Lessons learned to improve a PPP project. Metro de Sevilla. Spain.
Geneva, November, 23th 2016
INDEX

- The Specialist Centre on PPPs in Smart and Sustainable Cities. IESE Business School (PPP for Cities)

- Metro Sevilla Case Study

- Lessons learned
The Specialist Centre on PPPs in Smart and Sustainable Cities (PPP for Cities)
### WHO WE ARE?

#### Facts & figures

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>FACULTY</td>
</tr>
<tr>
<td>130</td>
<td>EXECUTIVE EDUCATION PROGRAMS</td>
</tr>
<tr>
<td>2</td>
<td>ASSOCIATED BUSINESS SCHOOLS IN ASIA</td>
</tr>
<tr>
<td>5</td>
<td>CAMPUSES AROUND THE WORLD</td>
</tr>
<tr>
<td>5</td>
<td>MBA MODULES OVERSEAS</td>
</tr>
<tr>
<td>33,000</td>
<td>PARTICIPANTS IN ALUMNI WORKSHOPS</td>
</tr>
<tr>
<td>15</td>
<td>ASSOCIATED BUSINESS SCHOOLS ON 4 CONTINENTS</td>
</tr>
</tbody>
</table>
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 development of projects involving collaboration between the public and private sectors.

PPP for Cities task is to help cities around the world transform themselves into Smart and Sustainable Cities (SSC) by embracing the Sustainable Development Goals (SDG) of the United Nations (UN). 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.
WHY PPP FOR CITIES?

TODAY, 50% OF THE WORLD LIVE IN CITIES...

60-80% OF ENERGY CONSUMPTION

75% OF CO₂ EMISSIONS

ONLY 2% OF OUR WORLD’S SURFACE.

75% OF THE POPULATION IN 2050

Some challenges are new... migration, economic crisis,

Others don’t... environment, poverty, climate change

Someone has to study and find good practices.....

Smart City is the one that has a strategy to face these challenges

ICT as a main driver to improve this strategy

21st century will be the century of Cities

The Specialist Centre on PPPs in Smart and Sustainable Cities (PPP for Cities)
The Specialist Centre on PPPs in Smart and Sustainable Cities (PPP for Cities)

WHAT DO WE DO?

- **Case Studies of PPP projects & Designing guides to PPP good practices** in urban development and Smart Cities
- **Holding periodic international conferences** on the development and transformation of cities through public-private partnerships
- **Creating working groups** to share good practices and communities of innovation
- **Research** thanks to all the information we collect from the Case Studies, the Working Groups
- **Developing a database of practical case studies and a network of specialized experts**
- **Holding seminars** on different aspects of PPP with the participation of both the public and private sectors
- **Hosting technical workshops** and training
- **Promoting partnerships among cities**, bringing together the public and private sectors
- **Independent consultancy services** for public administrations seeking to develop their capabilities and PPP markets
- **Creating standards for PPP projects in specific areas through multidisciplinary, multicultural working groups**
- **Hosting periodic international conferences** on the development and transformation of cities through public-private partnerships
The Specialist Centre on PPPs in Smart and Sustainable Cities (PPP for Cities)

OUR TEAM

International, multidisciplinary, with extensive experience in public-private partnerships, design strategies for cities, smart cities and sustainable development.

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Doctor of Philosophy Northwestern University. Doctor Industrial Engineer and PhD in Economics and Business Strategy Director Department at IESE and holder Carl Schroeder Chair

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Management Development Program (PDD), IESE Business School. B.A. in Economics, Universitat Autònoma de Barcelona.

Pascual Berrone
Associate Professor of Strategic Management. Schneider Electric Chair of Sustainability and Business Strategy. Ph.D. in Business Administration and Quantitative Methods, Universidad Carlos III de Madrid

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Associate Professor of Applied Economics at UAB. PhD in Economics, European University Institute (EUI), Florence, Italy.

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Esther Garcia – Technical Support
B.A. in Political Science in Universitat Pompeu Fabra

Carlota Monner – Technical Support
Master in Protocol, Organization & Executive Management of events and congresses. B.A. in Market Research and Techniques, UOC. B.A. in Business Administration, UAB
Metro de Sevilla Case Study

(case study still in working process. Expected final document: January 2017)
Metro de Sevilla Case Study

THE PURPOSE OF THE PROJECT

METRO de SEVILLA main goals:

1. **Improve metropolitan mobility** by facilitating mobility particularly from residential areas such as El Aljarafe to the city center and business areas.

2. **Facilitate access to strategic places** such as universities. Sevilla has two universities: Universidad de Sevilla and Universidad Pablo de Olavide, together with around 100,000 students.

3. Limit the use of private vehicles with the objective of **reducing traffic congestion and CO₂**.

Other goals considered:

4. **Revitalize retail commerce** in historical city districts

5. **Modernization of the image** of the city of Sevilla
The first metro project dates from 1975. Construction works were awarded in 1976. The metro was only projected for Seville city.

The project however was stopped in 1983 due to construction problems, expected large over-cost, and experienced delays. Additionally the population growth in the city resulted to be much lower than the estimates limiting the potential number of users of metro and consequently the project economic feasibility.

Seville is actually the fourth most populated province in Spain with a population of around 1.9 million inhabitants.

The current project was originally designed in 2002 to have four different lines.

The Metro project involved four municipalities in the metropolitan area of Seville whose City Councils agreed with the regional government, Junta de Andalucía, to finance the infrastructure.
# Metro de Sevilla Case Study

## BASIC PROJECT INFORMATION

<table>
<thead>
<tr>
<th>Title</th>
<th>DBOFT of Metro de Sevilla. Line 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Sevilla. Spain</td>
</tr>
<tr>
<td>Type</td>
<td>Greenfield</td>
</tr>
<tr>
<td>Client</td>
<td>Agency Public Works Regional Government of Andalucía, AOPJA</td>
</tr>
<tr>
<td>Sponsors/Bidders</td>
<td>JV: (11.77% AOPJA– 88.23% SACYR, Dragados, Gea21, CAF, Salvador Rus López Construcciones)</td>
</tr>
<tr>
<td>Terms of Transaction</td>
<td>35 years (3 years Construction + 32 years Operation)</td>
</tr>
<tr>
<td>Payment Method</td>
<td>Mixed Payment (Technical fare = User fee + Public subvention)</td>
</tr>
<tr>
<td>Size &amp; Scope</td>
<td>17 trains, 18 km, 21 metro stations</td>
</tr>
<tr>
<td>Investment &amp; Finance</td>
<td>14, 45 million passengers in 2014</td>
</tr>
</tbody>
</table>

- Initial investment: 428,5 M€ (VAT not included). 23,81 M€/km
- Final investment: 673 M€ (VAT not included). 37,18 €/km
Metro de Sevilla Case Study

TIMELINE

- **Contract Announcement** July 2002
- **Bid Submission** Nov. 2002
- **Contract Signature** June 2003
- **Financial Closure** February-2006
- **Start of Operation** April 2009
- **Contract Expiry** June-2038
THE TENDER PROCESS. BIDDING

The regional government invited companies to participate in an open tender to design, build and operate the Metro de Sevilla under a PPP scheme in which the private company would bear the design, build, financial and operating risk of the project.

Procurement method used was open procedure. Previously to the tender was done the bidding companies had to set a temporary guarantee in favor of the regional Ministry of Public Works and Transport of 7,19 M€, the 2% of the initial estimated budget. This temporary guarantee was to prove economical capacity.

The regional government estimated the cost at 359,9 M€, much less than the lowest bid (423,85 M€).

<table>
<thead>
<tr>
<th>Bidders</th>
<th>Leading company and bid</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bidder # 1</td>
<td>Dragados Conces.: 382 million infrstr. + 41.85 rolling stock (423.85 million). Technical fare subvention: 433 m. Total: 865.85</td>
<td>Spain</td>
</tr>
<tr>
<td>Bidder # 2</td>
<td>FCC: 393 million infrstr. + 68.40 rolling stock (461.40 million). Technical fare subvention: 755 m. Total: 1,219.4</td>
<td>Spain</td>
</tr>
<tr>
<td>Bidder # 3</td>
<td>Ferrovial: 445.7 million infrstr. + 63.80 rolling stock (509.50 million). Technical fare subvention: 1.015 m. Total: 1,524.5</td>
<td>Spain</td>
</tr>
</tbody>
</table>
The awarding committee decided to award the project to the Special Purpose Vehicle (SPV) Guadalquivir Sociedad Concesionaria de la Junta de Andalucía-Guadalmetro S.A. led by Dragados Concesiones de Infraestructuras S.A.

The criteria used by the committee to award the contract was based not only on the economic bid and financial plan (400 points) but also on technical bid and works execution (260 points), technical bid for the service provision (240 points), and coordination commitments with other public transports (100 points).

Those firms, which had not been awarded the project and obtained more than 500 points, will be compensated with 15,000 euros for bidding cost.

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<td>Spain</td>
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</table>
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THE BUILDING PROCESS

Over-cost:

**Initial estimated cost** (awarded): 428M €

**Final cost** (Dec. 2013): 673 M€ + 63,6%

Delay during the building process:

The construction process started on January 14th, 2004 and finished in April 1st, 2009, **more than two years after the initially expected finishing time**.

Reasons:

Several project modifications occurred. Also a bad design concerning the streams of the Guadalquivir river and the findings of archaeological remains increased time and costs.
Metro de Sevilla Case Study

THE PPP PAYMENT METHOD

In order to keep the project financial balance the payment system should cover the capital expenditure (the % of construction cost paid by the SPV), the operation expenditure, and SPV’s internal rate of return of the capital. To reach this purpose the project included a technical fare (or technical tariff).

The total cost are paid by user’s fare (ticket price) plus a subventions of the administration equal to the gap between the technical fare and the ticket fare paid by users. The contract includes yearly 100% Consumer Price Index update.

<table>
<thead>
<tr>
<th>Technical fare</th>
<th>Costs</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capex + Opex + IRR 100% CPI update</td>
<td>Subvention regional government Parameter A: 36.1% Parameter B: 38.5%</td>
<td>User’s fare 23.7%</td>
</tr>
</tbody>
</table>

Regarding the payments of the regional administration to the Metro de Sevilla S.A. during operation time includes two different amounts:

**Parameter A** (36,1% of total 2015 revenues): guaranteed revenue paid by the Grantor obtained by applying the Technical Tariff (100% CPI indexed) to the traffic projections agreed in the concession contract

**Parameter B** (38,5% of total 2015 revenues): revenue paid by the Grantor obtained by applying the Technical Tariff (100% CPI indexed) to actual traffic.

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2.65 euros</td>
<td>3.52 euros</td>
<td>3.88 euros</td>
<td>32,8%</td>
<td>46,4%</td>
</tr>
</tbody>
</table>

Other Revenues (1,7% of total 2015 revenues): mainly renting of photovoltaic plants on the roof of the maintenance buildings, commercial activities (vending machines, street-display ads) and collection fee for CTAS cards.
Metro de Sevilla Case Study
THE PPP PAYMENT METHOD (II)

The increase of the revenue is explained by the increase of the number of passengers, despite the fact that from 2013, the raise of the price of the user’s tickets has been frozen (political decision).

<table>
<thead>
<tr>
<th>Tickets</th>
<th>0 jumps</th>
<th>1 jump</th>
<th>2 jumps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple Ticket</td>
<td>1.35</td>
<td>1.60</td>
<td>1.80</td>
</tr>
<tr>
<td>Return Ticket</td>
<td>2.70</td>
<td>3.20</td>
<td>3.60</td>
</tr>
<tr>
<td>All-day ticket</td>
<td>4.50</td>
<td>4.50</td>
<td>4.50</td>
</tr>
<tr>
<td>Bonometro</td>
<td>0.82</td>
<td>1.17</td>
<td>1.37</td>
</tr>
<tr>
<td>Bono plus 45</td>
<td>30.00</td>
<td>42.00</td>
<td>50.00</td>
</tr>
<tr>
<td>Bono plus transfer</td>
<td>0.82</td>
<td>1.17</td>
<td>1.37</td>
</tr>
</tbody>
</table>

Prices for the different tickets at Seville’s Metro in € (2016).
Metro de Sevilla Case Study

FINANCE & FUNDINGS.

**Evolution cost construction**

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>382</td>
<td>382</td>
<td>408</td>
<td>439</td>
<td>527</td>
<td>549</td>
<td>584</td>
</tr>
<tr>
<td>Increase</td>
<td>26</td>
<td>57</td>
<td>145</td>
<td>167</td>
<td>202</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The over-cost was payed by the SPV (Shareholders contributions), with 90 M€ and by the Regional Government, with 154 M€.

**Financial structure**

<table>
<thead>
<tr>
<th>Initial construction cost</th>
<th>Amounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil work and instalations</td>
<td>382</td>
</tr>
<tr>
<td>Rolling stock</td>
<td>46</td>
</tr>
<tr>
<td>Rests costs</td>
<td></td>
</tr>
<tr>
<td>Total costs</td>
<td>428</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Initial financing</th>
<th>Amounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil work and instalations</td>
<td>584</td>
</tr>
<tr>
<td>Rolling stock</td>
<td>47</td>
</tr>
<tr>
<td>Rests costs</td>
<td>42</td>
</tr>
<tr>
<td>Total costs</td>
<td>673</td>
</tr>
</tbody>
</table>

Source: Globalvia Inversiones S.A.U.

To assume the Over-Cost, the SPV and the Regional Government decided to increase the Technical Fare (increase in 2013 is for adapting to inflation)

<table>
<thead>
<tr>
<th>Technical fare</th>
<th>Increase 2003-2009</th>
<th>Increase 2003-2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>2.65 euros</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>3.52 euros</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>3.88 euros</td>
<td>32.8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>46.4%</td>
</tr>
</tbody>
</table>
Metro de Sevilla Case Study

THE RESULTS (PASSENGERS)

- On **urban journeys**, Metro de Sevilla’s demand has **gained passengers** from Buses lines & Tram.

- On **intercity journeys**, demand is attracted from Intercity coaches and private vehicles.

- Demand attracted from private vehicles is due to the congestion levels.

- On **interurban journeys**, demand is increasing because of outskirts population growing.

Metro de Sevilla is growing at a higher rate than City Buses.

Source: Globalvia Inversiones S.A.U.
The Spanish economy, including Andalucía economy, experienced an extended period of economic growth that ended abruptly in 2008 due to the impact of the international financial crisis. In Spain, the sudden lack of credit in the international financial markets, led to the bust of the housing bubble, and a drastic reduction in civil works.

Source: INE
Before 2014, 88.23% of the capital was held mainly by construction companies that were highly affected by the deep economical crisis in Spain and the lack of new public works.

In 2014, Globalvia became the main shareholder after paying 177 million euros for the 88.23% of the capital. The other shareholder was the regional public agency, Agencia Obra Pública de la Junta de Andalucía (11.77% shares).
Metro de Sevilla Case Study

THE "NEW OWNER". GLOBALVIA

GLOBALVIA is a worldwide concession management leader
Specialized on mobility PPPs: highways and urban rail
It operates PPPs such as:
  - Metro Sevilla
  - Tramway Barcelona
  - M45 urban Highway in Madrid
  - Metro Barajas (from Airport to city center in Madrid)
  - Autopista del Aconcagua (Chile)
  - Highway Pocahontas (USA)
  - Urban highway of Dublin
Metro de Sevilla Case Study

THE "NEW OWNER". IMPROVING OPERATIONAL COST

- Total cost reduction is being implemented improving O&M processes.
- Strong operating synergies are achieved while maintaining outstanding quality ratios.
- External maintenance contracts renegotiation and some systems performed in-house.

Achieved: 22.9% O&M cost reduction in 2 years.
Metro de Sevilla Case Study

THE “NEW OWNER”. IMPROVING CUSTOMERS SATISFACTION.

- The number of registered complaints is declining, while demand is increasing.
- Customer satisfaction is growing, according to annual quality surveys

Source: Globalvia Inversiones S.A.U.
Lessons Learned
Lessons learned

PPP FOR CITIES EVALUATION

1. Procurement method & Bidding process
   1.1 Value for Money analysis or CBA* No
   1.2 Real Competition for the Contract Yes 3 Bidders
   1.3 Tender evaluation committee Yes Internal

2. Contractual issues & incentives
   2.1 Bundling Yes DBFOT
   2.2 Quality verifiable Yes Service interruptions / punctuality
   2.3 Externality Yes Positives
   2.4 Duration Yes 35 years

3. Risk, finance & payments
   3.1 Construction & Operation Risk Transferred If contract enforced
   3.2 Demand Risk Partially transferred Eco activity / Govt. fiscal constraints / adjustments for inflation
   3.3 Policy & Macroeconomic Risk Partially transferred
   3.4 Payment Mechanism Technical fare (Users + Public subvention)
     Globalvia (88.2%) & Agencia Obra Pública de la Junta de Andalucía (11.8%)
   3.5 Special Purpose Vehicle (SPV) Yes

4. Governance
   4.1 Transparency No
   4.2 Participatory decision-making process Not observed
   4.3 International/External monitoring Partially
     Junta de Andalucía oversee the activity of Agencia Obra Pública (contracting authority)
   4.4 Legal framework Not at the beginning
     Royal decree 1098/2001, Regulation for Law of contracts with PPAA
   4.5 Distribution of tasks Contracting
     Agencia Obra Pública
   4.6 Renegotiation Regulation
     Agencia Obra Pública & Junta de Andalucía
   4.7 Operation & Quality

5. Construction process
   5.1 Cost Overrun Yes Construction 637.6%
   5.2 Delayed deadlines Yes More than two years (designed by parts, project modification, construction mistakes)

6. Potential Benefits
   6.1 Possible Price Certainty Yes If contract enforced
   6.2 Transfer of responsibilities to private Yes If contract enforced/partially
   6.3 Scope & Incentives for innovation Yes
   6.4 Savings in public payments No Technical fare increased due to construction overcost
   6.5 Life-cycle approach Yes If contract enforced
   6.6 Incentive to be on time Yes
Lessons learned

ACHIEVEMENTS

- **Increasing the number of users of Public transport.** Previously to the start of the Metro service (2009), public transport had less than 19 million trips per year while in 2015 the number of trips per year almost reached 25 million.

- **Reducing the use of private transport.** 44.1% of Metro de Sevilla users will be using private transport if there was no metro service.

- **Increase of commuting.** About 86% of the Metro users on week days are commuting to the office or University in many cases benefiting from the intermodality tickets.

- **The retail commerce has been revitalized** in the historical city districts.
Lessons learned

REACHING UNSDG

METRO de SEVILLA may have reached the following UN SDGs:

Goal 9: Build resilient infrastructure, promote sustainable industrialization and foster innovation

Goal 11: Make cities inclusive, safe, resilient and sustainable

Goal 13: Take urgent action to combat climate change and its impacts

Goal 17: Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships.
Lessons learned

IS IT A GOOD PPP?

What have we learned?

Preparation of a good project (that will reduce over-costs)

Improve the bidding process (More precise estimation of the construction cost by the contracting authority)

Need of better Governance and cost control (that will reduce the delays and over-costs)

Public authorities must have previous knowledge (over-cost could have been financed through the capture of increases on commercial and residential value around metro stations).

An industrial Partner is crucial to improve performance, as seen with Globalvia.
Lessons learned

METRO DE SEVILLA. A SUCCESSFUL PPP PROJECT

At the end, because it reached some UN SDG, and therefore improved quality of life for residents in Sevilla metropolitan area, we can deduce that it was a successful PPP project.
Thanks for your attention

PPP for Cities, an ICoE at UNECE

&

an International platform of collaboration between public and private sector in cities arena

With the support from:

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