

Spending Review 2019/2020 Transport infrastructures

July 2020

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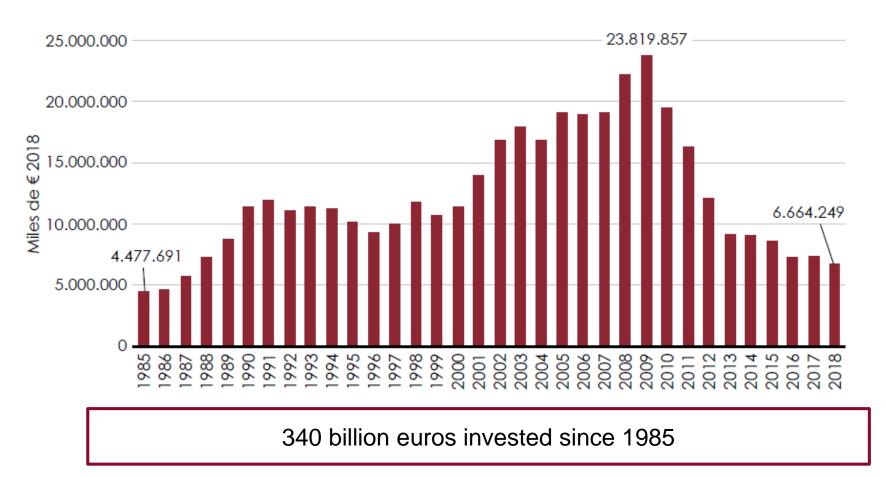
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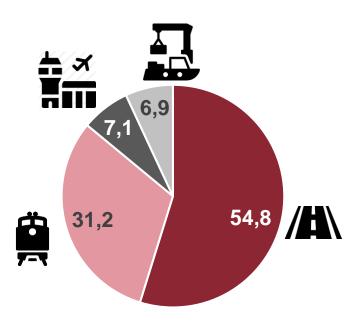


Investment in transport infrastructures

35 years of investment

Gross Investment in transport infrastructures

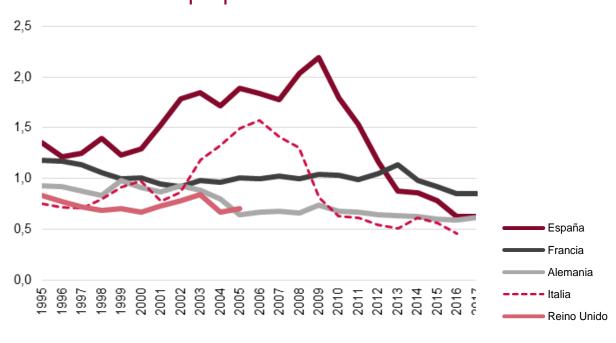






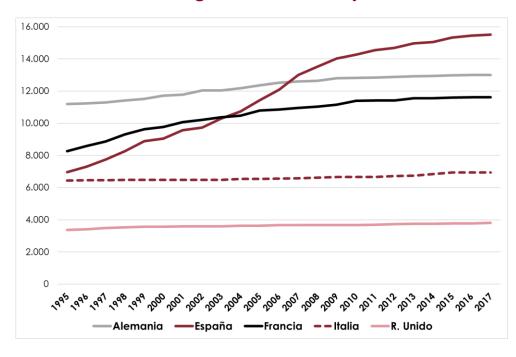
International comparison

Gross investment in transport infrastructure as proportion of GDP



Source: IVIE, OECD, MITMA.

Length of motorway.



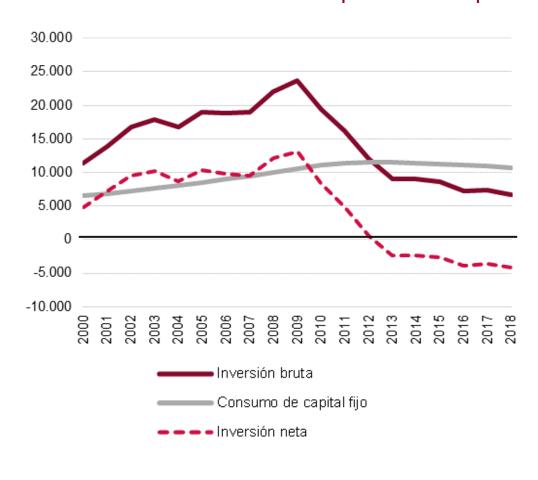
Source: Eurostat.



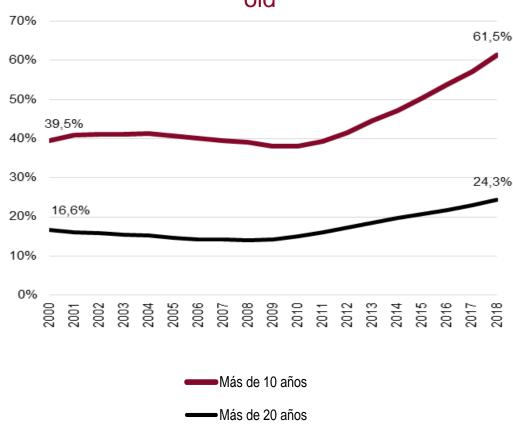


Age of the stock

Gross investment and fixed capital consumption



Percentage of investments over 10 and 20 years old





Main conclusions

- In the period 1985-2018, Spain made **huge** investments in transport infrastructure.
- Of the large European countries, Spain is by far the one that invested the most in transport infrastructures in the period 1995-2017.
- Spain has drastically reduced the gap in transport infrastructure provision with the major European countries.
- The investment has been almost exclusively public.

- European funds contributed over 57,64 billion euros in the period 2000-2020, accounting for 22% of the total amount invested.
- Interregional infrastructure capital inequalities have remained almost constant over time.
- The sharp drop in investment since 2012 has meant that annual gross investment does not cover stock depreciation.
- If investment remains at current levels over the next decade, the ability to provide infrastructure services will fall significantly.

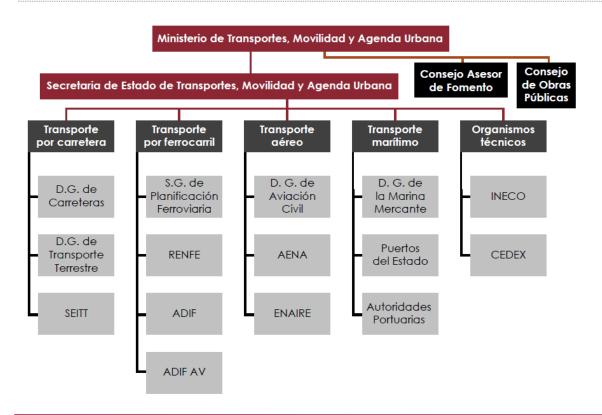


Infrastructure governance

Coordination and cooperation

Governance

The infrastructure investment policy is essential for ensuring high quality public networks, which, in turn, are essential for guaranteeing economic growth and raising the general welfare of society. In a context of limited resources, decision-making processes must be transparent and predictable and they must allow efficient use of public funds.



- The complex structure of the Ministry of Transport, Mobility and Urban Agenda (MITMA) requires a special effort in terms of coordination, cooperation and planning.
- Significant delays in the approval of key infrastructure management documents have been identified: only the airport sector has the planned document in force, while the other means of transport have recorded significant delays in drawing up their plans.



Strategic infrastructure planning

- Ambitious planning, without prioritisation of actions or budgetary links:
 - The plans have become a list of projects that are implausible due to their size and deadlines
 that are impossible to fulfil. It is easy for each regional government to build up a discourse of
 grievance based on the list of projects that have not been undertaken or which have been
 delayed, which leads to excess allocation.
 - There is no link between the plans, the budget process and the economic situation. Neither is the project selection process linked to the annual availability of funds.

Forecasts of the strategic infrastructure plans

	PIT	PEIT	PITVI	Situación actual
Año previsto de finalización de obras	2007	2020	2024	2020
Km de AVE previstos	7.700	8.100	8.740	3.086
Presupuesto (M€ 2018)	48.642	95.787	S.D.	54.313
Coste por km (M€ 2018)	6,3	11,8	S.D.	15,3
Fuente: MITMA y AIReF.				

Undervaluation of the planned investments: The costs of the projects to be performed have been underestimated at the different stages of the project planning process.



Strategic infrastructure planning

- Improvable transparency and public participation: The transparency of planning processes is insufficient and there is ample room for improvement in the public debate and participation process in decision-making.
- Improvable transparency in data: One of the major shortcomings identified in the evaluation is the limited availability of public data with sufficient level of detail on the infrastructures, transport services and specific projects.
- Absence of evidence in planning: There is no methodology that builds the link between diagnosis, data, evidence and the plan's decisions. Neither are past investments evaluated ex post.



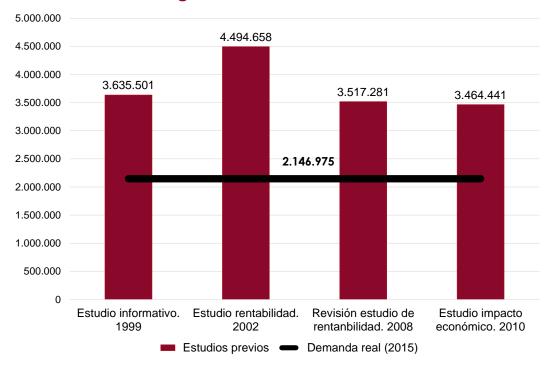
Project management

- Optimism in planning: A clear trend has been identified to underestimate the costs and timescales of the plans and projects, to minimise their risks and to overestimate their benefits, especially the demand for travel.
- Investment decisions are made on the basis of data that are far from realistic.

Differences between forecast and actual cost. 2018 Furos.

Línea / Tramo	Previsión	Inversión Real	Diferencia	Diferencia (%)	Año
Madrid - Barcelona	8.578.350.632	13.618.716.137	5.040.365.505	58,8	1997
Córdoba-Málaga	1.743.604.754	2.710.840.646	967.235.892	55,5	1999
Madrid-Valladolid	2.710.016.945	4.099.085.293	1.389.068.348	51,3	2000
Madrid - Valencia	3.579.972.398	4.784.281.702	1.204.309.305	33,6	2000
Zaragoza - Huesca	211.772.823	312.372.574	100.599.751	47,5	2001
Palencia - León	572.704.836	823.284.478	250.579.643	43,8	2002

Actual demand vs. expected demand (2015). Passengers. Madrid-Valencia Line





Project management

- No real ex ante evaluation is carried out of the investments to be made:
 - Most of the time, the most important decisions are made before starting feasibility studies.
 - Despite the great heterogeneity of the projects, the results of the feasibility studies are very similar and always above the legal minimum.
 - Infrastructure planning is not carried out by identifying mobility problems and focusing interest and resources on possible alternatives to solve those problems. The aim becomes to carry out one or another project.
 - On other occasions, the results of the feasibility studies, however strong they may be, do not determine the final decisions taken by the government.

International comparison

There is an extensive list of good practices that Spain could apply, by adapting them to its specific situation, in order to reduce the planner's optimism, identify transport needs, better estimate the costs of the projects, specify *ex ante* and *ex post* evaluation methods for infrastructure investments and improve transparency, participation and accountability.



High-speed rail

International comparison

País	km AVF operación	km AVF construcción	km AVF planificados	km AVF (op. +constr.) por millón de habitantes	km AVF (op.+constr.) por 1.000 km²
España	2.852	904	1.061	80,65	7,52
Japón	3.041	402	194	27,16	9,44
Francia	2.814			41,93	5,14
China	31.043	7.207	1.071	27,59	4,07
Alemania	1.571	147	81	20,78	4,92
Italia	896	53		15,67	3,23
Corea del Sur	887		49	17,23	9,1

Fuente: UIC, 2019.

País	Pasajeros-kilómetro (1.000 millones)	Pasajeros-km por km de vía en operación (2017)
España	16	5.435
Japón	101	33.344
Francia	58	20.718
China	578	18.606
Alemania	29	18.141
Italia	15	16.853
Corea del Sur	15	16.798
Fuente: UIC, 2019.		

The second largest network in the world after China.

The lowest utilisation rates of all countries with a significant high-speed network



Investment

Total investment in high-speed rail. 1987-2018. 2018 Euros

Concepto de Inversión	Total	%
Construcción de líneas	54.138.693.476	88,6
Construcción de estaciones	1.749.733.532	2,9
Adquisición y reforma de trenes y material ferroviario	4.909.844.357	8,0
Estudios	316.004.783	0,5
TOTAL	61.114.276.148	100
Fuente: ADIF y RENFE.		

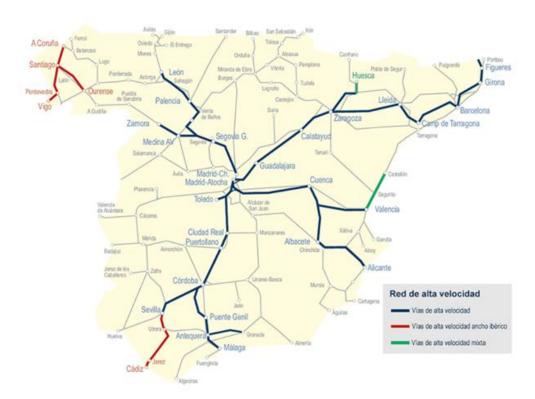
The **European Union** has financed €14,09 billion euros (25.2%) of the high-speed railway infrastructure (lines and stations)

- 55,89 billion euros invested in highspeed infrastructures.
- The average construction cost of high-speed lines in Spain has been 15.3 million per kilometre, well below the international and European average.
- Today, driven by the growth in demand seen over recent years, the overall operation of high-speed rail lines is profitable, although the Northern Corridor is still in deficit.



The current network and the target network

Current high-speed network



Final image of the high-speed network approved in the Infrastructure, Transport and Housing Plan 2012-2024

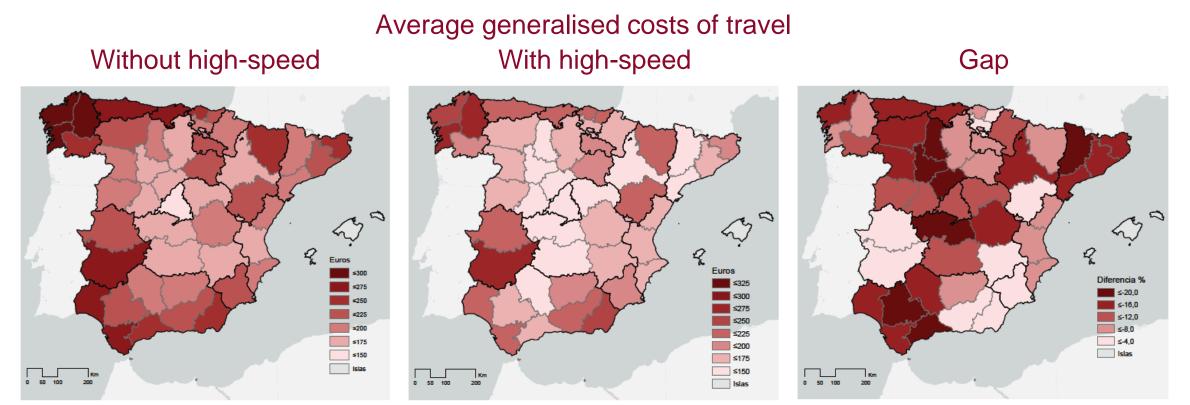


Source: ADIF, MITMA.

The current Infrastructure, Transport and Housing Plan (Spanish acronym: PITVI) sets the target network at 8,740 km, which leaves 5,654 km yet to be built, which means a minimum investment of an additional 73 billion euros.



Territorial and social cohesion



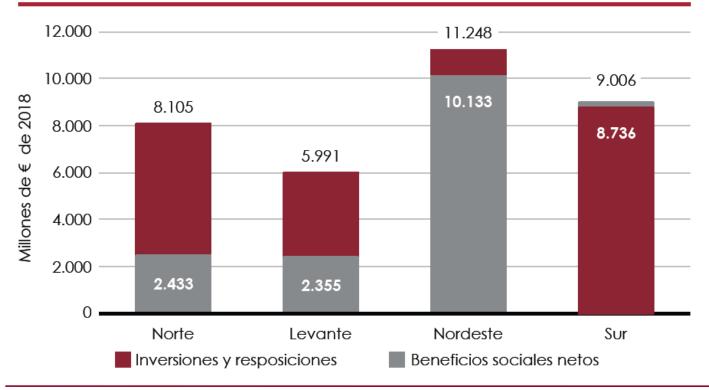
- High-speed rail travel has led to significant improvements in travel times (27%) and savings in the generalised cost of transport for all mainland provinces (14%).
- However, it has contributed towards an increase in provincial disparities in these metrics, while no increase in social cohesion is observed.



Ex post cost benefit analysis

	Norte	Levante	Nordeste	Sur
VAN	-5.672 M€	-3.636 M€	-1.115 M€	270 M€
TIR	-0,21%	0,22%	2,65%	3,11%

Fuente: AIReF.



- The results show between zero and minimum levels of socio-economic returns in all high-speed corridors
- The business profits do not offset the fixed construction costs, and they offer even less security in scenarios that are subject to uncertainty and in which the opportunity cost of public funds is high.
- The likely increase in demand as a result of the liberalisation of the rail market or a hypothetical and unlikely ban on mainland flights would improve the results, but only slightly.



Proposals I

I. DEVELOP A NEW REGULATORY FRAMEWORK

1. Develop a cross-cutting mobility law

 It is proposed that new comprehensive mobility and transport infrastructure legislation be approved, which defines common criteria and objectives for all means of transport and which aligns planning and management with international commitments made with regard to sustainable mobility

II. DEVELOP THE BUDGETARY LINK FOR INFRASTRUCTURE INVESTMENTS

2. Develop budgetary coordination and planning mechanisms for the short and medium term.

- It is proposed that the budgetary planning mechanisms of infrastructure plans and projects be strengthened, with greater involvement from the Ministry of Finance.
- It is proposed that an objective path be established for investment in transport infrastructure in the medium term which is based on the minimum necessary expenditure for proper maintenance of the current infrastructure.



III. TRANSPORT INFRASTRUCTURE PLANNING

3. Develop a Mobility and Transport Infrastructure Strategy or Plan

- It is proposed that a new comprehensive transport infrastructure and services plan be implemented
 as soon as possible. This plan should be based on the following basic principles in line with
 international best practices.
- It is proposed that permanent monitoring of execution of the plans be implemented. This will include a
 scoreboard reflecting the extent to which the economic, social and environmental targets proposed
 by said plans are achieved over time.

4. Draw up sector transport plans and link them to the national plan.

• It is proposed that sector planning instruments be approved as quickly as possible and to do so ensuring methodologies that focus on proposals based on evidence, transparency and public participation.

5. Approve the regulatory documents of the railway sector.

• It is proposed that ADIF's programme of activities be defined urgently and a programme contract signed between the ministry and the infrastructure manager, with the aim of complying with the legal obligation and ensuring appropriate planning of its activities and autonomy in its management.



IV. CREATE A NEW FRAMEWORK FOR EVALUATING AND PRIORITISING PROJECTS

6. Creation of an independent administrative authority for project evaluation.

 It is proposed that an independent body be set up to evaluate infrastructure projects. This body should have sufficient technical and economic capacity for effective oversight and to offer the necessary evidence for the decision-making process, including at a regional and local level.

7. Definition of a new framework for project evaluation

- Definition of the content of informative studies.
- Obligation to evaluate projects' socio-economic return (cost-benefit analysis).
- Evaluate territorial convergence and ex-post effects of the infrastructures.
- Create unique evaluation mechanisms for major projects.



V. PRIORITISE PLANNED INFRASTRUCTURE PROJECTS

8. Evaluate pending high-speed rail activities.

- It is proposed that an overall assessment be performed of the high-speed network yet to be completed, bearing in mind the costs already incurred and expected demand on the basis of actual data on journeys on the lines in operation and investment alternatives for solving mobility problems.
- It is proposed that a legislative and regulatory framework be established to increase the intensity of use of the high-speed network, which is the only way to increase the social return on the investments made.

9. Prioritise the projects to be implemented.

 It is proposed that the huge number of informative studies, both approved and currently being drawn up, on the different means of transport be compiled and, on the basis of transparent and objective criteria, a proposal of investment priorities be made.



VI. STRENGTHEN CIVIL SOCIETY CONSULTATION, TRANSPARENCY AND ACCOUNTABILITY

10. Strengthen public participation.

- It is proposed that mechanisms be created to facilitate the genuine involvement of stakeholders in decision-making before decisions have been made.
- It is also proposed that the provision of information and proactive measures be guaranteed in order to enable ongoing and open broad-based dialogues that involves the relevant stakeholders in the planning, selection and prioritisation of projects.

11. Implement an open data policy.

 It is proposed that all available data or information be made public unless there is a powerful reason not to do so. Publication of all the accumulated information, beginning with the most recent information, should be a core objective of MITMA, ADIF and RENFE.

12. Application of the comply or explain principle

 The key to achieving real improvement in governance is to ensure that political bodies follow the comply or explain principle so that in the event that they do not apply the technical recommendations, the reasons are made public.



VII. IMPROVE COORDINATION AND COOPERATION BETWEEN DIFFERENT ADMINISTRATIONS

- 13. Create mechanisms for coordination and cooperation between administrations and reform the Sector Conference on Infrastructure.
 - It is proposed that mechanisms for coordination and cooperation between the different administrations in relation to infrastructure be improved.
 - It is proposed that the recommendations for the improvement of territorial governance of the Spending Review 18: Evaluation of Subsidy Strategy and Procedure be applied to the transport infrastructure.
- 14. Create mechanisms of co-responsibility in the spending of territorial administrations.
 - It is proposed that options for involving regional governments in co-financing the projects that affect them be explored.
- 15. Agree on a framework for planning and evaluating infrastructure projects with regional governments and local councils.
 - It is proposed that a common framework be agreed for planning and evaluating major infrastructure projects developed by regional governments and local councils.



Cercanías suburban rail metropolitan transport

The current situation

Rail passengers by type of service

	Miles de viajeros	Millones viajeros- kilómetro
Cercanías	562.152	9.724
Servicios convencionales (larga y media distancia)	36.488	7.290
Servicios de alta velocidad (larga y media distancia)	29.985	11.315

Fuente: Observatorio del Ferrocarril de España, 2018.



Source: Spanish Railway Observatory

- The *Cercanías* suburban rail system is the most extensively used rail service with 562.2 million passengers in 2018, 90% of all train journeys made that year in Spain.
- The service is divided into 12 hubs that are very heterogeneous in terms of length, number of lines and users.
- Madrid and Barcelona account for 86% of travellers and 34% of the network

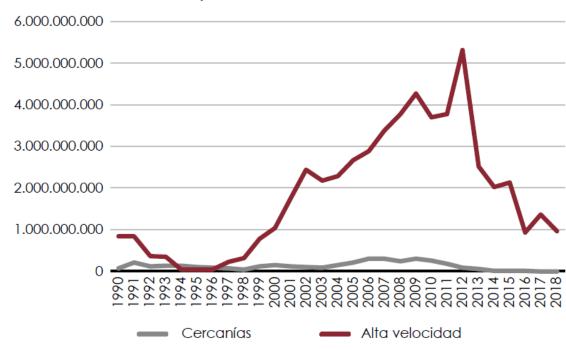


Investment

Investment in *Cercanías* infrastructure 1990 – 2018.

Núcleo	Euros de 2018	Peso
Madrid	1.760.005.517	47,8%
Barcelona	619.563.290	16,8%
Cádiz	607.665.661	16,5%
Asturias	297.969.854	8,1%
Málaga	185.397.310	5,0%
Resto de núcleos	209.330.817	5,7%
TOTAL	3.679.932.449	100%
Fuente: ADIF		

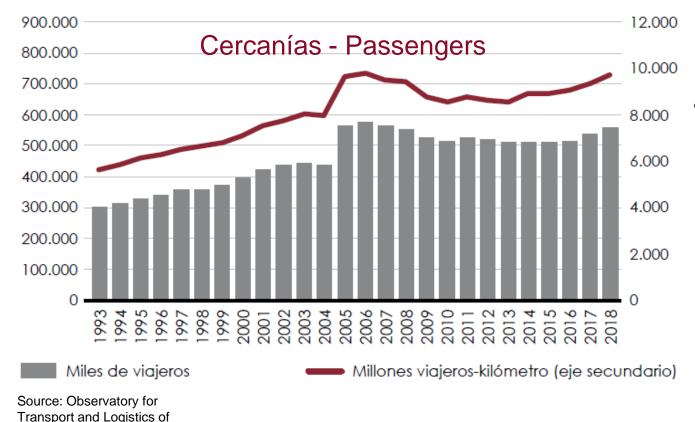
Investment in *Cercanías* and highspeed rail. 2018 Euros



- Between 1990 and 2018, a total of 3,68 billion euros has been invested in Cercanías, a very low investment particularly when compared with high-speed rail. (55,89 billion).
- Very low level of renewal of rolling stock, which has an average age of 21 years, with a significant part of the trains with an age that is about to pass 30, or even 40, years.



Cercanías - Demand



- The number of Cercanías journeys has almost doubled since 1990 despite low investment in the system
- The economic crisis reduced demand, which began to rise as from 2014, driven by the increase in passengers in Madrid and Barcelona, as most of the other hubs continued to lose passengers in the period 2013-2018.



Spain (OTLE), MITMA

Management, planning and governance

- Cercanías services, managed and operated by ADIF and RENFE, have not been fully integrated into public transport consortiums or authorities.
- The weaknesses in infrastructure planning and governance are applicable to Cercanías.
 Enormously ambitious investments that are not fulfilled, no link to budget availability, no project evaluation, no integration of Cercanías planning with other means of metropolitan transport.

Inversión en el núcleo de cercanías					
Núcleo Planificada Ejecutada					
Madrid	5.000	396			
Barcelona	4.000	304			
Comunitat Valenciana	3.400	0,3			
TOTAL	12.400	701			

Planes de cercanías de Madrid (2009-2015), Barcelona (2008-2015 y Comunitat Valenciana (2010.2020) y MITMA.

Fuente: Ministerio de Fomento, 2007, 2008, 2009. MITMA

Between 2009 and 2020, 5.5% of the planned 12.4 billion euros for the three main hubs was invested.



Proposals II

VIII. CERCANÍAS SUBURBAN RAIL

- 16. Effectively integrate the management and planning of the *Cercanías* service and its infrastructures into public transport consortiums or authorities.
 - It is proposed that *Cercanías* should be fully integrated, both the responsibilities of ADIF and those of RENFE, in each of the public transport authorities of the metropolitan areas.
 - It is proposed that a process of reflection be undertaken in relation to the best distribution of responsibilities in metropolitan transport and in relation to the operability and efficiency of maintaining independent railway systems in the same metropolitan areas.

17. Redefine the financing of metropolitan transport.

• It is proposed that the financing system be modified by following the recommendations of the aforementioned Spending Review 18: Evaluation of Subsidy Strategy and Procedure and creating a mechanism with equitable allocation criteria for all Spanish metropolitan areas.

18. Strengthen the *Cercanías* service in accordance with the new Project Evaluation and Prioritisation Framework.

 It is proposed that the Cercanías service be strengthened in the coming years on the basis of plans and projects undertaken in accordance with a new evaluation and prioritisation framework.



Evaluation of air transport subsidies for residents in non-mainland territories

Policies to promote mobility in non-mainland territories

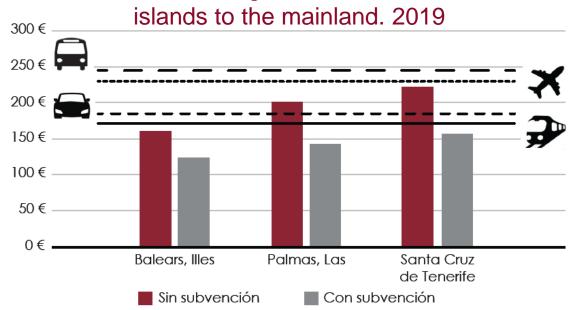
 Article 138(1) of the Spanish Constitution provides that "the State guarantees the effective implementation of the principle of solidarity by endeavouring to establish a fair and adequate economic balance between the different areas of the Spanish territory and taking into special consideration the circumstances pertaining to those which are islands".

Policies to promote mobility in non-mainland territories in Spain

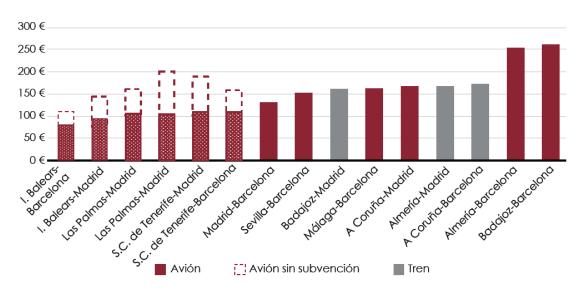
- 1. Public service obligations: €2.68m in 2019
- 2. Discount for residents: €730m between July 2018 and June 2019
- 3. Cross-subsidies and reduced fares applied at non-mainland airports: €268m in 2019
- 4. Incentive programmes in non-mainland territories

Generalised cost of transport

Generalised interprovincial cost on the mainland by means of transport vs. generalised cost of flights from



Generalised cost of interprovincial travel Long distance by public transport. 2019



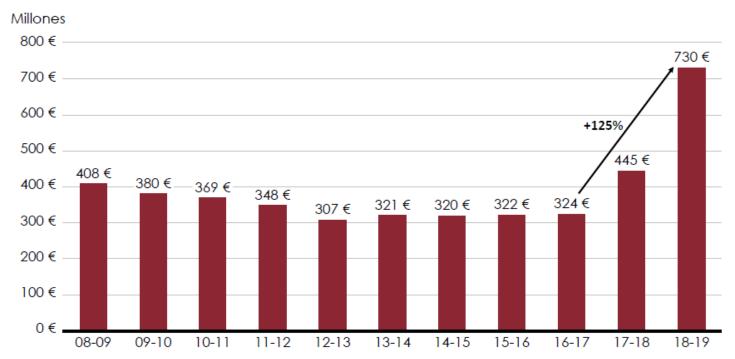
- Once the 75% subsidy has been applied, it costs less for an island resident to travel to the mainland than for a resident of the rest of Spain to travel to another province.
- Even without subsidies, thanks to the Islands' good air connections, the generalised cost of travelling from the Canary and Balearic Islands to the mainland is lower than the average cost of travelling by air within the mainland.

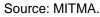


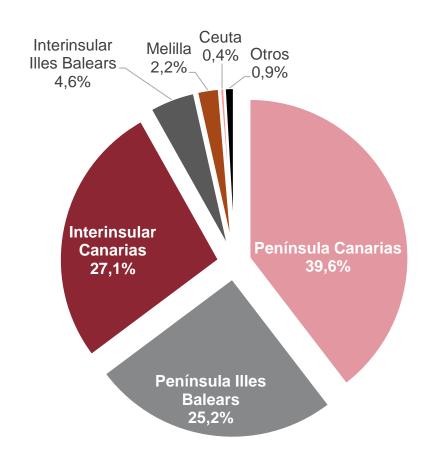
Public spending

 There has been a notable increase in public spending, overall by 125%.

Total spending on subsidies to residents. Constant 2018 Euros









Supply and demand

Change in resident and non-resident passengers before and after the increase in the subsidy to 75%

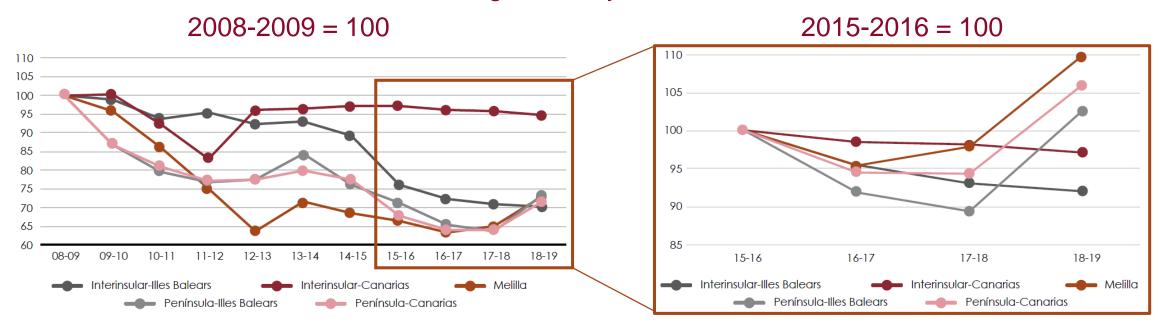
Mercado aéreo	Tipo de pasajero	Δ pasajeros 12 meses antes del 75%		Δ pasajeros 12 meses después del 75%	
Península Canarias	Residentes	+163.932	Δ 6,5%	+604.124	Δ 22,4%
	No residentes	+314.204	Δ 6,5%	+213.894	Δ 4,1%
Península Illes Balears	Residentes	+144.896	Δ 5,1%	+474.749	Δ 16,0%
	No residentes	+580.163	Δ 9,3%	+157.070	Δ 2,3%
Interinsular Canarias	Residentes	+166.193	Δ 6,8%	+947.674	Δ 36,1%
	No residentes	-6.846	Δ-1,6%	+89.997	Δ 21,0%
Interinsular Illes Balears	Residentes	+26.114	Δ 5,4%	+158.679	Δ31,2%
	No residentes	-31.628	Δ-14,2%	-3.189	Δ-1,7%
Fuente: MITMA, AENA y AIReF					

 The average percentage of residents rose on flights in all segments as a result of an increase in resident demand and a slowdown in the growth of non-resident passengers



Prices

Average fares by traffic sector

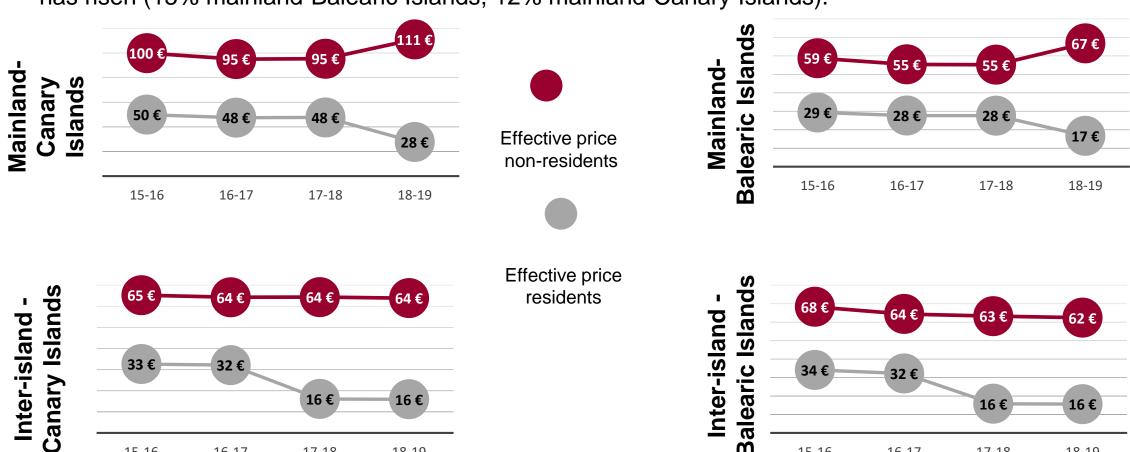


- There has been a price rise on tickets for journeys with the mainland (12% for mainland-Canary Islands and 15% for mainland-Balearic Islands).
- Prices on the inter-island market in the Canary Islands have remained stable, as they have over the last ten years when prices on the other routes fell by over 30%.
- In the case of the inter-island market in the Balearic Islands, prices have fallen over the last decade, but the rise to a 75% subsidy has not increased prices.



Prices

- The cost of tickets for residents has fallen significantly (47% on average).
- The cost of tickets for non-residents on flights between the islands and the mainland has risen (15% mainland-Balearic Islands, 12% mainland-Canary Islands).





15-16

16-17

17-18

18-19

 $\mathbf{\omega}$

15-16

16-17

17-18

18-19

Subsidies for non-mainland flights

Model 1 - Regression Discontinuity

$$NL (Deflated average fare_i) = \beta_0 + \beta_1 * Treatment + \beta_2 * X_i + u_i$$

Model 2 - Continuous treatment model

$$NLDeflated average fare_i$$

= $\beta_0 + \beta_1 * Treatment * \% Residents + \beta_2 * X_i + u_i$

Model 3 - Differences in differences

```
NLDeflatedaveragefare_i
= \beta_0 + \beta_1 * Treatment + \beta_2 * Time Dummy + \beta_3 * Treatment
* Time Dummy + \beta_4 * X_i + u_i
```

Model 4 - Discontinuity by quintiles

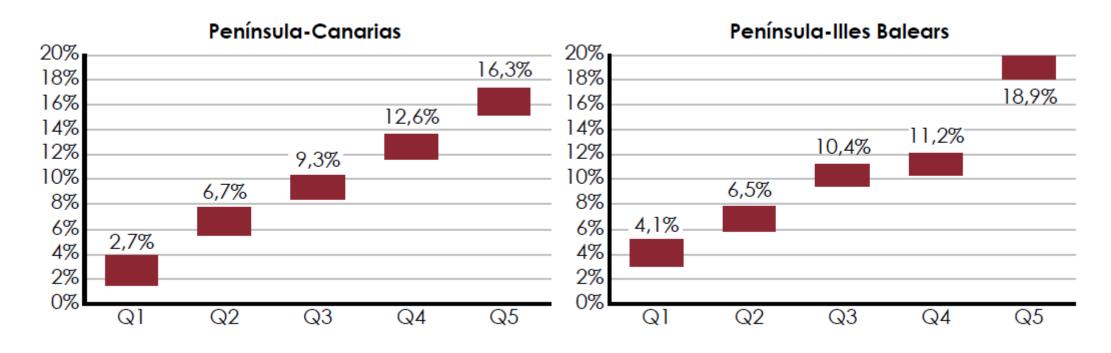
Dividing the sample into 5 quintiles according to the % of residents on the flights model 1 estimates are repeated for each of these 5 quintiles

- The results of model 1 allow us to conclude that the increase in the subsidy to 75% has significantly influenced the rise in prices that we have observed in the Mainland – Canary Islands and Mainland – Balearic Islands routes.
- Models 2, 3 and 4 also reveal that the higher the likelihood that a flight will carry residents, the higher the price increase, or, in other words, the higher the percentage of residents on a flight, the greater the effect of the subsidy increase on prices



Subsidies for residents' tickets - Prices

Coefficients associated with the variable of interest in the regressions by quintiles and 95% confidence interval bands.



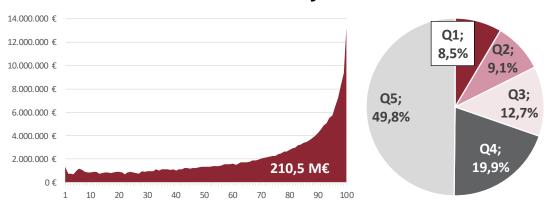
The more residents a flight has, the greater the effect the policy change has had on prices.

Distribution analysis

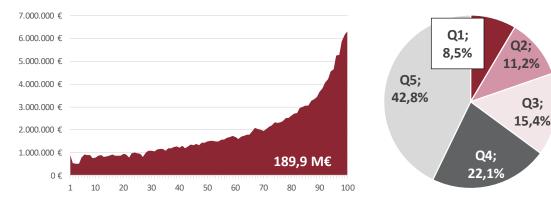
- The subsidy has a very unbalanced distribution among the population: Half of residents do not fly, and therefore do not receive any help.
- The routes between the Canary Islands and the mainland, which are those that receive the highest volume of subsidy in 2018 (210 million euros), have a very uneven distribution by income level.
- The 20% of residents on the highest income account for 50% of the total subsidy, the richest 10% for 35% and the 1% with the highest income for 6.3%, i.e. 13.2 million euros. In contrast, the 40% of the population on the lowest income receive 17% of the total subsidies.

Distribution of the subsidy by income level (percentiles)

Mainland-Canary Islands



Inter-island - Canary Islands



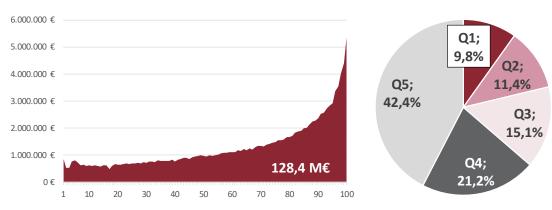


Distribution analysis

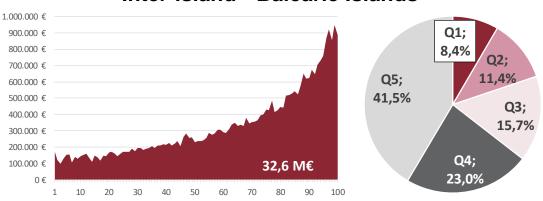
- The mainland-Balearic Islands routes have the most equitable distribution of the six markets analysed. This is particularly the result of the greater percentage of subsidies received by the 20% of residents on the lowest incomes, almost 10% of the total amount of subsidies.
- However, it remains inequitable, with the 40% of the population on the lowest income receiving 21% of the subsidies.

Distribution of the subsidy by income level (percentiles)

Mainland-Balearic Islands



Inter-island - Balearic Islands

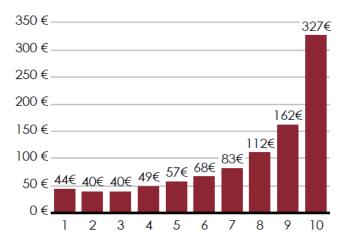


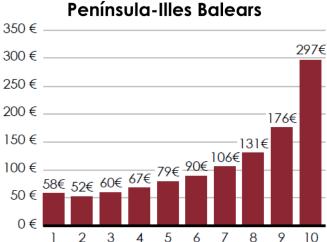


Distribution analysis

Average annual subsidy by income deciles

Península-Canarias





- People with higher incomes fly more often and buy more expensive tickets. As a result, it is the higher income individuals who are receiving a greater share of the subsidy
- From a distributive and public expenditure efficiency point of view, there is evidence that a fixed subsidy per route offers advantages over an ad valorem subsidy such as the current one. In addition, its distribution would be less unbalanced by income levels.
- Placing a limit on the number of flights to be subsidised or on the amount of the total annual subsidy would have positive redistributive effects.



Proposals III

IX. AIR TRANSPORT SUBSIDIES FOR RESIDENTS IN NON-MAINLAND TERRITORIES

- 19. Replace the current subsidy of 75% of the journey price (ad valorem) with a lump-sum subsidy for each of the routes.
 - It is proposed that the current ad valorem subsidy be replaced by a lump sum per route.
- 20. Study mechanisms to achieve a more equitable distribution of the subsidy by income level.
 - It is proposed that mechanisms be studied to achieve a more equitable distribution of public support for mobility in non-mainland territories.
- 21. Analysis of competition in the Canary Islands inter-island air market and promotion of policies to increase it.
 - It is proposed, firstly, that competition in these markets be maximised (by encouraging the entry of new companies, removing barriers to entry, etc.). Secondly, the National Markets and Competition Commission (Spanish acronym: CNMC) should analyse the inter-island market in the Canary Islands with the aim of determining its efficiency and whether there is scope for prices to fall in line with the other markets analysed under suitable competition arrangements.



