IESE Business School
University of Navarra

PPP for CITIES
Specialist Centre on PPP in Smart and Sustainable Cities

WITH THE SUPPORT OF:
UNECE

PPP FOR CITIES CASE STUDIES

BEACH MAINTENANCE IN BARCELONA'S METROPOLITAN AREA

Jordi Salvador, Joan Enric Ricart,
Xavier Fageda and Miquel Rodríguez Planas

With the collaboration of Àrea Metropolitana de Barcelona (AMB)

JUNE 2017

PPP FOR CITIES CASE STUDIES

BEACH MAINTENANCE IN BARCELONA'S METROPOLITAN AREA

Jordi Salvador, Joan Enric Ricart,
Xavier Fageda and Miquel Rodríguez Planas

With the collaboration of Àrea Metropolitana de Barcelona (AMB)

PPP FOR CITIES

The Specialist Centre on PPPs in Smart and Sustainable Cities (**PPP for Cities**) is a research, innovation and advisory center that aims to provide public administrations throughout the world with support in the organization, management and development of projects involving collaboration between the public and private sectors in the smart cities arena.

It is also a partnership platform between companies and administrations from all over the world where they can further explore the dynamics of public-private partnerships, create guides to good practices and standards and design solutions to the issues facing cities.

The center is led by IESE Business School and is part of the United Nations' International Centre of Excellence on PPPs program. It has the support and sponsorship of Barcelona City Hall and other public administrations and private companies.

TABLE OF CONTENTS

1. Introduction: Origin of the Project and Agreements

In the past, management of the facility maintenance and cleaning service for beaches in the metropolitan area of Barcelona was handled by each of the municipalities independently. Given the potential benefits that could come from an integrated management of the entire coastline due to its morphology, the Àrea Metropolitana de Barcelona (AMB) began managing these tasks. They are included in the latest agreements signed in 2011 (2015 for Barcelona) between the AMB and the city councils in Barcelona's metropolitan area, which formalized and regularized the situation regarding facility maintenance and beach cleaning in the metropolitan area.

These management agreements were signed in accordance with the goal of the Association of Municipalities of the Barcelona Metropolitan Area (MMAMB) (now part of the AMB[1]), as set out in Article 5 of its statutes: "The development of the regional structuring actions necessary for the linking, connectivity, mobility, and functionality of the territory. These actions refer basically to infrastructure (…) beaches (…)"; and on the basis of Article 10 (Delegation of Management) of Law 26/2010 on the Legal and Procedural System of Catalonia's Public Authorities.

The city councils that signed the agreements were:

Sant Adrià de Besòs	April 1, 2011
Gavà	April 6, 2011
Badalona	April 7, 2011
Viladecans	May 1, 2011
Castelldefels	May 3, 2011
El Prat de Llobregat	May 10, 2011
Montgat	May 19, 2011
Barcelona	October 14, 2015

The main tasks that the agreements assigned to the AMB[2] with regard to the metropolitan beaches were the maintenance of beach facilities and furniture and the cleaning of the beaches. More specifically, the AMB was to be responsible for:

- Provision and supply, installation, maintenance, cleaning, repair, and replacement of the beach street furniture installed by the AMB and its removal out of season, if necessary.
- Maintenance, cleaning, and repair of the elements not installed by the AMB, if so agreed.
- Cleaning of the beaches (not in Barcelona).

In addition, the agreements included:

- Cleaning the sand and collecting trash from the beach (not in the case of Barcelona).
- Sanitary control and monitoring of sand quality (not in Barcelona).
- Maintenance, assembly, and dismantling of the public address system.

Tasks such as quality control of swimming water and the water in drinking fountains, showers and foot showers; surveillance and security services on the beaches; control of the consumption of supplies; cleaning inside the restroom modules; and maintaining breakwaters, among other tasks, are not included among the services subject to the agreements signed with the councils.

The provision, supply, and installation of street furniture for the beaches is the responsibility of the AMB,[3] with the exception of cases where the councils decide of their own volition to install sports facilities or similar facilities.

The specific cases of public toilet modules and first aid modules (without taking into consideration bars and associated modules) are cofinanced by each of the councils and the AMB.[4] However, the respective councils, which own the modules, are responsible for cleaning them and paying for water and electricity.

[1] The AMB was created under Law 31/2010, dated August 3, 2010, on the Metropolitan Area of Barcelona. The AMB took on the powers of the Metropolitan Transport Body (EMT) and the Metropolitan Water Services and Waste Treatment Body (EMSHTR), as well as the activities of the Association of Municipalities of the Barcelona Metropolitan Area.

[2] For simplicity, from here on "AMB" will also be used to refer to the MMAMB, since the AMB has taken over its duties.

[3] Recent examples are Dossier 448/14 – Manufacture, Supply and Installation of Two First Aid Modules and 11 Toilet Modules for Metropolitan Beaches (€456,503.36 including VAT) and Dossier 900401/15 – Supply and Installation of Three First Aid Modules and Eight Toilet Modules for Metropolitan Beaches (€422,617.91 including VAT).

[4] In the case of the first aid modules, this is split 50% each. In the case of public toilets, the AMB provides 75% of the financing, and the councils the remaining 25%.

An analysis of the supply contracts, however, goes beyond the scope of what this document is studying.

The agreements include a clause (the fifth) whose objective is to implement a metropolitan plan for organizing beach furniture in order to standardize the elements and services on the beaches of each of the councils.

The tasks assigned to the AMB in the spheres of maintenance and cleaning are included in two different contracts:[5]

- Contract for the maintenance and conservation of the metropolitan beach furniture and facilities (last contracts: 397/09 from 2009 and 2245/15 from 2015, beginning in June 2016).
- Cleaning service contract for AMB beaches (last contract 3392/13 of 2013).

2. Quick Facts: Beach Furniture and Facilities Maintenance Contract

Highlights

The Àrea Metropolitana de Barcelona (AMB) manages the furniture and facility maintenance and conservation service for the beaches in the municipalities of Badalona, Barcelona, Castelldefels, El Prat de Llobregat, Gavà, Montgat, Sant Adrià de Besòs, and Viladecans. In total, there are 41 metropolitan beaches, which have more than 2 million square meters of sand and are visited each year by more than 8.5 million people.

The furniture and facilities maintenance service for the metropolitan beaches ensures that all the elements (children's playgrounds and sports facilities, showers, walkways, benches, etc.) are kept in proper condition so that users can enjoy their time on the beaches comfortably and safely.

The contract's objective is to provide an integrated maintenance and conservation service to all AMB municipalities with a beach.

Location: The AMB includes 36 municipalities with 3,239,337 inhabitants (2012).

[5] However, the AMB has more than just two contracts regarding its beaches.

Characteristics of the Contract

Type of project: Brownfield[6]
Size: 8 municipalities, 41 beaches, 42 kilometers of coastline
Type of contract: Indirect management using the concession method
Tender amount: €6,396,030.06 (including VAT)
Awarding of first contract:[7] April 24, 2008
Start of first contract: June 1, 2008
Contract end date: May 31, 2014
Duration: 6 years, renewable for 2 more
First-ranked bidder's award amount: €5,414,239.45 (including VAT) with a definitive guarantee of €216,569.58 (4% of the award amount)
Amount bid by the second-ranked bidder: €5,317,659.39 (including VAT)
Awarding of second contract*: March 13, 2009
Start of second contract: March 16, 2009 (second contract signed on March 27, 2009)
Amount of second contract: €4,593,070.72 (including VAT) with a definitive guarantee of €183,722.83 (4% of the award amount)
Method of payment: Monthly for service provided, with the prior agreement of the Directorate of Technical Services, which is in charge of the quality of service provided
Contracting authority: AMB

*First contract was canceled due to financial problems of the concessionaire. The contract was then awarded to the second ranked bidder.

Bid-Winning Company

Initial bid-winning company: STACHYS SA (liquidated)
Second bid-winning company: COPTALIA SAU (http://innovia.es/)
Main shareholder: COPCISA CORP (www.copcisa.com)
Source: Contracts and tender documents provided by AMB

[6] The term *brownfield* project refers to a project that is already in operation – in this case the comprehensive management of a service that was already being provided, albeit independently by each of the councils.

[7] On February 24, 2009, the contract of the first bid-winning company was rescinded because of breach of contract.

3. Contract for the Maintenance and Conservation of the Metropolitan Beach Furniture and Facilities

The aim of this document is to analyze the contract for the maintenance and conservation of the metropolitan beach furniture and facilities (dossier 397/09); this contract started on June 1, 2008, and ended on May 31, 2014.

The elements, installations, and tasks that are covered by the service are:[8]

- Showers
- Footbaths
- Chairs and benches
- Trash cans
- Wooden walkways
- Rollout walkways
- Information signs for the beaches
- Children's playgrounds
- Beach volleyball courts
- Lifeguard towers
- Public toilets
- Marker buoys for defined bathing area
- Breakwater marker buoys and cleaning
- SOS cabinets
- Water access for disabled people
- Bicycle parking racks installed by the AMB (in Barcelona)

The contract states that all these elements located on the metropolitan beaches must be in the best condition aesthetically, functionally, and in terms of safety.

[8] The appendix contains a detailed list of the total number of elements to be maintained for each category.

The execution of the work is divided into two seasons:

- Peak season: from Easter Week (inclusive) to September 30.
- Off-peak season: from October 1 to Easter Week.

Each of the seasons has a series of defined activities, with different degrees of availability of the facilities in view of their variable use due to the expected presence of more or fewer users.

The work to be carried out by the AMB under this contract is:

- Installation and dismantling of temporary elements at the beginning of the peak and off-peak seasons.
- Operational and preventive maintenance following the programs and protocols established in the planning schedule.
- Corrective maintenance and resolution of emergencies and unplanned actions in the manner and time required for each situation.
- Repair and construction work and/or supply of elements and installations within the scope of the contract.

4. Tender Process

The contract was awarded through an open tender procedure in which both Spanish and foreign companies could take part if they demonstrated their economic, financial, and technical or professional solvency.

The criteria used to award the contract were the following:

- C1: Economic criteria (up to 50 points), which valued mainly the percentage reduction compared with the bid price.
- C2: Technical criteria.
  - Technical drafting of the proposal and organization of the service (up to 10 points).
  - CV of the works manager (up to 10 points).
  - CV of the company and quality systems in place (up to 10 points).
- C3: Protocol and organization for resolving emergencies (up to 10 points).
- C4: The company's experience with similar projects (up to 10 points).

The scores earned from the five companies that took part in the tender are presented in the table below.

Table 1. Scores for bidding companies

COMPANY NAME	ECONOMIC BID (€)	ECONOMIC SCORE	TECHNICAL SCORE	WORKS MANAGER CV	COMPANY CV	RESOLUTION OF EMERGENCIES	EXP. SIMILAR JOBS	TOTAL
Azahar, jardinería y riesgos SA	5,628,506.45	34.07	7	8	7	8	7	72.07
Urbaser SA	5,623,712.10	34.36	9	8	9	8	8	76.36
Stachys SA	**5,414,239.45**	**46.96**	**9**	**8**	**9**	**8**	**9**	**89.96**
Cespa SA	5,731,780.40	27.86	7	8	9	8	8	67.86
Coptalia SAU	5,317,659.39	44.87	9	8	8	8	7	84.87

Source: Data provided by AMB. Award report 839/07.

The bidding companies' average bid was €5,555,486, which is 13.14% lower than the tender amount (€6,396,030.06).

The cheapest bid was the one made by Coptalia SAU, which totaled €5,317,659.39. A slight disadvantage in the company's CV and experience with similar projects prevented it from winning the bid for the contract in the first round.

The contract was initially awarded to Stachys SA for the amount of €5,414,239.45, including VAT, on April 24, 2008, with the contract starting on June 1, 2008.

On February 24, 2009, less than a year after the contract was awarded, a decree to terminate the contract was signed in view of the company's failure to fulfill its obligations to provide workers, machinery, and other necessary resources from January 29, 2009.

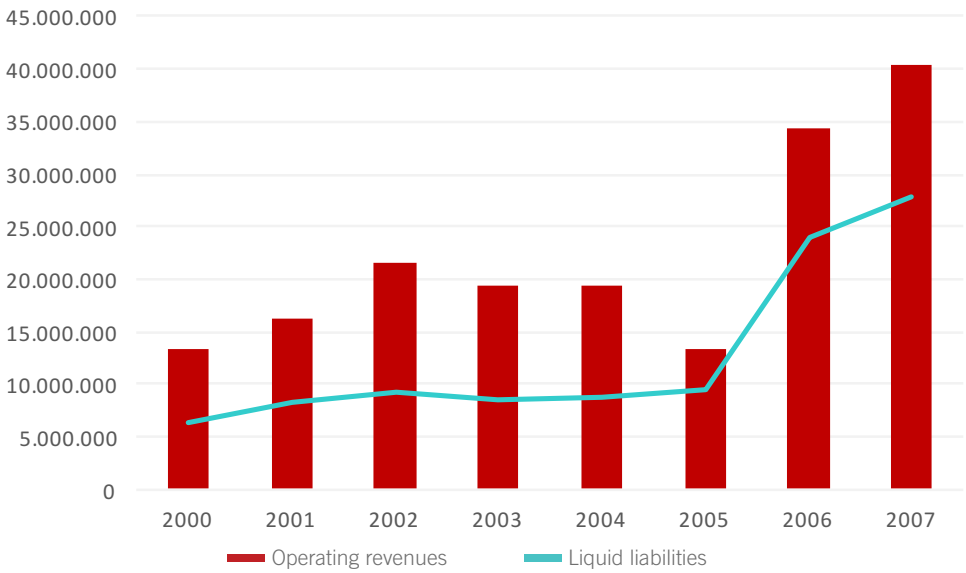
According to information from the Sabi database, the audit report for the company for the year 2007 already expressed reservations. According to the company's financial statements, the firm went from having a debt ratio[9] of 54.8% in 2005 to 86.19% in 2007. In addition, liquid liabilities accounted for 84.8% of total liabilities, which probably caused liquidity tensions in the company when it came to facing up to its payment obligations, which ultimately led it to experience solvency problems.

The graph below shows how the strong growth in operating revenues was accompanied by (and probably stemmed from) strong growth in the company's liquid liabilities as well. However, this growth in revenues was not enough to offset the financial obligations. This delicate financial situation arising from a high level of indebtedness led to the company's dissolution in 2009.

Starting on March 16, 2009, the contract was awarded for the amount of €4,593,070.72, including VAT, and a duration of five years and two and a half months to the company that came second in the tender process, Coptalia SAU, with a bid of €5,317,659.39.

[9] (Total liabilities and equity capital – equity funding / Total liabilities and equity capital) × 100.

Figure 1. Operating revenues and liquid liabilities



Source: Prepared by the authors based on data from SABI, last accessed April 2017.

5. Internal Characteristics of the Project

After the termination of the contract with Stachys SA, the project was awarded to Coptalia SAU (now Innovia Coptalia, http://innovia.es/). The company specializes in the comprehensive maintenance of municipal services and infrastructures. Coptalia SAU focuses its activity on upkeep of the road network (superhighways, highways, roads), airport maintenance, road cleaning, urban solid waste collection, and beach cleaning.

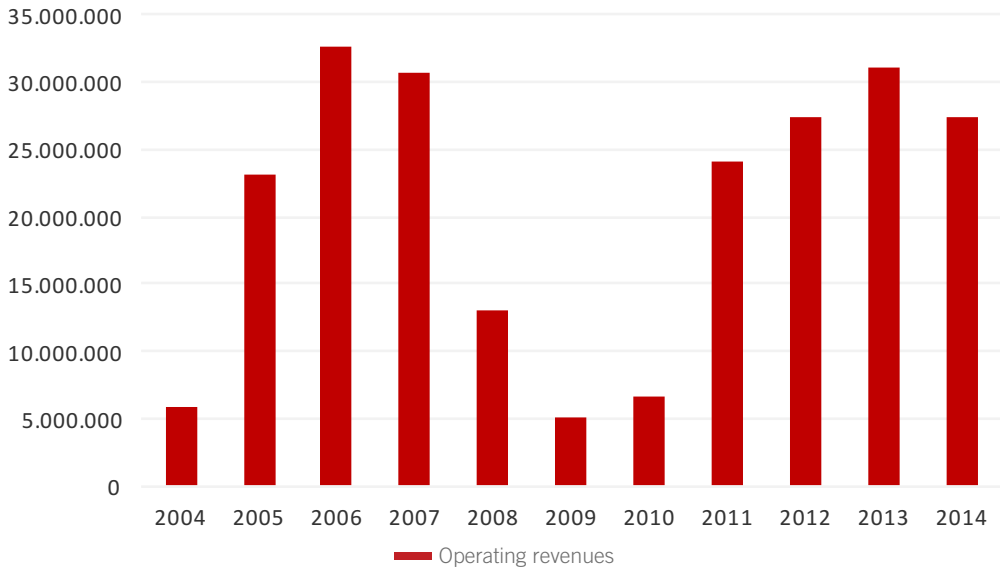
The company is part of the group Copcisa Corp (www.copcisa.com), which has more than 1,000 employees and 60 years of service, and is a recognized company in the construction, concessions, and services sectors in Spain. In 2015, the company had operating revenues of €6,102,564 and a bottom line of €4,678,154, with total assets of €79,767,631.

In turn, in 2014 the subsidiary Innovia Coptalia had operating revenues of €27,301,757, a bottom line of €1,639,699, with assets of €23,811,572. The company has 250 employees.

5.1. Financing

Coptalia SAU is a company that has achieved average operating revenues of €20,647,578.20 for the past 10 years and has a solid financial capacity because it belongs to Copcisa Corp.

Figure 2. Innovia Coptalia operating revenues



Source: Data provided by AMB.

5.2. System of Payment

The system of payment is that the contractor submits invoices previously authorized by the Directorate of Technical Services, which is in charge of verifying the quality of the work performed. The certifications are conducted in accordance with the criteria and procedure set out in Chapter 3 of the technical specifications document.

Table 2. Summary of contract award amounts 2008-2014

June-December 2008	€573,123.24
January-December 2009	€902,373.24
January-December 2010	€902,373.24
January-December 2011	€902,373.24
January-December 2012	€902,373.24
January-December 2013	€902,373.24
January-May 2014	€239,250
CONTRACT TOTAL	**€5,414,239.44**

Source: Data provided by AMB.

In case deductions have to be made because poor quality service was provided, they shall be made based on the contract price before VAT is applied.

The work to be carried out by the concessionaire is managed by a project and site manager appointed by the AMB. The manager must approve the planning schedule of the contractor's work each month.

To certify the work each month, the work done on the beaches in each of the municipalities is measured (verified) and rated by the AMB's inspectors based on its quality. If the quality score earned in all the municipalities is greater than or equal to 40 points, no deduction is applied to the concessionaire's revenues.

The quality scores that are awarded for each of the elements in accordance with the criteria set out in the technical specifications are as follows:

- Good. Satisfactory status (60 points).
- Acceptable. This is the lowest admissible limit (40 points).
- Unacceptable. The defects in the elements contravene the objective set out in the contract.
- Critical. The level of unacceptability is particularly serious and requires immediate intervention.

5.3. Risk and Risk Mitigation

The theory of public-private partnerships (PPPs) states that proper risk assessment and distribution are one of the crucial factors to ensure success in the provision of the service when using this kind of contract. The scholarly literature[10] has often argued that the risk should be transferred to the party that can manage it the best. Thus, risk cannot be transferred to an agent if that agent has no ability to reduce it or manage it.

However, optimal risk transfer in PPP contracts requires a prior evaluation of each of the parties' incentives – often monetary incentives – to carry out the tasks assigned to it.

The indirect management contract signed to carry out the maintenance and conservation of the metropolitan beach furniture and facilities involves a limited risk transfer from the AMB to the concessionaire, Coptalia SAU. The company is paid depending on the work carried out, after previous approval by the project and site management, in order to maintain the quality criteria stipulated in the contract.

Table 3. Risk transfer

Type of risk	Allocation
Design	AMB
Construction (installation)	AMB
Financing	Coptalia SAU
Inflation	AMB/Coptalia SAU
Interest rates	Coptalia SAU
Demand	AMB/Coptalia SAU
Maintenance	AMB/Coptalia SAU
Political	City councils

Source: Prepared by the authors.

Design risk. The maintenance contract did not include tasks relating to the initial design of the project (deciding on the facility locations) but was limited to maintenance tasks for previously installed furniture and facilities (brownfield). Integrating the supply and maintenance contract could be a source of heightened efficiency due to lower spending on maintenance and management. Possible cost overruns caused by nonoptimal design in the location of facilities are borne by the AMB.

[10] Contract theory studies how economic actors manage the clauses of contracts, usually in the presence of asymmetric information. This theory states that the risk should be allocated to the party that can control the source of the risk or the party that is better able to absorb the risk in cases of high risk aversion (Engel, Fischer, and Galetovic, 2014).

Construction (installation) risk. The management contract being analyzed did not include the initial installation, since this falls within another contract, which the AMB also manages. Traditionally, PPPs are understood to be projects that integrate the construction (installation in this case), operation, and maintenance of a facility, where this task integration can generate heightened management efficiency. In this case, the supply costs and risks are borne by the AMB, which pays the company based on the cost of installing the facility.

Financial risk. The financial risk associated with the purchase of the facilities is borne by the AMB and the councils (owners of the facilities) in the cases where the facilities are cofinanced. However, the financing of the material needed to carry out the maintenance (the purpose of the contract being analyzed) is borne by the concessionaire, Coptalia SAU. Nonetheless, the materials needed to carry out the tasks entail a minimal investment for a company such as the concessionaire.

Inflation risk. The maintenance contract updates prices based on the national inflation rate published by the National Statistical Institute (INE), except for those amounts executed during the first year of the contract and the first 20% of the budget executed. A historically higher inflation rate in Barcelona province may bring a slight risk of inflation for the concessionaire.

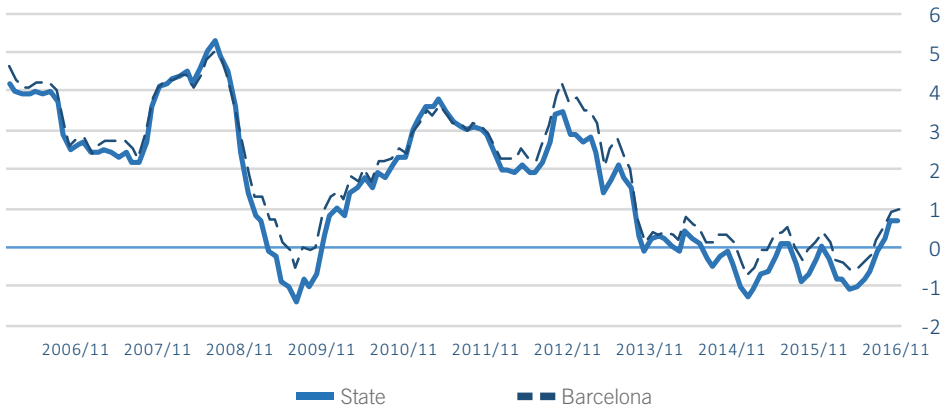
Interest rate risk. The cost of financing the service and the specific supplies needed to properly maintain the facility is borne by the concessionaire, Coptalia SAU. However, the investment needed is limited given the volume of the company's assets.

Demand risk. Greater use of the beaches will require an increase in the frequency of the maintenance work. For this reason, it was determined when each period starts – peak season and off-peak season. The cost of increased maintenance will be borne by the AMB, which pays the concessionaire according to the tasks to be performed.

The number of elements to maintain and conserve for the duration of the contract can be modified by the AMB. Thus, up to 10% of variability in these elements in the operational and preventive maintenance tasks and assembly and dismantling will not lead to a revision of the contract. It is therefore a risk that the bid-winning company bears.

Maintenance risk. The maintenance risk is borne by Coptalia SAU, which has to ensure that the facility is properly maintained. However, if this increase in activity comes from an extraordinary cause (increased social unrest, neighborhood conflict or weather factors), the AMB will bear this cost overrun with prior approval.

Figure 3. CPI evolution, national / Barcelona province



Source: Prepared by the authors based on data from INE, last accessed December 2016.

If the contract is terminated because the contractor has failed to fulfill its obligations, as happened with Stachys SA, the administration will keep the guarantee (€216,569.58) for any damage caused.

Political risk. The political responsibility for the project is borne by the councils, which are the public bodies closest to the citizenry and ultimately the ones responsible for the proper maintenance of their facilities. Users will view deficiencies in the maintenance of the furniture and facilities as mismanagement on the part of the municipal team, with possible electoral consequences.

5.4. Technical Elements

The technical specifications clearly define the criteria for maintaining the facilities in proper working order.

Thus, anomalies are classified as follows:

1. Urgent matters to be resolved outside the planning schedule (the contractor must arrive at the site in no more than two hours).

2. Serious incidents – not urgent but too important to wait for the next monthly planning schedule to be repaired.

3. To be resolved as part of the planning schedule for the month after which it has happened.

The activity schedules that must be guaranteed are as follows:

- Peak and off-peak season: every day, including public holidays, at the rate of eight hours per day in a time slot between 6 a.m. and 6 p.m.

Irrespective of the working hours mentioned, emergency teams must guarantee that they can act at all times.

Regarding the machinery, materials, and tools, and the vehicles and uniforms, it is stipulated that the contractor will have all these elements needed to implement the contract properly.

Each of the elements to be maintained has features to be assessed quantitatively with precision and, on the basis of these features, the contractor is paid.

5.5. Governance

In this contract, as with any medium-term contract in which there are different actors with their particular interests, even opposing interests in some cases, governance of the project is one of the keys to its success. Throughout the life of the project, unexpected situations can arise that force the parties to come to an agreement on issues that had not been considered initially. For this reason, contracts are considered incomplete, even more so the longer the duration of the contract (Grossman and Hart, 1986).[11]

Being equipped with good governance mechanisms will therefore be key to ensuring that the project runs smoothly throughout its duration.

The governance system is headed by Technical Services, which proposed the contract and also appoints a technician with the role of manager, who is in charge of:

[11] Sanford J. Grossman and Oliver D. Hart (1986). "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration." Journal of Political Economy. 94: 691–719; Oliver D. Hart and John Moore (1990). "Property Rights and the Nature of the Firm." Journal of Political Economy. 98: 1119–58.

- Interpreting and enforcing the technical specifications.
- Giving the appropriate orders to achieve the work objectives.
- Reporting to Technical Services on possible incidents when the contracted work is being performed.
- The work is subject to the orders of project and site management, which manages the work and approves the tasks to be done each month. The project and site management is appointed by the AMB.

The manager is in charge of examining and checking that the tasks have been performed according to the quality standards stipulated in the contract. The manager evaluates whether the work carried out complies with what is stipulated in the contract and issues a favorable report, if appropriate, that will be sent to Technical Services.

The contractor must submit an annual service program, in which the following tasks are planned and assessed:

- Preventive and operational maintenance.
- Installation and dismantling of elements.
- Provisions necessary to ensure corrective maintenance and the resolution of emergencies and unplanned actions.

The program will be divided on a monthly basis and will be presented to project and site management before the 25th of each month. Project and site management will have to approve this action plan. The contractor will have to economically evaluate each of the actions to be performed under the contract awarded.

In parallel, within the partnership agreements that exist with the different councils, they work with the AMB to create a Contract Monitoring Committee, through which the AMB is in charge of the maintenance and conservation of the furniture and facilities on the metropolitan beaches.

This Committee is made up of a chief technician, appointed by each of the two administrations, who is charged with coordinating, monitoring and supervising the tasks assigned. The Committee has the capacity to resolve any incidents which arise.

The Monitoring Committee meets the first quarter of every year to schedule the tasks to be performed and to improve the coordination with other municipal services: rescue and lifeguards, maintenance work, safety and public order, management of public events, etc.

At the same time, the Committee must issue a report containing the tasks performed and an assessment of the costs of the service, as well as any incidents that arose.

6. Quick Facts: Beach Cleaning Contract

Highlights

The Àrea Metropolitana de Barcelona (AMB) manages the cleaning of the beaches in the towns of Badalona, Castelldefels, El Prat de Llobregat, Gavà, Montgat, Sant Adrià de Besòs, and Viladecans. This covers a total of 22,365 linear meters and 2,156,192 m² of beaches.

The beach cleaning service (between the beachfront promenade or the last built façade and the sea) encompasses the cleaning of sand, furniture, and facilities, along with all the elements installed on the metropolitan beaches in general. This includes the material resources and the provision of the human resources needed to perform all the operations.

Location: The AMB includes 36 municipalities with 3,239,337 inhabitants (2012).

Characteristics of the Contract

Type of project: Brownfield
Size: 7 municipalities, 22,365 meters of coastline and 2,156,192 square meters of beaches
Type of contract: Special administrative contract for services
Tender amount: €8,332,290 (VAT not included), €7,762,290 for operational maintenance and €570,000 for corrective maintenance. €833,229 must be added for VAT. Total €9,165,519. Provisional guarantee of €249,968.70 (3% of €8,332,290)
Estimated value of the contract: €11,109,720 before VAT, including a two-year extension
Awarding of contract: February 27, 2014
Start of contract: April 1, 2014
Contract end date: March 31, 2020
Award amount: €7,167,946.50 (not including VAT) plus €716,794.65 for VAT. Definitive guarantee of €358,397.33
Duration: 6 years, renewable for 1 + 1 more
Method of payment: By submitting invoices, pending their approval by the Directorate of Public Space Services
Contracting authority: AMB
Bid-winning company: FCC SA (www.fcc.es)
Source: Contracts and tender documents provided by AMB

7. Contract for Beach Cleaning in the Barcelona Metropolitan Area

The purpose of this document is to analyze the contract to clean the beaches in the Barcelona metropolitan area (Dossier 3392/13), which began on April 1, 2014, and ends on March 31, 2020. The contract encompasses the cleaning of the sand, the furniture, and the facilities, along with all the elements installed on the metropolitan beaches in general.

The areas covered by the contract are listed in the table below.

Table 4. Areas subject to contract

Municipalities	Beaches	Total meters of coastline	Total m²
Castelldefels	All beaches	4,840	738,253
Gavà	All beaches	3,800	318,465
Viladecans	All beaches	2,700	315,300
El Prat de Llobregat	Els Militars, El Prat and nudist beaches	3,740	381,100
Sant Adrià de Besòs	Litoral and Fòrum beaches	750	68,540
Badalona	All beaches	3,705	215,463
	Breakwater stretch of the platform	225	2,250
Montgat	All beaches	2,080	111,300
	Breakwater stretch of the platform	525	5,520
Total		**22,365**	**2,156,192**

Source: Data provided by AMB.

The following are included within the areas of action:

- Breakwater area.
- Areas of sand, dunes, and natural vegetation.
- Nonsand areas, rocks, dirt areas, jetties, and breakwaters.
- Entrance areas or areas directly connected to the beach and which are used for access (staircases, ramps, etc.).

The contract also encompassed the expansion of the cleaning service in the areas stated in the table below.

Table 5. Possible future areas to be added to the contract

Municipalities	Beaches	Total meters of coastline	Total m²
El Prat de Llobregat	Ca l'Arana	960	53,125
	Carrabiners	1,090	68,670
Barcelona	All beaches	4,808	435,150
Sant Adrià de Besòs	Northern coastline of Sant Adrià	470	23,500
Total		**7,328**	**580,445**

Source: Data provided by AMB.

The scope of the contract encompasses all the work needed to keep the beaches in the metropolitan area clean as well as all the furniture elements and other installations located there.

- **Operational:** This includes the tasks that correspond to routine, predictable operations in the regular course of maintaining the beaches in a proper state of cleanliness. The annual and monthly plans shall be drawn up based on this list of technical conditions, and their purpose will be to achieve the quality levels stipulated in this document.

- **Corrective:** This includes the tasks on the metropolitan beaches determined by Technical Services, such as cleaning tasks that cannot be attributed to a failure to complete ordinary or functional maintenance. They may include those listed below:

  – Remains of large animals or a proliferation of macroplankton.

  – Extraordinary accumulations of waste and sand after storms or in areas that have been declared disaster areas.[12]

  – Extraordinary regularization of sandy areas.

  – Large-scale acts of vandalism.

The contractor is obligated to perform all the corrective tasks assigned by Technical Services via Work Orders.

[12] Although the movement of sand on the beaches is the responsibility of the Ministry of Agriculture and Fishing, Food, and Environment, the AMB may do it in extraordinary cases and by mutual agreement.

[13] ITeC is a private foundation whose goals are to support innovation, the generation and transfer of information and knowledge and the provision of technological services to improve the competitiveness of construction sector agents: organizations, companies and professionals (http://en.itec.cat/).

8. Tender Process

The contract was awarded through an open tender procedure in which both Spanish and foreign companies could take part if they demonstrated their economic, financial, and technical or professional solvency.

Bidders were required to submit bids for:

- Operational maintenance: Bids with an upper limit (price/m²) of €0.60/m², calculating the area to be maintained as 2,156,191.67 m².

- Corrective maintenance: The tasks will be assessed with reference to prices listed by ITeC (2014),[13] without discounts.

The criteria used to award the contract were the following:

- Envelope number 2, award criteria weighed according to value judgment (Organization of the service and improvements).

- Envelope number 3, award criteria automatically evaluated by applying formulas (Economic bid).

Table 6. Score for organization of the service

	Score
ORGANIZATION OF THE SERVICE	**42**
Organization of the ordinary service including the elements and material and human means to be used, and especially the bidder's organizational chart, distribution in the region, number of teams, and response capacity	32
Organization and operation of urgent measures and emergencies	4
Management of incidents: information, resolution, communication, reports	3
Optimization of the sustainability of the service	2
Self-monitoring of the quality of service	1
IMPROVEMENTS	**7**
Proposals to increase the quality of the service over the required minimums	7
ECONOMIC BID	**51**
Starting price of €0.60/m²/year	From 0 to 51

Source: Data provided by AMB, Administrative specification 3392/13.

A total of nine companies submitted bids to the tender and earned the scores presented in the table below.

Table 7. Participating companies

FINAL POSITION	COMPANY	FINAL SCORE	SUBTOTAL "ENVELOPE 2"	SUBTOTAL "ENVELOPE 3"
1	FCC SA	89.86	39.00	50.86
2	URBASER SA	88.90	41.50	47.40
3	TAHLER SA	86.00	35.00	51.00
4	EULEN SA	82.74	33.00	49.74
5	CESPA SA	79.39	30.50	48.89
6	INNOVIA COPTALIA SAU	79.04	30.00	49.04
7	ACCIONA SA	66.64	30.50	36.14
8	UTE ARNÓ Y ROMERO	63.34	24.00	39.34
9	RUBATEC SA	37.27	29.50	7.7

Source: Data provided by AMB, Administrative specification 3392/13.

The Contracting Committee awarded the contract to the bid with the highest score; it was submitted by Fomento de Construcciones y Contratas SA (FCC) (www.fcc.es). The main characteristics of the winning bid were:

- It was a comprehensive, exhaustive proposal in the organization of the service which defined the human means, timetables, mechanical means, and transport vehicles.
- Saint John's Eve operations with back-up workers, sand-cleaning machines, and extra collection trucks. (On the evening of June 23, Saint John is celebrated with fireworks on the beach.)
- The improvements included:
  - Installation of automatic detectors of the fullness levels and weight of the semi-buried trash cans.
  - 0.5% expansion of the amount of the 2% deduction of the promotion and management, for a total of 2.5%.
  - Installation of a coastal management tool via monitored video to tally the number of beach users.
  - Application of a mobile app "infobeaches."
- Economic bid 15% under the stated amount.

9. Internal Characteristics of the Project

The contract was awarded to FCC. The company defines itself as a citizen services company with an international presence in more than 25 countries that performs its activity in the environmental services, water and infrastructure sectors.

In 2015, FCC's turnover was €6.48 billion, 47% of which came from international markets, primarily Europe and the Americas.

FCC's three major spheres of action are:

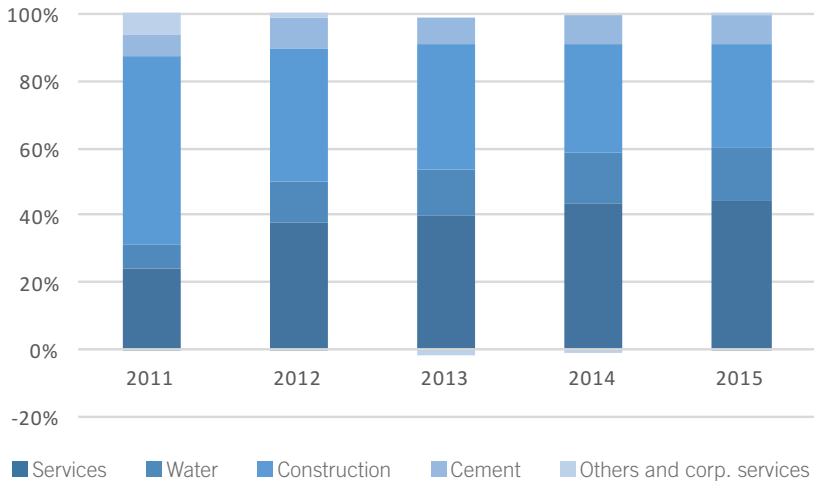
- Environment: It manages and treats domestic and industrial waste and is in charge of cleaning streets and maintaining parks and gardens, among other activities.
- Water, under the name Aqualia: It oversees the entire water cycle, from the infrastructures needed for the service to the supply of households and businesses.
- Infrastructures: The group operates via FCC Construcción i Cementos Portland Valderrivas. FCC Construcción designs, develops, and performs infrastructure maintenance tasks.

Table 8. FCC turnover by area (in millions of euros)

Turnover	2011	2012	2013	2014	2015
Services	2,890	2,828	2,771	2,805	2,856
Water	845	901	946	954	1,034
Construction	6,686	2,936	2,597	2,076	1,993
Cement	751	654	541	543	580
Others and corp. services	724	111	-104	-44	14
TOTAL	**11,897**	**7,429**	**6,750**	**6,334**	**6,476**

Source: FCC annual accounts, http://www.fcc.es/en/informes-anuales-acc, last accessed December 2016.

Figure 4. FCC turnover by area



Source: Prepared by the authors based on data from INE, last accessed December 2016.

9.1. Financing

FCC is a company that is listed on the IBEX 35* index, which encompasses the 35 companies with the highest capital in the state, with the account balance presented in the table below.

Table 9. FCC account balance (in millions of euros)[14]

	2011	2012	2013	2014	2015
Net equity	2,915	1,697	243	495	487
Noncurrent liabilities	7,535	7,587	3,475	7,834	7,718
Current liabilities	11,997	7,587	11,914	5,693	4,657
Total liabilities	**22,448**	**19,723**	**15,632**	**14,023**	**12,862**
Noncurrent assets	11,074	10,593	8,458	7,854	8,184
Current assets	11,373	9,129	7,174	6,169	4,678
Total assets	**22,448**	**19,723**	**15,632**	**14,023**	**12,862**

Source: FCC annual accounts, http://www.fcc.es/en/informes-anuales-acc, last accessed December 2016.

*The IBEX 35® is the index made up by the 35 most liquid securities traded on the Spanish Market (www.bolsamadrid.es)

Therefore, the company has sufficient financial capacity to take on the commitments stemming from the beach cleaning contract, such as the purchase of machinery to carry out the assigned tasks and salary advances until the service is paid by AMB at the end of the month.

9.2. System of Payment

The payment system works by the contractor submitting invoices that have previously been approved by the Directorate of Technical Services. The certifications are conducted in accordance with the criteria and procedure set out in Chapter 3 of the technical specifications document.

The payments are made to the company based on the monthly operational maintenance tasks listed and assessed in the Monthly Plan, and deductions may be made according to Quality Control results. The tasks invoiced include the other Work Orders issued by Technical Services.

All tasks that are performed as corrective tasks shall be measured on-site and assessed by applying the ITEC reference prices (2014), without discounts.

The tasks shall be invoiced monthly and the invoice shall be broken down by municipalities.

Table 10. Scopes, targets and quality parameters

SCOPE	TARGET	PARAMETER
Sand	Service areas	Cleaning
	Unsifted area	Cleaning
	Sifted area	Cleaning
	Wet area	Cleaning
	Rainwater channels and washes	Cleaning
	Breakwaters and other spaces	Cleaning
Equipment	Showers	Cleaning
	Footbaths	Cleaning
	Walkways	Cleaning
	Signage	Cleaning
	Children's games	Cleaning
	Wooden benches, chair and modules	Cleaning
	Bicycle parking racks	Cleaning
	Trash cans	Cleaning
	Wooden staircases	Cleaning
	Vertical elements	Cleaning
	Fountains	Cleaning
	AMB service modules	Cleaning
	Sports installations	Cleaning
	Large-capacity semi-buried trash cans	Cleaning
	Life preserver cabinet	Cleaning
	Lifeguard towers and chairs	Cleaning
Business service	Company management team	Accuracy and reliability
	Personnel and human resources	Professionalism
	Personnel and human resources	Uniformity, appearance and treatment
	Health and safety	Compliance
Action duration	For urgent intervention	Compliance
	Maximum in case of serious incidents	Compliance
	For planned work	Compliance

Source: Data provided by AMB.

[14] Includes only general line items; the amounts noted do not add up to total assets and liabilities.

The evaluation of the quality of each municipality is calculated monthly using the Quality Index (QI) formula.

QI = 1/2 Sand + 1/2 Furniture/Facilities
QI = 1/3 Sand + 1/3 F/E + 1/3 Repair Time
QI = 1/4 Sand + 1/4 F/E + 1/4 Repair Time + 1/4 CS

The range of evaluations follows these criteria:

- Good – 60 points
- Acceptable – 40 points
- Unacceptable – 20 points
- Critical – 10 points

Table 11. Range of evaluations and derived actions

QI<20	Critical	Requires immediate intervention
20≥QI<40	Unacceptable	Does not attain established objectives
QI≥40	Correct	Satisfactory level

Source: Data provided by AMB.

The overall score is obtained by aggregating the different QIs of each municipality, calculating their arithmetic mean, which is regarded as the monthly value of the quality of the contract.

Sand is qualified as good when there are no:

- Dangerous, unhygienic solids
- Large solids and plant waste
- Concentrations of small solids
- Concentrations of small plant waste
- More than three medium-sized solids
- Nonaccepted organic solids
- Excessive vegetation or vegetation with sharp elements

9.3. Risk and Risk Mitigation

The theory of PPP projects states that proper risk evaluation is one of the determining factors for ensuring the success of the provision of the service using this contractual framework. The scholarly literature[15] has often argued that the risk should be transferred to the party that can manage it best. Thus, risk cannot be transferred to an agent if that agent has no ability to reduce or manage it. However, optimal risk transfer in PPP contracts requires a prior evaluation of each of the parties' incentives – often monetary incentives – to carry out the tasks assigned to it.

The special administrative services contract signed to clean the beaches entails a limited transfer of risk from the AMB to the concessionaire, FCC. The company is paid according to the tasks performed, which is approved by the Technical Services following the quality criteria stipulated in the contract.

Table 12. Risk transfer

Type of risk	Allocation
Financing	AMB
Inflation	AMB/FCC
Interest rates	FCC
Demand	AMB/FCC
Cleaning maintenance	FCC
Political	City councils

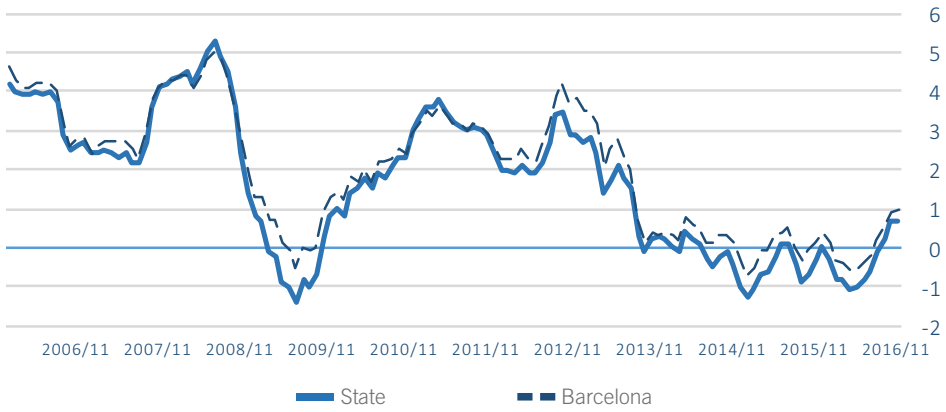
Source: Prepared by the authors.

Financial risk. The financial risk of the service is borne by the AMB, which is the party that manages the contract and makes the payments to the concessionaire. However, the concessionaire, FCC, finances the supplies needed to carry out the maintenance.

Inflation risk. The maintenance contract updates prices based on the national inflation rate published by the National Statistical Institute (INE) after the second year and only for 85% of the price variations for both operational and corrective maintenance. For corrective maintenance, this is over the prices set by ITEC in 2014.

[15] Contract theory studies how economic actors manage contractual clauses, usually in the presence of asymmetric information. This theory states that the risk should be allocated to the party that can control the source of the risk or the party that is better able to absorb the risk in cases of high risk aversion (Engel, Fischer, and Galetovic, 2014).

Figure 5. CPI evolution, national / Barcelona province



Source: Prepared by the authors based on data from INE, Estadística territorial, 2017, http://www.ine.es/FichasWeb/RegProvincias.do?codMapa=9, and Índices nacionales: general y de grupos ECOICOP, http://www.ine.es/jaxiT3/Tabla.htm?t=22344&L=0, last accessed December 2016.

A historically higher inflation rate in Barcelona province may entail a moderate risk of inflation for the concessionaire above and beyond the 15% which is not updated according to the contract.

Interest rate risk. The risk of financing the machinery needed to clean the beaches (tractors, sand-cleaning machines, etc.) is borne by the contractor, FCC SA, which has to have the supplies needed to carry out the assigned tasks.

Demand risk. More intense use of the beaches will require an increase in the frequency of beach cleaning tasks. To that effect, a date is set for the beginning of each period: peak season, mid-season, and off-peak season. The cost of increased maintenance will be borne by the AMB, which pays the concessionaire according to the tasks to be performed.

The number of beaches managed is not predetermined and can be increased or decreased depending on need. If this happens, there will be changes in the contract price proportional to the changes in the land area, either upward or downward.

However, if the changes in the sand land area or furniture are lower than 10%, they are borne by the contractor without any additional cost for the AMB.

Cleaning risk maintenance. The risk of the cleaning maintenance is borne by FCC. However, if this increase in actions comes from an extraordinary cause, AMB will have to bear this cost overrun if it is previously approved.

Political risk. The political responsibility for the project is borne by the councils, which are the public bodies closest to the citizenry and ultimately the ones responsible for the proper maintenance of their facilities. Users will view deficiencies in the maintenance of the furniture and facilities as mismanagement on the part of the municipal team, with possible electoral consequences.

9.4. Technical Elements

The technical specifications clearly define the criteria for maintaining the facilities in proper working order.

The tasks are defined based on three seasons:

a. Off-peak season. This corresponds to the months when there are the fewest people using the beaches. From October 1 through the Easter holidays.

b. Mid-season. This is a transitional period, when beach occupation is highly variable depending on the weather conditions, although it can be quite high, especially on holidays and weekends. From the Easter holidays (inclusive) until May 31.

c. Peak season. This period is when the AMB beaches have the maximum number of users, coinciding with the summer. From June 1 to September 30.

The contractor shall draw up an annual plan of tasks and jobs to be performed, where the jobs corresponding to the following categories should be planned and assessed:

- **Cleaning with manual means**, which includes the collection of all kinds of waste; organic solids of any size such as plant remains (seaweed, trunks, etc.), dead animals (terrestrial and marine), excrement; and inorganic solids such as plastics, the remains of bonfires, glass, rocks, rubble, metal elements, hazardous waste, etc. This cleaning also includes the removal of graffiti

using the best system depending on the medium used, as well as the cleaning of all the furniture elements and installations on the beaches (showers, trash cans, benches, platforms and wooden walkways, children's playgrounds, sports facilities, etc.).

- **Cleaning with mechanical means.** This consists of the cleaning of the sand areas in order to achieve perfect surface cleanliness which leaves the sand in perfect aesthetic and hygienic condition. The machinery used will include: sand-cleaning machines, tractors, small self-propelled sand-cleaning machines to clean hard-to-reach areas, or magnet-drive machines to remove metal pieces from the sand.

- **Waste removal.** All the waste resulting from the different cleaning jobs, including manual cleaning, the removal of bags, the emptying of trash cans, and the material collected by the sand-cleaning machines must be gathered either in transfer facilities run by the contractor or left in sites determined by Technical Services. The usual jobs include annual interior maintenance of the large-capacity semi-buried trash cans to leave them in acceptable hygienic conditions without any accumulations of water, smells, insects, etc. These jobs require the use of compacting trucks to empty the large semi-buried trash cans and compacting trucks to empty the standard trash cans.

- Topographic **levelling** of the beaches to prepare for mid-season.

- **Beach dragging.** The purpose of dragging the beaches is to turn the sand over up to a depth of 50 cm in order to expose the sand underneath to the wind and sun. Oxygen and the sun's ultraviolet radiation significantly improve the hygiene of the sand and reduce the proliferation of microorganisms and fungi. This dragging also includes all the beaches in Barcelona. All the metropolitan beaches must be dragged within a maximum period of 15 calendar days.

- **Special cleaning provision for Saint John's Eve.** Special provision for cleaning the beaches on June 24 of each year.

- **Adaptation** of the river mouths into the sea.

9.5. Governance

In this contract, as with any medium-term contract in which there are different actors with their particular interests, even opposing interests in some cases, governance of the project is one of the keys to its success. Throughout the life of the project, unexpected situations can arise that force the parties to come to an agreement on issues that had not been considered initially. For this reason, contracts are considered incomplete, even more so the longer the duration of the contract (Grossman and Hart, 1986).[16]

The management and official inspection of the tasks encompassed within this contract are performed by the individuals appointed by the AMB.

The contractor is required to carry out the instructions issued by Technical Services, which will evaluate the quality levels of each beach in accordance with the Quality Control Model (chapter 3), supervise fulfilment of the annual and monthly work plans (broken down in the annual plan), and invoice the jobs performed.

The functions of Technical Services include:

- Approving the Annual Work Plan and the monthly plans within it.

- Supervising the required tasks and issuing Work Orders as deemed necessary.

- Invoicing the jobs performed, assessing their quality, and suggesting any relevant discounts and sanctions in accordance with the contents of this document.

The contractor is required to execute all the corrective tasks indicated by Technical Services via Work Orders.

In parallel, within the framework of the partnership agreements that exist with the different councils, they work with the AMB to create a Contract Monitoring Committee in which the AMB is in charge of the maintenance and conservation of the furniture and facilities on the metropolitan beaches.

This Committee is made up of a chief technician, appointed by each of the two administrations, who is charged with coordinating, monitoring and supervising the tasks assigned. The Committee has the capacity to resolve any incidents which arise.

The Monitoring Committee meets the first quarter of every year to schedule the tasks to be performed and to improve the coordination with other municipal services: rescue and lifeguards, maintenance work, safety and public order, management of public events, etc.

At the same time, the Committee must issue a report containing the tasks performed and an assessment of the costs of the service, as well as any incidents that arose.

[16] Sanford J. Grossman and Oliver D. Hart (1986). "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration." *Journal of Political Economy*. 94: 691–719.
Oliver D. Hart and John Moore (1990). "Property Rights and the Nature of the Firm." *Journal of Political Economy*. 98: 1119–58.

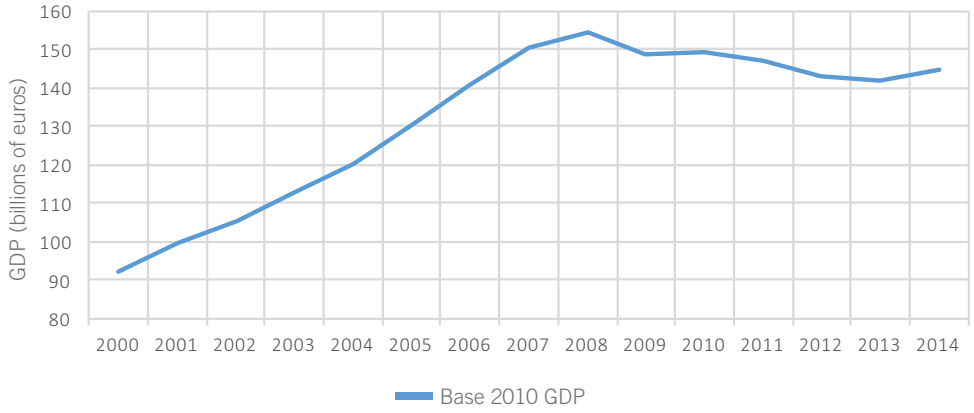
10. External Characteristics of the Projects

10.1. Economic Conditions

In 2009, the Spanish economy entered a severe crisis whose consequences are still felt today, especially through unemployment rates that are still high and a large volume of debt which limits the spending and investment capacity of families, companies, and public administrations.

This crisis hit the construction industry particularly hard, after years of steep growth primarily financed by bank debt. Many companies that have historically worked in this industry were unable to reinvent themselves as service companies quickly enough and were forced to close due to the adverse economic conditions. One of the companies forced to close was Stachys SA, the company that was first awarded the maintenance contract, which started a bankruptcy proceeding in 2009. Other companies managed to quickly promote new business areas in the service sector, including FCC SA.

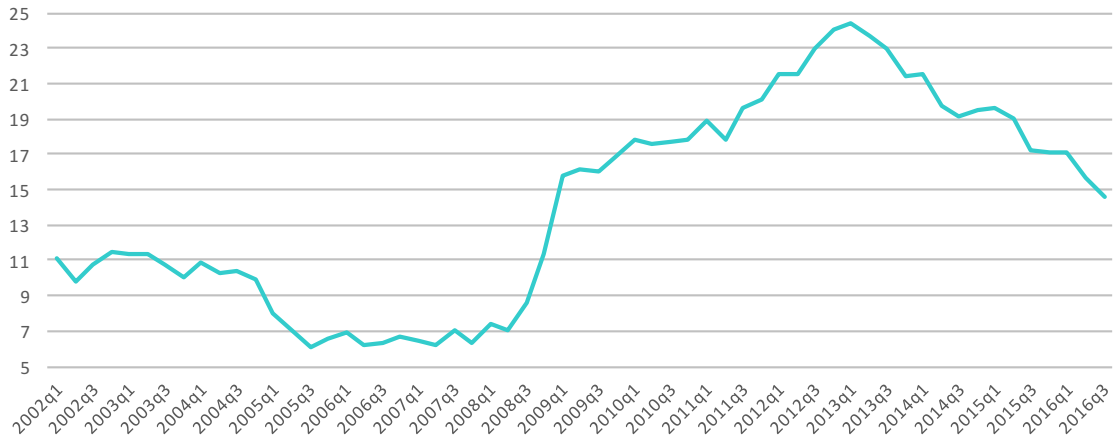
Figure 6. GDP of Barcelona province



Source: Prepared by the authors based on Statistical Institute of Catalonia (Idescat), last accessed December 2016.

As mentioned above, the economic downturn had a heavy impact on employment, leading to unemployment rates as high as 26% in 2013, as seen in the following graph.

Figure 7. Unemployment rate



Source: Prepared by the authors based on data from INE, last accessed December 2016.

10.2. Legal Conditions

Maintenance contract 397/09 is based on the following laws:

- Royal Legislative Decree 2/2000 dated June 16, 2000, which approves the recast text of the Law on Public Administration Contracts, and Royal Decree 1098/2001 dated October 12, 2001, which approves the general regulations of the law.
- Legislative Decree 2/2003 dated April 28, 2003, which approves the recast text of the Municipal Law on the Local System of Catalonia within the framework of the basic legislation on the local system in the terms set forth in article 149.18 of the Spanish Constitution.
- Decree 179/1995 dated June 13, 1995, which approves the Regulation on Construction, Activities and Services of Local Entities in Catalonia.

Beach cleaning contract 3392/13 is based on the following laws:

- Royal Legislative Decree 3/2011, dated November 14, 2011, which approves the recast text of the Law on Public Sector Contracts.

As indicated in the list of administrative conditions and the contract, respectively.

10.3. Political Conditions

The AMB was created via Law 31/2010 dated August 3, 2010, on the Barcelona Metropolitan Area. The AMB took over the authorities of the Metropolitan Transportation Body (EMT) and the Metropolitan Water Services and Waste Treatment Body (EMSHTR), in addition to the actions previously performed by the Association of Municipalities of the Barcelona Metropolitan Area (MMAMB).

10.4. Environmental Conditions

Every year the Foundation for Environmental Education (www.fee.global) gives each of the beaches and ports a Blue Flag (www.blueflag.global/) as a symbol of environment quality and the quality of installations following these criteria:

- Environmental education
- Water quality
- Environmental management
- Safety and services

In May 2016, Catalonia had a Blue Flag on 98 beaches, 13 of them managed by the AMB, and 24 sports marinas.

Table 13. Metropolitan beaches with a Blue Flag

Beaches	Location
Dels Pescadors	Badalona
Cristall	Badalona
Del Coco	Badalona
Bogatell	Barcelona
Nova Mar Bella	Barcelona
Mar Bella	Barcelona
Nova Icària	Barcelona
Barceloneta	Barcelona
Somorrostro	Barcelona
Sant Sebastià and Sant Miquel	Barcelona
La Pineda	Castelldefels
Lluminetes	Castelldefels
Gavà	Gavà

Source: Generalitat de Catalunya. 2017. Sala de premsa. [Online]. Accessed April 2017. Available from: http://premsa.gencat.cat/pres_fsvp/AppJava/notapremsavw/292675/ca/catalunya-rep-distintiu-banderes-blaves-98-platges-24-ports-esportius.do.

11. Impact of the Project

11.1. Administration

Through the unification of the maintenance and conservation service for furniture and facilities on the beaches, the councils benefited from the greater efficiency generated by the integration of the services along the entire coastline.

With the integration of the contracts of eight different councils (seven councils in the case of beach cleaning), it was possible to lower the costs stemming from multiple contracts (management and advertisement), to attract larger companies to the project, companies that benefit from economies of scale and pay[17] higher average salaries[18] because they are more productive.

[17] E. Moral-Benito (2016). *Growing by Learning: Firm-Level Evidence on the Size-Productivity Nexus*, Working Paper Series No. 1613, Banco de España.

[18] Walter Y. Oi and Todd L. Idson (1999). "Firm Size and Wages," in *Handbook of Labor Economics*, Vol. 3, Part B, edited by O. Ashenfelter and D. Card, Elsevier.

11.2. Residents

With the standardization and homogenization of the quality of service, the residents of the different towns benefit in general from improved maintenance of the installations and cleanliness along the entire coastline.

The beaches are used by users regardless of the town where they are located, so leisure activities like riding bicycles or jogging often run through different municipalities, which should have optimal use criteria based on the quality criteria in the contract.

11.3. Winning Companies

Since being awarded their respective contracts, both Coptalia SAU and FCC SA not only earn income from the maintenance and cleaning tasks but also get essential experience by performing the same activity in the towns adjacent to the AMB and can benefit from synergies in the maintenance of the different facilities on the Catalan coastline.

12. Assessment of the Project

12.1. Public-Private Partnership (PPP) Methodology

This case study refers to two important decisions by the local administrations in the provision of services that fall within the scope of their authority.

- First, whether the service is provided by the council or is delegated to a supramunicipal administration in what is usually called intermunicipal cooperation.
- Second, whether the service is provided internally, either by the council or the supramunicipal public entity, or is outsourced through a contract with a private company.

In this context, there are two important features of the Spanish legal framework,

- namely that municipal corporations or entities cannot provide services in other municipalities, and
- that supramunicipal entities can execute and oversee contracts with private companies.

In other countries, we find that municipal corporations can operate in other municipalities and that supramunicipal entities cannot engage in contracts with private companies.

Bearing this in mind, there are numerous theories that provide arguments for analyzing the advantages and disadvantages of internal production versus outsourcing, which can also be used to evaluate whether or not intermunicipal cooperation is beneficial. We shall evaluate the beach furniture and facility maintenance and conservation contract and the beach cleaning contract of the AMB based on the arguments posited by these theories.

Within the framework of industrial organization, one important argument in defense of both intermunicipal cooperation and the outsourcing of services is the potential exploitation of economies of scale by private companies and/or supramunicipal entities. Because municipal corporations in Spain can only operate within their own municipality, private companies and/or supramunicipal entities have the advantage of being able to offer services to multiple municipalities while drawing on the same human and material resources. In the case of the two contracts being examined here, the potential exploitation of economies of scale seems clear given the territorial continuity of the beaches in the municipalities that are parties to the contract and the different way that the city of Barcelona is treated (in the cleaning contract), since it can exploit economies of scale via direct municipal production because of its size. On the other hand, management by a private company does not seem to mean significant differences in the exploitation of economies of scale compared with direct management by the AMB.

However, within the framework of industrial organization, as well as the theory of public choice, one argument to defend the outsourcing of services is the possibility of introducing competition for the contract. This requires the contract to be awarded in an open tender, so different companies submit bids, and the criteria for selecting the company should be as objective as possible. Furthermore, the contracts cannot be long-term, which is only feasible when they are not associated with a high investment. In the case we are analyzing, all these criteria seem to be fulfilled, given the large number of companies that submitted bids and the reasonable objectivity in the selection criteria. As possible areas for improvement, there seems to be no clear reason for limiting the length of the two contracts to two/three years and for failing to consider the financial situation of the company that wins that contract for furniture and facility maintenance. Likewise, the cleaning contract was won by the leading company in this kind of contract in the Barcelona metropolitan area, which staves off potential financial problems in the company but serves to reinforce its dominant position. In any event, the competition for the contract seems to work well as an argument in favor of outsourcing the furniture/facility maintenance contract and the beach cleaning contract of the AMB.

The theory of property rights suggests that outsourcing may lead to cost savings at the expense of a lower-quality service being provided. Behind this theory is the idea that the property rights in a public company are held by citizens, such that the public manager cannot appropriate the gains derived from a reduction in the costs of providing the service for itself. In contrast, a reduction in quality could indeed have negative consequences for the public manager (and the politician who made the appointment) in terms of citizen complaints, and it could even have electoral consequences. In the case of a public company, the property rights are held by the owner/shareholders, so they can appropriate the gains derived from a reduction in costs for themselves. In contrast, improvements in the quality do not necessarily have consequences for the company's bottom line, especially when the service is provided as a monopoly. Therefore, this theory suggests that the outsourcing of services is only recommendable when there is strict oversight of the quality of the service provided by the private company. In the case of the two contracts examined, a rigorous mechanism was defined to oversee the quality of the service provided by the private companies, so we should not expect the private companies to reduce their costs at the expense of lower quality.

The theory of transaction costs, unlike other theories, suggests that outsourcing services can lead to an increase in costs compared to internal production instead of a reduction. In this sense, the transaction costs are the costs of designing and overseeing the contract in the context of incomplete information and possible opportunistic behaviors by the private company. Therefore, internal production implies that there are no transaction costs, since these costs are directly associated with the contract signed with an outside company. The transaction costs will be higher in services that require a high investment in specific or sunk costs (costs that cannot be recovered if the company leaves the market) and the more difficult it is to measure the company's results. According to this theory, outsourcing services is only recommendable when the transaction costs derived from contracts are low. It should be noted that the theory of transaction costs suggests that large municipalities (or integrated municipalities for the purposes of the management of a service in a supramunicipal entity) have a greater capacity to deal with the uncertainty inherent in contracts or with possible opportunistic behaviors by private companies which try to renegotiate contracts to their advantage. In the case of the contracts examined here, we can expect the transaction costs to be low since no noteworthy investments in sunk costs are needed and measuring the results does not seem overly complex. What is more, the AMB's capacity to handle possible opportunistic behaviors seems unquestionable. Therefore, the argument of transaction costs that advises in favor of internal production is not applicable in the contracts associated with the beaches in the Barcelona metropolitan area.

Another argument to defend outsourcing services is associated with a possible transfer of the risk from the public sector to private companies. Here the most important risk is associated with the use of the beaches, which does not appear to be something that a private company can control (once the provision of the service is guaranteed with suitable quality levels).

Finally, another possible advantage of outsourcing services is related to the joint production synergies of different tasks associated with the contract. However, these two arguments come to the fore when the contract is associated with high investment and the length of the contract is for many years. In the contracts for the beaches of Barcelona, the contracts are relatively short and not associated with any major investment. Having said this, the integration of tasks related to the supply chain with the conservation/maintenance of the furniture and facilities in a single contract could bring benefits in that the maintenance needs of facilities would be taken into account when making purchasing decisions. Along the same lines, the integration of the supply and cleaning of the modules into a single contract could mean savings on cleaning costs.

In summary, potentially exploiting economies of scale and dealing with possible transaction costs allow us to support the delegation of the services examined from the AMB municipalities. Furthermore, the introduction of competition for the contract also leads to a positive evaluation of the outsourcing of the services examined. However, costs could be trimmed by integrating tasks that are currently in different contracts and with variable degrees of cofinancing by the AMB and the councils.

Finally, establishing a regulated procedure to oversee quality eliminates the main disadvantage of outsourcing the furniture/facility maintenance and the beach cleaning services. However, on this last point the proper application of this procedure could be assured by adding a third company (external to the AMB) which would be in charge of overseeing fulfilment of the tasks associated with the contract.

The table below outlines the main characteristics of the projects in terms of PPP.

Table 14. PPP methodology for the maintenance contract (dossier 397/09)

PPP METHODOLOGY	MAINTENANCE OF FURNITURE AND FACILITIES	
	EXISTING	DETAILS
1. Public contracting method and selection process		
1.1. Value-for-money analysis or cost-benefit analysis	No	
1.2. Real competition for the contract	Yes	5 bidders
1.3. Contract evaluation committee	Yes	Association of Municipalities of the Barcelona Metropolitan Area
2. Contractual issues/problems and incentives		
2.1. Bundling	Not applicable	Not applicable since it is a contract for services managed indirectly
2.2. Verification of quality	Yes	Technical Services
2.3. Externalities	Yes	Positive
2.4. Duration		6 years + 2
3. Risk, financing and payments		
3.1. Construction and operations	Not applicable	
3.2. Maintenance risk	Partly transferred	Increased cleaning requirements (nonextraordinary causes) are borne by the contractor
3.3. Macroeconomic risk and public policies	Partly transferred	The risk of rising inflation is partly borne by the contractor
3.4. Payment mechanism		Monthly certifications
3.5. Contractor	Yes	Stachys SA/Coptalia SAU
4. Governance		
4.1. Transparency	Yes, but can be improved	Online access to the contract documents must be improved
4.2. Participative decision-making process	No	Residents are not consulted
4.3. Internal/external monitoring	Yes/no	Technical Services ensures fulfilment of the contract according to established quality standards
4.4. Legal framework	Yes	
4.5. Distribution of jobs	Agreement	8 city councils
	Monitoring compliance	Technical Services
	Renegotiation	No
	Regulation	Assembly of the Association of Municipalities of the Barcelona Metropolitan Area
	Operation and quality	Project and site management / Technical Services
5. Process of operations		
5.1. Cost overrun	No	
5.2. Deadline exceeded	Not observed	
6. Potential profits		
6.1. Price certainty	Yes	
6.2. Transfer of responsibilities to the private sector	Yes, in part	
6.3. Incentives for innovation	No	
6.4. Savings in public payments	Yes	
6.5. Life-cycle approach	No	
6.6. Incentives to deliver services on time	Yes	

Source: Prepared by the authors.

Table 15. PPP methodology – cleaning contract (dossier 3392/13)

PPP METHODOLOGY	BEACH CLEANING	
	EXISTING	DETAILS
1. Public contracting method and selection process		
1.1. Value-for-money analysis or cost-benefit analysis	No	
1.2. Real competition for the contract	Yes	9 bidders
1.3. Contract evaluation committee	Yes	Contracting Committee
2. Contractual issues/problems and incentives		
2.1. Bundling	Not applicable	Not applicable since it is a special administrative services contract
2.2. Verification of quality	Yes	Technical Services
2.3. Externalities	Yes	Positive
2.4. Duration		6 years + 1 + 1
3. Risk, financing and payments		
3.1. Construction and operations	Not applicable	
3.2. Maintenance risk	Partly transferred	Increased cleaning requirements (nonextraordinary causes) are borne by the contractor
3.3. Macroeconomic risk and public policies	Partly transferred	Inflation is partly borne by the contractor, around 15% variation
3.4. Payment mechanism		Monthly certifications
3.5. Contractor	Yes	FCC SA
4. Governance		
4.1. Transparency	Yes, but can be improved	Online access to the contract documents must be improved
4.2. Participative decision-making process	No	Residents are not consulted
4.3. Internal/external monitoring	Yes/no	Technical Services ensures fulfilment of the contract according to established quality standards
4.4. Legal framework	Yes	
4.5. Distribution of jobs	Agreement	7 city councils
	Monitoring compliance	Technical Services
	Renegotiation	No
	Regulation	AMB
	Operation and quality	Technical Services
5. Process of operations		
5.1. Cost overrun	No	
5.2. Deadline exceeded	Not observed	
6. Potential profits		
6.1. Price certainty	Yes	
6.2. Transfer of responsibilities to the private sector	Yes, in part	
6.3. Incentives for innovation	No	
6.4. Savings in public payments	Yes	
6.5. Life-cycle approach	No	
6.6. Incentives to deliver services on time	Yes	

Source: Prepared by the authors.

12.2. United Nations Sustainable Development Goals

Table 16. UN Sustainable Development Goals (dossier 397/09)

SUSTAINABLE DEVELOPMENT GOALS	FURNITURE AND FACILITY MAINTENANCE CONTRACT	
	BIG IMPACT	MODERATE IMPACT
1. No poverty		
2. Zero hunger		
3. Good health and wellbeing	✓	
4. Quality education		
5. Gender equality		
6. Clean water and sanitation		
7. Affordable and clean energy		
8. Decent work and economic growth	✓	
9. Industry, innovation and infrastructure		✓
10. Reduced inequalities		
11. Sustainable cities and communities	✓	
12. Responsible consumption and production		
13. Climate action		✓
14. Life below water		
15. Life on land		
16. Peace, justice and strong institutions		
17. Partnership for the goals	✓	

Source: Prepared by the authors.

Table 17. UN Sustainable Development Goals (dossier 3392/13)

SUSTAINABLE DEVELOPMENT GOALS	METROPOLITAN BEACH CLEANING CONTRACT	
	BIG IMPACT	MODERATE IMPACT
1. No poverty		
2. Zero hunger		
3. Good health and wellbeing	✓	
4. Quality education		
5. Gender equality		
6. Clean water and sanitation	✓	
7. Affordable and clean energy		
8. Decent work and economic growth	✓	
9. Industry, innovation and infrastructure		✓
10. Reduced inequalities		
11. Sustainable cities and communities	✓	
12. Responsible consumption and production		
13. Climate action		✓
14. Life below water		✓
15. Life on land	✓	
16. Peace, justice and strong institutions		
17. Partnership for the goals	✓	

Source: Prepared by the authors.

The impact of the projects to maintain the facilities and clean the beaches on the attainment of the United Nations Sustainable Development Goals (UNSDGs) can be clustered around the struggle against climate change. More specifically, both contracts for facility maintenance (dossier 397/09) and beach cleaning (dossier 3392/13) clearly allow for attaining UNSDG number 11 (Sustainable cities and communities) and, to a lesser extent, number 13 (Climate action). In the case of beach cleaning, numbers 6 and 15 (Clean water and sanitation, and Life on land, respectively) are clearly attained and number 14 (Life below water) is achieved indirectly.

Thus, all of these goals (6, 11, 13, 14 and 15) are directly related to the struggle against climate change, and therefore we can conclude that these contracts are a key factor in attaining this goal.

Beyond this, the cleaning and maintenance of the beaches and facilities allow for attaining other UNSDGs as well. Thus, both contracts have other clear, direct effects, such as improving Health and wellbeing (goal 3), guaranteeing Decent work and economic growth (goal 8), and obviously generating Partnerships for the UNSDGs (goal 17).

12.3. Cities in Motion

Table 18. Cities in Motion Index (dossier 397/09)

SMART CITY EVALUATION	FURNITURE AND FACILITY MAINTENANCE CONTRACT	
	BIG IMPACT	MODERATE IMPACT
1. Human capital		✓
2. Social cohesion		
3. Economy		✓
4. Public management	✓	
5. Governance		✓
6. Mobility and transportation		
7. Environment		
8. Urban planning		✓
9. International impact		
10. Technology		✓

Source: Prepared by the authors.

Table 19. Cities in Motion Index (dossier 3392/13)

SMART CITY EVALUATION	METROPOLITAN BEACH CLEANING CONTRACT	
	BIG IMPACT	MODERATE IMPACT
1. Human capital		✓
2. Social cohesion		
3. Economy		✓
4. Public management	✓	
5. Governance		✓
6. Mobility and transportation		✓
7. Environment	✓	
8. Urban planning	✓	
9. International impact		
10. Technology		✓

Source: Prepared by the authors.

This involves two service-provision contracts and, therefore, it is a public-private partnership for delivery of a service. It has been treated with the more traditional procurement mechanism of public services, and therefore several improvements are possible:

1. There is no attempt to explicitly integrate this tender with its contribution to the city model and therefore connect it to the strategic plan. Thus, it should be considered whether they are purely operational services where controllable quality measures must be specified and, essentially, where the most economical provider must be sought.

2. It does not take advantage of attracting more innovative offers with a more open system like Citymart.com, which Barcelona already uses for other challenges facing the city. Little opportunity for innovation remains when the tasks to be performed and how they should be performed are defined instead of the results sought.

3. The quality indicators do not mention the sustainability parameters being sought with these measures.

4. The specifications do not explicitly encourage any "smart" integration in the project, such as the installation of sensors or other monitoring parameters, even though FCC does include them.

5. No explicit interactions with other aspects of the city are sought. For example, congestion or mobility parameters could be defined, jobs could be found for the most disadvantaged populations given the nature of the tasks to be performed, the impact of the city's tourism could be determined, etc. Even from the standpoint of financing, it is possible to consider additional sources of financing, such as parking near the facilities, advertising on the urban architecture, etc.

13. Conclusions

Both the contract to maintain and conserve the furniture and facilities on the metropolitan beaches (dossier 397/09) and the contract to clean the beaches (dossier 3392/13) are framed within the tasks assigned to the AMB by different municipalities within the Barcelona metropolitan area to maintain and clean the beaches in an integrated fashion along the entire coastline. This integration of the management of the different municipalities allows for gains in management efficiency if the morphological criteria and typology of the coastline permit, as they do. However, often this integration of municipal services comes upon the problem of overlapping authorities among administrations, and on how to share the expenses among the different councils, such as by square meters of land area, linear meters, or hotel beds.

The purposes of the contracts analyzed refer separately to two of the different tasks assigned by the municipalities to the AMB, namely maintenance and cleaning. This situation in which the maintenance and cleaning tasks are contracted separately (without considering supplies for the facility itself: showers, benches, etc.) may be surprising given the possibilities of integrating tasks which could lead to gains in efficiency, even more so if the supply and initial installation were included.

However, this situation is not exclusive to the AMB but instead is a common practice in other beaches around Spain with a high influx of users given the complexity of reaching agreements among multiple actors with different authorities. For example, in particular cases such as areas near port facilities, we can find different actors such as the Ministry of Defense (safety), the Ministry of Agriculture and Fishing, Food, and Environment - Coast and Sea, the Ministry of the Interior (customs), the Port Authority, the City Council, etc.

On the other hand, the study detected possible focal points of improvement in the integration of tasks, such as in the design (installation) of the furniture and facilities, material procurement, the installation of the furniture and facilities, and the payment of utilities. Bundling the different tasks would consider the entire life cycle of the facilities, which could lead to gains in efficiency. This improvement could come from the acquisition of the furniture and facilities that was the easiest to maintain and clean throughout their entire product lifecycle, or that come with systems that facilitate savings in the consumption of utilities – primarily water and electricity – despite an initially higher price.

Regarding the supervision of the tasks performed by the contractors, one possible source of improvement was detected involving assigning these tasks to an independent company instead of to the same authority that designed and tendered the specifications. This would make it possible to improve the inspection of the tasks performed any time of day (including weekends), and it would improve the independence of the assessment and the effectiveness of the monitoring, which would, in turn, allow possible improvements in the technical specifications to be detected with the aim of maximizing the users' satisfaction levels in future contracts.

Related to the supervisory tasks, clearly the association between the quality of the service and some proven international indicator, such as the one from the Foundation for Environmental Education (Blue Flags), could be a good way to compare the quality of the beaches with those in other geographical areas.

Finally, to avoid situations such as the one that arose with the maintenance contract when the contractor declared bankruptcy, measures must be included that guarantee the solvency of the company, beyond the guarantee, since the company submitted provisos to its financial statements in 2007, in order to prevent the appearance of dysfunctions in the provision of services.

In summary, both contracts work successfully. Nevertheless, improved intergovernmental coordination among all levels of government and administrations, councils and the AMB could bring improvements in efficiency with clear benefits for the users, the administrations and, especially, the taxpayers.

Appendix

Facilities on Barcelona's beaches, according to season.

Facilities	Peak season	Off-peak
Showers	287	287
Footbaths	41	41
Trash cans	933	313
Walkways	2352	2083
Signage	151	151
Synthetic benches	31	31
Wooden benches	4	4
Shower seats	23	23
Wooden benches, tables, chairs	4	4
Children's games	16	16
Lifeguard towers	16	16
Lifeguard chairs	27	0
Wooden fencing	7	7
Life preserver cabinet	3	3
Public address system	24	24
Breakwater marker buoys	13	0
Bathing area marker buoys	164	0
Boat channel buoys	9	0
Bathing area aid buoys	8	0

Source: Data provided by AMB.

References

- Àrea Metropolitana de Barcelona (2016). "Beaches." http://www.amb.cat/en/web/territori/espai-public/platges.
- Barcelona City Council (Ajuntament de Barcelona) (2014). *Platges de l'Àrea Metropolitana – Presentació de resultats: Del 15 de maig a 21 de setembre de 2014 [Beaches of the Metropolitan Area – Presentation of Results: From May 15 to September 21, 2014]*, Barcelona. http://www.amb.cat/en/web/territori/actualitat/publicacions/detall/-/publicacio/enquestes-platges-2014/1039326/11656.
- Blue Flag (2016). "Blue Flag Beaches." http://www.blueflag.global/beaches2.
- Bordanove, Jordi (head of development and conservation at Àrea Metropolitana de Barcelona) (2016). Interviews by Miquel Rodríguez Planas and Jordi Salvador, Barcelona.
- Cellnex (2016). *Annual Results 2016*. https://www.cellnextelecom.com/content/uploads/2015/10/Cellnex-Results-FY-2016.pdf.
- Copcisa Corp (2016). "Qualitat, innovació i compromís" ["Quality, Innovation and Commitment"]. http://www.copcisacorp.com/cat/basicas.html.
- Engel, Eduardo, Ronald D. Fischer, and Alexander Galetovic (2014). *The Economics of Public-Private Partnerships: A Basic Guide*. Cambridge University Press, New York.
- Grossman, Sanford J., and Oliver D. Hart (1986). "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration." *Journal of Political Economy* 94: 691–719.
- Haro, José Luis (project analyst at Àrea Metropolitana de Barcelona) (2016). Interviews by Miquel Rodríguez Planas and Jordi Salvador, Barcelona.
- Hart, Oliver D. (2003) "Incomplete Contracts and Public Ownership: Remarks, and an Application to Public-Private Partnerships." *The Economic Journal* 113(486): C69–C76.
- Hart, Oliver D., and John Moore (1990). "Property Rights and the Nature of the Firm." *Journal of Political Economy* 98: 1119–1158.
- Moral-Benito, Enrique (2016). *Growing by Learning: Firm-Level Evidence on the Size-Productivity Nexus*, Working Paper Series No. 1613, Banco de España (Bank of Spain).
- Oi, Walter Y., and Todd L. Idson (1999). "Firm Size and Wages," in *Handbook of Labor Economics*, vol. 3B, edited by Orley C. Ashenfelter and David Card, Elsevier, Amsterdam, 2165–2214.

IESE Business School
University of Navarra

www.iese.edu

A WAY TO LEARN
A MARK TO MAKE
A WORLD TO CHANGE

Follow us

IESE Business School

IESE Business School

iesebs

iese

Barcelona
Av. Pearson, 21
08034 Barcelona, Spain
(+ 34) 93 253 42 00

Madrid
Camino del Cerro
del Águila, 3
28023 Madrid, Spain
(+34) 91 211 30 00

New York
165 W. 57th Street
New York,
NY 10019-2201 USA
(+1) 646 346 8850

Munich
Maria-Theresia-Straße 15
81675 Munich, Germany
(+49) 89 24 20 97 90

Sao Paulo
Rua Martiniano de
Carvalho, 573
Bela Vista
01321001 Sao Paulo,
Brazil
(+55) 11 3177 8221