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Vision Statement

TML – Transportes Metropolitanos de Lisboa

Studies & Planning Department

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Executive summary

The Lisbon metropolitan area (LMA) is Portugal's most populated region and faces significant mobility challenges due to its diverse geography and population densities. The use of private cars dominates other modes of transport with a share of around 52 per cent, while public transport accounts for only 39 per cent of commuting in the region. This is a trend that has been particularly accelerated by the COVID-19 pandemic.

Despite the high level of coverage of the public transport network in Lisbon and its first crown, there is a clear decline as we move to the outskirts of the metropolitan area. These inequalities highlight the urgent need for flexible transport solutions to address inequalities in accessibility, especially in remote and sparsely populated areas.

With ArtMED, TML (Metropolitan Transport for Lisbon) aims to better plan flexible transport solutions such as demand-responsive transport (DRT) or autonomous mobility on demand (AMOD) solutions by transferring methodologies from École Centrale de Lyon (AVENUE) and CARNET (MultiDEPART) with 3 other PTAs: Slovenia (PO), Italy (ALOT), Greece (PF), to optimise and implement a publicly available AMOD impact assessment tool in a transnational approach.

The tool will help PTA analyse the potential impact of AMOD for four local use cases and develop vision statements, investment plans and transport model designs, for political, financial, and planning support of those solutions.

The four use cases selected by TML present unique decision-making challenges such as legal integration, security concerns, data management, communication with passengers and resource allocation. The Lisbon Transport Authority (TML) is tasked with introducing on-demand services in rural areas, integrating them into the existing public transport framework and managing funding, operations, and stakeholder involvement.

TML's vision is to improve public transport accessibility and promote sustainable mobility in the LMA through innovative and flexible transport solutions. Achieving this vision will require overcoming regulatory, financial, and technological barriers while engaging the community and encouraging innovation.

In summary, the proposal for on-demand transport solutions in the Lisbon Metropolitan Area emphasises the need for adaptable, inclusive, and sustainable mobility options that respond to the diversity of the population. Through strategic planning and policy development, TML aims to create a more connected and accessible metropolitan area.

1. Introduction

The Lisbon metropolitan area comprises eighteen municipalities covering an area of approximately 2,800 km^2 and concentrating 2.8 million inhabitants, almost one-third of the country's population. Most of its population (~72%) lives on the north bank of the Tagus River, however, the highest population growth occurs in the municipalities of the south bank, with an increase of 3.7 per cent in the number of residents in the last decade.

The area is served by a multimodal public transport network including suburban and regional rail, metro and light metro, bus, and ferry services, all integrated into the Navegante ticketing and fare system. Private cars are responsible for 57,6% of the commuting trips in the region, followed by public transport with 25,4% of the share and active modes (walking and cycling) with 17%. In the last decade, and especially after the COVID-19 pandemic, there has been an increase in the use of private transport and active modes of transport while the share of public transport has decreased.

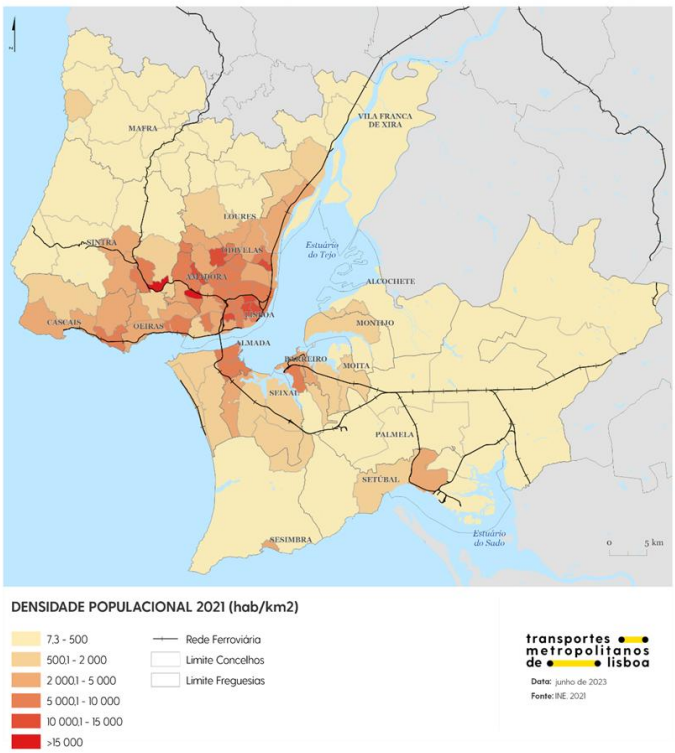

Figure 1 - Lisbon Metropolitan Area - Population density by parish in 2021
Source: TML based on INE Censos 2021 and BGRI

Like all large urban areas around Mediterranean Europe, it faces mobility and transport problems for passengers and goods. The diversity of the metropolitan territory, with densely populated areas contrasting with less dense regions, underlines the need for a more adaptable and flexible transport offer, integrating transport models that better meet the varied needs of the population

Many municipalities, in the region, offer flexible passenger transport services to meet specific travel needs in addition to regular public transport. These services complement the existing offer or, in some cases, are the only offer available. Flexible public transport solutions are

often the best way to solve accessibility inequalities. They are particularly advantageous for meeting the needs of specific groups, such as people with reduced mobility, the elderly, and children, especially for access to non-commuter opportunities in places with low population density.

The operating services in the region vary according to the degree of flexibility implemented. There are distinct levels of freedom and adaptability, but only a few services are on-demand. Flexible public transport is available in at least five LMA municipalities: Almada, Cascais, Lisboa, Loures and Odivelas. These services are flexible in terms of routes, stops and schedules, and some have a service request or reservation system.

Figure 2 - Lisbon "Porta-a-porta" flexible transport service
Source : https://www.jf-misericordia.pt/viver/mobilidade/porta-a-porta

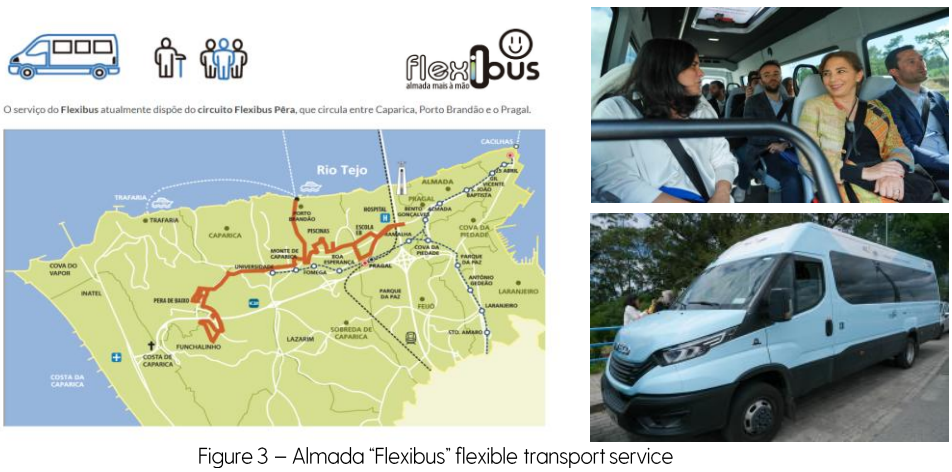

Figure 3 – Almada "Flexibus" flexible transport service
Source : https://wemob.pt/flexibus/ and Flexibus | CM Almada

The regulation associated with on-demand/flexible services

The transcription of European directives on public transport to Portuguese law resulted in the publication of the Legal Framework for Public Passenger Transport Services (Law no. 52/2015 of 9 June), which covers national, interregional, inter-municipal and municipal passenger transport, identifies the competent transport authorities and defines the organisational architecture of the transport system and a regime of 'regulated competition' in public

passenger transport. For flexible public passenger transport services specific regulations are outlined in Decree-Law no. 60/2016 of 8 September.

Flexible passenger transport can adapt to users' requirements, allowing flexibility in at least one aspect of service provision, such as routes, schedules, stops, or the type of vehicle. It applies to situations, namely, where there is a low demand for regular public transport or when regular public transport or taxi transport does not meet the needs of citizens, such as in regions with a low population density, at night or on weekends.

Like conventional public passenger transport services, flexible transport services, such as Demand-Responsive Transport (DRT) services, are carried out through a contract between the operator and the competent transport authority, which regulates the provision of services, regarding aspects such as tariffs and other operating conditions.

Concerning to autonomous vehicles (AV) and autonomous mobility on-demand (AMOD) In Portugal the development of a solid regulatory framework for autonomous vehicles (AV) and autonomous mobility on-demand (AMOD) has been relatively slow, preventing these vehicles from circulating freely on Portuguese roads.

However, the Portuguese government is working to regulate general vehicle safety, which includes advanced driver assistance systems, and to create a legal framework that helps autonomous vehicle tests to be carried out under controlled conditions. This legal framework is essential to ensure the safety and effectiveness of systems before they are widely implemented. Clear regulations are crucial to encourage investment and innovation.

The importance of AMOD and the lack of experience

Innovation and sustainability have become increasingly important in urban mobility, as PTAs seek more efficient and environmentally friendly solutions. Technologies such as electric buses, bike sharing and transport apps are changing how people get around, helping to reduce pollution and congestion in urban areas. Autonomous vehicles and AMOD have great potential to transform mobility further, creating a more connected and efficient transportation ecosystem.

However, in Portugal, there are still challenges and a lack of experience even in traditional on-demand transport, let alone in autonomous vehicles. It is important to build capacity and expertise in this area to ensure that the country does not miss out on the benefits of AMOD.

While there have been some pilot projects, such as in Lisbon and Cascais, these are still limited in scope. More extensive testing and partnerships are necessary to gather data and insights on how AMOD can be effectively implemented.

Figure 4 - Autonomous bus pilot in Cascais

Source : https://data.cascais.pt/mobilidade/autocarro-autonomo

Portuguese road and transport infrastructures are not fully prepared for AV and AMOD operations. Investments are needed to enhance infrastructure, including smart traffic management systems and dedicated lanes.

The use cases for the Lisbon Metropolitan Area

One of the challenges observed in mobility and transport is the lack of adequate provision in rural, peripheral, and dispersed areas, where traditional services are limited or non-existent. These areas present significant potential for more flexible transport services that complement or replace conventional routes. There is also a clear opportunity to transform underutilised transport circuits into flexible services, enabling more efficient resource management and a more direct response to the population's needs.

Decision-making process challenges

The decision-making process for the implementation and exploitation of DRT or AMOD services within regular public transport networks comprises several challenges, related to operational and institutional/legal dimensions, namely:

- Legal integration of the DRT/AMOD service into the regular service contract
- Concerning AMOD services, safety issues may arise.
- How to collect and analyse all the relevant information to continuously improve the overall services based on the DRT/AMOD services, considering available vehicle types to fit demand and infrastructure restrictions
- Collecting and analysing personal data and correspondent anonymisation process
- Establish the appropriate channels and mechanisms for interaction between the central system and the driver and passenger.
- How to inform passengers, mainly older ones, of the way DRT/AMOD services work and to deal with flexible waiting times (or even flexible routes and, thus, route times)

- What is the best way to operationalise a service request for several passengers belonging to a common group, so that the number of passengers in the vehicle can be monitored?
- How to integrate flexible service tariffs with conventional service tariffs
- How to discourage no-shows after a service request

Other challenges arise, some of which are specific to the characteristics of the implemented service solutions, as described in each use-case section.

2. Use Case definition for Lisbon Metropolitan Area context

2.1. Case 1 – DRT in a deviation to a certain stop

2.1.1. Service Design

Main objective: To improve the accessibility of low-demand areas where conventional public transport economic viability is very low and resource allocation might be inefficient.

Target: There is no specific passenger target. The service is directed to all citizens living or visiting the covered area.

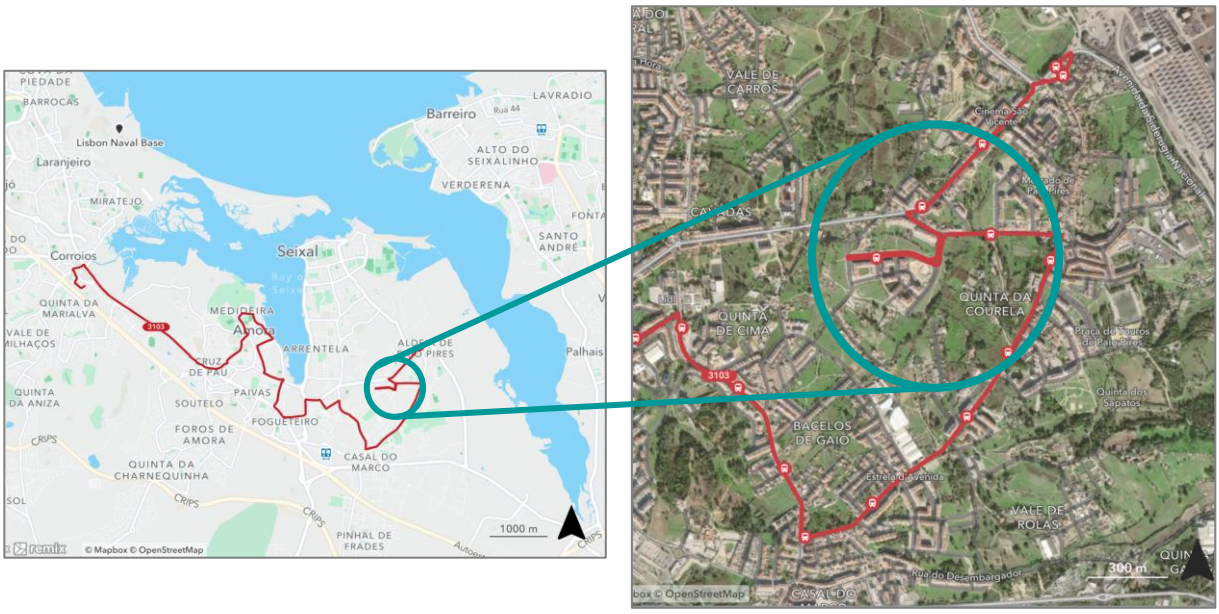

Figure 5 - Schematic representation of service type in Case 1

Service description

- Consists of a loop or deviation from the main route, to serve a given set of stops, under passenger request.
- The deviation/loop section may comprise several stops and the route is fixed.
- If one of the stops covered by the loop or deviation has a passenger request, all the stops are served.
- The service request must be done through validation at the stop or booking via app/web/phone.
- The service can be requested at short notice, ensuring it is carried out before the deviation takes place.
- No shows requests will be monitored.
- If the deviation/loop does not exist, in the absence of other transport alternatives, it implies significant walking distances to connect to the main public bus transport route/network.

Service characteristics

Design typology	Classification	Description
Service Coverage	Large	The deviation/loop is located in low-demand regions, covering an area if not served would imply significant walking distances to connect to the main public bus transport route.
Operational Domain	Complex	The served routes are roads with several junctions and crossroads, without sidewalks, used by pedestrians, motorcyclists, cyclists, cars, buses, etc.
Vehicle type	Bus	The service is ensured by standard buses according to the vehicle type allocated to the main service.
Route predictability	Fixed	The route of the deviation/loop is fixed but is only carried out if there is a request.
Timetable	Fixed	The timetable of the main service is fixed until the passenger request the deviation/loop. After the deviation, the timetable is affected.
Traffic Type	Complex	The level of traffic is mainly low, but all types of traffic may coexist. Traffic lanes are standard and mainly bidirectional, but sidewalks are not expected.
Fleet size	Large	The size of the fleet is dimensioned according to the length and frequency of the main route.
Special assistance	No	Is not expected that the passengers require any special additional assistance to enter/exit the vehicle or assistance with directions.
Road ownership	Public	The road is public property, mostly municipal, but some might be national roads.
Speed of service	High	The speed in the deviation/loop route is usually less than 40 km/h.

Use case specific decision-making process challenges

- What is the best way to maximize the resources that are freed up when the loop is not running? If the loop is not done: i) turn flexible the time of the beginning of the next service (it improves the supply level, but reduces service predictability on low-frequency routes), or ii) just increase the waiting time at the end of the route (saves fuel and some other operating costs)?
- Solve the lack of predictability of the timetable, in the event of a diversion/loop, for the passenger already inside the vehicle and those waiting at subsequent stops.
- How do passengers inside the vehicle signal their desire to get off at a stop included in the deviation/loop section?
- How do passengers outside the vehicle signal their willingness to use the service and board at a stop included in the deviation/loop? How far in advance should they do it?

- The loop route must be feasible by a conventional BUS, and if the outward and return circuit is made through the same road, it must be possible to make a U-turn at the end of the loop.

2.1.2. Potential impact

An improved public transport service such as the one described above can significantly enhance social accessibility for residents in low-density areas while promoting environmental sustainability through energy savings by optimising routes based on demand, and economic benefits by reducing operating costs associated with empty vehicle circulation.

Social	Environmental	Economic
Accessibility and inclusivity – Improved access to public transport for those living in low-density areas with infrequent services.	**Energy consumption savings** by adjusting routes to demand.	**Cost savings** – Reduced operational costs due to less empty vehicle circulation in the served area.

2.2.Case 2 - DRT to Public Facilities

2.2.1. Service Design

Main objective: Improve access to public facilities where or when supply is low (healthcare, campus, business park, etc.).

Target: Citizens working, studying, and/or visiting the covered area. It may vary depending on the function of the public facility served.

Figure 6 - Schematic representation of service type in Case 2

Service description

- Consists of a fixed route with a flexible timetable linking a transport hub/interface and a public facility (healthcare facilities, university campus, business park, etc.) that is not currently directly or permanently served by public transport.
- The service can be requested at short notice through validation at the stop or booking via app/web/phone.
- No shows requests will be monitored.
- If the service does not exist, in the absence of other transport alternatives, it implies significant walking distances to connect to the main public bus transport route/network.

Service characteristics

Design typology	Classification	Description
Service Coverage	Small	The service operates in low-demand schedules (weekends, off-peak) covering an area that if not served would imply significant walking distances to connect to main public transport interface.
Operational Domain	Complex	The served routes are roads with several junctions and crossroads, without sidewalks, used by pedestrians, motorcyclists, cyclists, cars, buses, etc.
Vehicle type	Bus/Minibus	The service is ensured by Urban Minibus or Vans depending on demand.
Route predictability	Fixed	The route and stops are fixed.
Timetable	Flexible	The timetable is flexible and the service is only done when a request is made.
Traffic Type	Simple	The level of traffic is mainly low, but all types of traffic may coexist. Traffic lanes are standard, mainly bidirectional and with sidewalks.
Fleet size	Small	The size of the fleet is dimensioned according to the area covered.
Special assistance	No	The service is directed to all citizens living or visiting the covered area.
Road ownership	Public	The road is public property, mostly municipal, but some might be national roads.
Speed of service	Low	The speed of service is usually less than 30 km/h.

Use case specific decision-making process challenges

- If the public facility has some kind of access control to its interior, it will be necessary to automatize or, at least, speed up the procedures for the public transport vehicle to enter and run inside the campus.
- Depending on the distance between the public facility and the transport hub/interface and the number of vehicles allocated, it may be necessary to ensure that the route is not congested in order for the service to be efficient and make the connection on time.
- There is the need to ensure a parking slot on both ends of the circuit, near the transport hub and at the entrance/inside the campus, in order to be waiting for a new request.
- Considering the type of passengers to be served, the vehicle may need to be adapted to their specific needs. In the case of a hospital, for example, the vehicle may need to have more disabled spaces than usual, as well as easy access.

2.2.2. Potential impact

The on-demand transport service described above not only has the potential to significantly improve accessibility and social inclusion by providing better access to public facilities that are currently poorly served by infrequent public transport, enabling people from different demographic groups, including those with mobility difficulties, to participate in community activities and services.

DRT can also benefit the environment by effectively reducing congestion and emissions through strategic substitution of individual car journeys, thereby reducing the number of vehicles on the road.

In addition, this DRT service ensures operational efficiency by optimising the size and number of vehicles used in response to real-time demand, thus maximising the use of resources and minimising waste, while meeting the diverse needs of the community it serves.

Social	Environmental	Economic
Accessibility and inclusivity – Improved access to public facilities with infrequent PT services	Reduces traffic congestion and lower emissions by replacing individual car trips.	**Fleet optimisation** – adjusting the size and number of vehicles according to demand

2.3.Case 3 – DRT to main transport stations or interfaces

2.3.1. Service Design

Main objective: Increase connectivity and social inclusion by providing flexible transport during off-peak hours.

Target: There is no specific passenger target. The service is directed to all citizens living or visiting the covered area.

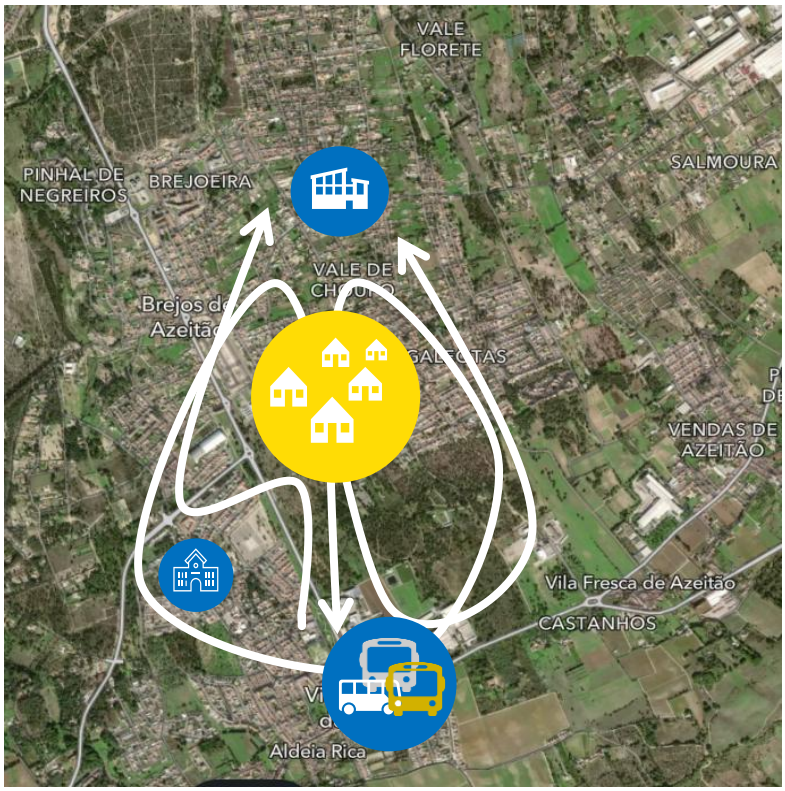

Figure 7 - Schematic representation of service type in Case 3

Service description

- Consists of a fully dynamic service with a flexible route and timetable serving an area or neighbourhood sparsely populated, with low demand, and with insufficient service to connect to an interface or main PT route.
- Operates within a geofenced neighbourhood on a stop "corner to corner" basis.
- Routes are automatically defined in real-time, and communicated to the driver, to serve real demand better and reduce travel times.

Service characteristics

Design typology	Classification	Description
Service Coverage	Large	The service operates in low demand regions, covering an area that if not served would imply significant walking distances to connect to the main public bus transport route.
Operational Domain	Complex	The served routes are roads with several junctions and crossroads, without sidewalks, used by pedestrians, motorcyclists, cyclists, cars, buses, etc.
Vehicle type	Bus	The service is ensured by Minibus or Vans.
Route predictability	Dynamic	The route is dynamic, it is only carried out if there is a request.
Timetable	Flexible	The service is only done by request.
Traffic Type	Complex	The level of traffic is mainly low, but all types of traffic may coexist. Traffic lanes are standard and mainly bidirectional, but sidewalks are not expected.
Fleet size	Small	The size of the fleet is dimensioned according to the area covered.
Special assistance	No	There is no specific passenger target. The service is directed to all citizens living or visiting the covered area. Is not expected that the passengers require any special additional assistance to enter/exit the vehicle or assistance with directions.
Road ownership	Public	The road is public property, mostly municipal, but some might be national roads.
Speed of service	Low	The speed of service is usually less than 30 km/h.

Use case specific decision-making process challenges

- Criteria to define the boundary of the area to be covered by the flexible service.
- Depending on the area to be covered, dedicate one or more parking lots for the vehicle to stop and wait for another service while minimizing empty services.
- Optimum resource allocation in situations where demand levels are volatile and unpredictable.
- How to define the maximum detour times to be adopted to meet passenger expectations and needs.
- Since the routes are flexible, the routing service must be able to define which turns can and cannot be done by each type of allocated vehicle.
- How to monitor the available capacity of each vehicle in real time, given that the vehicles are more limited than usual (minibuses or vans), as there is no record of passengers getting off, so only services that can be provided are accepted.
- How to communicate the services and routes to be done with the driver, also considering real-time traffic.

- What is the best way to provide information to the passenger, in order for him to monitor vehicle service and ETA's (both at origin and destination).
- How to adopt an optimal process to manage locations to park vehicles.

2.3.2. Potential impact

By improving the social connectivity of suburbs through easier access to key public transport hubs and urban functions, an on-demand transport service with the characteristics described has the potential to promote greater community interaction and accessibility.

At the same time, it addresses environmental concerns by reducing reliance on private car, which not only helps to reduce carbon emissions and improve air quality but also benefits public health by reducing road traffic accidents; however, there are also economic considerations, in particular the increased costs associated with implementing advanced route optimisation technology, which while potentially leading to more efficient service provision and reduced operating costs in the long term, require careful planning and investment to balance the immediate financial impact with the overall benefits to society and the environment.

Social	Environmental	Economic
Suburban connectivity allows easier access to the main public transport hubs and urban functions	**Reduce dependence on private** cars, with positive impacts on the environment and public health	**Optimising routes** - Increased cost in route optimisation technology, but more efficient service provision and reduced operating costs

2.4.Case 4 - AMOD to public facilities

2.4.1. Service Design

Main objective: Provide more innovative and cost-effective transport connections to public facilities (healthcare, campus, business parks)

Target: There is no specific passenger target. The service is directed to all citizens living or visiting the covered area.

Figure 8 - Schematic representation of service type in Case 4

Service description

- Consists of a fixed route with a flexible timetable to connect public facilities (healthcare facilities, university campus, business park, etc.) not directly and permanently served by public transport.
- Shuttle services provided by an urban autonomous vehicle
- Route might be operated in highly segregated lanes
- The service can be requested at short notice through validation at the stop or booking via app/web/phone.
- No shows requests will be monitored.
- If the service does not exist, in the absence of other transport alternatives, it implies significant walking distances to connect to the main public bus transport route/network.

Service characteristics

Design typology	Classification	Description
Service Coverage	Small	The service operates in low demand schedules (weekends, off-peak) covering an area that if not served would imply significant walking distances to connect to main public transport interface.
Operational Domain	Complex	The served routes are roads with several junctions and crossroads, without sidewalks, used by pedestrians, motorcyclists, cyclists, cars, buses, etc.
Vehicle type	Bus/Minibus	The service is ensured by an urban autonomous vehicle
Route predictability	Fixed	The route is fixed, it is only carried out if there is a request.
Timetable	Flexible	The service is only done by request.
Traffic Type	Simple	The level of traffic is mainly low and traffic lanes are segregated, mostly bidirectional and with sidewalks.
Fleet size	Small	1 or 2 vehicles
Special assistance	No	There is no specific passenger target. The service is directed to all citizens living or visiting the covered area. No additional assistance for passengers to enter/exit the vehicle or assistance with directions is expected
Road ownership	Public/Private	Segregated lanes on public and private property roads
Speed of service	Low	The speed of service is usually less than 30 km/h.

Use case specific decision-making process challenges

- All the specific decision-making process challenges applicable to Use Case 2 (DRT to public facilities) are also applicable to Use Case 4.
- Additionally, there are some specific challenges related to the autonomous service:
  - Legal and regulatory framework.
  - Compatibility with traffic signalling and communication infrastructure.
  - Road infrastructure adaptation.
  - Safety issues, considering the infrastructure is shared by other users.

2.4.2. Potential impact

Introducing an Autonomous Mobility on Demand (AMOD) service could significantly transform suburban transport, providing users with a more comfortable and reliable mode of transport.

At the same time, it would reduce environmental impacts through the use of autonomous vehicles powered by green energy, resulting in lower emissions and overall energy consumption,

Although it requires a higher initial investment in fleet and infrastructure development, it could ultimately result in lower operating costs due to reduced driver costs, creating a multi-faceted positive effect that promotes sustainability and stimulates economic growth through innovation.

Social	Environmental	Economic
More **comfort and reliable** transport.	As autonomous vehicles run on green energy, there will be **less emissions and energy consumption.**	Higher **investments in fleet and infrastructures** Lower spending with drivers

3. Deployment timing and responsibilities

In the short term, on-demand transport services are expected to be introduced in certain rural and sparsely populated areas of the Lisbon metropolitan area.

TML intends to incorporate these on-demand services into the regular public passenger transport services contracted for the region, thereby assuming responsibility for financing and managing the service. The contracted operators will manage the service's day-to-day operational aspects.

TML, as the transport authority, will play a crucial role in engaging stakeholders throughout the development and implementation of these services. Both TML and the municipal administrations will oversee the communication strategies for the DRT and Autonomous Mobility on Demand (AMOD) services.

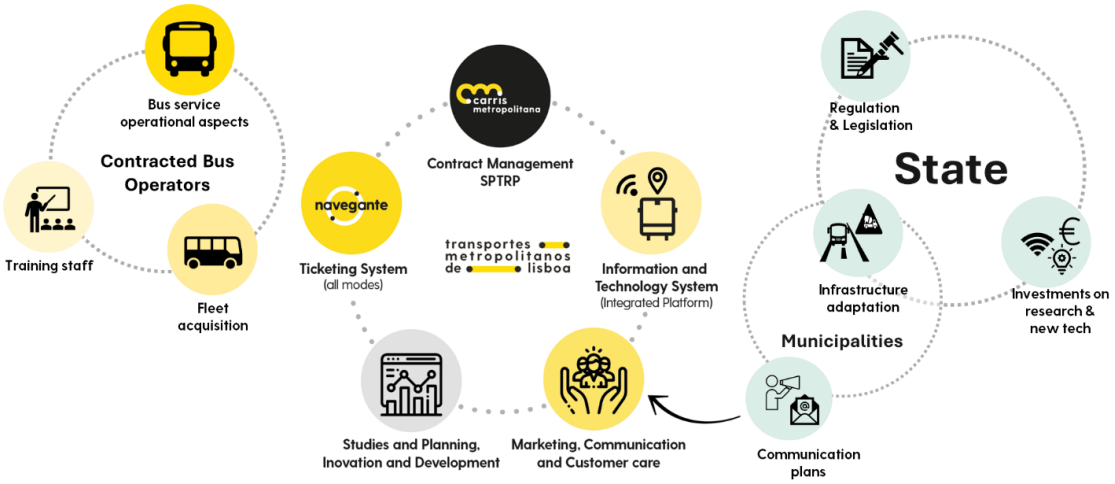

Figure 9 - Main stakeholders and responsibilities

The main challenges to address include service design, operational and contractual considerations, and achieving social acceptance.

The transition to AMOD implies further regulatory and legislative maturation, which lies with the national transport and road safety regulatory authorities.

The timetable for implementing on-demand transport services in sparsely populated areas of the Lisbon metropolitan area depends on the complexity of the service and the regulatory environment. It will be a gradual implementation, focusing on reliability and scalability, as the transition from fixed systems to more dynamic and autonomous systems take place.

While the implementation of conventional on-demand services is expected to take place in the short term, DRT with dynamic routes and eventually AMOD will take longer to materialise.

Early and continuous engagement with the community and stakeholders will be key to successfully implementing these services, particularly AMOD.

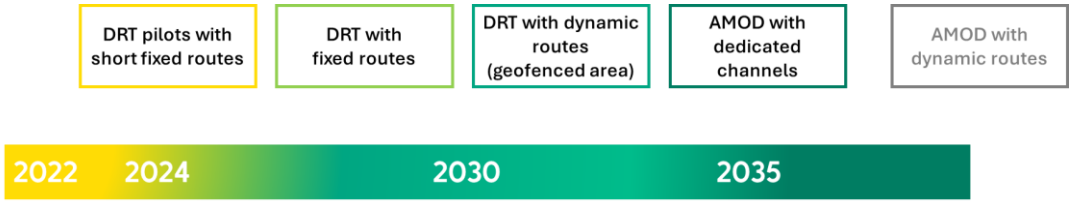

Figure 10 - Expected timing of deployment

4. Vision statement

A future where mobility in the Lisbon metropolitan area is sustainable, where flexible public transport solutions are accessible and effectively connect all communities, especially the most isolated and vulnerable ones.

Through innovative services, such as Demand-Responsive Transport and, in the future, Autonomous Mobility on-Demand, TML aims to improve access to all urban functions, reduce car use, minimize environmental impacts, and enhance the quality of life for LMA residents and visitors.

TML envisions improving accessibility by public transport and promoting sustainable mobility patterns in the Lisbon metropolitan area, especially in sparsely populated areas, by providing new flexible mobility solutions including Demand Responsive Transport (DRT) and, in the future, Automated Mobility on Demand (AMOD).

By strategic investments in these solutions, TML aims to enhance the efficiency of public transport services, improve access to urban functions, reduce car use, minimize environmental impacts, and increase the quality of life of the LMA residents.

Regulatory, financial, and technological challenges must be overcome to achieve this goal, and a participated and innovation-led long-term planning needs to be implemented.

This vision statement has the potential to influence policy development by providing a clear direction, encouraging sustainable practices, fostering innovation, promoting equity, and establishing a participative planning process. It can serve as a guiding principle for mobilizing resources, community support, and stakeholder engagement towards creating a more connected, accessible, and sustainable metropolitan area.

5. Closing remarks

The Lisbon metropolitan area faces some complex and multifaceted mobility challenges due to its geographical diversity and population dynamics. The current public transport network, although comprehensive in its offer of buses, metros, trains, and ferries, is heavily dependent on private cars. This trend has been exacerbated by the COVID-19 pandemic, highlighting the urgent need for innovative and flexible transport solutions that address the specific accessibility needs of low-density and remote areas.

The proposal for on-demand transport solutions in the Lisbon Metropolitan Area highlights the need for adaptable, inclusive, and sustainable mobility options to meet the distinct needs of the population. The potential benefits of DRT, or AMOD in the future, are significant and represent a shift towards more efficient and environmentally friendly transport options.

The four use cases selected in this paper present unique decision-making challenges, such as operational integration, safety concerns, data management, passenger communication and resource allocation. TML is looking to introduce on-demand services in low-density areas and integrate them into the existing public transport framework while managing funding, operations, and stakeholder engagement.

TML's vision focuses on improving public transport accessibility and promoting sustainable mobility through innovative and flexible transport solutions. To achieve this vision, it will be necessary to overcome regulatory, financial, and technological barriers, involve the community and encourage innovation.

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