

# Information and Communication Technologies (ICT)

## 31. IT Network Integration, Barcelona, Spain



Photo Credit<sup>68</sup>

### Background

The Barcelona City Council wanted to accelerate the integration and expansion of its existing information technology (IT) network (fiber optic and Wi-Fi), which was divided into five different IT networks and managed by six different companies. It also wanted to procure a better, safer, and customized IT service for its own use. To this end, the council, through its Municipal Institute of Information Technology (IMI), decided to pursue a PPP to integrate the management of its active and passive networks<sup>69</sup> to leverage efficiencies in investment, management, and monitoring.

The PPP involved bundling a number of activities that were previously isolated to improve efficiency and finance investments in new equipment.

### Project Structure

The resulting PPP entailed the financing, operation, management, and transfer of IMI's active and passive IT networks, in addition to some small-scale construction works. The design of the project was settled on through a competitive dialogue process, which the city initiated by inviting private operators to submit designs for the IT infrastructure in accordance with guidelines set by the city council. Once the design work was completed, IMI, as the entity in charge of IT provision for the council, began the tender process. The same two private operators that participated at the design stage then submitted bids. Tradia Telecom S.A. won the contract in January 2014, and began operations in March of the same year, with a total contract duration of ten years. In this case, due to the comparatively small size of the project, compared with Tradia's assets, no special purpose vehicle was used.

The project uses a creative business model under which the concessionaire provides corporate services to the city and IMI allows the concessionaire to sell spare capacity in the infrastructure created by the PPP, which is owned by the city, on the wholesale market. Tradia assumed the construction, financing, inflation, demand, operation, and equipment supply risks, while IMI took on the risks related to land and space acquisition and availability, as well as the political risks. Both partners shared the design risk.

Under this scheme, the private operator finances the investment in upgraded IT infrastructure and, in return, receives availability payments, plus the right to sell excess network capacity to telecommunications operators. Tradia would pay an estimated EUR 7,562,500 (USD 8,550,730) for the initial investment cost of purchasing and installing new equipment (NXM and Wi-Fi), while IMI would pay EUR 1,150,000 (USD 1,300,300) per year, including VAT, for Tradia's IT operation service. IMI also receives an annual fee of EUR 220,000 (USD 250,000) from the private operator for the use of the infrastructure that the operator can then sell to other operators on the wholesale market. The internal rate of return (IRR) was forecast at 11.3 percent over the 10-year period. However, on 9 May 2014, three months after the contract went into effect, the Spanish parliament passed Law 9/2014 – General Law on Telecommunications, which reportedly impacted the expected IRR.

<sup>68</sup> Harvey Barrison from Massapequa, NY, USA ([https://commons.wikimedia.org/wiki/File:Barcelona\\_2015\\_10\\_10\\_0488\\_\(22749913489\).jpg](https://commons.wikimedia.org/wiki/File:Barcelona_2015_10_10_0488_(22749913489).jpg)), „Barcelona 2015 10 10 0488 (22749913489)“,

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<sup>69</sup> Active networks involve commuting and routing equipment and passive networks involve fiber-optic cables, poles, and boxes that will be relayed to the operator. This is: nodes within the municipal and urban corporate network, citizen Wi-Fi network hot spots, urban Wi-Fi, corporate fiber-optic network, urban mobility control network and urban tunnel telecontrol network, dark fiber network of the 22@ district, urban tunnel telecontrol network items of equipment, and radio links. Due to the complexity of the networks, the measurements of each of them could vary, which concessionaire would have to accept.

The network-sharing model at the core of this project allowed the private firm to make an up-front investment in new and improved IT infrastructure, providing Wi-Fi throughout the city council's buildings and at access points in the outdoor network, while at the same time generating new revenue for the city. In addition, it has been reported that the operating costs for the city's IT administration increased by no more than EUR 7,400 per year.

Between 2011 and 2015, the number of city council buildings with fiber optic connections grew by 26.2 percent, the number of kilometers of fiber optic cable laid increased by 116.8 percent, and the number of Wi-Fi hot spots increased by 119.39 percent. Despite a change of government, the contract was not affected, though the previous smart city strategy was reevaluated.

### Lessons Learned

The project reportedly yielded benefits for both Barcelona's public administration and its residents, including improved service in the city council's offices and the expansion of Wi-Fi service throughout the city. It is also reported, however, that legal and regulatory changes have made it more difficult for Tradia to sell the spare network capacity.<sup>70</sup>

This project highlights the following:

- Innovative project structures, such as bundling several IT services and contracts that were

previously separated, can facilitate better and more efficient management and operations, while also making the project more attractive to private investors. At the same time, this may help guarantee the same quality standards across the bundled services.

- PPPs should be pursued purposefully, with clear objectives and justifications for procuring a private partner. In this case, the city evidenced a clear and consistent development strategy, which facilitated the cooperative design of the project with prospective private operators in advance of the tender.
- Permitting the sale of the new infrastructure's spare capacity provided an additional and innovative funding source. Creative approaches to additional funding mechanisms can help make PPPs more commercially viable and appealing to the private sector.
- Permitting the sale of the new infrastructure's spare capacity was a creative funding source that made the project more commercially viable and appealing to the private sector.
- Municipal PPPs may be subject to unforeseeable impacts resulting from decisions made by higher levels of government. Municipal PPP agreements should plainly allocate the risks related to changes in law and regulation and, to the extent possible, include responsive mechanisms that protect both parties.

## 32. Next Generation Nationwide Broadband Network, Singapore



Photo Credit<sup>71</sup>

### Background

To enhance Singapore's global competitiveness and meet its future economic and social needs, the Singapore government decided to develop a new Next Generation Nationwide Broadband Network (NBN). The NBN involved a fiber-to-anywhere network project offering open access, competitively priced, ultra-high-speed broadband access from

1Mbps to 1Gbps for consumers and businesses. To this end, the Singapore government decided to pursue a PPP to leverage private sector innovation and capacity and optimally allocate the risks, rewards, and responsibilities between public and private sectors.

<sup>70</sup> Salvador, Jordi, Joan E. Ricart, Francesc Trillas, and Miquel R. Planas. *Barcelona Gix: IT Network Integration (Spain)*. IESE Business School: Barcelona, 2017. Accessed January 26, 2019. <https://www.iese.edu/wp-content/uploads/2019/03/ST-0445-E.pdf>.

<sup>71</sup> Someformofhuman ([https://commons.wikimedia.org/wiki/File:Singapore\\_Skyline\\_Panorama.jpg](https://commons.wikimedia.org/wiki/File:Singapore_Skyline_Panorama.jpg)), „Singapore Skyline Panorama“,

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