downtown areas, where private vehicles can only enter if they comply with a certain Euro standard
- Creation of EMEL, the **municipal parking company**, to regulate car parking in the city, restricting car use by commuters, taxing public space use for parking, creating resident zones and promoting surface parking
Construction of underground car parking, to reduce illegal parking, mainly on sidewalks (EMEL has 20 locations totaling 4,133 parking spaces, other companies have 319 locations with 77,056 parking spaces, the public transport system has 9 locations with 3,803 parking spaces, totaling 348 locations and 84,992 parking spaces);

Creation of park&bike programme, promoting car parking at city entrances and a switchover to public transport in the urban area by means of integrated ticketing;

Commencement of planning of 6 Bus with High Level of Service (BHLS) to empower BUS operator and increase service level;

Creation of 7 door-to-door small flexible bus services in historic areas, where the population is mostly elderly and has greater personal mobility constraints, measure that is now being extended to all 24 Lisbon parishes;

Organization of European Mobility Week and Car Free Day, with dozens of sustainable mobility events and permanent measures announced and implemented every year; Lisbon shortlisted for European Mobility Week Award 2015 and 2016;

Creation of 7 30km/h zones and shared zones, with traffic calming measures that reduce traffic crossing in residential and commercial neighborhoods, increasing road safety and assuring easier walking and cycling (32 zones planned, 6 zones operational - 48km streets adapted);
• Implementation of **540 public electric vehicle charging points** (awarded MOBI-E programme), with electricity **free of charge** and no parking fees now being upgraded with 100 new semi-fast (22kW) and 3 fast (50kW) points;

• **Acquisition of 103 electric vehicles** for the municipal fleet, including 57 light passenger vehicles representing 22% of the total 263 road fleet, making it nº 1 in Portugal and one of Europe’s largest electric fleets;

• Acquisition of 54 heavy duty natural-gas vehicles, integrated in the urban cleaning fleet. These measures have contributed greatly to Portugal winning **1st place for European cities with the lowest carbon dioxide emissions**.

• Creation of the Municipal **Participatory Budget program** allowing people to propose projects to be developed by the Municipality, and vote for the ones to be implemented - most have been towards sustainable mobility, particularly the creation of cycle infrastructure;

• Acquisition and installation of **21 radars, 6 variable message panels and 43 traffic monitoring video-cameras** in the most important urban avenues to promote slower car speeds, integrated with a centralized **traffic light control system that manages 256 of the 534 traffic light interceptions of the city**, another system that controls the tunnels and 17 real-time digital parking panels;

• Creation of the “Verdinhos” project (Portuguese diminutive for green, a reference to the green colored pedestrian signal), aimed at **regulating traffic on indicated crosswalks adjacent to schools**, to make for safe walkable routes to school for pupils. Recruitment of volunteers is conducted locally and will be the responsibility of Parish Councils.

• Crucial project “**Lx Porta a Porta**” (Lisbon Door-to-Door) created in 2004 by the municipality offers **free flexible**
shuttle services and establishing circuits in historic neighborhoods namely where transport is unsatisfactory and does not comply with the needs of the local population, particularly elderly people.

- **Improvement of public space** traditionally used by cars (thousands per hour), in dozens of streets and squares and on the riverfront;

**Figure 10** – Before & after of the significant interventions that occur during 2017
3C. Future Plans

Lisbon has a clear **vision** of the urban development model to pursue. This vision is cohesively embedded into the improvement of public space and in the definition of a **new multimodal integrated mobility system**. The main objective is to have a people friendly city that guarantees that anyone, anywhere in the city, can access at least two different sustainable, efficient, comfortable, safe and inclusive modes (alternative to private cars) within less than 500m.

**Figure 11** – Lisbon Mobility Strategic Vision organized in 10 mobility networks and services

*Lisbon Mobility Strategic Vision (MOVE Lisboa)* set guidelines for the design of a coherent mobility and accessibility system, aligned with the Density/Diversity/Design approach.

**Five objectives**: freedom (of mobility choice), inclusion, sustainability, attractiveness and prosperity.

**Methodology:**

- Higher density in the city by **recovering population** lost in the last decades to get critical mass for urban public transport and reduce private car commuting needs;
- Promote **multifunctional diversity**;
- **Restrict car circulation** by design, to protect neighbourhoods and the city centre;
- **Reduce car speed** citywide;
- **Rationalize car parking**;
- Radically **improve public transport** system;
- Create **better walking and cycling** infrastructure;
- Deploy **sharing** services;
- **Optimize intermodality** and expand multimodal system;
• **Eliminate trips** by including services in public transport interfaces (kindergartens, supermarkets, gyms...);
• Lower impacts from **urban logistics**;
• **Reduce home-school distances** and assure good school transport;
• Maximize number of **neighbourhood functions** (daily needs at walking distance);
• **Reduce mobility needs** (telework, on-line services...);
• Promote **travel behavior change**

**Figure 12** – MOVE Lx concept – Lisbon Mobility Strategic Vision

MOVE Lx focuses on optimizing and integrating 10 layers: walking, bicycling, PT, interfaces, traffic, parking, shared systems, urban logistics, tourism transport and other mobility services (school, door-to-door, etc....).

Integration, justaposition and coherence assured by transversal mobility management dimensions: integration with other city sectors/areas, control systems, financing, regulation, incentives, information, promotion, public participation, technology, monitoring and evaluation.
Lisbon is now developing Sustainable Urban Mobility Plan (SUMP), frameworaked by Horizon2020 project PROSPERITY.

Actions (highlights) preview for the next few years:

- Universal walking and cycling access to neighbourhood proximity functions (multifunctionality) such as schools, commerce or small scale services. Neighbourhood protected from crossing traffic and under revitalization of public space. 24 new neighbourhood bus lines (5 just launched) will complement short distance travelling

- Access to city/large scale functions such as universities, hospitals and employment areas, undertaken by efficient urban PT. Metro expansions now being designed (including circle line). Bus operator now under municipal control, changes include:
  - 250 new Buses, most CNG or electric – 60M€ investment
  - 220 new drivers
  - 7 new BHLS lines, improving commercial speed 42%
  - New bus lanes
  - Tram network extended and new tram routes
  - Children <13 to ride for free and senior tickets reduced 60% (15€/month)
  - Smarter and integrated ticketing, innovative ITS
  - On-line real time information to public (App being tested)
  - Free wi-fi in all buses
Redesign and integrate tariffs to create unique multimodal payment and validating system, mobility credits based, that includes all metropolitan mobility services (integrated with scholar card in case of students).

Bike Sharing System just launched, 1410 bikes (2/3 electric) available on 140 stations.

30km of cycling infrastructure just built (2017), 60km under construction (or about), another 50km in 2021.

Massive numbers of on street and off street bike parking.

Inclusive and comfortable walking rapidly developing (Access Walking Plan – 3,5M€), eliminating artificial barriers. 2500 pedestrian crossings and 2000 bus stops to be fully accessible (750 crossings and 110 BUS stops in 2018).

Vision Zero Dead’s due to traffic.
Application Form for the European Green Capital Award 2020

- Plaza Programme: revitalization of 150 urban squares (22 just finished). Pavimentar 2020 Programme: renew more than 100 streets (dozens finished), an unprecedented effort to improve public space.

- New inclusive mechanical means: Mouraria escalators (end 2017), Sé elevator (2018), Graça funicular (2018), adding to 4 recent public lifts and 19th century lifts and funiculars.

- More car, scooter and bike sharing schemes plus other smart phone based services to be launched, on top of existing 1410 bikes, 170 eScooters and 260 cars. 700 new shared cars (150 to 700 electric) still in 2017.

- Park&ride integrating new infrastructure: 4455 new places in outskirt parks will soon be available.

- On street charged parking rapidly growing: 54.000 beginning 2017, 105.00 in 2018.

- Electric motorization increasing dramatically. Public network of 540 eCharging points being upgraded with 100 semi-fast (22kW) and 3 fast (50kW) equipments. City Council fleet, with 100 electric vehicles, will add 47 new e-vehicles (plus 16 hybrids) in 2017, and 53 new fast and semi-fast eCharging points to the existing 100.

- Smart mobility monitoring and control system being upgraded, allowing for real time reactions: H2020 Lighthouse Sharing Cities (with London and Milan), Smart Open Lisbon (Open Data dynamic platform), Lisbon Integrated Operational Centre and WebSummit (> 60.000 investors/enterpreneurs in 2017).

- An integrated user-friendly public information platform will centralize and connect all relevant mode data for maximum optimization of urban travel. The existing contactless integrated ticketing system will expand to all new mobility services and will soon evolve to an unmaterialized system.
3D. References

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