

# TRANSPORT INFRASTRUCTURES IN UPLAND AREAS OF IBERIA

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## 1. INTRODUCTION

Attention must first be paid to prior definition of terms relating to transport (accessibility, enclave, transport corridor, border effect) and to terrain in mountainous areas, in respect of the incidence of topography, which implies a physical boundary effect and other limitations (slopes, tunnels, corridors, impacts) for land transport. At times these are enhanced by the effects of political borders, whether they may be national frontiers or boundaries between regions or provinces (frontier crossings, dead ends) all of which can alter routes and networks in transport systems.

In this context, mountainous zones, through their relief, exercise pressure on the efficiency of transport networks, as measured in terms of speed indicators (distance as the crow flies divided by time actual spent on the journey) and of curvatures (the distance in the given means of transport divided by the distance as the crow flies). Hence, mountainous terrain has a direct impact on the cost of infrastructures and their efficiency. In other words, it is a factor shaping the paths taken by road and rail transport, leading to the appearance of corridors, or a concentration of routes along passes between mountains or along the edge of their foothills. Such zones are themselves characterized by their harsh relief and steep slopes, having fewer inhabitants and a low density of population with scattered settlements and few towns of any size. Thus they have a poorly structured urban system, patchy economic activity and in general a lack of middling to large industrial establishments, having few tertiary installations, as also severe difficulties in ensuring they are provided, when demand is sparse and highly dispersed. This leads to the state of affairs that the benefits of modern communications between urban areas, that is, access to motorways and to long distance and intercity trains, do not always reach these areas in a timely fashion.

## 2. BOUNDARY ZONES AND TRANSPORT CORRIDORS IN THE UPLANDS OF IBERIA

Documents concerning national planning for the sector recognize that in Spain the development of transport infrastructures is strongly affected by physical and geographical characteristics of the country. It has a peripheral situation relative to the heartlands of activity in Europe, mountainous terrain and a highly unbalanced distribution of population. These are features that constitute a clear comparative disadvantage in terms of access to the centres of activity in question. Moreover, its harsh terrain affects the costs of networks of infrastructures, which often have low levels of use, but at the same time a lack of capacity, and impose serious limitations on the adoption of policies for cohesion or territorial balance with any economic viability (Ministerio de Obras Públicas [Spanish Ministry of Public Works], 1994, pages 98 to 99). Thus, the zones showing low (absolute and relative) accessibility to the centres of activity are to be found in Spain and Portugal primarily in upland areas and boundary regions. This is despite their relative closeness, in some cases, to major economic centres, owing to their mountainous status and their having quite deficient transport infrastructures.

An outline of the situation of transport infrastructure in each of these zones, oriented towards processes of change and improvement, as well as the difficulties that exist, will help to gain an overview of current realities and medium-term prospects, covering the whole Iberian Peninsula. On this point, when speaking of transport infrastructures in upland areas, it should be recalled that in recent years the most dynamic activity in such places has in general been connected with tourism. This fact points to the interrelationships between transport, tourism and territory, extensive reflexions upon which are to be found in Millán Escriche (2010).

## 3. TWO UPLAND BOUNDARY AREAS, THE SOUTHERN SLOPES OF THE PYRENEES (EXTERNAL BOUNDARY) AND THE CANTABRIAN RANGE (INTERNAL BOUNDARY)

Firstly, the *Spanish Pyrenean Zone* is, as mentioned above, the most extensive boundary area in the Iberian Peninsula, even if less marginal at its two ends. It is characterized by the presence of an international frontier with three states involved (Spain, France and Andorra). Until not long ago, this was seen by Spain's northern neighbours as a cultural and continental frontier line: «Europe ends at the Pyrenees».

The same situation is not found in the upland areas of the interior of the Iberian Peninsula, as they have barrier effects just as significant as in the Pyrenean Mountains, or perhaps more so, thanks to the similar structural problems to be seen there, whether socio-demographic (considerable ageing of the population), or of land use (depopulation and extreme scattering or «atomization» of settlement), but show less economic and tourist development. This is the case for the *south-facing slopes of the Cantabrian Mountains*, an area very much cut up into longitudinal valleys and small transverse valleys, which communications infrastructures have partially modified.

In both upland areas the basis is a similar type of folding and mountain formation. The average heights are alike, both areas have zones which are designated as protected environments and thus have similar effects as a physical boundary when transport infrastructures are being installed across the areas. One inheritance from the pre-industrial past is the tracks and lanes that run up to the mountain passes, and often also into the many dead-end valleys. It was not until the nineteenth century was well advanced that first rail lines, and then, in more recent times, motorways began to be built, which reduce the average altitude to be climbed by means of tunnels in some of the most centrally placed valleys for communication between towns. Other features which are relatively different between the two areas are the extent of tourist activity, particularly ski resorts, hot spring spa centres, and hotel and other accommodation in the Pyrenees, as shown by tourist figures, not to mention the presence of the unusual enclave of Andorra. The effects of the national political frontier have been considerable limitations on the building of road and rail links through the central Pyrenees, owing to the opposition of the French government, under pressure from ecological lobbies. Nevertheless, the challenge of a crossing of the Pyrenean mountains has merely been postponed for the moment, in view of the need to divert some of the heavy flow of traffic from the extreme ends of the area to the middle portions, thus encouraging greater closeness and co-operation across the frontier and between cities. This situation is not found in the same way in the Cantabrian area, where the Asturias-to-Leon and Cantabria-to-Castile axes of transport have now been reinforced by more modern infrastructures of high speed rail links and motorways, which are ample for the levels of traffic between towns and between regions.

#### **4. CONCLUSION**

The territories forming enclaves in the mountain ranges and uplands of Iberia face major difficulties for modernization, organization of land use and accessibility. This is unsurprising in view of the fact that they start with physical disadvantages, such as high altitudes, steep slopes, and an extreme temperature range, as also with socio-economic disadvantages, like lesser development, rural character, depopulation and ageing of the population. These limit the extent to which they can overcome the features of peripheral status and long-standing limitations which have been typical of them. This is all the more so because of the bounds within which policies for territorial improvement have to work here, where above all the natural and cultural heritage has to be preserved, and all development has to be sustainable.

The general absence of cities in these areas, and the weakness of their few central settlements, highly dependent on the cities outside these zones, together with the sparse density of their population and the fragility of their resources, present serious difficulties for these areas and regions in any attempt to overcome the marked degree of isolation of most of them. At the same time they are faced with the effects of through traffic and the environmental impact of modern communication routes. However, other factors have to be taken into account, such as the trend for the processes of urbanization and agglomeration to spread, or the mobility of the part of the population linked to upland areas by ownership

of a holiday home or by leisure activities practised there. These are playing a role as a motor for change at the present time.

Moreover, the current economic situation in Spain means that public authorities must necessarily rethink their interventions and actions, rather than continue on the same lines as the various former projects for major transport infrastructures. Hence, the evaluation criteria for new road and rail links must address, with even greater attention if possible, the principles of environmental sustainability and minimum impact, of cohesion and of land use organization along the network and of efficiency with regard to construction and maintenance costs. On these lines of a logical re-adaptation to the economic situation affecting the country, the aims of actions must include, among others, improved accessibility and encouragement for routes between towns and regions. In this context, mountain fringe zones must also be new areas of attraction and linkage. To this end, among other criteria, the following should apply 1) better use made of the urban and semi-urban potential of settlements at the meeting-points of regions or nations, with an eye to logistics and economic activities, 2) planning of transverse rapid roads between valleys or in the foothills, on the one hand, as an alternative to the more expensive and invasive building of motorways, and on the other, as a way of improving the accessibility of upland settlements.

These sorts of action must apply both to mountain areas straddling nations (the Pyrenees) and to those between regions (other mountainous zones). This is because the intensification of links and exchanges between nations and regions offers certain opportunities to add to those derived from the protected status of high and middling mountain areas, the rehabilitation of rural and mining villages, and potential seasonal or year-round tourist activities. In this, small urban centres (Jaca and La Seo d'Urgell) and semi-urban localities (Puigcerdá, Benasque, Aguilar de Campoo, Villablino and many others) may serve as a trigger for channelled tourist development, either as an alternative or as a complement to the economic development of upland settlements.