

An On Demand Transport in a Low Density Region of Portugal - Alentejo

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Abstract: ON DEMAND TRANSPORT IN A LOW DENSITY AREA OF PORTUGAL - ALENTEJO

Mobility and accessibility to services in low density areas is a concern of municipal management policies in the Alentejo. Alentejo is the least populated region in the country, representing over one third of national territory but only 7.1% of its population. It is also the region with the oldest population, 22.9% being 65 years of age or more (while the national average is 17.5%). The CCDRA (Coordination Commission of Alentejo) has proposed, working with the municipalities, to model an on-demand-transport, based on a suitable selection of route centres and itineraries, with the objective of increasing coverage of the existing public transport network (providing an offer in areas and / or periods of the day or year where this offer does not exist or is in deficit). The project will start soon with five municipalities and, in a second phase all the remaining 40 municipalities can be added according to their will. In a first stage, routes, schedules and frequencies are established depending on health needs, supply needs, weekly markets, access to administrative and financial services or for linking with other means of transportation, and serving mainly elderly people living in distant places not served by public transport. Vehicles only make the routes if, in advance, the service has been requested and only go to the stops that have reservations.

Keywords: on demand transport; flexible mobility; low density regions

Introduction

The project "On Demand Transport for Alentejo" will cover, in an initial stage, five municipalities of the Alentejo Region (Reguengos de Monsaraz, Moura, Beja, Mértola and Odemira). The main objective is to increase the coverage of the existing public transportation network, providing an offer in areas and/or periods of the day or year where this offer does not exist or is deficient.

Like regular public transport, there are circuits, stops and schedules initially defined. However, on-demand transport services are distinguished from regular transport because the customer is the one who triggers the journey, through a previous request to a reservation center. In this way, the vehicles only make the service if, in advance, the service has been requested and only go to the stops that have reservations.

The five municipalities associated to this project has defined the stops, according to the objectives of the project, namely places where there are possible clients and where the offer of public transport is low or non existent.



All the movements and schedules of existing public transport were identified, and the on-demand transportation project does not overlap with existing services, aiming at eliminating gaps in the existing network transportation in each municipality, and complementing with existing services.

It is the municipalities that make the service available. CCDR Alentejo only intends to facilitate and guarantee management availability, being responsible for modeling of the routes and programming of the platform that receives the orders. Both platform and geographic information system need to be linked in order to produce three outputs:

- travel information for the customer
- travel information for those taking the vehicle (public or private operators)
- information on the cost of travel for those who provide the service (municipality)

Each municipality made a deal with the transport operators (mainly taxis) in order to invite them to join the project and to present conditions. In the next stage, the Social Entities that the municipality can define, should also be invited so that trips can be made available for disabled people (in particular wheelchairs, since some of these entities have properly equipped vehicles for this type of transportation).

The decision to start the project

Demand Responsive Transit (DRT) systems (also called dial-a-ride systems) have emerged in the last decades as an attempt to satisfy the dynamic nature of users' demands. They rely on flexible services able to provide almost 'door-to-door' transportation in small vehicles, with the possibility of pre-booking. DRT systems are nowadays mainly implemented as services for small groups of persons (e.g. elderly or handicapped persons). However, massive and on-demand services are far from being considered as a possibility or an alternative to the conventional public transportation system. (Archetti *et al*, 2016)

In neighboring Spain these on-demand transportation experiences are working well namely in Castilla and León and are based on on-line technologies of Advanced Vehicle Monitoring. The testing phase began in May 2004 in peripheral areas, raising quickly the number of municipalities which participated in the project as well as its number of passengers, thanks to the loss-leader effect. This system has benefited firstly users who may have access where scheduled lines do not arrive, granting the speed and provision of service by removing unnecessary stops being reported in real time by terminals; secondly the operator due to route optimization, cost saving, the increase in the number of passengers and the easiness to adapt the type of vehicle to specific requirements; finally to the Administration, which is able to control the service quality. This has enabled the reduction of displacements by private cars, family spending, accidents and the CO2 emissions. (Urrecho and Fernandez, 2016)

But, the first decision of project in Alentejo was to adapt a similar project already in operation since 2013 in another region of the country with characteristics not very different from Alentejo, the region of Médio Tejo. (Portal Regional do Médio Tejo, 2019). The past experience of these projects has allowed an evaluation of sharing problems in order to create efficient solutions. It was possible to understand that on average, on-demand travels cover around 7% of the km that would be required with a regular basic service. Furthermore in the same project it has been identified that 67% of travels

are made for health reasons. The Medio Tejo community presented the conclusion that this mobility solution allows them to give a qualified answer to mobility needs of the population living in areas of low population density, particularly for disadvantaged groups, thus giving the project a social relevance. As well it reveals a more economical solution and greater environmental sustainability compared to the regular network. High levels of satisfaction (greater Comfort and shorter travel times than regular service) are presented by users of the Médio Tejo municipalities.

With this information and also according to governmental decisions to support more sustainable mobility solutions, CCDRA decided to start working with some municipalities in order to define a pilot project that could accommodate a number of municipalities whose routes and decisions could be used as models and then later export to the rest of the territory. Figure 1 shows the five municipalities of Alentejo region that belong to this pilot project.

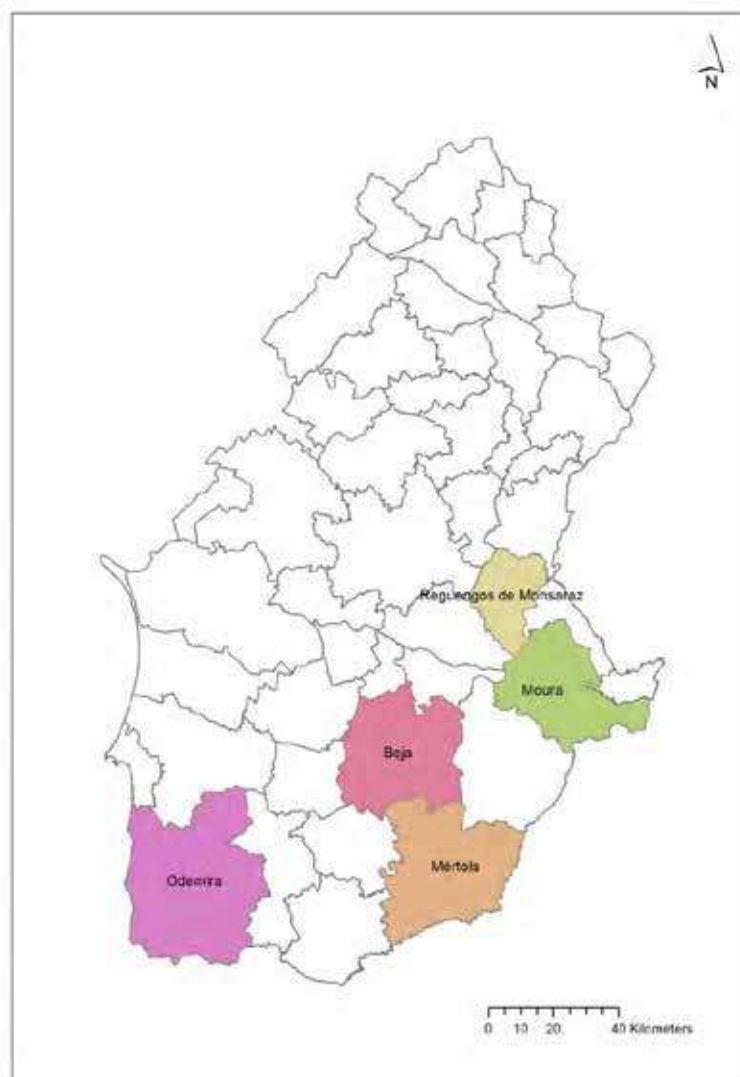


Figure 1 - Municipalities that are starting OnDemand Transportation

The road network

Each municipality was invited to define stops, suggesting that it could be in any place where there are possible users and where the offer of public transport is low or non-existent. Also there can be an existing offer but in a different time of day or day of week.

Once defined the stops and having associated routes, a different color was defined and associated to each route, as shown in Figure 2, the on-demand transportation network for the municipality of Beja (7 routes with 68 stops).

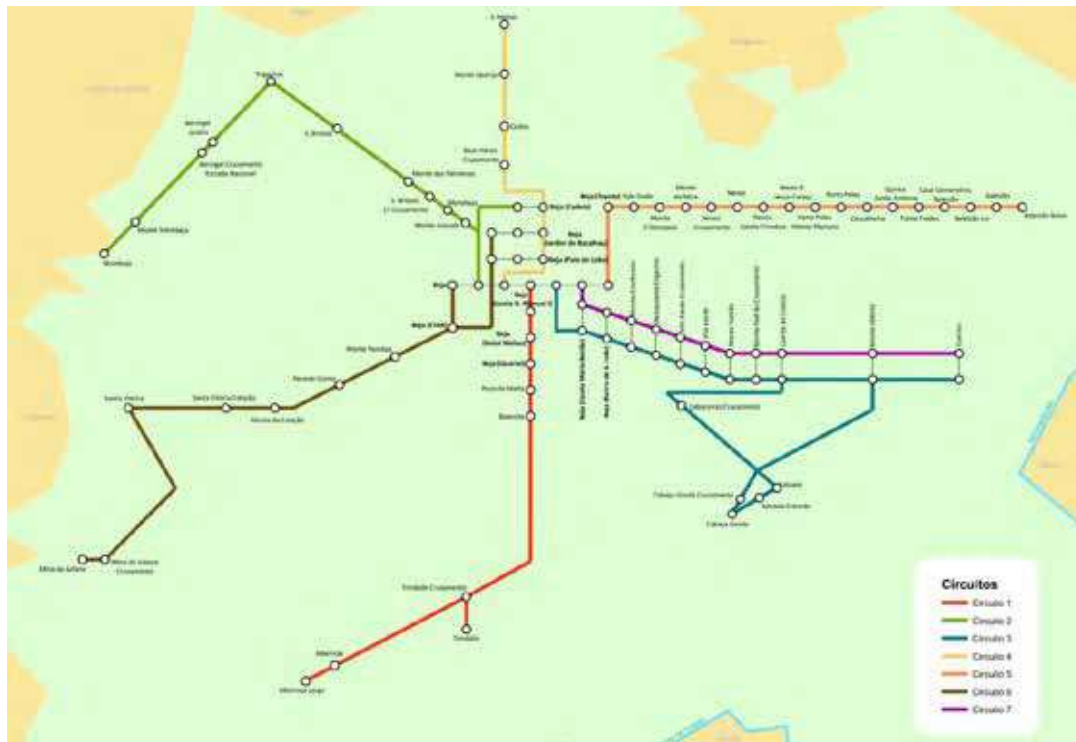


Figure 2 – On-demand Transportation Network for the Municipality of Beja

Travel prices

All prices were defined by the municipalities, according to travel distances and the normal price rate for regular trips. The prices are about 1.5 x regular route prices that correspond roughly to the taxi trip value divided by 4 passengers (echelons depending on distance 1,60€ to 5,10€). For more frequent travels a book of 10 pre-purchased tickets is available, with 30% discount. Figure 3 shows the image on line and in paper flyer to illustrate the different prices according to distances.



Figure 3 – On line different prices according to distances

Travel requests – the service user

Besides the site information (soon on line and shown in Figure 4 as it will be on line), each municipality has a paper flyer with all the information needed to request the service:

1. The customer contacts the service through the phone number up to 12:30 the previous business day of the trip;
2. The caller performs the reservation according to the request. Until 16h00 / 18h00 on that day, a call is made to the client to confirm the time and cost of the trip;
3. On the day and time scheduled by the passenger, the transport will be at the default stop.



Figure 4 – Image on line to show all steps of travel request process

The travel requests – additional frequently asked questions

In order to ensure that no user has doubts and is easy understand every moment of the service, the FAQs - frequently asked questions - have been set on each paper flyers, as well as on the website and they are as follows:

What is On-Demand Transportation? It is a public transport service where the passenger has to pre-book a trip. It is a service provided by your municipality that intends to get transportation to places where it does not exist or is deficient. On-demand transport does not overlap with the existing offer, but only complements it.

How can I book? Reservations can be made until 15:00 on the business day prior to the day of travel, by calling the telephone number 300 079 000.

Does a booking request have costs? The phone numbers beginning with 300 are called nomadic numbers, and their usage is charged as a call for a fixed service according to their tariff.

What information should I give of my reservation? Name, Phone number, Stops and hour of origin and destiny.

What happens if you do not make a reservation? If a reservation is not made until 15:00 on the previous business day, the transport service is not guaranteed. Late reservations may be allowed, but only for stops that already have reservations.

After booking is the trip guaranteed? No. You must wait for the confirmation of your trip, so you will be contacted by an operator who will give you the confirmation of the trip, as well as the information about the time and associated costs.

How far can I go with on-demand transportation? There are pre defined circuits of the on-demand transportation service operating in the counties of Beja, Mértola, Moura, Odemira and Reguengos de Monsaraz. There are stops, routes and pre-defined times in each municipality. You should consult this information in the brochures available in your local authority or parish.

What kind of vehicle is included by the service? The services are carried out by taxis (of 4 or 7 places) or by vehicles of the respective municipality.

Will the vehicles collect the passengers at their houses? No. Although the shuttle service is also made by taxis, it is not a taxi service. There are stops (properly identified with the Symbol of the Transport on-Demand), schedules and defined circuits.

Where can I buy the ticket and how much? The ticket can be purchased at the premises of the town hall, the parish headquarters or the driver, and each trip corresponds to a ticket.

How can I get more information? For more information you can call the phone number 300 079 000, running every working day, from 09:00 to 12:30 and from 14:00 to 17:30.

The travel requests – the platform proceedings

The "Call Center Operator" registers the reservation request by the "User", indicating to the platform:

- County
- Name, Tax identification number, Phone number and Email
- Origin and destiny

The platform processes the various booking requests of the day and evokes the Geographic Information System for optimization. According to this optimization it generates work orders and notifies the "Local Service Manager" (a person defined by the municipality and working there) that validates service orders (validates vehicles and associates drivers) according to availability and notifies the "Call Center Operator". Then, the "Call Center Operator" confirms the reservations with the "User" according to the processed Service orders.

The platform aggregates service orders confirmed by municipality and notifies by mail the following stakeholders:

- Municipal Manager and Local Service Manager, with all the orders that are to be carried out by that municipality
- Transport Operator, with the work orders that were assigned to their vehicles
- Driver, with the work orders assigned to him.

This information allows all those involved in the process to keep track of all the trips as well as the financial costs of each trip attributed to the municipality.

The near future work

On May 30 the CCDRA developed a public presentation event for the project. The objective of this event is that municipalities of the pilot project as well as the managers of the Middle Tejo project can share the strategies and the experience of the definition of routes and tariffs. Each of the remaining forty municipalities can thus begin to prepare the possible association to the platform and begin the procedures that precede this association.

Before the project goes into operation it is still necessary that "Local Service Manager" in the municipalities as well as "Call Center Operators" receive specialized training for the operation of the platform.

At the same time a monitoring plan is being set up for all procedures from the reservation to the final destination of each trip. In this plan there are also surveys of satisfaction to the users that allow later to indicate the needs of updating each network or specific services.

The long term future work – second stage of the project

The first major objective for the future work is to accommodate all other municipalities that intend to be associated to the platform.

The platform is already being prepared to evolve from a project of On-Demand Transportation to a project of Mobility as a Service. In this second stage, all types of public transport should be associated

and users can book a trip that has more than one type of transport and therefore for travel between different municipalities. Since it will be at a time when users are already familiar with the project, online travel reservation as well as a mobile application will also be available.

References

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Portal Regional do Médio Tejo, Date of Access 28/05/2019
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