Assisting the Public Transport Authority in the Procurement of O&M and Asset Management services of the largest driverless metro network

Impact of operation in the Asset Management life cycle cost/strategy

Didier Boudon, Egis
A few words about Egis

IMAGINE. CREATE. ACHIEVE.

a sustainable future
EGIS, A GLOBAL OFFER

- Roads
- Aviation
- Rail
- Buildings
- Urban development
- Mobility
- Water & Ports
- Environment & Energy
- Major structures

Consultancy, Engineering, Urban planning, architecture & landscaping, Turnkey, Project structuring, Operations, Mobility services
€1.13 Billion
MANAGED TURNOVER IN 2018

Engineering 71%
- Rail 30%
- Buildings 25%
- Roads 18%
- Water & Ports 7%
- Aviation 6%
- Energy & Environment 7%
- Urban development 4%
- Mobility 3%

Operation and mobility services 29%
- Mobility services 20%
- Airport operation 10%
- Road operation 67%
- Energy 3%
OUR GEOGRAPHICAL FOOTPRINT

TURNOVER BREAKDOWN BY GEOGRAPHICAL ZONE

- Europe (excl. France): 37%
- Americas: 9%
- Africa: 9%
- Middle East: 13%
- Asia: 8%
- Australia-Oceania: 2%

63% of our business outside France
EGIS’ SHAREHOLDER STRUCTURE

25%
Partner executives and employees

Iosis Partenaires and
Corporate mutual fund shares

75%
Caisse des Dépôts
Background Information:
The Riyadh Metro Network

- 6 lines (lines 4 & 6 with a common trunk)
- 168 km of double track
  - Elevated: 76.4 km
  - At Grade: 35.9 km
  - Shallow Underground: 16.5 km
  - Deep underground: 39.3 km
- 92 Served Stations (pairs of platforms) = 88 stations buildings (locations),
  - including 3 major iconic stations with amenities and ancillary services
- 12 Parks & Ride facilities connected to stations
- Rolling Stock fleets
  - 45 trains of 4 cars
  - 145 trains of 2 cars
- 7 Depots
- 5 Operation control centers
Background Information:

Contract scope

- Metro Operations & Maintenance
  - Timetables / Train Operations
  - Station Operation (Fare Collection, Access Control)
  - OCC(s) + TCC Support
  - Customer Services, Passenger Information & Assistance
  - Safety and Security
  - Interface with Bus Operations
  - Maintenance and asset management of all the metro assets: civil works, buildings, facilities, transit system...
Background Information:

Base Packages

<table>
<thead>
<tr>
<th>Package</th>
<th>1</th>
<th>2</th>
<th>3</th>
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</thead>
<tbody>
<tr>
<td>Lines</td>
<td></td>
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</tr>
<tr>
<td>Length</td>
<td>38</td>
<td>25</td>
<td>41</td>
</tr>
<tr>
<td>Stations</td>
<td>25</td>
<td>15</td>
<td>22</td>
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www.railway-asset-management.org
Key Principles of O&M Contracting Strategy

- Contract duration 10 years (5 + 5)
- 2 or 3 operators = 2 or 3 contracts to manage
- “Gross Cost” contracts = contractors does not bear any revenue risk
- The O&M Operator contract(s) to incorporate the transit system maintenance. The transit system supplier(s) could be retained as the transit system maintainer(s)
- “Saudization” and knowledge transfer are essential within the contract
- Flexibility in management of change
- Consistency with Bus Operations
Overriding Objectives

- Riyadh Public Transport Network “RPTN“ = “A safe & secure, rapid & reliable and also comfortable, demand responsive, seamless door to door Transportation Service to all Riyadh dwellers“.

- Overriding objectives:
  - Provide a Transportation Service to users, commuters and dwellers;
  - Manage the Assets provided by the Asset Owner (metro infrastructure and related systems);
  - Contribute to a positive and attractive Image of the city, as a major public service provider.
Structure of the Terms of Reference

- **A. Operation Services**
- **B. Maintenance Services**
- **C. Development Period**
- **D. Corporate Management**
- **E. Saudization & Localization**
- **F. Rail Safety**
- **G. Information & Reporting**
Focus on Maintenance Services Requirements

|--------------------------|--------------------------------------------------------|---------------------------------------------------|

### Maintenance Core Activities

- **Maintenance Strategy**
  *Defines overall framework for maintenance definition, delivery and continuous improvement*
- **Maintenance Planning**
- **Emergency works**
- **Spare parts Management**
- **Maintenance activities**
  - Inspections
  - Preventive Maintenance
  - Corrective Maintenance
  - Lifespan preservation
- **Recordings**
- **Maintenance services performance reporting**
- **Asset Condition reporting**

### Asset Management

- **Asset Management Plan**
  *Assets condition allows delivering a world class service, preserving assets optimal lifespan*
- **Feedback and Continuous Improvement**
- **Asset management system certification to ISO 55001**
- **Asset management system reporting**
- **Asset management assistance to ADA**
- **Interface with ADA overarching solution**
- **Asset Monitoring Database**

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Focus on Maintenance Services Requirements

**Performance based contract**

Maintenance performance measured through dedicated KPIs

**Riyadh Metro Performance**

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<td>Maintenance Core Activities</td>
<td>Asset Management</td>
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Focus on Maintenance Services Requirements

Core maintenance activities

D&B Contracts maintenance documentation is an input for maintenance activities

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Riyadh Metro Performance

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<th>Transit System Maintenance performance indicators (KPI)</th>
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<td>Facilities Maintenance performance indicators (KPI)</td>
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Focus on Maintenance Services Requirements

Asset management requirements

International best practices compliance through ISO 55001 3rd party certification
Focus on Maintenance Services Requirements

Asset information & Knowledge management

Data management to build Employer’s knowledge

Riyadh Metro Performance

|--------------------------------------------------------|--------------------------------------------------|

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**Asset Information & Knowledge management**
- Computerized Maintenance Management System
- Interface with ADA overarching solution
- Asset Monitoring Database

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O&M Contractors’ CMMS and Employer’s Asset Management Overarching Solution

- O&M contractors are required to implement a modern, state-of-the-art Computerized Maintenance Management System

- O&M Contractors’ CMMS and asset databases to be fully compatible with the Client’s asset management overarching solution.
Performance Measurement

Four Streams of Performance Criteria:

<table>
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<th>Transit System Maintenance</th>
<th>Facilities Maintenance</th>
<th>Management</th>
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<tbody>
<tr>
<td>Passenger satisfaction</td>
<td>Rolling stock, SCADA, Communications, Power, CCTV system, Other systems</td>
<td>Civil works, Buildings, Depots, Stations</td>
<td>Health and safety and security, Human Resources and Organization, Environment, Reporting</td>
</tr>
</tbody>
</table>

⇒ 41 Separate KPI’s
### Performance Measurement

- **Overall KPI Score**: KPIs are weighted to take into consideration that some of them may have greater effects on the service provided than others.
- The overall score corresponds to the weighted sum of the individual KPIs.

<table>
<thead>
<tr>
<th>Area</th>
<th>Level 1</th>
<th>Level 1 weight</th>
<th>Area weight</th>
</tr>
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<tbody>
<tr>
<td><strong>Operations</strong></td>
<td>A Passenger satisfaction</td>
<td>16 %</td>
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<tr>
<td></td>
<td>B Information</td>
<td>10 %</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C Cleaning</td>
<td>12 %</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D Network effectiveness</td>
<td>2 %</td>
<td>40%</td>
</tr>
<tr>
<td><strong>Transit system Maintenance</strong></td>
<td>E Transit system maintenance</td>
<td>20 %</td>
<td>20 %</td>
</tr>
<tr>
<td><strong>Facilities maintenance</strong></td>
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<td>20 %</td>
<td>20 %</td>
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<tr>
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<td>G Health and safety and security</td>
<td>10 %</td>
<td></td>
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<tr>
<td></td>
<td>H Human Resources and Organization</td>
<td>6 %</td>
<td></td>
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<td></td>
<td>I Environment</td>
<td>2 %</td>
<td></td>
</tr>
<tr>
<td></td>
<td>J Reporting</td>
<td>2 %</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Overall</strong></td>
<td>100 %</td>
<td>100 %</td>
</tr>
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Lessons learned and key benefits

- A valuable framework to define Asset Management practices for a greenfield project
- ISO55000 = a recognized international and scalable set of practices
- “Rules of games” are clearly defined for all players
- Certification provides long-term insurance to the owner
Thank you for your attention

Didier Boudon, Egis