Urban Mobility Metropolitan Plan
PMMU 2019-2024

The Proposal
1. Object, stages and participation process
2. Mobility tendency scenario
3. Mobility Model and quantitative objectives
4. Strategic topics and measures
5. Environmental evaluation
6. Cost estimation
7. Plan management
8. Juridical considerations
1. Object, stages and participation process

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Object

- The **Urban Mobility Metropolitan Plan (PMMU) 2019-2024** is the planning and programming instrument of mobility politics and actions, that AMB has to boost and develop within the next 6 years.

- The PMMU is a local plan with plurimunicipal nature, based on the existence of a interdependent mobility scheme among the metropolitan municipalities, as stated in the Law 9/2003 of mobility.

- The PMMU accomplishes one of the competences included in the Law 31/2010 of AMB and, at the same time, is set as a reference framework for the SUMP of the 36 metropolitan municipalities.
1. STAGE 1: ANALYSIS AND DIAGNOSIS + STRATEGIC INITIAL DOCUMENT (DIE)

2. STAGE 2: SCENARIOS AND PROPOSAL + STRATEGIC ENVIRONMENTAL STUDY (EAE)

   Initial approval

3. STAGE 3: PROCESSING AND APPROVAL

   PMMU + SUMMARY DOCUMENT

   Final approval

4. STAGE 4: EVALUATION AND MONITORING

Object, stages and participation process
- Participation process with AMB Mobility Board

- Participation process with Expert Commission

- Participation process with metropolitan Councils
1. Object, stages and participation process

2. Mobility tendency scenario

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6. Cost estimation

7. Plan management

8. Juridical considerations
Expected effects: mobility, consumption, CO2 emissions and air quality

- INCREASE IN MOBILITY, not only people’s but also goods’.
- POOR MODIFICATION OF MODAL SHARE
- LOW PENETRATION OF LEVs; new actors in mobility (PMVs, sharing mobility, “collaborative economy”)

**CONSEQUENCES:**
- No accomplishment of Climate Change Agreements (energy consumption and CO$_2$ emissions)
- Worsening of air quality in cities (exceeding the UE and WHO limits)
Mobility model

- HEALTH: Minimize the effects of the transport system in people’s health
- SUSTAINABILITY: Reduce the environmental impacts and contribution to climate change of the transport system
- EFFICIENCY AND TIC: Enhance the transport system efficiency, assuring the social and economic progress
- EQUITY, PEOPLE AND GOVERNANCE: Promoting a fair mobility system, that guarantees public transport access and social cohesion

Mobility model and quantitative objectives
Healthy mobility

01.1 Reduce accident rate related to mobility
01.2. Reduce mobility impact on local air pollution
01.3. Reduce mobility impact on noise pollution
01.4. Promote active mobility and physical training
## Mobility model and quantitative objectives

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Value 2016</th>
<th>Quantitative objective 2024 (vs 2016)</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1. Victims in road accidents (injured and deaths)</td>
<td>18,989</td>
<td>-50% (Vision 0%)</td>
<td>SDO: -50% injured 2020, vs 2010 Catalonia Road safety Plan 2017-2019: -45% deaths 2019, vs 2010</td>
</tr>
<tr>
<td>1.2. Population exposed to poor air quality related to NO2</td>
<td>52%</td>
<td>-50% (Vision 0%)</td>
<td>UE: ≥40 µg NO2/m³ on annual average</td>
</tr>
<tr>
<td>1.3. Population exposed to poor air quality related to PM2,5</td>
<td>1.2%</td>
<td>-50% (Vision 0%)</td>
<td>UE: ≥20 µg PM2,5/m³ on annual average</td>
</tr>
<tr>
<td>1.4. Population exposed to noise levels Lden ≥ 65dB (A)</td>
<td>44.2%</td>
<td>-50% (Vision 0%)</td>
<td></td>
</tr>
<tr>
<td>1.5. Mobility by foot, bicycle and PMVs in working day</td>
<td>4.8 millions</td>
<td>+10%</td>
<td>OMS: Δ 10% physical activity</td>
</tr>
</tbody>
</table>
Sustainable mobility

02.1. Reduce energy consumption and greenhouse gas emissions related to mobility
02.2. Promote the modal shift to sustainable mobility modes
02.3. Encourage the change to low emissions vehicles (LEV)
02.4. Reduce the transport system’s impact on landscape ecological functionality and boost green infrastructures for active mobility
02.5. Support an urban model that promotes sustainable mobility
### Mobility model and quantitative objectives

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<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1. Fossil fuel energy consumption in transport</td>
<td>0.87 M tep</td>
<td>↓</td>
<td>.</td>
</tr>
<tr>
<td>2.2. CO₂ emissions from transport and mobility</td>
<td>2.538 milers tCO₂</td>
<td>-5%</td>
<td>UE and Pla Clima AMB: -30% GEH in metropolitan area by 2030, vs 2005</td>
</tr>
<tr>
<td>2.3. Modal share of motorized private vehicle in a working day</td>
<td>29.8%</td>
<td>27.0%</td>
<td></td>
</tr>
<tr>
<td>2.4. Average interurban trips distance in motorized private vehicle</td>
<td>5.3 km</td>
<td>↓</td>
<td></td>
</tr>
<tr>
<td>2.5. Cycling Network (cycle paths, green paths, traffic calming streets)</td>
<td>1.496 km</td>
<td>2.000 km</td>
<td></td>
</tr>
<tr>
<td>2.6. Penetration of LEVs (electric, hybrid, gas)</td>
<td>0.3%</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>2.7 Self-contained municipal working mobility</td>
<td>70.4%</td>
<td>↑</td>
<td></td>
</tr>
</tbody>
</table>
### Efficient mobility

03.1. Reduce congestion and improve passenger transport system’s efficiency  
03.2. Enhance public transport services quality  
03.3. Promote a more efficient goods urban distribution

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Value 2016</th>
<th>Quantitative objective 2024 (vs 2016)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1. Car occupancy</td>
<td>1,16 pers/veh</td>
<td>+5%</td>
</tr>
<tr>
<td>3.2. Commercial speed in TB network</td>
<td>12,08 km/h</td>
<td>+10%</td>
</tr>
<tr>
<td>3.3. Commercial speed in AMB network during daytime</td>
<td>13,97 km/h</td>
<td>+10%</td>
</tr>
<tr>
<td>3.4. Commuter rail services punctuality</td>
<td>94%</td>
<td>98%</td>
</tr>
<tr>
<td>3.5. Satisfaction of public transport [from 0 to 10]</td>
<td>7,2</td>
<td>7,5</td>
</tr>
<tr>
<td>3.6. Railway modal share in goods from/to Barcelona’s Port</td>
<td>7,5%</td>
<td>12%</td>
</tr>
<tr>
<td>3.7. Covered surface by DUM microplatforms services</td>
<td>7,8 km2</td>
<td>30 km2</td>
</tr>
</tbody>
</table>
Equitable mobility

04.1. Ensure public transport accessibility
04.2. Ensure public transport affordability

<table>
<thead>
<tr>
<th>Indicador</th>
<th>Valor 2016</th>
<th>Valor objectiu 2024 (Respecte 2016)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Population with high PT service levels</td>
<td>67%</td>
<td>75%</td>
</tr>
<tr>
<td>4.2. Bus stops adapted to disabled people (1\textsuperscript{st} ring)</td>
<td>35,6%</td>
<td>60,0%</td>
</tr>
<tr>
<td>4.3. Train stations adapted to disabled people</td>
<td>90,0%</td>
<td>98%</td>
</tr>
<tr>
<td>4.4. Ratio between public transport interannual average tariff variation and CPI</td>
<td>-0,9</td>
<td>1</td>
</tr>
</tbody>
</table>
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6 Strategic Topics

Topic A. Urban model and metropolitan mobility networks
Topic B. Safety, healthy and equitable streets
Topic C. Integrative, efficient and high-quality public transport
Topic D. Flexible and efficient metropolitan mobility governance
Topic E. Mobility’s intelligent management
Topic F. Changing habits encouragement

29 Action lines

102 Measures
**Topic A. Urban model and metropolitan mobility networks**

It integrates measures that promote, on one hand, a sustainable urban model and urbanistic planning, and, on the other, actions in priority mobility infrastructures, clue to encourage a higher use of sustainable transport means, and a better efficiency in daily metropolitan mobility. It is established areas and coordination bodies between urbanism and mobility AMB departments (PDU-PMMU).

A.1 Mobility in urbanism planning

A.2 Basic main road network at the service of the metropolitan mobility system

A.3 Metropolitan connectivity for active mobility

A.4 Infrastructures to consolidate metropolitan public transport

A.5 Interchange points’ metropolitan system

A.6 Infrastructures to organize goods transport
The definition of the MBRN implies the progressive assumption of new AMB responsibilities in it, particularly about traffic programming, management and operation.
Interchange point’s metropolitan system

Complete and enhance the existing interchange point’s network

Bus Interchange Metropolitan Plan
Interchange points metropolitan system

Metropolitan Interchange Parking System (P+R)

Huge capacity bicycle’s park Plan in railway stations
Critical mobility infrastructures for AMB

Public transport

Pla Metropolità de Mobilitat Urbana 2019 - 2024. Proposta del pla

MAPA 18 (EIX A)
Actuacions infraestructures prioritàries per a la mobilitat en transport públic (execució a 6 anys)
Critical mobility infrastructures for AMB

Private vehicle

Pla Metropolità de Mobilitat Urbana 2019 - 2024. Proposta del pla

MAPA 10 (EX A)
Actuacions infraestructurals prioritàries per a la mobilitat en vehicle privat (execució a 6 anys)
Topic B. Safety, healthy and equitable streets
It integrates measures that revalue public space as convivial spaces and improve urban habitability, giving the prominence to all citizens equally and promoting the use of less pollutant means of transport.

B.7 Urban habitability and low emissions zones

B.8 High-quality, accessible and inclusive public space

B.9 Road safety: zero vision

B.10 Parking and road payment model

B.11 Low emissions vehicles (LEV)
Priority zones to improve urban habitability
Develop and monitor LEZ-Rondes

<table>
<thead>
<tr>
<th>Escenari</th>
<th>Desembre 2018</th>
<th>Gener 2020</th>
<th>Gener 2024</th>
</tr>
</thead>
<tbody>
<tr>
<td>Període</td>
<td>En cas d’episodi de contaminació Dll – Dv 7:00h – 20:00h</td>
<td>Permanent Dll – Dv 7:00h – 20:00h</td>
<td>Permanent Dll – Dv 7:00h – 20:00h</td>
</tr>
<tr>
<td>Restricció</td>
<td>Dièsel i Gasolina</td>
<td>Dièsel i Gasolina</td>
<td>Gasolina</td>
</tr>
</tbody>
</table>
Homogenize criteria for load/unloading goods in urban areas

Defining a metropolitan policy for road payment because of use, congestion or pollution

- Metropolitan toll scheme (congestion or toxicity toll) is seen as a mechanism for achieving sustainability in mobility
- AMB is willing to become an actor that helps doing this analysis and its debate, giving technical elements for widening knowledge and promoting the participation through workshops and specific coordination roundtables.
Extend the Metropolitan electric charging points network
Topic C. Integrative, efficient and high-quality public transport
It integrates measures that intensify the public transport competitiveness and attractiveness, in order to make it the selected option for the mobility needs of people, instead of taking private vehicles.

C.12 Improvement of bus and railway services

C.13 Public transport vehicles and facilities more sustainable and efficient

C.14 Public transport for everyone

C.15 Image and mobility service information homogeneity

C.16 Fare system sensible to socioenvironmental framework

C.17 Attractive and competitive metropolitan taxi

C.18 Bicycle in public transport
Metropolitan high-performance bus network

2nd ring bus services improvement Program

- It includes, among others: fleet increase, on demand services, new lines viability study and rush-hour frequency improvement.
Fleet renewal with LEVs and depots’ adaptation

Includes direct management services (regular and Barcelona Bus Turístic) and indirect management services (daytime, nocturnal, Barcelona City Tour and Aerobús)

Surrounding and accessibility improvement in bus stops and railway stations

Obj. 2024
60 % stops 1st ring adapted

Obj. 2024
98 % stations adapted
Taxi fleet renewal with LEVs and for disabled people

- Taxis >10 years banned
- No diesel vehicles will be authorized from 2019, except those adapted to disabled people.
- Promoting a 2014 scenario when all new taxis won’t be diesel.
- Grants/fiscal incentives for buying LEVs.
- Grants for adapting vehicles to disabled people.
Topic D. Flexible and efficient metropolitan mobility governance

It integrates measures that strengthen relations and institutional collaboration between public Governments and other organisms, in order to deal with future metropolitan mobility challenges in a more efficient way.

D.19 Governance and interadministrative accord

D.20 Metropolitan integration of local policies

D.21 Metropolitan strategy on touristic mobility

D.22 Public transport financing
Coordination between SUMP and PMMU

- Writing a methodological and procedure guide for the revision of the 36 SUMP.
- Technical and economic support for writing and implementing SUMP.
- Implementing and monitoring SUMP.

Improve the normative framework about active mobility and Personal Mobility Vehicles

- Complement the AMB bicycle’s ordinance model with new articles related to pedestrian mobility and PMVs.
- Generate diffusion material for citizens about the main aspects harmonized at AMB scale.
- Collaborate in the definition of signaling criteria in convivial spaces between cyclists and pedestrians.
- Create a recommendations guide for standardizing sharing bicycle and PMV companies without specific premises in urban centers.
Agreement on the financing sources of public transport

- Harmonizing methodology for calculating the coverage rate in public transport.
- Agree on the new financing sources within the future development of the Law 21/2015, of Catalonia public transport system financing.
- Promote the participation of other administrations involved in the compensation of social fare tickets selling.
- Reform of Decret 344/2006 about evaluation study of generated mobility (EAMG).
Topic E. Mobility’s intelligent management
It integrates measures that allow not only the modernization of mobility management with new techniques but also the development of new paradigms of mobility in our cities.

E.23 Integrated information and Communications systems

E.24 New mobility monitoring systems

E.25 Optimizing management in goods urban deliveries

E.26 New paradigms in mobility and energetic transition
Develop a metropolitan digital platform for managing goods urban distribution
Create new picking-up points

CitiPaq in Sarrià-FGC

- Passengers Railway Network
- Picking-up points in public premises
- Picking-up points in public transport stations
Boost new microplatforms for delivering urban goods
**Topic F. Changing habits encouragement**

It integrates measures that try to modify existing unsustainable mobility behaviours, through actions of awareness, training or policy enhancing in specific sectors, as the mobility generator centres.

F.27 Sustainable access to work and mobility generator centres

F.28 Education for sustainable mobility

F.29 Awareness and promotion of sustainability in mobility
Assist when planning and managing mobility in work centers and mobility generator centers

Develop different actions in collaboration with ATM, City Councils and other organisms:
- Economic and technical support for developing PDEs or PMEs and improve public transport services.
- Economic and technical support for developing and implementing projects on generated mobility, not only to workers but also to suppliers and customers.
- Establish monitoring and evaluation protocols, in order to redefine the type of actions to be subsidize.

Launch sensibilization campaigns for/about logistic sector, goods and e-commerce

- Promote learning courses for carriers related to safety and ecological driving and safety parking.
- Promote quality certify programs (EMAS, ISO 14.001, Lean and Green, EcoCity, EcoStars, ISO 390001 Road Traffic Safety, etc.).
- Work for achieving a correct use of load/unloading places.
- Write a good practice guide for companies working with e-commerce.
- Raising awareness about mobility problems generated by e-commerce
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### Results of alternative scenarios and PMMU scenario

#### Variaciones 2016 Λ 2024 tendency Λ 2024 Scenario 1 Λ 2024 Scenario 2 Λ 2024 Scenario 3 Λ 2024 Pla

<table>
<thead>
<tr>
<th>Milion veh-km total [road+railway]</th>
<th>13.821</th>
<th>8,1%</th>
<th>5,0%</th>
<th>-1,8%</th>
<th>-1,9%</th>
<th>-3,2%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total energy consumption [road+railway] (milers tep)</td>
<td>869</td>
<td>3,3%</td>
<td>3,5%</td>
<td>-3,3%</td>
<td>-3,8%</td>
<td>-5,0%</td>
</tr>
<tr>
<td>Total CO₂ emissions [road+railway] (milers tones)</td>
<td>2.538</td>
<td>2,1%</td>
<td>1,6%</td>
<td>-5,2%</td>
<td>-5,7%</td>
<td>-6,9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variaciones</th>
<th>2016</th>
<th>Λ 2024 tendency</th>
<th>Λ 2024 Scenario 1</th>
<th>Λ 2024 Scenario 2</th>
<th>Λ 2024 Scenario 3</th>
<th>Λ 2024 Pla</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOX emissions [road] (tones)</td>
<td>7.398</td>
<td>-17,2%</td>
<td>-26,6%</td>
<td>-29,5%</td>
<td>-31,7%</td>
<td>-32,5%</td>
</tr>
<tr>
<td>PM₁₀ emissions [road] (tones)</td>
<td>545</td>
<td>-12,1%</td>
<td>-24,1%</td>
<td>-27,3%</td>
<td>-30,0%</td>
<td>-30,9%</td>
</tr>
<tr>
<td>PM₂,₅ emissions (tones)</td>
<td>398</td>
<td>-12,4%</td>
<td>-25,3%</td>
<td>-28,6%</td>
<td>-31,1%</td>
<td>-31,9%</td>
</tr>
</tbody>
</table>

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**Environmental evaluation**
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Total cost estimated PMMU 6 years: 10.276 Mio €

- Developing infrastructures: 8.922 Mio €
- FMB and Rodalies maintenance Plan: 895 Mio €
- Other actions: 519 Mio €
Total cost estimated PMMU 6 years (without infrastructures): 1.354 Mio €

- FMB and Rodalies maintenance Plan: 895 Mio €
- Other actions: 519 Mio €
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Management Plan Program, to evaluate the execution and goal’s meeting, structured in 4 points

1. Strategic indicators of evaluation

2. Annual report of evaluation

3. Institutional coordination and social participation
   • Internal, institutional and social governance (through Consell de Mobilitat)

4. Citizen participation and spreading the Plan
1. Object, stages and participation process
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Juridical ordinance of AMB interventions in the Metropolitan Basic Road Network (MBRN)

- It is included a **LAW PROPOSAL** with regulatory characteristics:
  - Its content determines the juridical effects derived from the MBRN definition, in the different categories, specially in what affects competencial intervention of the different public Administrations in the mobility and transport field.
  - Internal character

- It is proposed **different types of intervention**, depending on:
  - BRN structurant
    - Preferential competence: Owner Administration
  - BRN secondary
    - Preferential competence: AMB
  - BRN local
    - Preferential competence: Municipalities and Owner Administration
  - RING-ROADS
    - Preferential competence: AMB
  - Local road network, not basic
Supervision:
Àrea de Mobilitat i Transport de l’AMB

AMB i Mobilitat

Coordination, writing and edition:
Institut d’Estudis Regionals i Metropolitans de Barcelona (IERMB)

iern

Technical assistance: