SMARTA
smart rural transport areas

ON-DEMAND POOLING SERVICES

IN THE LOW DEMAND AREAS OF CATALUNYA REGION

Country: Spain

OVERVIEW

On-demand pooling transport services have been introduced in 2017-2018 in the municipalities of Sant Cugat del Vallès and Vallirana in the surrounding area of the Barcelona conurbation.

The services cover low demand peripheral areas of both the municipalities.

In both cases, the services were designed as replacement of former ineffective regular services and they were implemented introducing a pooling technological platform (provided by Shotl, IT company) which provides valuable services for all the stakeholders (PT Operator, PT Authority, customers). The service is operated by mini-vans and bus stops are used for pick-up and drop-off.

The results achieved after the introduction of new services in terms of number of trips, costs optimization and user satisfaction levels prove that "on-demand" services represent an effective solution for low-demand areas.

Figure 1. On-demand pooling transport
source: Shotl brochure

Main aspect/issue addressed by the good practice

The good practice allows an ex-ante/ex-post analysis of the re-design of conventional bus line into on-demand flexible transport in low demand areas.

In particular the good practice addresses the role and the effects of the technological platform allowing the operation of the flexible services and providing solutions and value services to all the stakeholder (PT Operators, Authorities, customers). From the technological point view, the level of acceptance of the APP by different user segment (age, sex, education, etc.) as a tool to book the trip can be compared with the traditional modalities (i.e. phone) both adopted in Sant Cugat.

Main objectives of the good practice

The good practice demonstrates the higher performance of the flexible service compared to the conventional bus service for answering the needs of low demand areas. The performance assessment is carried out according to the following criteria: number of trips operated, capability in matching the trip request and in optimizing the service scheduling (i.e. waiting time of the user at pick up points, travelling time, occupancy of the vehicle during the trip), customer satisfaction (willingness to use public transport, matching with mobility needs, comfort, etc.), reported discrepancies between the operated service and the scheduling.

DESCRIPTION OF THE AREA

Region	Target area	Population	Population density
Catalunya	Can Barata *(Sant Cugat del Vallès, whole population)*	Few thousands	34 inhab./Km^2
	Vallirana *(target area)*	88.900 inh. (2016) Few thousands	1.578 inhab./Km^2 23 inh./Km^2
	Vallirana *(whole municipality)*	14.784 inh. (2017)	621 inh./Kmz

Other

Can Barata and Vallirana are residential areas built on mountainous terrain with streets which are spread out irregularly.

Target user groups and needs

The target user groups are the residents of some peripheral areas of both the Municipalities: Can Barata in Sant Cugat and Vallirana.

Can Barata was served by the circular conventional bus line operated in the municipality of Sant Cugat. This line connects San Cugat with the nearest train station. Due to the high travel time and the poor coverage outside the peak hours, the service was poorly used and most of the rides were carried out almost empty (around 6 passengers/trip). Vallirana's public transport operator, Soler-i-Sauret had been dealing with the complexities

of the town's territory for years. The conventional bus services were not frequent. Although accessible stops throughout the network were extensively distributed, user satisfaction levels were low due to the high waiting time and the walking distance from the origin point of the trip and the nearest bus stop.

In both situations the ineffectiveness of conventional public transport services brings a heavy dependence on the use of private car for traveling.

DETAILED DESCRIPTION OF THE PRACTICE

Timeframe(s)

In Sant Cugat the first pilot tests were carried out in July 2017 and the effective pilot was running in September. The full operation of the service started in November and the integration with the e-ticketing system was carried out in January 2018. The service in Vallirana started in September 2018 after a pilot phase lasting two months.

Bodies involved

The main actors are the PT Authority regulating/ contracting the transport service (the local Municipalities), the PT Operator (Soler-i-Sauret in Vallirana, Moventis in Sant Cugat) and the IT provider of the pooling platform (Shotl).

The PT Operator are the concession holder of the former lines replaced by the flexible services.

Mobility services provided/addressed

Both the services connect peripheral areas of the Municiaplity to the central area or main interchange points such as the train station or the bus terminal. In Sant Cugat, the flexible service connects a residential area named "Can Barata" with the town centre. The two most popular destinations in the town centre are: the train station (90% of the requests) and the care centre of Can Mates. In Vallirana the flexible service connect some residential areas on the boundaries of the Municipality with the town centre.

DETAILED DESCRIPTION OF THE PRACTICE

Legal Framework

Under Spanish PT regulation it is obligatory to have a license to operate a transport service. The licenses are assigned locally by the Municipalities but the maximum number of them is defined at regional level. The flexible transport services in Sant Cugat and Vallirana are operated in the framework of the PT concession assigned by the interested Municipalities.

Cost and Financing sources

The services are subsided by the Regional Administration.

Organizational set-up

In San Cugat the trip reservation can be carried out by APP or by phone, in Vallirana only by APP. The users can book the trips up to 7 days in advance. The trip can be requested according to 15-minute slots (e.g. 18.15-18.30). One hour before the requested time slot, the user receives a notification on the APP specifying the detailed time and place (bus stops) for pick-up.

The passenger APP allows the users to submit a trip request. After selecting the number of passengers and typing in the addresses of origin and destination, the APP provides an accurate pick-up time and the estimated time arrival. Users are also provided with navigation being informed about walking directions towards a pick-up point and from the drop-off point to their final destination.

The driver APP supports him/her in retrieving the passengers at a pick-up point providing navigation mode to the final drop-off point. The machine learning algorithms ensure all routes are fully dynamic and adjusted in real time, based on traffic and demand.

The Management module provides web interface for fleet and operation managers who have full access to a central console to set network and stops configuration, to supervise demand fluctuations, to manage vehicle availability and to check the status of every trip. The management module provides als the reporting of service actually operated and the comparative analysis with the scheduling and the assessment of service performance.
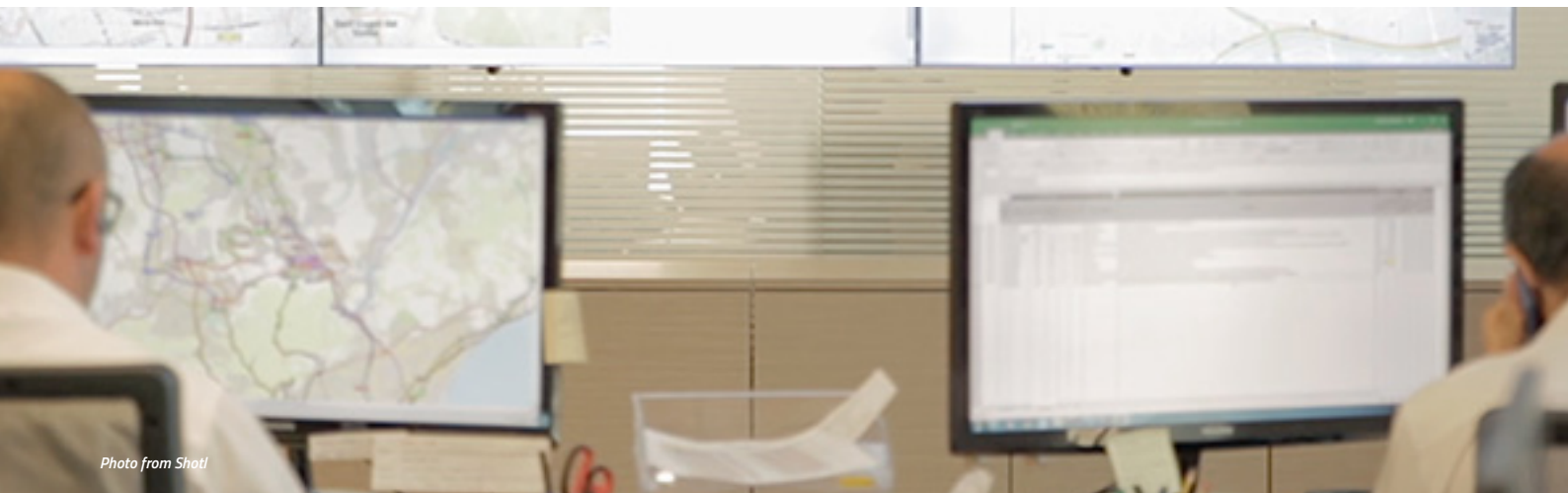

Photo from Shotl

Supporting technologies

The platform consists of a management module and three different interfaces: one App for the passengers, a second APP for the driver and a desktop interface (for the PT operator and the Authorities).

The ticketing system is integrated with the system operated for the conventional service.

INNOVATION ASPECTS

ORGANISATIONAL RESPONSIBILITIES AND PARTNERSHIP WORKING ARRANGEMENTS

N/A

LEVEL OF PUBLIC SECTOR FINANCIAL SUPPORT

N/A

INTERCONNECTIONS BETWEEN SHARED AND PUBLIC TRANSPORT SERVICES

The flexible services act as feeder of conventional bus lines allowing the passengers to reach the train stations or the interchange bus terminal

ICT CONNECTIONS AND IMPACTS OF THE TECHNOLOGICAL SOLUTIONS IMPLEMENTED

Operation of an integrated platform supporting the management of flexible services and providing valuable services for all the stakeholder through dedicated interfaces. Use of machine learning algorithms for the optimization of the scheduling compared to the request and the traffic information.

OTHER (E.G. SOCIAL INNOVATION, ETC.)

N/A

ASSESSMENT

Ridership and other key metrics/results (through key-indicators, where applicable)

In Sant Cugat the average occupancy of the vehicles increased from 6 passengers/trip (for the former conventional line) to 16 (with the on-demand services). The average number of passengers transported each week was about 20 and it slightly increased from the launch of the service (12-14 each week). 85% of the passengers are concentrated between 7-10h and 14-18h.

In Vallirana the previous service had a daily average ridership of 20 passengers. In Week 1 after the launch of the service, ridership increased to 28 trips per day. In Weeks 3 and 4, ridership grew to 36-38. The barrier of 50 was broken in Week 6. Most of the trips go from the town centre to the residential area as passengers are more likely to walk downhill from their homes to the centre, but less willing to walk uphill on their way back from work or leisure activities or whilst carrying heavy shopping bags.

Good Governance

With the use of the Shotl platform, PT operators are better able to meet the transport needs of the users: indeed, the platform allows the optimization of the service scheduling with respect to users' waiting time at pick up points, travelling time and occupancy of the vehicle during the trip. This resulted in a better PT provision and, consequently, in higher number of passengers.

Success factors/strengths

TIn Sant Cugat the operational costs of the flexible service are 15% less than the former conventional line. 70% of the trip requests are carried out by APP, the remaining by phone. The performance of the software algorithm for dynamic routing seems to be good: the average waiting time from the trip request is about 9 minutes.

In Vallirana a total of 35 new stops were added after the launch of the service, taking the overall number of bus stops from 50 to 85. Consequently, this meant that areas which were previously undersupplied now have a bus stop closer to their homes.

Average waiting times have dropped to as low as 15 minutes; from the moment a ride is requested until the passenger gets picked up, curtailing up to 5 times when compared to the previous service.

The APP is ranked 4,4 stars by the users on the market.

Difficulties encountered/weakness

In both areas of Sant Cugat and Vallirana, the main difficulty encountered was due to the feeling of uncertainty of the authority contracting the transport service (i.e. the local Municipalities) and the PT operator (Soler-i-Sauret in Vallirana, Moventis in Sant Cugat) in replacing a conventional service, in operation for years, with a new Demand Responsive Transport service of which they had no experience whatsoever.

FEATURES THAT ARE CONSIDERED TO BE GOOD PRACTICE (LESSON(S) LEARNT)

The good practice has two key elements which can be highlighted: the first is the service planning and the second is the ITS operation. From the service planning point of view the flexible services have been designed to replace ineffective conventional bus lines previously running on low demand area. From the technological point of view, the service operation is supported by an integrated platform providing value services for all the stakeholder through dedicated interfaces. In Sant Cugat del Vallès the use of an APP interface for the user can be assessed compared to the phone call. The APP allows not only the trip request but it provides also a range of supporting functionalities to the user (navigation to the bus stops, etc.)

REFERENCES FOR FURTHER DETAILS

Contact of the operator and of relevant stakeholders

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Key references

- Shotl brochure and technical documentation

Websites

- Website of the Municipality of Sant Cugat del Vallès, www.santcugat.cat/web/tad-canbarata (services in Sant Cugat)

- Shotl website, https://shotl.com/news/shotl-triples-ridership-demand (services in Vallirana)