Asociación Caminos

Global evaluation of the analyzed sectors of the public works of Spain 2023

Airports
Roads
Water Cycle
Railways
Ports
Urban Public Transport

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• Global evaluation of the analyzed sectors

Indicators:
Experts:

	Average	Roads	Railways	Ports	Airports	Water	UPT
Spain	6.9	6.4	5.8	8.0	7.1	6.9	7.1
Germany	6.9	7.8	7.0	3.9	8.4	7.1	7.1
France	6.9	7.1	7.0	4.2	7.0	8.1	7.8
United Kingdom	6.5	5.9	7.0	4.1	7.7	6.9	7.5
Italy	5.8	5.4	6.3	6.3	4.7	6.8	5.4
Poland	4.8	4.8					
Ireland	5.7	5.7					
Turkey	5.2	3.3		5.0	7.0	5.5	
Portugal	6.8	5.9		7.8			
Netherlands	9.5			9.5			
Belgium	7.5			7.5			
USA	7.1	6.9	5.6	7.5	8.6	8.1	6.0
Mexico	4.2	3.5	3.2		5.1	5.0	
Brazil	5.6				5.7	6.0	5.1
Colombia	5.4						5.4
Canada	5.7						5.7
Peru	5.0				5.2	4.9	
Chile	4.0		2.2		5.9		
Morocco	6.2		4.3	8.0			
Egypt	3.1		2.9			3.5	2.9
South Africa	3.9						3.9
Israel	6.9					6.9	
Saudi Arabia	4.4					4.4	
Japan	7.4	7.4	7.7	7.3	7.3	8.1	6.4
China	6.9		5.6	9.5	7.3	5.6	6.5
India	4.3		4.1	4.6	5.4	4.4	3.0
South Korea	7.0	6.6		8.7			5.6
Taiwan	6.0		6.0				
Australia	5.5						5.5

▪ Comparative analysis of the evaluated sectors in an international context

The best rated countries on a global level are Japan (7.4), the USA (7.1), South Korea (7.0) and China (6.9); followed by a group of European countries: Spain, Germany, and France (6.9); Ports is the only sector analyzed in The Netherlands and Belgium in which they have obtained a very favorable result (9.5 and 7.5, respectively).
6.5 is the overall rating obtained by the public works sector in Spain (result obtained from both the evaluation by experts and by indicators).

In the Sectors joint evaluation, the best rated sectors are Airports (6.9) and Urban Public Transport (6.8). It is worth mentioning that all sectors in Spain have obtained very similar ratings (between 6.2 and 6.8).

In the Criteria joint evaluation, the ratings obtained in Capacity, Performance and Safety stands out (7.4; 7.4; and 7.7, respectively). Financing obtains the worst rating (5.4) and Operation and maintenance obtains a 5.9. These ratings highlight that it is necessary to invest to a great extent in the public works sector and, specially, it is crucial to invest in their conservation and maintenance.

Overall, looking at the public works sectors evaluation results, it is reasonable to say that the public works sector in Spain, is among the best in the world, especially regarding its Capacity and Performance.

SECTORS		
ROADS	6.4	D
RAILWAYS	5.8	E
PORTS	8.0	B
AIRPORTS	7.1	C
WATER CYCLE	6.9	D
UPT	7.1	C
Evaluation by Objective Indicators	**6.9**	**D**
Indicators Considered: 333		

SECTORS		
ROADS	6.1	D
RAILWAYS	6.7	D
PORTS	6.1	D
AIRPORTS	6.8	D
WATER CYCLE	5.7	E
UPT	6.4	D
Evaluation by Objective Indicators	**6.3**	**D**
Responses Received: 201		

CRITERIA		
CAPACITY	7.8	C
PERFORMANCE	8.0	B
FINANCING	5.5	E
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	6.0	D
OPERATION AND MAINTENANCE	6.1	D
SAFETY	8.7	B
RESILIENCE	7.1	C
ENGINEERING AND INNOVATION	5.7	E
Global Evaluation by Indicators	**6.9**	**D**

CRITERIA		
CAPACITY	7.1	C
PERFORMANCE	6.9	D
FINANCING	5.3	E
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	6.1	D
OPERATION AND MAINTENANCE	5.9	E
SAFETY	6.7	D
RESILIENCE	6.4	D
ENGINEERING AND INNOVATION	6.2	D
Global Evaluation by Experts	**6.3**	**D**

GLOBAL ASSESSMENT OF THE PUBLIC WORKS BY SECTOR		
SECTORS		
ROADS	6.3	D
RAILWAYS	6.2	D
PORTS	6.5	D
AIRPORTS	6.9	D
WATER CYCLE	6.3	D
UPT	6.8	D
FINAL RATING	**6.5**	**D**

CRITERIA		
CAPACITY	7.4	C
PERFORMANCE	7.4	C
FINANCING	5.4	E
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	6.1	D
OPERATION AND MAINTENANCE	6.0	D
SAFETY	7.7	C
RESILIENCE	6.8	D
ENGINEERING AND INNOVATION	5.9	E
FINAL RATING	**6.5**	**D**

• Evaluation of Railways

Indicators:
Experts:

Rating		
Spain	5,8	E
Germany	7,0	C
France	7,0	C
United Kingdom	7,0	C
Italy	6,3	D
USA	5,6	E
Mexico	3,2	FX
Chili	2,2	F
Morocco	4,3	FX
Egypt	2,9	F
Japan	7,7	C
China	5,6	E
India	4,1	FX
Taiwan	6,0	D

▪ Comparative analysis of Spanish Railways in an international context

In the global indicator evaluation related to railways, Spain is in the middle of the rating table of the countries analyzed, obtaining a good rating in Capacity (7.6) and Safety (7.9); Sufficiently high in Resilience; Sufficient in Performance, Adaptability to the future and Sustainable Development; and Insufficient in Financing and in Operation and maintenance.

It is worth highlighting the good ratings obtained by Germany, France, the United Kingdom, and Japan. The USA and China obtained a similar rating to the one obtained by Spain. Also noteworthy is the very insufficient rating obtained Chile and Egypt.

Evaluation of Railways with indicators (Max 10)		
CRITERIA		
CAPACITY	7.6	C
PERFORMANCE	5.9	E
FINANCING	3.4	FX
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	5.8	E
OPERATION AND MAINTENANCE	3.4	FX
SAFETY	7.9	C
RESILIENCE	6.3	D
ENGINEERING AND INNOVATION	5.9	E
Evaluation with Objective Indicators	**5.8**	**E**
Indicators Considered: 67		

Evaluation of Railways by experts (Max 10)		
CRITERIA		
CAPACITY	8.2	B
PERFORMANCE	6.2	D
FINANCING	6.0	D
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	6.6	D
OPERATION AND MAINTENANCE	5.8	E
SAFETY	7.1	C
RESILIENCE	6.8	D
ENGINEERING AND INNOVATION	6.9	D
Evaluation by experts	**6.7**	**D**
Responses Received: 33		

Key results of the report

- The high-speed rail network in Spain is one of the best in the world, with a track length of 3,487 km in 2020. It is expected that in 10 years the average user will have a high-performance railway station in less than 50 km from their residence.
- The conventional network requires modernization improvements such as infrastructure renewals, implementing ERTMS-type Safety systems, increase the speed and electrification of lines, as well as carrying out improvement in its efficiency and sustainability. In In the long term, changing track widths into the international gauge (1,435 mm) must be considered.
- It is necessary to improve the features and services of the railway network in medium- sized cities, as well as in the intermodal connections to ports.

Final evaluation of Railways (Max 10)		
CRITERIA		
CAPACITY	7.9	C
PERFORMANCE	6.1	D
FINANCING	4.7	FX
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	6,2	D
OPERATION AND MAINTENANCE	4.6	FX
SAFETY	7.5	C
RESILIENCE	6.5	D
ENGINEERING AND INNOVATION	6.4	D
Final Weighted Evaluation	**6.2**	**D**

- The investment made in recent years has focused exclusively on high speed, with no notable investments made in conventional lines. Political and territorial criteria have prevailed over real demand and economic criteria. The extension of the high-performance network must be carried out in a balanced manner, considering the current demand and the economic and social profitability of the infrastructure network.
- Some experts believe that the involvement of private investment can improve the railway network. To do this, it is necessary to improve the works bidding and execution processes.
- Railways require adequate planning to complete the high-performance lines under construction before starting with new infrastructure. It is also necessary to invest in conventional lines to improve the service and performance provision.
- It is necessary to improve how the investment planning is managed, trying to meet technical and profitability criteria. The decarbonization of the sector involves the progressive elimination of fossil fuels.
- In general terms, ordinary conservation is well dimensioned, although there is a need to better manage and invest more in extraordinary conservation, particularly in the regionally owned railway network.
- The installed ITS systems are insufficient, as well as traffic surveillance to prevent reckless driving.
- The measures implemented to improve resilience in high-speed networks are good, but they are usually scarce or non-existent in the conventional networks.
- The research being carried out by Spanish railway engineers is adequate. The digitalization of railway projects is essential for improving the entire process. Investing in digitization, such as BIM, should be a priority.
- Improvements are needed in the digitalization of projects, the disaggregated demand studies, and the evaluation and selection of train energy sources.
- It is essential to increase freight rail transport, improving productivity and implementing advanced management systems. Experts estimate that the annual investment in railway infrastructure should range between €1.5 billion and €3 billion

• Evaluation of Roads

Indicators:
Experts:

▪ Comparative analysis of Spanish Roads in an international context

Rating		
Spain	6.4	D
Germany	7.8	C
France	7.1	C
United Kingdom	5.9	E
Italy	5.4	E
Poland	4.8	FX
Ireland	5.7	E
Turkey	3.3	FX
Portugal	5.9	E
USA	6.9	D
Mexico	3.5	FX
Japan	7.4	C
South Korea	6.6	D

The best rated country on a global level is Germany (7.8), followed by Japan (7.4), France (7.1), USA (6.9), South Korea (6.6) and Spain (6.4).

Spain is well positioned in relation to the rest of the countries analyzed, standing out in the Capacity, Performance and Safety Criteria.

In Capacity, Spain achieves the highest rating, closely followed by Germany and France; In Performance it is among the first positions, along with Germany and the USA; In Safety it is also in the first positions along with the United Kingdom, Ireland, France and Germany.

However, Spain obtained an Insufficient rating in Financing (it occupies the worst position along with Mexico, Poland, and Italy). In the Innovation criterion, Spain is in an intermediate situation (5.1), due to the low financing of innovation.

Evaluation of Roads with indicators (Max 10)		
CRITERIA		
CAPACITY	8.7	B
PERFORMANCE	8.2	B
FINANCING	3.4	FX
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	4.7	FX
OPERATION AND MAINTENANCE	5.2	E
SAFETY	8.2	B
RESILIENCE	8.0	B
ENGINEERING AND INNOVATION	5.1	E
Evaluation with Objective Indicators	**6.4**	**D**
Indicators considered: 75		

Evaluation of Roads by experts (Max 10)		
CRITERIA		
CAPACITY	7.6	C
PERFORMANCE	6.8	D
FINANCING	4.9	FX
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	5.3	E
OPERATION AND MAINTENANCE	5.9	E
SAFETY	6.3	D
RESILIENCE	6.1	D
ENGINEERING AND INNOVATION	6.1	D
Evaluation by Experts	**6.1**	**D**
Responses Reveiced: 29		

Key results of the study

Final evaluation of Roads (Max 10)		
CRITERIA		
CAPACITY	8.1	B
PERFORMANCE	7.5	C
FINANCING	4.1	FX
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	5.0	E
OPERATION AND MAINTENANCE	5.6	E
SAFETY	7.2	C
RESILIENCE	7.1	C
ENGINEERING AND INNOVATION	5.6	E
Final Weighted Evaluation	**6.3**	**D**

- The high-capacity road network is one of the best and most extensive in the world, although some specific sections require improvement (for example in large urban areas, improvements in the connection of intermodal nodes must be made and also between some itineraries, and in the access to some ports.)
- Specific itineraries and certain sections of the conventional road network require adaptations and improvements.
- It is necessary to develop a good road planning in the medium and long term which takes into account mobility and future demands.
- Roads require significant financing to recover the effects of the lack of investment made in the recent years. Experts estimate that the investment necessary for the coming years in all road networks altogether should be between 1% and 2% of the asset value, which is greater than 0.6% of GDP (€7.5 billion/year).
- Experts consider that it is necessary to implement service and rest areas in the high-capacity road network. Conventional roads require improvements in their performance and equipment.
- Most experts consider it appropriate to implement a fee for the use of high-capacity roads, although it can increase traffic on the conventional road network and, with it, accidents rate.
- More emphasis should be placed on the environmental preservation and non-polluting vehicles.
- It is necessary to update legislation in areas related to sustainability and the use of new technologies. Cost-benefit analysis must be carried out in order to study the economic viability of future investments in roads.
- Cost-benefit analyses are necessary to study the economic viability of future road investments.
- Infrastructure must be deployed to enable the use of alternative vehicles to internal combustion engines and new technologies.
- The absence of the required investment in conservation, maintenance, and major replacements, along with the instability of investments, has resulted in a significant deterioration of the road infrastructure in recent years.
- Measures implemented on roads to prevent accidents and reduce their effects are highly effective. Continued efforts are needed to achieve accident reduction goals, recognizing that other factors, not just infrastructure, influence this issue.
- To facilitate research, development, and innovation (R&D&I) in the road sector, it is essential to introduce criteria for innovative public procurement in public contracts.
- The high level of engineering expertise in Spanish roads has been primarily fostered by engineering companies. Government authorities have not consistently met the required standards regarding bidding systems and project management.
- In recent years, road administrations have increasingly embraced Building Information Modeling (BIM) methodology in the field of roads.

• Evaluation of Ports

Indicators:
Experts:

Rating		
Spain	8.0	B
Germany	3.9	FX
France	4.2	FX
United Kingdom	4.1	FX
Italy	6.3	D
Turkey	5.0	E
Portugal	7.8	C
Netherlands	9.5	A
Belgium	7.5	C
USA	7.5	C
Morocco	8.0	B
Japan	7.3	C
China	9.5	A
India	4.6	FX
South Korea	8.7	B

▪ Comparative analysis of Spanish Ports in an international context

It is important to highlight the difficulties faced for obtaining the necessary data for analyzing the port indicators. In general, it is very difficult to find a unified databases which contains ports information at an international level.

For the quantitative evaluation, eleven indicators were chosen which correspond three Criteria: Performance, Financing and Adaptability to the future and sustainability. The results obtained in the evaluation regarding these three criteria have been included (with a weight of a 50%) in the rating results of the expert's evaluation for being able to final ratings of the port sector.

Evaluation of Ports with indicators (Max 10)		
CRITERIA		
CAPACITY		
PERFORMANCE	8.2	B
FINANCING	9.1	A
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	6.7	D
OPERATION AND MAINTENANCE		
SAFETY		
RESILIENCE		
ENGINEERING AND INNOVATION		
Evaluation with Objective Indicators	**8.0**	**B**
Indicators considered: 11		

Evaluation of Ports by experts (Max 10)		
CRITERIA		
CAPACITY	6.6	D
PERFORMANCE	6.7	D
FINANCING	5.3	E
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	5.7	E
OPERATION AND MAINTENANCE	6.1	D
SAFETY	6.3	D
RESILIENCE	6.1	D
ENGINEERING AND INNOVATION	5.9	E
Evaluation by Experts	**6.1**	**D**
Responses Reveiced: 33		

Key results of the study

Ports are key infrastructures for the transport system in countries with sea access. They encourage and facilitate the economic development and as well, they are essential for the movement of people and goods. The direct, indirect, and induced activity of the Spanish Port System represents around 20% of GDP of the transport sector, representing 1.1% of GDP of the Spanish GDP. Internationally, the Spanish port system is strongly. According to the EUROSATAT figures, the total traffic in the Spanish ports is significantly higher the European average and, specifically, higher than in Germany and France. The Spanish port system includes 48 ports of general interest, which are managed by 28 port authorities. It also includes a significant number of port facilities of lesser importance who have fishing and sporting uses which are managed (directly and indirectly) by the Autonomic Administrations.

Final evaluation of Ports (Max 10)		
CRITERIA		
CAPACITY	6.6	D
PERFORMANCE	7.6	C
FINANCING	7.2	C
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	6.2	D
OPERATION AND MAINTENANCE	6.1	D
SAFETY	6.3	D
RESILIENCE	6.1	D
ENGINEERING AND INNOVATION	5.9	E
Final Weighted Evaluation	**6.5**	**D**

According to the experts, the main developments that port infrastructures require for the next 10 years are:

- Reduce the negative impact of climate change with measures addressed to purify and recycle rainwater, generate fresh water, generate renewable energy, and promote biodiversity in the coastal area which is near the ports.
- Generate logistics activities areas in the vicinity of the terminals.
- Implement measures related to decarbonization and automation in ports: electrical connection, new fuel supply systems, installation of renewable energy sources (photovoltaic panels, wind turbines), install beacons for assistance in manoeuvres and automatic mooring systems.
- In some ports, capacity expansions are required: (i) expand docking lines in congested ports and (ii) expand esplanades for storing goods, warehouses, and machinery.
- Implement measures for improving connectivity, resilience, digitalization and intercommunication. Analyze the group ports which share the same coastline.
- Promote rail access and dry ports.
- Improve land connections and the non-intrusive inspection equipment. Install nearby fast charging points for electric vehicles.
- Increase the storage capacity of surface waters and increase the regulation of Mediterranean basins.
- There is no hydraulic policy at the national level. In general, the idea of water as a public good is not respected; it is considered a territorial resource, which practically makes interconnections between basins impossible.
- Some experts believe that private management for low supply should continue to be maintained, which is more efficient if there is strict regulation. At high level, management by basin organizations is efficient and capable of responding to challenges.
- There is a deficit of investment in purification in the urban water cycle.
- Some experts believe that private investment must be increased and, to do so, the real cost of the water cycle must be reflected in the rates.
- Overexploitation of surface and groundwater is detected, which prevents achieving the objectives of the EU Framework Directive.
- In the urban area, the creation of systems or associations large enough to guarantee technical, economic and environmental viability must be promoted. In irrigation, the priority must be focused on improving and modernizing the systems, to reduce high water consumption.

• Evaluation of Airports

Indicators:
Experts:

Rating		
Spain	7.1	C
Germany	8.4	B
France	7.0	C
United Kingdom	7.7	C
Italy	4.7	FX
Turkey	7.0	C
USA	8.6	B
Mexico	5.1	E
Brazil	5.7	E
Peru	5.2	E
Chile	5.9	E
Japan	7.3	C
China	7.3	C
India	5.4	E

Comparative analysis of Spanish Airports in an international context

The best country rated y taking into account the established indicators is the USA (8.6) followed by Germany (8.4). The following countries also obtain good ratings:

France, the United Kingdom, Turkey, Japan, and China. Spain also obtains a good rating (7.1), like France.

Spain obtains an excellent rating in Safety (10); good rating in Capacity (7.6), Operation and Maintenance and Resilience (7.1, 7.4 and 7.2, respectively); Sufficiently high in Performance, Financing, Adaptability to the Future and Sustainable Development; and Sufficient in Engineering and Innovation.

Evaluation of Airports with indicators (Max 10)		
CRITERIA		
CAPACITY	7.1	C
PERFORMANCE	6.5	D
FINANCING	6.1	D
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	6.6	D
OPERATION AND MAINTENANCE	7.4	C
SAFETY	10.0	A
RESILIENCE	7.2	C
ENGINEERING AND INNOVATION	5.9	E
Evaluation with Objective Indicators	**7.1**	**C**
Indicators considered: 72		

Evaluation of Airports by experts (Max 10)		
CRITERIA		
CAPACITY	7.2	C
PERFORMANCE	7.7	C
FINANCING	5.9	E
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	6.7	D
OPERATION AND MAINTENANCE	6.0	D
SAFETY	7.4	C
RESILIENCE	7.4	C
ENGINEERING AND INNOVATION	5.7	E
Evaluation by Experts	**6.8**	**D**
Responses Received: 23		

Key conclusions of the report

- Spain's airport network is one of the best in the world in capacity and services. It is self-funded by collecting of fees for the use of the facilities without having to intervene in the General State Budgets.
- The participation of private companies in the design and construction of airport works is excellent, but the participation in the operation is very insufficient.
- Investment in airports depends exclusively on landing fees and non-aeronautical income, it is managed by Aena and executed by Aena without the intervention of any other actor in the industry beyond the client-supplier relationship, contrary to what happens in countries also with a robust airport industry.
- Reducing the carbon footprint is one of the main challenges of the sector. Currently, airports have a low contribution compared to airlines.

Final evaluation of Airports (Max 10)		
CRITERIA		
CAPACITY	7.1	C
PERFORMANCE	7.1	C
FINANCING	6.0	D
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	6.7	D
OPERATION AND MAINTENANCE	6.7	D
SAFETY	8.7	B
RESILIENCE	7.3	C
ENGINEERING AND INNOVATION	5.8	E
Final Weighted Evaluation	**6.9**	**D**

- With respect to sustainability, it is proposed: improvements in taxiing (reduction in noise, increasing electric taxiing (aircraft/push back) per apron and taxiways); Operational efficiency at airports with high traffic (time analysis in the process); reduction of engine delay and stop times, to reduce gas emissions; improve the design of the terminals, using efficiency solutions, use of renewable materials, approach to new architectural solutions, apply geothermal solutions, increase the use of renewable facilities and implement more efficient air conditioning systems; generalize the use of BIM-based designs.
- At some airports, the capacity of some subsystem, such as airfields, needs to be expanded. Space is needed, especially in the Terminals.
- Airport infrastructure must be designed taking into account situations that produce threats or adverse incidents, providing the infrastructure with sufficient spaces to carry out appropriate controls. The training of personnel involved in Safety is a relevant factor.
- In the future, the investment effort will not focus so much on the construction of new infrastructure, but rather on the transformation, conservation and improvement of existing ones. The actions will be aimed at improving sustainability, especially in the field of renewable energy generation, reuse and recycling; also to the implementation of advanced processes of digitalization, interconnection, continuous improvement and modernization of the infrastructure of both terminals and taxiing, and increased capacity of key airports. As well as expanding the capacity of the main airports to operate as HUBs, both in terminal buildings and operations, and updating and improving the infrastructure of medium and small airports.
- Experts estimate that the approximate annual investment required to develop airport infrastructure in the next 10 years is between 7,000 and 10,000 million euros.

• Evaluation of the Complete Water Cycle

Indicators:
Experts:

Rating		
Spain	6.9	D
Germany	7.1	C
France	8.1	B
United Kingdom	6.9	D
Italy	6.8	D
Turkey	5.5	E
USA	8.1	B
Mexico	5.0	E
Brazil	6.0	D
Peru	4.9	FX
Egypt	3.5	FX
Israel	6.9	D
Saudi Arabia	4.4	FX
Japan	8.1	B
China	5.6	E
India	4.4	FX

▪ Comparative analysis of Spanish Complete Water Cycle in an international context

In the evaluation by indicators, the best countries rated globally taking into account the established indicators are France, Japan and the USA (8.1). Spain, Germany, Italy, the United Kingdom and Israel have obtained a similar rating (between 7.1 and 6.8). Spain obtains a good rating in Capacity (7.6), Performance (9.1), Operation and maintenance (8.6) and Safety (8.9).

The evaluation by the experts is lower than the evaluation by indicators: it gives Spain the rating of sufficient, standing out in Capacity (6.4), Performance (6.8) and in Engineering and Innovation (6.1). Experts rate the financing as insufficient.

Evaluation of the Water Cycle sector with objective indicators (Max 10)		
CRITERIA		
CAPACITY	7.6	C
PERFORMANCE	9.1	A
FINANCING	6.0	D
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	6.6	D
OPERATION AND MAINTENANCE	8.6	B
SAFETY	8.9	B
RESILIENCE	6.9	D
ENGINEERING AND INNOVATION	5.3	E
Evaluation with Objective Indicators	**6.9**	**D**
Indicators Considered: 57		

Evaluation of the Water Cycle sector by experts (Max 10)		
CRITERIA		
CAPACITY	6.4	D
PERFORMANCE	6.8	D
FINANCING	4.8	FX
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	5.9	E
OPERATION AND MAINTENANCE	5.7	E
SAFETY	5.5	E
RESILIENCE	5.8	E
ENGINEERING AND INNOVATION	6.1	FX
Evaluation by Experts	**5.7**	**E**
Responses Received: 56		

Highlights of the study

- In Spain, water is a public domain good and the regulators are the different public administrations. Water management is very heterogeneous, involving the Administration (both state and regional), independent municipal regulators and hundreds of private operating entities.
- The urban water sector represents 0.64% of GDP, with a turnover of 7,650 million euros. Direct employment in the sector is 33,000 people, with highly qualified training. In 2022, the average price of domestic water is €1.97/ m3, one of the lowest in Europe, and represents an average of 0.9% of Spanish household spending.
- The domestic supply situation is good, but industrial and agricultural supply is very variable. In each region, alternative infrastructures and objectives must be developed, depending on their situation.
- There is no national-scale water policy. In general, the concept of water as a public good is not consistently respected; instead, it is considered a territorial resource. This practicality hinders interconnections between river basins.
- Some experts argue that private management should continue for low-level water supply, which can be more efficient with strict regulation. However, for high-level supply, management by river basin authorities is efficient and capable of addressing challenges.
- There is a deficit in investment in wastewater treatment within the urban water cycle.
- Some experts suggest increasing private investment and passing on the actual cost of the water cycle to tariffs.
- Overexploitation of surface and groundwater resources prevents the achievement of EU Water Framework Directive goals.
- In urban areas, there is a need to promote the creation of sufficiently large systems or consortiums to ensure technical, economic, and environmental viability. In irrigation, the priority should be on improving and modernizing systems to reduce water consumption.
- Enhancing the safety of water-related installations with the establishment of protocols and increased surveillance is necessary.
- Strengthening the role of engineering, maximizing the potential of the digitalization PERTE, and increasing private sector participation throughout the research, development, and innovation process are crucial steps.

Final evaluation of the Water Cycle sector (Max 10)		
CRITERIA		
CAPACITY	7.0	C
PERFORMANCE	7.9	C
FINANCING	5.4	E
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	6.3	D
OPERATION AND MAINTENANCE	7.1	C
SAFETY	7.2	C
RESILIENCE	6.3	D
ENGINEERING AND INNOVATION	5.7	E
Final Weighted Evaluation	**6.3**	**D**

• Evaluation of the Urban Public Transport

Indicators:
Experts:

Rating		
Spain	7.1	C
Germany	7.1	C
France	7.8	C
United Kingdom	7.5	C
Italy	5.4	E
USA	6.0	D
Brazil	5.1	E
Colombia	5.4	E
Canada	5.7	E
Egypt	2.9	F
South Africa	3.9	FX
Japan	6.4	D
China	6.5	D
India	3.0	FX
South Korea	5.6	E
Australia	5.5	E

▪ Comparative analysis of Urban Public Transport in an international context

The best countries rated taking into account the established indicators are the European countries (except Italy): France (7.8), the United Kingdom (7.5), and then Germany and Spain (7.1). China (6.5), Japan (6.4) and the US (6.0) are rated the worst; Italy (5.4) only achieves the rating of sufficient.

Spain obtains a good rating in Capacity (7.9) and Resilience (7.3), excellent in Performance (10.0) and very good in Safety (8.4). In Financing it obtains a sufficient rating (5.0).

Evaluation of Urban Public Transport with indicators (Max 10)		
CRITERIA		
CAPACITY	7.9	C
PERFORMANCE	10.0	A
FINANCING	5.0	E
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	5.8	E
OPERATION AND MAINTENANCE	5.9	E
SAFETY	8.4	B
RESILIENCE	7.3	C
ENGINEERING AND INNOVATION	6.2	D
Evaluation with Objective Indicators	**7.1**	**C**
Indicators Considered: 51		

Evaluation of Urban Public Transport by experts (Max 10)		
CRITERIA		
CAPACITY	6.6	E
PERFORMANCE	7.1	C
FINANCING	4.9	FX
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	6.2	D
OPERATION AND MAINTENANCE	6.1	D
SAFETY	7.7	C
RESILIENCE	6.5	D
ENGINEERING AND INNOVATION	6.4	D
Evaluation by Experts	**6.4**	**D**
Responses Received: 27		

Highlights of the study

Urban Public Transport at present responds to the existing, largely captive demand but is not conceived or designed as an effective option to attract demand from other modes of transportation.

The most notable opinions of the experts are:

- There is a lack of coordination of powers and transport policies between the different AAPPs. The offer is very unequal from one city to another.
- In large metropolitan areas, there is a shortage of platform infrastructure reserved for public transportation.
- Cities must improve the operation of public transport through the implementation of various measures, such as giving traffic light priority to public transport, applying stricter private vehicle parking policies, etc.
- It is necessary to develop mobility studies written by highly qualified multidisciplinary technical teams, without political implications.
- Substantial improvements are required in real-time information and the development of low-emission zones that limit the indiscriminate use of private vehicles.

Final evaluation of Urban Public Transport (Max 10)		
CRITERIA		
CAPACITY	7.3	C
PERFORMANCE	8.6	B
FINANCING	5.0	E
ADAPTABILITY TO THE FUTURE AND SUSTAINIBILITY	6.0	D
OPERATION AND MAINTENANCE	6.0	D
SAFETY	8.1	B
RESILIENCE	6.9	D
ENGINEERING AND INNOVATION	6.3	D
Final Weighted Evaluation	**6.8**	**D**

In relation to the main public transport infrastructure needs that are necessary in the next 10 years, experts point out the following:

- Improve intermodality and integrate new modes of transport (such as carsharing, carpooling) with public transport networks.
- For Low Emission Zones to be a reality compatible with the economic and social development of cities, infrastructure must be better coordinated to promote sustainable mobility and urban planning plans.
  Promote intermodal stations and reserved lanes.
- Renew and decarbonize the urban and interurban bus fleet; implement priority bus systems (BRT type), favor alternative fuels to internal combustion (electric, green hydrogen, hydro- generators), implement segregated priority lanes for public transport within cities and at the entrance through the main roads , build modal interchanges, consider mobility as a service, fully integrate all modes of transport into fare systems, achieve universal accessibility in all stations.
- Some experts estimate that the investment needs in Urban Public Transport must make spending compatible with the income from public coffers; the investment estimate can be between €90 and €110 per inhabitant per year.