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1. Introduction
Athens Ring Road Project was a Ring road (Beltway) type project in the country of Greece. It was one of the largest infrastructure construction project in the country. The total financing of the project amounted to 1.73 billion Euros which could not be financed from a single source and was sourced through methods.

The project required a long time to arrange the finances due to the legal and the financial structures which were new to Greece.

1.1 Project summary
The aim of the project was to provide a dual three-lane ring road running 65 kilometres north of Athens.

The need for such a road became apparent when the construction began for the new Athens International Airport at, scheduled to be opened in 2001 and the Summer Olympics Games to be help in Athens in 2004. The road is intended to reduce the traffic congestion and to connect the city to its new airport in Spata, 50 Km to the west. The Build-operate-transfer (BOT) concession, including a fixed-price construction contract which runs for 23 years from the financial closing, when all loans and guarantee agreements were signed, performance bonds were issued, and insurance was procured.

The concessionaire is a consortium of 11 leading Greek construction companies and Egis Projects, one of Europe’s main roadway operators.

1.2 History
In may 1996 the Ministry of environment, Physical Planning and Public works awarded a concession to design, build, operate and maintain the road to Attiki Odos, a consortium of 11 leading Greek construction companies. Because of EIB’s desire that a strong, internationally recognised motorway operator be committed to the project throughout the life of the concession. Egis projects became a 49 percent shareholder. Egis projects is a subsidiary of Groupe Egis, formerly Transroute, One of Europe’s leading motorway operators.

The concession contract was ratified by the Greek legislature and carries the force of Greek Law. EIB signed its loan agreement with the concessionaire in December 1997, but the agreement was subject to the various conditions precedent, including finalising the guarantee structure with the bank syndicate and the Greek government. The financial closing, covering all the financing and project contracts, was not achieved until March 2000, after three years of negotiation.
2. Asset Characteristics
The ring road is intended to reduce traffic congestion and to connect the city to its new airport at Spata, 50 km to West. It is being developed in six sections, to be completed and opened over two years, and will have a capacity of 20,700 vehicles per day. It is one of the largest infrastructure projects in Greece.

2.1 Added benefits
The ring road will also connect to many of the facilities that were being developed for the summer Olympic games to be held in Athens in 2004.

2.2 Capacity of the project
Completion in 6 phases, 207,000 vehicles per day on completion of the project

Period of financial closing- March 2000

2.3 Risks
- The failure of the contractor to finish construction on time
- Insufficient toll revenue because of the light traffic
- Risk rising from the fact that the toll roads would be using the electronic toll readers which have certain disadvantages
- Currency risk when the loan is being taken from the international banks as it was not a part of the Economic and Monetary Union (EMU) of the European Union (EU)

3. Feasibility aspects

3.1 Market feasibility
The purpose of this project was to develop the inner ring and integrate a full road network for fast and safe transport in the entire Attika region.

The Attica Tollway was designed to:
- Provide access to the new Athens International Airport
- Leave urban congestion by providing a ring road around metropolitan Athens
- Reduce accidents
- Reduce environmental impact

Thus, the main market of this project would be all the users, private vehicles (passenger cars) and freight traffic. The location of this project combines large open spaces and quick access to ports, railway and provides links to the Athens International Airport and to the two main National Roads. The toll road will be connecting the 30 municipalities of the Attica basin, allowing quicker access to areas, which, before its construction, required a great amount of travel time. Thus the connectivity of this project site would attract many users in the future as there were no other similar projects planned in the future. The
forecasted AADT (Annual average Daily traffic) was estimated to level off at approx. 245,000 vehicles after 10 years of operation with a gradual increase from 160,000 in 2004. Revenue could be generated by imposing tolls on the urban axis, which would be controversial since this would be the first instance of toll in Greece. However, the high level of service provided by Attica tollway and many large logistics centres having emerged or relocated to the western part of the Tollway will diminish any reluctance of paying tolls.

### 3.2 Technical aspects
Construction within urbanized area under adverse geotechnical conditions called upon employing vibration recorders to restrict peak particle velocity below 6mm/sec in open-cast mining excavations; the NATM (Drill & Blast) method. The tunnel construction method using Roadheader machinery would have to be applied to reduce vibrations (the peak particle velocity was limited to 0.7 mm/sec) and to avoid using explosives in areas of historical interest (monuments, churches etc.) for tunnel construction; the Incremental Launching System may also be used for constructing the superstructure of bridges. Road pavement will be constructed using the latest construction methods and mechanical equipment, reliable materials and specialized laboratory measurements and tests to ensure durability over time.

The Greek construction sector was fragmented and this project would be a major challenge for their technical abilities and ability to take on a major financing/investment project. The project will be considered a milestone in the development of the Greek construction sector.

### 3.3 Management
Since this project was a humongous task for any individual party in Greece to take on and complete by themselves. The financial ability, technical capabilities and risk mitigation could only be provided by consolidation of all the major construction parties in Greece along with active involvement (concessions) of the government. Thus, AttikiOdos S.A was formed as a joint venture of almost all large Greek construction companies [AKTOR, AVAX, ALTE, ATTI-KAT, HELLENIC TECHNODOMIKI, ETETH, SARANTOPOULOS, PANTECHNIKI, TEV, TEG, EGIS PROJECTS.]. ATTIKI ODOS S.A. is the SPV, the consortium Attikiodos is the construction consortium and AttikesDiadromes S.A. is the operator. All companies were involved in all three formulations with slightly varying shares. The Concession Company’s shareholders’ structure consists of: - AKTOR CONCESSIONS S.A. (member ELLAKTOR S.A. Group) 59.25%, - J.&P. AVAX S.A. 21.00%, - ETETH S.A. (member J.&P. AVAX S.A. Group) 9.82%, - PIREAUS -ATE BANK S.A. 9.88% and - Transroute International. 0.04%.

### 4. Financials- Cost of Project, Means of financing
The public sector, the Greek Government, wanted to allocate most of the project risks to the private sector. It was clear from the beginning, however, that due to
several factors (e.g. this was the first PPP in the road sector in Greece, construction difficulties were envisaged, and help was needed in dealing with 30 local authorities), the project required strong state help. This financial help was necessary because, at that time, sponsors considered that the road traffic levels and the tolls the users were prepared to pay were not enough to provide an adequate return on the investment they were required to make. Therefore the project had to be developed as a PPP so as to:

- Minimise public funding. Public funding (including EU Structural funds) covered 34% with the private sector providing the remaining 66% project funding.
- Allocate risks to the private sector. The project structure allowed the Greek Government to allocate most risks to the sponsors.

The construction was financed (€1,346,309,241 Euros) as follows (Exhibit provides details of financing):

- Equity: 157,777,077 Euros
- Loans: 666,246,607 Euros (the majority were EIB loans)
- Greek State: 420,569,293 Euros
- Income from interest: 11,985,546 Euros
- Income from operation (during construction): 89,930,718 Euros

These funds were required for 3 major cost components. These include-

- **The Lump Sum Object**- Part of project corresponding to construction and operational responsibility of the concessionaire as per the Concession Contract. These were mainly financed by long term loans by EIB, European Union Grants & Greek State Contribution. The amount to be raised was approximately € 1.249 billion
- **Parallel and Additional work**- As per the Concession Contract, this includes the tasks required for the realization of the project. Parallel and additional works were paid according to the bill of quantities and the value of these works could not exceed 50% of Lump sum object cost. These parallel and additional costs were financed entirely by the Greek State and EU Grants. The predicted cost for these works was € 147 million but it got exceeded the maximum limit of € 220 million
- **Independent Engineer, expropriations, archaeological investigations**- This was also a part of the total budget for the project. Predicted cost for Independent Engineer, expropriations, moving of utilities & archaeological investigations was about € 440 million but it had exceeded its limit.
<table>
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<tr>
<th>Sources of Funds</th>
<th>€ million</th>
<th>% component</th>
<th>% of total</th>
</tr>
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<tr>
<td><strong>Lump Sum Object</strong></td>
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<tr>
<td>Long term loans (mainly from EIB)</td>
<td>637</td>
<td>51%</td>
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<td>Revenues before end of construction</td>
<td>37</td>
<td>3%</td>
<td>1%</td>
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<td>Private Equity</td>
<td>162</td>
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<td>EU Grants</td>
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<td>Greek state contribution</td>
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<td>6%</td>
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<td>Total</td>
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<tr>
<td><strong>Additional &amp; Parallel works</strong></td>
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<td>Greek State</td>
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<tr>
<td>EU Grants</td>
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Project timeline
References

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