

SUMMARY OF ARTICLE: doi: <http://dx.doi.org/10.12795/rea.2019.i38.07>

From Linear to Zonal Management Contracts: A Proposal for the Public Inter-Urban Transportation of Travelers by Road in Aragón

Ricardo Badía-Lázaro

rbadia@unizar.es  <https://orcid.org/0000-0003-0572-3681>

Eugenio Climent-López

ecliment@unizar.es  <https://orcid.org/0000-0001-6788-4873>

Grupo de Estudios de Ordenación del Territorio (GEOT). Universidad de Zaragoza

Departamento de Geografía y Ordenación del Territorio

Universidad de Zaragoza. C/ San Juan Bosco, nº 7. 50009 - Zaragoza

KEYWORDS

Public transportation
Bus
Inter-urban
Rural accessibility
Management contract

1. INTRODUCTION

Public transport guarantees a fundamental social right: freedom of movement of persons at different socio-temporal scales. Thus, we could consider it as a public service on which public entities have to be responsible for. With regard to intercity bus services, typically are provided by private companies holding administrative concessions or management contracts.

Intercity bus services need to be planned to address the needs of the population and ensuring social profitability. In the interest of social cohesion, governments must put particular focus on economically, socially or physically disadvantaged groups, such as child, elderly, disabled and other population without car availability.

The regional scope of this research is the Aragón Autonomous Community located in northeast Spain. In this region, all the management contracts expired in December 2017. This situation has allowed the design of a completely new interurban transport system, with a better overview and more adapted to current needs. The sector enterprises, anticipating that date, sponsored a study to make a reorganization proposal, starting from the diagnosis of the current situation. The objective of this article is to present the methodology used and the most relevant results of that study.



2. METHODS

The methodological process is divided into two parts: 1) The diagnosis of the current intercity bus transport system 2) The evaluation of proposals to implement the new system.

As for the diagnosis, we have created a spatial database containing data on the supply of public transport as well as on its demand. For the analysis of these data: Firstly, we have classified all the routes according to the rank of their destination town in the urban hierarchy. Secondly, we have calculated an indicator that states the quality of service, taking into consideration the number of trips along with travel times.

In a second stage, we have proposed a shift from linear to zonal management contracts. This decision has been supported by an iterative process. Primary, we have considered the existence of trunk lines serving certain nodes that centralize feeder lines. Then we have delimited functional areas enclosing a single trunk line and its feeders. For each of these areas, we have redesigned its transport routes itineraries optimizing their costs. Finally, we have undertaken an economic assessment.

3. DIAGNOSIS OF THE INTERCITY PASSENGER TRANSPORT BY BUS IN ARAGÓN

The spatial distribution of the population strongly determines the structure of the intercity bus services in Aragón. This region is characterized by a strong contrast between the Zaragoza metropolitan area, where a 57% of the overall population lives (totalling 744.579 inhabitants), in contrast with the rest of the territory where the population density is very low due to an intense rural depopulation process.

A total of 288 routes, divided into two groups, compose the intercity bus system: a) Trunk routes, whose function is to connect the regional and provincial capital cities with other major towns. b) Feeder routes that serve small settlements in rural areas and connect them with major towns. Due to the low population density, the majority of the latter have even less than a frequency per working day, meaning that way and return trips to satisfy basic needs can only be made twice or three times a week. In parallel to this service, an independent and extensive school bus system operates.

The quality of the intercity bus system has been synthesized through the combination of frequency, measured as the number of trips per day, and accessibility, determined as travel times from each village to the nearest major town. In light to the above, an excellent quality requires more than 10 services a day lasting less than 30 minutes per trip. To the extent that the number of services decreases and travel time increases the quality worsens. 77% of the Aragón's population has an excellent quality of service, this is people living in major towns and cities, including Zaragoza; 12% has a good quality of service, 5% a fair quality, 2% poor quality and 4% very poor quality. In the two latter situations, although the population affected is small, there are half of the inhabited settlements since the smallest villages have the poorest level of service.

The intercity bus system cost is 20.8 million euros. The annual income amounts to 13 million euros, covering 63% of the operating cost. Thus, there is a deficit that is partly covered by the regional and local entities that subsidize transport companies with 4.2 million euros since it is a public service.

The diagnosis of the system brings to light that intercity bus service in Aragon covers the needs of a high proportion of the Aragón's population. Notwithstanding, there are some inefficiencies derived from the fact that the system is based on a big number of linear management contracts. This situation provokes different routes to overlap, resulting in a worse level of service and higher operational costs. School transport is managed as an independent system (although there are a few examples of coordination) incrementing inefficiency of the whole system. Overlapping between networks is more problematic in the smallest settlements since they feature the worst quality of public transport.

4. PROPOSAL FOR INTERCITY PASSENGER TRANSPORT BY BUS IN ARAGÓN

This proposal establishes eight zonal management contracts. Each zone is structured around a trunk line that passes through different nodes, located in major towns. Six of these zones have radial trunk lines that



connect the city of Zaragoza with the following towns respectively: Fraga, Alcañiz, Teruel, Calatayud, Tarazona-Ejea de los Caballeros and Huesca-Jaca. The seventh zone connects Huesca with Barbastro and Monzon. The eighth zone is articulated around the city of Teruel without any clear trunk line.

In our proposal feeder routes interchange with trunk lines at nodes located at major towns and other central places through coordinated transfers allowing travellers to continue their trips towards the provincial or regional capital. As for school transport, is organised with regular transport where possible creating mixed routes. As a consequence, there is a large increment of trip opportunities from rural settlements towards destinations with primary or secondary schools allowing travellers to connect to trunk lines again. Additionally, on-demand transport systems are proposed to serve the smallest villages.

If we compare our proposal with the current situation, we can appreciate the lack of a negative impact in the level of service along with an important reduction in the number of kilometres driven as well as in the operational costs. As a result, the operational deficit is reduced, and so on the number of public subsidies.

5. DISCUSSION AND CONCLUSIONS

This study confirms the difficulty of providing an appropriate level of accessibility by public transport in low density areas. The diagnosis reveals that its quality is insufficient on almost half of the Aragon's territory, coinciding with the least populated areas.

The paper demonstrates that there is room for the improvement of the level of service along with a reduction of the operational costs. Systems based on lineal concessions cause important inefficiencies that affect not only the quality of the system but also their deficit. In contrast, zonal management contracts allow a more flexible and coordinated operation. The hierarchy of routes, the choice of strategic nodes and the systematic use of transfers with coordinated schedules create new travel opportunities with considerable savings in kilometres and operating costs.

A joint management of passenger and school transport avoids overlapping routes, saving money and creating new travel opportunities in the least populated places. On-demand transport can complement this system, arriving virtually to all settlements when necessary, in reasonable conditions for passengers and companies.

After this study, the Aragon government has assumed a zonal management system, although its proposal differs from ours in several points. Firstly, the implementation of the government's proposal will offer an improvement in the quality of the service, but it still addresses passenger and school transport as two separate networks. Secondly, it consists of a bigger number of management contracts, specifically 19 zones, what entails that some important overlaps will still be present. Both points lead to an important operational deficit that the regional government will cover with subsidies in order to guarantee the right to mobility of rural communities.