

1.10 Demand responsive transport in Medio Tejo (PT)

Demand responsive transport services in the Portuguese region of Medio Tejo, operated by taxis (connections between dispersed villages) and mini-vans (connections between the 6 medium-sized cities also activated on-demand) with predefined routes schemes and pre-defined stops.

Good territorial coverage	Sustained ridership growth	Long-term durability

1.10.1 About Medio Tejo, Portugal

Country	Region	Target Area	Population	Population density
Portugal	Médio Tejo	3.344 km ²	247.331 inh.	74 inh./km ²

The Medio Tejo region is a NUTS3 sub-region in the central area of Portugal, included in NUTS2 region Centre. The Medio Tejo region is relatively close to Porto and Lisboa (less than 2 hours per car from the two main Portuguese cities). It includes 6 small towns (Ourem, Tomar, Abrantes, Torres Novas, Entroncamento and Fatima), with a population between 20.000 and 45.000 inhabitants. Medio Tejo is a mountainous area largely covered by forests and farms, full of natural water sources, pools/basins, lakes and rivers, as it is crossed by the Tejo River.



Figure 27 – Tejo River Valley

The 6 bigger cities in the region aggregate 30% of the population. 60% of the population lives in small villages of less than 2.500 residents. Indeed, the population density is extremely variable in the region: 1.470 inh/Km² in the town of Entroncamento, down to 150 inh/Km² in Torres Novas and Vila Nova da Barquinha and to 18 inh/Km² in the minor settlements and remote rural areas. The Medio Tejo region was affected by a relevant population ageing trend occurring from 2011 to 2021 and a downward trend in terms of overall population, having lost 7.5% between 2011 and 2021.

The commercial/services activities are the most relevant ones as they sum up to one third of the total number of enterprises/companies (manly distribution/retail) and to two thirds (68,86%) of the working population.

1.10.2 Description of the Mobility Solution

The DRT services have been introduced with the main objective of providing a feasible transport solution answering to unmet needs in terms of flexibility, coverage and interconnection with long-distance and railway services.

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This service in the region is operated by taxis and mini-vans: taxis serve sparsely populated villages while mini-vans offer a convenient direct connection between the main cities. The mini-vans service is called 'Link'.

The current offer includes a total of 82 routes (5 of which correspond to the Link service) which covers nowadays a total of 13 municipalities. In fact, although the administrative boundaries of the Médio Tejo Region have shrunk to 11 municipalities in 2022, the service continues to be deployed in all the previously served territories, covering a total of 247.000 inhabitants spread through a territory with 3.334 km² (74 inh/km²). Some of these municipalities have 30% of the residents living in very small villages with less than 40 inhabitants where more than a quarter of the population is over 75 years old.

The main feature of this mobility solution lies in the coordinated management of various services/schemes through a centralised booking/dispatch centre. The service is managed by the Comunidade Intermunicipal Medio Tejo (CIMT), an association of Local Municipalities and Public Authorities and operated by a pool of about 30 taxi operators and 3 mini-vans. In 2022, a total of 551.351 km were covered by all these flexible services.

Target user groups and needs

The DRT services in the region of Medio Tejo are not targeted for any specific target groups. The features of the services cope with regular mobility routines and also with the needs of flexible and non-systematic demand (e.g. access to health services, leisure, flexible work requirements, etc.).

Nonetheless, results from customer-surveys have shown that the service in Médio Tejo connecting sparsely populated villages transport few persons under 25 years old. In fact, 70% of the total number of users in Médio Tejo are elderly people, which is interesting to highlight in the sense that 34% of people use the service on a daily basis, so they ought to have a high number of mobility needs (50% of journeys are related to health issues).

However, it is important to note that the profile of the on-demand direct connections between the 5 medium-size cities is younger (although there is no precise data to confirm how much younger) than the one of the on-demand service linking sparsely populated villages. According to a survey carried out in 2020 to users of the Link service, the vast majority used the service very occasionally and especially to attend health related services.

Involved Bodies

The services are managed by CIMT (Comunidade Intermunicipal Medio Tejo) which design them in accordance with the needs expressed by the Local Municipalities. The CIMT manages the centralised booking centre to reserve trips for all the served areas.

On the other hand, Local Authorities are in charge of contacting taxi operators to operate the services. The funding of the services is sustained and managed by the Municipalities through the coordination of the CIMT. Tickets are also funded by a national programme that finances the reduction of public transport tickets nation-wide.

Mobility services provided/addressed

The DRT services are operated only in places and times of the day without conventional bus transport offer. Services are operated by taxis based on a fixed schedule and can potentially run every day if activated by a

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trip reservation over the phone and are available. The service scheme has pre-defined routes (a total of 82) and stops with time scheduling defined on the basis of the requests submitted by the users.

This scheme has been adopted in order to be close to the conventional service and not to replace the taxi service itself. No door-to-door service is operated. The routes have been designed to connect remote rural places to the respective nearest parish offices, to meet the travel needs for services located there, and, from these, to the nearest town. Moreover, the routes provide connections to regional buses and train services. The main performance KPIs of the service are reported in the table below, outlining also the balance between costs and revenues.

	<i>Km performed</i>	<i>Passengers transported</i>	<i>Fare revenues</i>	<i>Operational costs</i>	<i>Revenues / Costs</i>
2019	164.222	13.655	20.636 €	106.788 €	19 %
2020	265.190	15.871	21.018 €	197.646 €	11 %
2021	386.243	22.200	36.221 €	248.378 €	15 %
2022	551.351	32.682	55.689 €	343.543 €	16 %

Figure 28 – DRT Services KPIs

Ridership and other key metrics/results

The progressive extension of the DRT services from the pilot implementation to the actual coverage helps to demonstrate the success encountered among the target population. Since its launch as pilot initiative in Mação, passengers increased from less than 1.000 (in 2013) to 3.000 (2016).

The travelled Kms were 30.000 in 2016. 67% of the trips are carried out for health reasons demonstrating the service provides an effective answer to mobility needs of the population living in rural areas with low density of inhabitants, particularly for the disadvantaged groups which are more easily affected by social exclusion risks. It has been calculated that flexible transport services have allowed to reduce the travelled Kms to 7% of the theoretical amount of Kms which would had been required to operate conventional bus services.

The on-demand direct connection between cities (‘Link’ service) targets a younger generation (and is perceived as being more attractive from a touristic point of view due to the O/D points covered).

For using on-demand services, all users need to be registered (which particularly restricts the use by tourists) and also need to book trips in advance. Neither the classical on-demand service across villages and Link are available on Google GTFS, hence they are less visible for tourists. Also, there is currently no information in English about the mobility solution and the service is not active during weekends.

Customer satisfaction surveys conducted regularly demonstrate high level of satisfaction among the users (high comfort, short travel time, etc.). 72% of the customers use the service more than once.

The regional authority regularly conducts surveys of users (but not of non-users). They also get in contact with professional/vocational schools who often demand the extension of the services to meet the mobility needs of their students. But the regional authority considers that there are not regular engagement activities with local stakeholders and associations.

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The main complaints formally submitted to the transport authority concern requests for the installation of new bus stops and increased coverage of schedules and requests for refunding since the multi-journey ticket (charged with 10 trips) is only valid for 2 months after being bought.

Supporting technologies

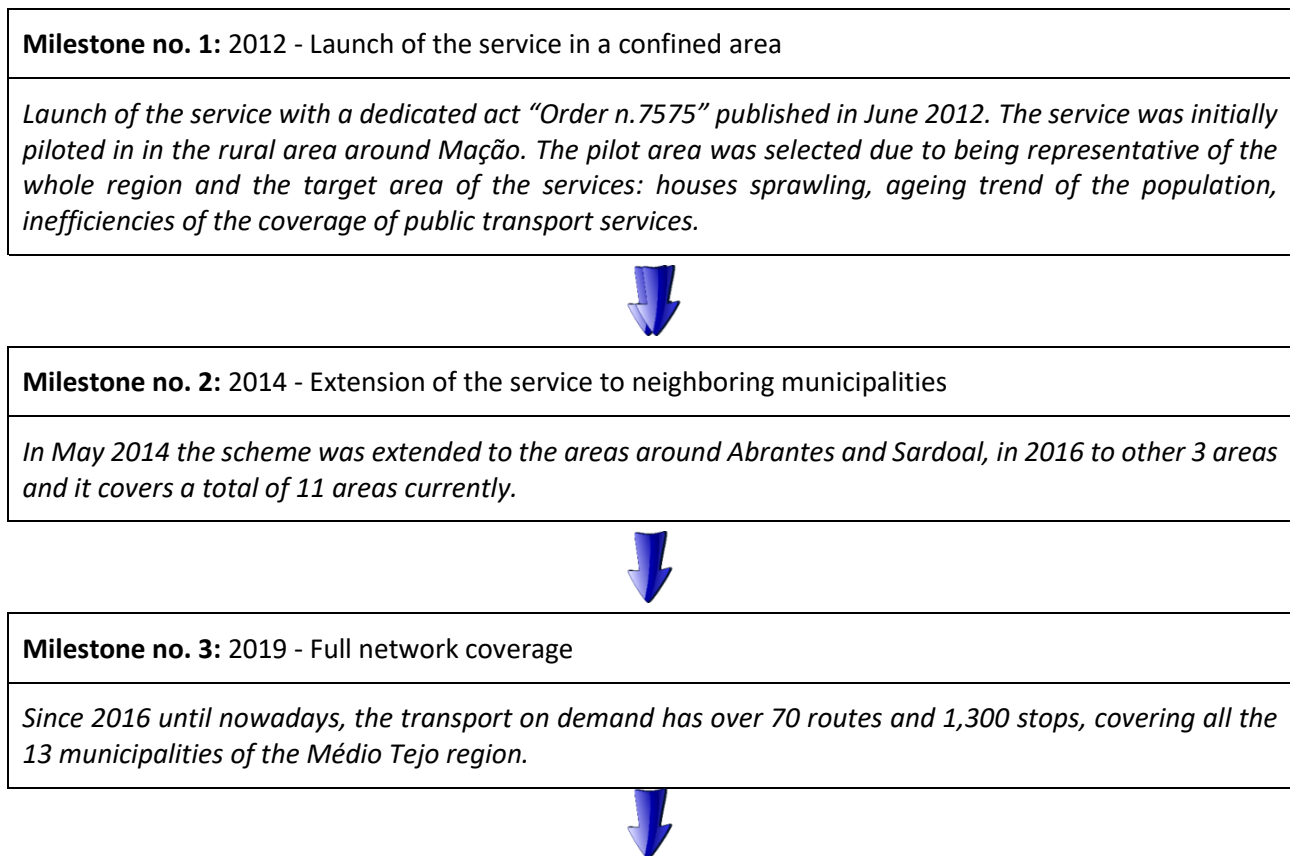
Currently, all the services are managed through a centralised control centre which is also in charge of managing trip requests by the users (Booking Centre) and to plan the (on-demand) scheduled services accordingly. The Booking Centre is operated by CIMT. The collection of trip requests and the service planning is carried out through a management software developed by the Spanish company GMV. The regional authority is still investigating whether a dedicated App is needed. Information about the service (routes, frequencies) are not currently available on Google, hence they are less visible for tourists).

Engagement aspects

The managing authority regularly conducts surveys of users (but not of non-users). These surveys demonstrate high levels of satisfaction among the users (high comfort, short travel time, etc.). 72% of the customers use the service more than once.

Nonetheless, there are no regular engagement activities with local stakeholders and associations, although professional/vocational schools often get in contact with the transport authority demanding the extension of the services to meet the mobility needs of their students. Important also to note that, for using the service, people need to register beforehand in the CIMT premises or through the website.

1.10.3 Timelines and Milestones



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Milestone no. 4: 2019 - New on-demand direct connections between the cities of the region

In 2019 the regional authority launches the 'Link', featuring a direct connection between all five cities of the region: <https://mediotejo.pt/index.php/link-estamos-ligados>

1.10.4 Long-term assessment

Success, Durability and Expansion

The service is still ongoing. In 2019 all the 13 municipalities of Médio Tejo were covered by the on-demand service. In 2019 a new on-demand direct connection between the five cities of the region started operations using mini-vans ('Link'). Future challenges are:

- Technological: the regional authority is still investigating whether a dedicated App is needed. The reluctance to invest in an App is because most of the users would not know how to use it;
- Organisational: the regional authority is also seeking to find a more flexible transport service, without predefined routes and without the need to schedule so long in advance;
- User-centric: there are many requests to provide services to professional and vocational students. These are allocated to schools regardless of the place they live and often leave school at night.

Funding and Financing

From the launch of pilot implementation in 2013 to 2016 the operational deficit has been reduced from 3.5 to 0.34 €/travelled Km. The tariff revenues covered 8% of the operation costs of the services in 2013 and 35% in 2016. Current ticket menu provided in Médio Tejo only includes pre-paid tickets and multi-trip journeys (package of 10 tickets). There is no offer of monthly passes due to the profile of users. During the pandemic, taxis have not received any money nor compensation from the regional authority. After the pandemic, the unitary value of contracts has raised due to the inflation. The overall investment cost in management software (developed by the Spanish company GMV) was around 120.000 €, 85% of which was cofounded by the national operational program. Running costs account to about 12.000 €/year and are embedded in the overall operational costs of the system.

Why is it considered a Good Practice?

The relevance of the Good Practice consists in the management of different services schemes/served areas through a common (centralized) Booking Centre as a solution to optimize operational costs. The Good Practice is also expiring for the adopted step-by-step implementation process based on the initial introduction of a pilot service (well representative of the target area) and the following extensions to other schemes/areas (managed by the same booking Centre). The cooperation with taxi operators is a second success factor. The ongoing reduction of deficits in the operational costs and the improved percentage of coverage of service costs guaranteed by the revenues (from 2013 to 2016) demonstrate the high potential in terms of costs optimization and the effectiveness of the monitoring//tuning process established by the Good Practice.

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1.10.5 Transferability considerations

CONTEXT PECULIARITIES	TRANSFERABILITY CONDITIONS
<p>The conventional public transport offer in the target area was fairly limited to serve main destinations and peak hours, since this model was the only one gathering financially viable conditions to operate the service under a commercial approach. Schedules were thus adapted only for school needs with relevant service breaks during the day, weekends and school holidays</p>	<p>The use case of Médio Tejo is more easily applicable whenever strong coordination mechanisms are in place between intermediate-level authorities (CIMT) and local municipalities are keen to play the role of coordination/planning. The good level of stakeholder cooperation is extended to the successful involvement of taxi operators. To implement this mobility solution is necessary to:</p> <ul style="list-style-type: none"> • Assess the regulatory framework for the provision of flexible transport service • Allocate responsibilities to an inter-municipal entity (e.g., an association of municipalities) that can take the leadership of the service • Engage existing taxi and small local operators through a collaborative framework • Start with a pilot area, to be extended over time
DIFFICULTIES ENCOUNTERED/WEAKNESS	LESSONS LEARNT
<p>The main barrier encountered by the service promoters rested on the cooperation with taxi operators which required to present them the flexible services as an opportunity to increase revenues, rather than the opposite. After overcoming this first barrier, a formula to establish the level of contribution of the service must be defined taking account the needs of Public Authorities to save money compared to the operation of the service with conventional bus services. Finally, a change in the working procedure was required in order to make available the scheduled timetable of the flexible (DRT) service (planned by the Booking Centre) to the various zones covered by taxis.</p>	<p>The adoption of a centralised Booking Centre has proved to be a good solution to optimise operational costs. The cooperation with taxi operators is a second success factor. The step-by-step implementation process adopted by the service promoter (CIMT) is also very inspiring: the service was firstly launched as a pilot in a demo area and progressively extended on the basis of the feasibility analysis of local Municipalities and CIMT and analysis of service performance. The ongoing reduction of deficits in the operational costs and the improved % of service costs coverage demonstrate the high potential in terms of costs optimisation and the effectiveness of the monitoring / assessment methods</p>

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**References for further details**

Organization: CIMT – Comunidade Intermunicipal de Medio Tejo

<http://mediotejo.pt/index.php/contactos-tap>

Contact Person: Maria do Céu Albuquerque, President CIMT

Phone: (+351) 249 730 060

Main data sources

- www.slideshare.net/PresentacionsAMTU/transporte-a-pedido-mdio-tejo-portugal
- “Casos de boas práticas em sistemas de transportes flexíveis”, Gabinete de Planeamento, Inovação e Avaliação, Instituto da Mobilidade e dos Transportes, 17 September 2014
- Decreto Lei 60/2016 Serviço Público de Transporte de Passageiros Flexível, Ana Pereira de Miranda, Instituto da Mobilidade e dos Transportes, 20 October 2016

Website sources

- SMARTA 2 documentation - Good practices catalogue: <https://ruralsharedmobility.eu/good-practices/>
- <https://transportepedido.mediotejo.pt/>

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