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Title

Protecting the public interest in Public Private Partnerships for the delivery of very large transport projects: the case of Athens Ring Road

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Being a Report submitted to the faculty of The Built Environment as part of the requirements for the award of the MSc Town and Country Planning at University College London:

I declare that this Report is entirely my own work and that ideas, data and images, as well as direct quotations, drawn from elsewhere are identified and referenced.

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Abstract

The dissertation will try to investigate if the involvement of the private sector through a Public Private Partnership for the development of Athens Ring Road has led to a socially just solution that serves the public interest. In the first major part of the dissertation, special focus is put on critically presenting the specific issues in the literature of Public Private Partnerships for infrastructure development and particularly toll highways that relate to the perspective from which the case study will be studied. In the following major part of this dissertation, a number of specific factors that determined the Public Private Partnership, its terms and its outcome are going to be analysed in an attempt to evaluate, after one year of the road's operation, the degree to which public interest has been safeguarded. This study does not aim to argue against the potential of serious benefits that private sector's involvement can offer but emphasize on some critical issues that are endemic in the planning and governance of mega transport projects and threaten the realization of those benefits through complex Public Private Partnerships. A central concern of this study is the role and responsibility of the government in achieving maximum public gain and the nature of the impediments that hindered its efforts. Therefore, the extent to which real road-transport needs are met in a fair, effective, economical and environmentally friendly way will be discussed and the insight into the project's governance and the policy implications regarding the level of public participation, transparency and competition will be a major challenge of this dissertation.

"Experience is the name everyone gives to their mistakes", Oscar Wilde

Abbreviations

AIA: Athens International Airport

ARR: Athens Ring Road

CBA: Cost/Benefit Analysis

CC: Concession Contract

CEO: Chief Executive Officer

CFO: Chief Financial Officer

CJV: Construction Joint Venture

CPI: Consumer Price Index

CSF: Community Support Framework

DSCR: Debt Service Cover Ratio

EBRD: European Bank for Reconstruction and Development

EC: European Commission

EIA: Environmental Impact Assessment

EIB: European Investment Bank

EMU: Economic and Monetary Union

ERDF: European Regional Development Fund

EU: European Union

GRD: Greek Drahma

LSP: Lump Sum Price

LSO: Lump Sum Object

NPV: Net Present Value

O/M: Operation and Maintenance

PO: Project Owner

PPP: Public Private Partnership

PPPs: Public Private Partnerships

P&S (Works): Parallel and Supplementary (Works)

ROE: Return on Equity

SAC: Supreme Administrative Court

UTPL: Upper Toll Price Limit

WPHI: Western Peripheral Highway of Immitos

1 Introduction

1.1 Research Motivation and Aim of the Research

Large and ambitious infrastructure projects have recently emerged in both developed and developing world. Their realization and the delivery of their objectives require enormous capital expenditures and are hindered by the high project-specific and contextual complexity and uncertainty. The political, economic, social and environmental implications of those projects are regarded as great as their size. Many governments have started during the past fifteen years (others much earlier) their efforts to transfer parts of the management and financial risk involved in those projects to the private sector aiming the increase of reliability and efficiency and the lessening of the taxpayers' burden of the project costs. However, this has not always been the case in large infrastructure projects and there is an increasing interest on identifying the reasons that cause the inability of the public sector to capture efficiently the benefits of the private sector's involvement.

In Greece, three very large transport projects have been delivered through concession type Public-Private-Partnerships and are currently operated by the private concessionaire[1]. The value of planning research on the first private toll road in the country increases due to the fact that a program of 800 kilometers of new urban and interurban private toll road links[2] will be procured in the country within the next year. The present government shows great zeal in promoting PPPs at the same time as various voices are frequently presenting

[1] In one of the three projects ('Eleftherios Venizelos' Athens International Airport), the concessionaire is a public-private joint venture and not a 100% private entity. The other two very large transport PPPs are the Rion-Antirion Bridge and ARR which is the studied project in this dissertation.

[2] The program includes seven distinct toll highway links of 800 km total length and estimated budget of more than € 7 billion (MOF: 2005, Interviewee I)

them as panacea whereas others[3] strongly challenge their incautious use given that Greece has already a record of unsuccessful PPPs during the last ten years[4]. A new legal framework governing PPPs is going to be ratified by the parliament after a consultation phase which resulted in limited interventions into its content. All the latter circumstances are further motivating the research on private participation in infrastructure projects in Greece, the conditions for their success and the criteria of evaluating this success from the perspectives of different stakeholders and especially the citizens.

Although there is some work done on evaluating the specific PPP arrangement for the development of Athens Ring Road according to technical/construction and financial efficiency criteria there is limited scholar interest on appraising the project's success after a period of full operation according to the fundamental planning ethics of public interest protection. The latter is the aim of this research. The hypothesis to be tested is if the public interest has been served in the arrangements between the public and private sector. This appraisal effort will go beyond the notion of public interest as the fulfilment of real road-transport needs in an efficient, economical and environmental friendly way. What probably is more challenging in this work is the insight into the project's governance and the policy implications regarding the level of public participation, transparency and accountability in general.

Both the way a PPP for a toll road has been implemented in the Greek political and socioeconomic context and the particular features that deviate (or align) this specific PPP from the international practice comprise issues of planning

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[3] Technical Camber of Greece and Associations of Contractors (Naftemporiki: 02/09/05 , Naftemoriki:06/08/05)

[4] A number of projects for the 2004 Olympics including transport links, the development of Athens Olympic Village and the Hippodrome venue but also other large transport projects as the metro of Thessalonica and the submerged tunnel of Maliakos gulf in which the PPP arrangements between the private and public parties could be finalized (MOF: 2005, Interviewee I, II)

interest and research. Digging into the politics and economics of a very large and expensive urban transport project which is the first of its kind in the country (a toll highway implemented through a concession) reveals a number of critical issues to be considered by planners, economists, governments and the civil society. The fact that there are internationally common patterns of policies, practices and problems in long term concession agreements may give a considerable potential of generalization to the outcome of this research. At least, the discussion and findings of this dissertation would aim to comprise a constructive feedback on issues related to the interaction of public and private agents in Greece and the potential of future PPPs to safeguard the real benefit for the citizens.

1.2 Research Domain and Approach

Although, the methodological approach will be discussed and documented in detail in the third chapter, it is quite helpful for the reader and functional for the flow of this dissertation to provide at this point a schematic research flow diagram together with the general research domain of this work. Those are illustrated in figure 1 and figure respectively.

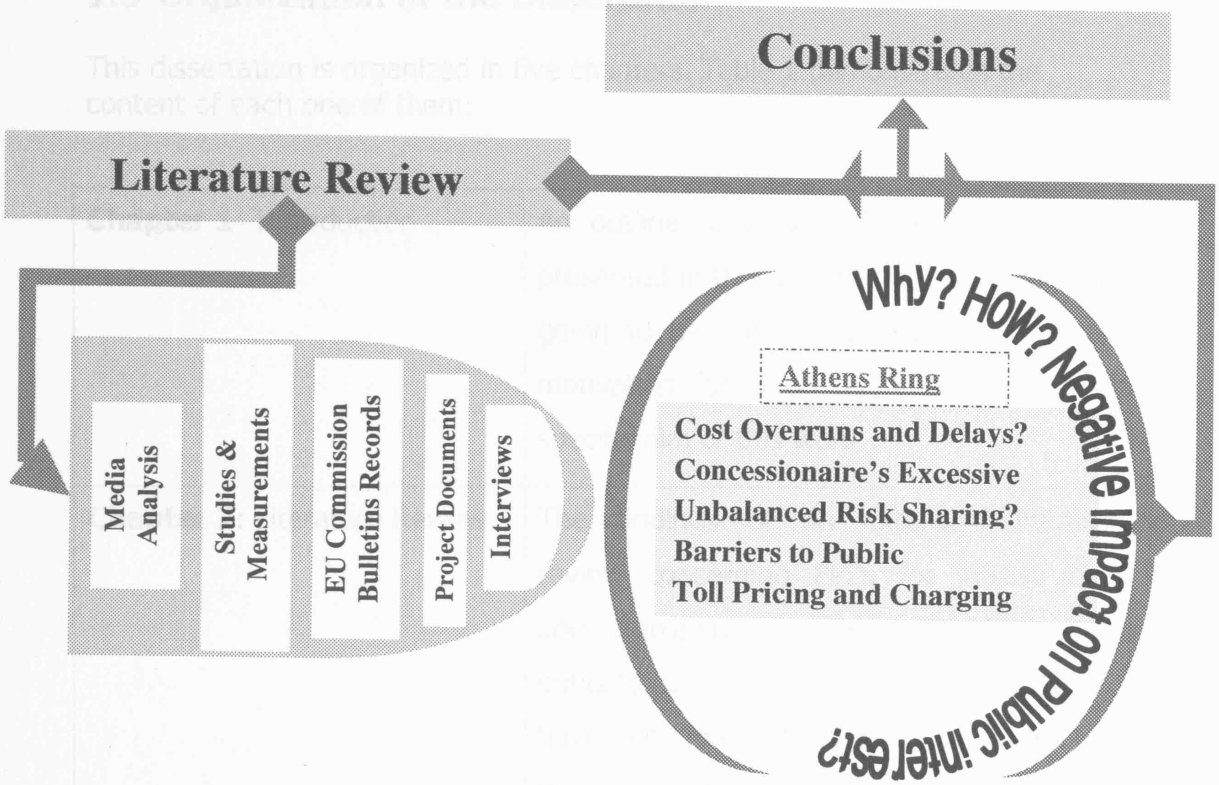

Figure 1. Research flow diagram

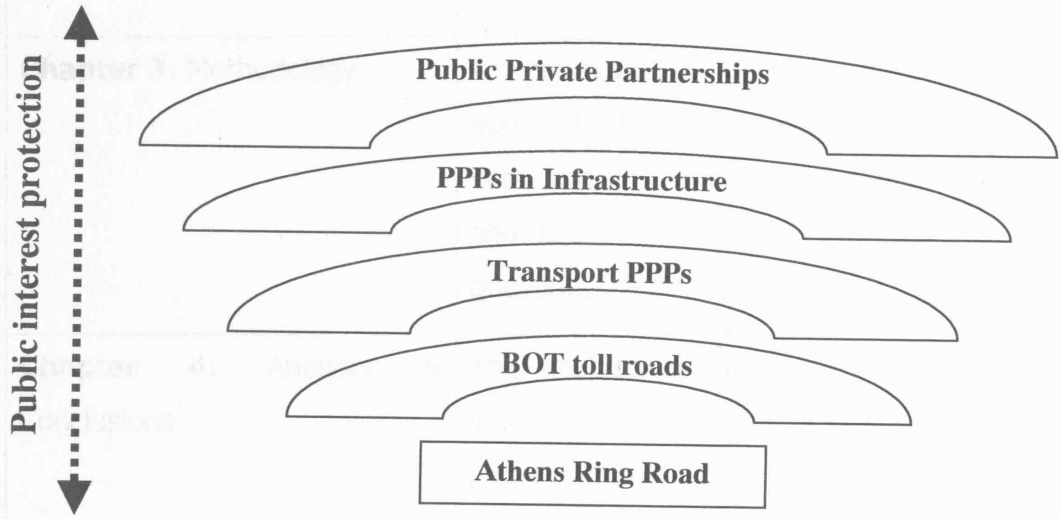

Figure 2. The research domain

1.3 Organization of the Dissertation

This dissertation is organized in five chapters. Table 1 demonstrates the content of each one of them:

Chapter 1: Introduction	An outline of what will be discussed and presented in this dissertation and how this is going to be done. It presents the general motivation for doing this research and the specific aim of this work
Chapter 2: Literature Review	The findings of an extensive literature review concerning PPPs for infrastructure and transport. Special focus is put on critically discussing the specific issues that have been met in the literature and relate to the perspective from which the case study will be studied but also to the objectives of the research.
Chapter 3: Methodology	A presentation of the methodological approach of the research. Description of the data and the methods that are employed and the way they link with the research questions
Chapter 4: Analysis & Conclusions	The analysis of the case study presents initially the basic facts and figures of ARR and continues to the core objectives of the research. The findings and the conclusions drawn from the analysis of the five research

	questions are presented in five separate sections and in a concise summarization at the end of the chapter where also some relevant recommendations are made.

Table 1. Organization of the dissertation

2 Literature Review

During the last 15 years there has been an increasing academic interest on Public-Private Partnerships (PPPs) due to analogous increase in the use of PPPs as a policy instrument to involve the private sector in the financing and the whole life-cycle of project development under an agreement with the public sector. The available theoretical and empirical research domain on PPP mechanisms for the delivery of infrastructure and public services reveals that they have been an issue of concern for both academics and professionals related with economics, finance, construction, planning and surely government and politics. The different perspectives of the associated parties form diverse approaches on the issue which are impossible to cover in this study and moreover it is out of the scope of this research. The adopted standpoint of this research tends to be close to the one of the planner in the broader sense which is the protection of the public interest and therefore, the content of this chapter will be distilled to reflect this perspective on PPPs theory and the toll highways concessions.

2.1 The Emergence of PPPs – The Global Context

In underdeveloped countries but also in the developing ones, the needs for infrastructure are immense and its expected contribution to development is significant. The same time public resources are limited and therefore the attraction of private capital and expertise is essential. International organisations[5] facilitate the influx of private capital in infrastructure development by providing loans, guarantees, policy advice and technical assistance to states and investors. Additionally, the serious inefficiencies in the operation and management of the public sector in those countries make the

[5] The World Bank, European Investment Bank, European Commission, European Bank for Reconstruction and other Multilateral and Regional Development Banks

concession of the operation of public services to a private entity a reasonable solution despite the problems that this may reveal eventually.

In developed countries which are the concern this dissertation, PPPs generally emerge out of different grounds while also some particularities in some of them play an important role[6] additionally to the initial common objectives to be met through PPPs (increased competitiveness and high quality requirements). The countries' progress up to now and the maintenance of their relative economic position has been - among others - supported by (and also supported) the existence and operation of substantial public infrastructure. This infrastructure has a heavy and increasing cost of maintenance, operation and renewal. Moreover, in an era of increasing efforts by the states for reducing public spending and taxes (due to the global competition), there are many social services[7] that "compete" for public resources.

In this context of increasing pressures for structural changes in the markets and in the needs that state budgets are asked to cover, the private sector emerges as an appropriate solution. Moreover, the traditional public sector appears inefficient in relation to the private sector which has already been adapted to the new conditions of flexibility and competitiveness (Pollitt: 2000). The experience acquired in partnerships between the public and the private sector and the tradition in the regulated operation of the market in conjunction with the established democratic institutions facilitate the broadening and deepening of the private sector's involvement in the delivery of infrastructure and services (OECD: 1994)

On the other hand, there are deeply established perceptions about the nature and role of public projects, their financing and the rights of their users (i.e.

[6] i.e. Germany after the reunification
[7] Health, education, social insurance etc

roads without tolls) that hinder the migration to a regime of broad private involvement in some infrastructure projects. In other cases, PPPs appeared more acceptable than full privatization and their use emerged as a first step or an alternative way towards the complete privatizing of services and infrastructure (Savas: 2000).

These new partnership regimes were realized initially in USA in late 1970s and then spread with varying pace to other countries (Carrol: 2000; Linder: 2000). In Europe, UK's conservative government had followed the belief in the 1980s when privatisation had taken a large extent (Feigenbaum: 1999). However, a more sceptical and pragmatic approach from an ideologically different government emerged in UK during 1990s while privatisation revealed a lot of problems. (Falconer: 2000) Taking the office in 1997 the Labour government acknowledged that it is better to act through "*combination of public and private actors*" and not only through privatisation and more importantly that PPPs are not a single model for every circumstance (HM Treasury: 2000). By then, PPPs have been expanded to many countries in Europe[8] and worldwide indifferently of their governments' political ideologies (The evolution of PPPs for toll roads is illustrated in Table 2).

[8] France had been a 'pioneer' in the use of PPPs for the development of a the country's highway network (Lorainne:2000)

	Toll Roads		
	1985-95	1995-98	1998-03
Numbers of project commitments			
North America	111	-17	51
Europe	67	28	76
Asia	120	16	-14
Other	83	67	-15
Total	381	94	98
Developed	116	3	135
Developing	265	91	-37
Investment commitment amounts (US$ billion)			
North America	34	-8.1	31.2
Europe	53.1	19.5	34.6
Asia	83.6	12	-21.6
Other	19.4	10.9	-9.8
Total	190.1	34.3	34.4
Developed	85.6	4.8	59.4
Developing	104.5	29.5	-56
Average size of project commitments (US$ million)			
North America	306	476	612
Europe	793	696	455
Asia	697	750	1,543
Other	234	163	653
Total	499	365	351
Developed	738	1600	440
Developing	394	324	1514

Table 2[9]**.** Evolution of planned commitments to toll road projects in the World (Estache: 2004)

Generally, the international interest in PPPs and the "promotion" of their various forms[10] can be viewed as part of a trend towards managerialism in

[9] While these commitments numbers give a useful sense of the upper limit of the private sector's involvement in the toll roads sector, they may somewhat be misleading. Indeed, only half of the new projects reported up to end of 2003 had effective financing –i.e. were under construction or operation.5 The evolution of these commitments is however interesting. It shows that since the 1997 Asia crisis, the number of commitments has dropped significantly but much more importantly in developing than in developed countries. (A. Estache: 2004)

[10] According to Loraine and Storker (Lorraine: 2000) and others (Getimis: 2000; Davis: 1997 Savas.: 2000; Bennett.:1999) the various forms of PPPs range from traditional contracting out or delegated management of operation and maintenance to full privatization. The criteria used for this typology for Lorraine is the level of authority conferred to the private sector and the length of commitment. The privatisation is an extreme form of partnership in which the PPP

government which is manifested through neo-liberal policies and deregulation (Getimis 2000; Hughes: 1998). International Organizations[11] often present the latter as panacea for the seemingly neutral objectives of structural changes and modernization of the public sector.

2.2 Forms of PPPs in Transport Infrastructure development

There are a myriad of possible contractual relationships that can be employed using PPPs but it is not within the scope of this work to be exhaustive with the used terminology nor the particularities and exceptions that each type of PPP may have.

A broad categorization of PPPs for transport infrastructure mainly based on Estache[12] is summarized in Table 3.

The contracting out of services	The private sector is contracted to provide services on behalf of the government for compensation, either in terms of a share of revenue, profit, or payments form the government. In general, contracting out does not involve financing risk, although it may involve revenue risk.
Joint ventures	The public and private sectors share responsibility for financing and operation of public facilities
Build, Operate, Transfer (BOT)	The private sector has the primary responsibility for financing, developing, and operating the facility for a fixed period of time (usually 15-40 years) which should be sufficient to both repay debt and provide the required return on investment. At the end

contract implies both maximum length of commitment and level of conferred authority to the private sector.

[11] World Bank, International Monetary Fund, Organisation for Economic Co-operation and Development, European Union and others

[12] See A. Estache and J. Strong :2000

	of the concession, assets are transferred to the government under terms agreed to in the contract. Perhaps the most familiar form of participation in transport infrastructure; this has been employed in many different variations one of which is the ARR project.
Build, Own, and Operate (BOO)	The private sector obtains the ownership and control of the facilities, with no transfer to the public sector. BOO projects resemble outright privatization of a facility. BOO projects are sometimes let with no provision of transfer of ownership to the host government. At the end of a BOO concession agreement, the original agreement can be renegotiated for a further concession period (Williams: 2003)
Design-Build-Finance-Operate (DBFO)	Frequently used in UK and some other countries[13] for highway projects constructed using the *Private Finance Initiative*- PFI (HM Treasury: 2000, HM Treasury: 2003). The DBFO private partner is responsible for the design, financing, construction, maintenance, and operation of a facility for a specific concession period. It is compensated through specified service payments during the operation of the project. For highways, this is expected to include traffic-related payments based on "shadow tolls" which are payments made by the public authority to the contractor on the basis of traffic flows at predetermined points along the roadway (HM Treasury: 2000).

Table 3. A Broad categorization of PPPs

[13] A number of major road projects have been undertaken in England, Finland, Scotland, Spain and Portugal on this basis (EC: 2004). A range of crucial issues are associated with this approach including the greater level of demand risk retained by the public sector and the fact that, as motorists do not directly pay for the economic cost of infrastructure provision, infrastructure investment may not be rationally allocated (EC: 2004)

All the above forms of partnerships are planned in advance by the public authority and most of the times assume a competitive auction procedure for the selection of the private partner as well as a negotiation phase that ends to the signing of a CC between the two parties.[14]

Prior to the needed procedures for the procurement of a transport infrastructure project, governments need to have clarified their development objectives and any new investment needs to be seen as an integral part a wider development process (Banister: 2000:75). The consistency of all actions and interventions has to be assessed together with the readiness of the government to strategically cooperate with the private sector in order to maximize the public benefit through a PPP.

2.3 Concession Contracts and their Importance

In natural monopolies[15] competitively auctioned concessions allow the benefits of competition to be brought to bear in the absence of direct competition between firms. That is, they substitute competition for the market for competition in the market[16] (Kerf: 1998). However, auctioned concessions do not remove the need for regulation during the concession period (Williamson: 1976); increase the need of gathering/processing multiple information on the object/content of the auction and generate various transaction costs (Fielding: 1993).

The major problem after the selection of the project to be developed is the preparation of the tendering and the negotiation of the final contract to be

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[14] Especially for EU counties, there is specific EU legislation (and guidance) about the procurement procedures to be followed for the award of transport infrastructure concessions (PriceWaterHouseCoopers: 2004, EC:2003)

[15] Natural monopolies (like roads, water distribution, gas and power transmission and distribution) are services that can be provided more cheaply (efficiently) by a single firm than by two or more (Kerf: 1998)

sighed by the two parties. The whole procedure aims the exploitation of the different capabilities of the two sides and the balancing of the contrasting concerns and objectives so as the long-term partnership to be smooth and uneventful. This partnership assumes a systematic organization and preparation of the institutions and services of the public sector but also preparation of the society to accept a different way of operation and provision of the new service. Additionally, a quite analytic and scientific study of the project itself is needed. The public-sector facilitator should define and clear the project before putting it out to tender.

All the needed analyses and preliminary studies (planning, technical, investment etc) have to be implemented by expert teams in the government authorities or through outsourcing to specialized consultants[17]. This feedback would provide a clear view of the appropriate measures and actions that have to be taken and also the expected responsibilities of the public sector: either specific (for the project itself) or at the institutional and organizational level. The new conditions in the market and the society and the expected users' exclusion have to be anticipated. Also, the public sector would be able to identify possible ways of restricting the monopoly power of the concessionaire and prioritize its quality and service standards requirements. The guarantees and the level of subsidy (if needed) that the public sector is willing to offer have also to be anticipated.

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[16] In monopolistic markets, ex- ante competition for the provision of the service is feasible whereas ex-post competition is limited if not practically non-existent (unlike naturally competitive markets where ordinary competition usually works well) (Kerf: 1998)

[17] The World Bank (World bank: 1999) advises that preparation before inviting the private sector to undertake toll road concession projects includes: (i) selection of a project with strong economic and financial justification, in view of its transport system impacts; (ii) retaining of financial advisors with international experience to structure the project and prepare the legal documentation; (iii) design of the bidding process to attract quality international investors, e.g., through carrying out a well-targeted promotional campaign and using clear bid evaluation criteria focused on the few parameters most related long-run efficiency; (iv) providing bidders with detailed engineering data, while giving them the time to prepare their own estimates; (v) state-of-the-art traffic forecasts; (vi) advance consideration of social and

The tender documents would describe in substantial detail the construction and operation of the project, providing minimum requirements and terms that safeguard the public interest. The attractiveness of the project to the private sector increases if the description of the project and the terms and rules are thoroughly studied and well defined in the tender documents. Bidders enter tenders with much lower expected rates of return, leaving more of the social surplus for users (G. J Fielding and D. B Klein: 1993). Since quality and performance standards are be well-defined in advance, the award criteria could be more rigorous, post-contractual administering would be reduced, and the threat of enforcing the contract would be more credible.

On the other hand, a very detailed specification of the various attributes of the project in the tender documents limits the possibilities of innovative financing/construction/operation approaches of the private party, leaves inadequate room for extensive informal consultation and communication between the parties and therefore restricts potential variations that may prove beneficial for the success of the contract (EC: 2003, E. Engel: 2002).

The tendering and awarding mechanisms are the concern of a great amount of the literature on highway concessions[18] which emphasizes on their increased importance for the success of a PPP.[19] The EC also has been active in publishing specific legislation and guidance on PPP procurement aiming to ensure transparency, open participation and cost effective solutions (EC: 2003, EC:2004). However, for complex PPP arrangements governments have sometimes to think beyond the barriers of such guidance and consider the specific and contextual particularities of the project.

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environmental issues and (vi) drafting a CC with incentives to improve performance and flexibility to manage uncertainty while avoiding opportunistic renegotiations.

[18] See Fielding: 1993 and Engel: 2002

As an overall conclusion, the success of the CC which can only be evaluated on the long run, is very much based on the general effort on preparation that has been made in both the country in general and of course the project itself. Moreover, the finalization of a CC and the arrangements of the PPP longer involve delays and higher transaction costs in relation to conventional procurement.

2.4 Basic Conditions for a Successful Concession

The literature shows that there are a number of essential but not always adequate conditions for the success of concessions. These conditions are of vital importance and their establishment denotes for a country a positive shift towards "PPP maturity".

-Removal of the legal, regulatory and institutional obstacles and development of institutional reforms that would enable a transparent and efficient PPP[20]. Well-drafted laws and regulations (general on concessions or for the specific type of the promoted type of private sector's participation[21]) are necessary. In general, an organized and credible operation of the domestic legal system is required as well as the existence of credible dispute resolution procedures (World Bank: 1999). Also, PPP development requires major institutional changes because the role and responsibilities of the public sector change from direct service provision to management and monitoring but also promoting, sponsoring and developing the PPP concept (Independent Regulators, PPP task forces[22]/public agencies[23]/independent agencies[24] for negotiating/structuring/monitoring etc.). All functions require new technical skills (i.e negotiating complex contracts, project financing) and improved

[20] Kerf (Kerf: 1998) discuses in great detail the role and importance of regulatory institutions.
[21] For example a legal/institutional framework facilitating enabling user charging and revenue generation for the private sector (D. Banister : 2000:71)
[22] See EC: 2003
[23] See V. Lee: 2005
[24] See Cohen R: 2004

institutional capacity. They require an in-depth understanding of the motives of the private sector and therefore how a balance can be achieved between these and the ultimate objective of safeguarding the public interest.(EC: 2003).

- A domestic market that is transparent and "cleansed" of state interventions and third party liabilities (not transparent in many cases) that may distort open and fair competition. EC[25] notes in its guidelines for successful PPPs (EC: 2003): PPPs should not impact negatively on the operation of open markets nor on the clear and transparent rules of these markets. This is very important during tendering and selection procedures; for the use to which grants are put; and for the provisions made for renewing contracts (with special reference to the length of concession agreements) and awarding other/new associated (neighbouring, extensions etc) projects. Regard must be taken to ensure that private parties are able to realise financial returns by guaranteeing sufficient opportunity to generate revenues and this must be matched with a concern to avoid the creation of non competitive or closed markets (EC: 2003). A market of open and clear competition does not necessarily imply that governments are weak in applying social (or other i.e. national) policies. An economic appraisal of the potential of such policies has to be implemented taking into account the consequent compensation of the private investor. Therefore, a transparent and competitive marke: may sometimes limit such policies but the same time it helps to their rationalization.

- The clear intention of the government to serve the public interest through the concession is obvious and expected but very complicated since it is associated with the broader distribution of benefit to the society.

[25] A number of Directives and above all the principles and rules of the Treaty set out the need for open and fair competition, transparency and proportionality in the European Union (EC: 30/4/2004)

Governments' decision making outcomes are often driven by unjustified optimism and rent-seeking behaviour[26] that may lead to quite unbeneficial results for the public interest. As Flyvbjerg et al[27] note, measures of accountability in the public sector appear to be the best way to eliminate or reduce behaviour that affects negatively the collective benefit. The main mechanism for enforcing accountability is transparency and constructive two way communication with the civil society and stakeholders[28]. The other major instrument for accountability in the public sector is the up front decisions (before considering various technical alternatives and before appraising the project) regarding the performance specifications that reflect the public interest requirements and policy objectives (economic performance, safety and environment etc) (Flyvbjerg:2003:123). This would lead to a purpose driven decision making process and appraisal, instead of one dominated by discussions, technical alternatives and trade offs that are not in favour of the citizen (Flyvbjerg: 2003:124).

- The establishment of trust between the partners is a key condition for the success of the PPP. It allows a reduction in risk and therefore cost, but also the development of effective and sustainable partnerships (EC: 2003). The creation of trust partially derives from the implementation of the previously described conditions but it also requires a broad social consensus and a strong level of political commitment which must be developed,

[26] The term "rent seeking behaviour" is used by Flyvbjerg et al in their entire referenced work denoting typical - in mega transport projects - actions that are aimed at making a profit – economic or political – for a certain stakeholder group, regardless the overall benefits and costs of a project. It is evident - they state - that planners and other decision makers at the public sector's side actively take part in such behaviour.

[27] See Flyvbjerg:2003:107-123

[28] This includes that professional expertise should be used to plan the implementation of participation and transparency just as professionals are hired to secure the quality of most other tasks in project implementation. Also, participation of stakeholders and the civil society from an early stage in feasibility studies and decision making, active role of government in identifying such groups, public hearings, scientific conferences and independent peer views for all important aspect of the project (Flyvbjerg:2003:123)

sustained and communicated by the necessary institutional structures (EC: 2003). Trust entails the open exchange of information between the partners and certainly the community. Finally, it is important to underline the relative meaning of trust depending on the objectives of the partners that need to be jointly achieved on a trust basis. Self interest is inherent in the private sector's objectives and long term collective benefit is not always inherent in the politicians' objectives which may be similarly selfish, opportunistic and short-term (Irwin: 1999). Therefore, trust is the basis that enables the mutual achievement of both business and collective interests because it prevents (not guarantees the non existence) opportunistic behaviour of the interested parties.

- The obtaining of long term lending/financing is necessary for the development of the project. Most of the times, it takes the form of project finance[29] (Estache: 2000). The financing is structured with as little recourse as possible to the sponsor (private company) while at the same time providing sufficient credit support through guarantees or undertakings of a sponsor, or third party, so that lenders will be satisfied with the credit risk (Nevitt: 1995). Banks (especially commercial banks) offer long term lending in politically stable countries where the capital market is developed[30] and the cash flows of the investment project can repay the debt. Despite the existence of various financial instruments and forms of debt capital to fund PPPs, financiers will always require that contracts, guarantees and insurances reflect an optimal risk mitigation framework that leaves the minimum possible residual risk for

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[29] Project finance has typically been used in those sectors that require large capital expenditures, that have long-lived assets, and that require long periods to amortize investment costs and generate required rates of return for both creditors and equity holders (usually the private sector in PPPs except in the case of joint ventures). (Estache: 2000)

[30] This is the reason why international organizations (development banks, multilateral agencies, export credit agencies) support with direct lending and guarantees PPPs for infrastructure in developing countries (EIC: 2003)

them to undertake[31]. Minimizing the risks associated with the project from the financing viewpoint is evidently a critical factor for success. Numerous attempts at arranging "bankable" concessions have failed to meet the requirements of the financial market (Flyvbjerg: 2003:95).

The above specific discussion on the viewpoint of financial institutions concerning risk in concessions directs the flow of this chapter to a more detailed analysis on the nature, categories and implications of risk and uncertainty.

2.5 Dealing with Risk

The risks inherent in large transport concessions are very high mainly due to the following seven important reasons:

1	Increased contractual and transactional complexity
2	High budgets
3	Long amortization period
4	Irreversible nature of investment
5	Dependency of the viability on general economic development
6	Different nature of commercial risk in relation to other competitive sectors
7	Long life of the partnership

Table 4. Reason that large transport concessions have high risk

In this context, risks derive from unexpected incidents that but also uncertain estimations and regulations in relation to the factors that affect the project's data (directly or indirectly). Risks cannot be eliminated, but they can be acknowledged and their impacts reduced through careful identification and allocation to the appropriate parties (Flyvbjerg: 2003:84). The sharing of risk between the public and private sector is the central principle in PPPs.

[31] Interest rate and currency risks are usually borne by the lenders since they are in the best position to control them. There are also cases where lenders have undertaken a part of revenue risk. (A. Estache: 2000)

From an analytic point of view, it is expedient to identify the following groups of risk:

1	Political risks
2	Construction risks
3	Market and Revenue risks
4	Operation risks
5	Finance risks
6	Legal risks

Table 5. Main groups of project risks

This classification is quite broad to specifically refer to other kinds of risk that are may be met in various listings in the literature such as environmental, archaeological, pre-construction, acceptability, technological force majeure etc. but can surely serve as a general framework when referring to risks in transport concessions.

The general ethos of allocating risks in a CC is that they go to the party best able to control them. Moreover, the ability to control a risk has to be associated with the cost of controlling it which has to be evaluated as well (Irwin: 1999, Kerf: 1998). Irwin mentions three other factors that need to be considered: the incentives a party has to reduce risk, the transactions cost of allocating risks and second-best considerations stemming from credibility issues and policy transitions. The risk allocating decisions require the balancing of various factors and a good prior preparation and study of the project and the general context (social, economic, political etc).

2.6 State guarantees and other Risk Reduction Policies

One of the best things governments can do to make projects more attractive without issuing guarantees or providing substantial financial support of any kind is to put in place good policies that generally reduce risks, raise expected

returns and cultivate a trust climate as analysed in the section discussing the basic conditions for successful concessions (removing institutional/legal/market obstacles etc.). Governments that have established such good conditions and persuaded investors that their policies will be maintained can attract private investment without extensive risk bearing (Irwin: 1999). However, the establishment of such policies is still a lengthy and difficult procedure for many countries and in many cases the project's economics reveal the necessity of the government's fiscal support in various ways, from guarantees to capital contribution. (Figure 3)

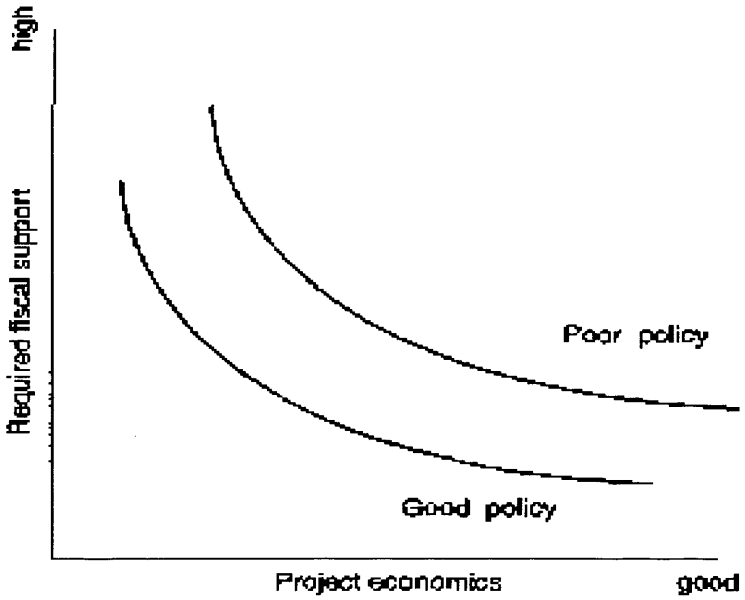

Figure 3. The relation between project economics, good polices and required fiscal support by governments (Irwin: 2003).

Most of the times, the government's direct contribution to a project is not limited to the costs of land expropriation and environmental/other planning-related approvals which is a mainstream and absolutely reasonable practice in toll concessions. Other major forms of direct contribution include the provision of equipment or additional land for free, allocation of revenue from an already

operational concessioned infrastructure, execution of improvements to facilitate access to the concessioned facility and direct awarding of the construction of auxiliary and parallel works to the concessionaire. It can also take the form of direct grants or subsidies especially in projects that offer multiple public benefits over a very long period – much longer than the concession (Bousquet: 2001, Flyvbjerg: 2003). These forms of contribution reduce the need for private debt and equity capital and subsequently the overall value of risk that their contributors undertake. General evidence shows that governments usually do provide strong financial support for concession arrangements.

Moreover, private investors and lenders often demand state guarantees[32] in order to additionally protect themselves from specific types of risks such as political / regulatory, and financial but also risks of non-payment by purchasers, cost overruns and low demand. Indicative examples include the toll revenues subsidising; favourable tax treatment for the concessionaire; exploitation rights of adjacent land or facilities; debt, equity and foreign exchange guarantees and concession extensions. Governments in their effort to encourage investment without making any direct cash outlays often consent offering a variety of guarantees and provisions of rights and therefore bearing risks that - in many cases - they are not in the best position to control (Irwin: 1999).

The problem is that poorly designed guarantees can undermine the benefits of a PPP. If the government bears the risk of the project's failing through various guarantees, the private investor will invest in projects that are more likely to fail or/and their interest in maximizing its chance of success will be limited (Irwin: 1999, Flyvbjerg: 2003). Moreover, guarantees may impose excessive costs on the taxpayers and expose them to too much risk without knowing the

extent of their exposure since guarantees rarely show up in the government's accounts or budgets although the associated contingent liabilities can become actual and current. Experience generally shows that it is very difficult for a government to act effectively as both a promoter of a project and the guardian of the public interest issue of protecting the taxpayer against unnecessary financial risks (Flyvbjerg: 2003: 91)

On the other hand a state fiscal support or guarantee may achieve significant socio-economic objectives and enhance fairness. It can be quite useful for internalizing the externalities in infrastructure markets and/or redistributing resources to the poor. A classic rationale for fiscal support for a service is the existence of positive externalities (Irwin: 2003) For example, poor road users may not use the toll (due to high toll prices) even if the social value (because of economic, environmental and safety benefits) of their being road users exceeds the cost. In principle, fiscal support for the infrastructure service giving rise to an externality may compensate for the externality and thereby facilitate the development of a socially valuable infrastructure network (Irwin: 2003). One additional point supporting the rationale of public financial support is that the cost of capital is less for the public sector than for the private. Moreover a state can even facilitate the provision of private debt for the project from an international financial institution or development bank on much better terms (i.e. Greece from EIB) This can be accomplished through loan (or bond) guarantees from the state and/or even better from a syndication of commercial banks.

In any case, the accurate estimation and quantification together with the ongoing monitoring and controlling (if possible) of possible risky outcomes is always needed (Irwin: 1999, Cohen: 2004). Moreover, the decision to go ahead with a project should be made contingent with the willingness of the

[32] The government's bearing a risk, either through an instrument known legally as a

private sector to participate without a sovereign guarantee for a part[33] of the total capital needs (Flyvbjerg: 2003:124). This would help capturing in the possible best way the benefits of private sector's participation in the project. Empirical research shows that the potential of high project performance; realistic risk assessment; reduction of risk and shift in risk from citizens to groups better able to protect themselves against it and elimination of rent seeking behaviour by special interest groups within the private or public domain is significantly higher. (Flyvbjerg: 2003:124).

2.7 Specific Issues in relation to Toll Highway Concessions

The literature that evaluates experiences from various countries indicates that the most appropriate type of roads to be developed through toll concessions are those that have high levels of traffic and also offer important services to their users (i.e. significant time savings).

A central feature in all toll road concessions is the charging system[34]. As Nakagawa et al[35] state, if there is no charging system that covers the cost of protecting the environment and promoting social welfare then road privatization will fail. New technology can play a crucial role in facilitate variable electronic tolling[36] that can reflect with reasonable accuracy the marginal costs of road use but they increase the project budget and may entail technological risks (Fielding:1993). International practice shows that

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guarantee or through a law or contract.

[33] In Flyvbjerg et al judgement one third or more of the total financing requirements should be financed by private risk capital (equity or loans) (Flyvbjerg: 2003:123)

[34] We refer to both the estimation of the right toll prices and their adjustment over time but also the toll collection mechanism

[35] See D. Nakagawa, R. Matsunaka :1998, page 154

[36] World Bank (World Bank: 1999) demonstrates critical issues regarding the charging in toll roads. The research appears to recommend the affordability of the rates, the uniformity of toll rates across the network and the differentiation of the rate by vehicle type, distance and time of day. On the other hand, the general approach of EU transport policy (EC: 2001) which is also actively promoted legislatively is that the charge for using infrastructure must cover not only infrastructure costs, but also external costs, that is, costs connected with accidents, air pollution, noise and congestion.

simple implementations of the charging system are more common despite the fact that a project's particular objectives as deriving from the public interest requirements should lead to a more sophisticated solution.

It is important also to mention the relation of demand risk with the right toll rates estimation and the collection system design. Increased tolls over a certain rate level will actually result in lower revenues as experience suggests[37] given that other demand drivers - as the overall economic development - the remain stable. The extent to which non-tolled alternative roads exist and their relative utility may play an important role to that. With regards to the economic development factor, experience shows that toll road traffic may change (increase/decline) at twice the rate of the economy.[38]

Many tolled highway projects have been developed based on irrational scenarios regarding the potential demand and underestimation of construction and operation costs. In general, despite the fact that accurate estimations are absolutely critical for the design of a deal that would have a great potential of protecting the public interest, the production of accurate estimations is rather an exception in the real world as Flyvbjerg et al in their comprehensive study of mega road projects conclude[39]. Due to overestimation of traffic demand and huge cost overruns, many concessionaires eventually face severe financial problems (bankrupted, were renegotiated, went public) (Estache: 2000, Flyvbjerg: 2003). Underestimation of demand may also lead to underdimensioned road projects that will need heavy further investment to

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[37] The toll price elasticity of with respect to tolls is often very high; experience suggests that the elasticity is typically in the range -1.4 to -2.5 (Flyvbjerg: 2003:100)

[38] An income (economic development) elasticity of about two is widely experienced while for major roads can be even higher. (Flyvbjerg: 2003:100)

[39] The study of more than 183 large scale road infrastructure projects in Europe and America showed that actual construction costs are, on average, 20 per cent higher than estimated. (Flyvbjerg: 2003:16). Moreover, for half of the mega road projects the difference between actual and forecast traffic is more than -/+20 per cent while for 25 per cent of those projects this difference is more than 40 per cent (Flyvbjerg: 2003:26). Generally, cost underestimation

cope with the needed capacity or an excessive return for the private partner (if not taken appropriate measures: flexible concession maturity according to the return on equity of the private investors and effective operation monitoring and auditing by the public sector). Indicative reasons that have caused traffic forecast inaccuracies in a sample of 208 projects (as stated by project managers and researchers) are illustrated in figure 4. However, as discussed earlier in this chapter, the source of the problem of inaccurate estimations (for both costs and demand) has to be searched rather in the existence of over optimism and rent-seeking behaviour within the decision making processes than in technical incompetence.

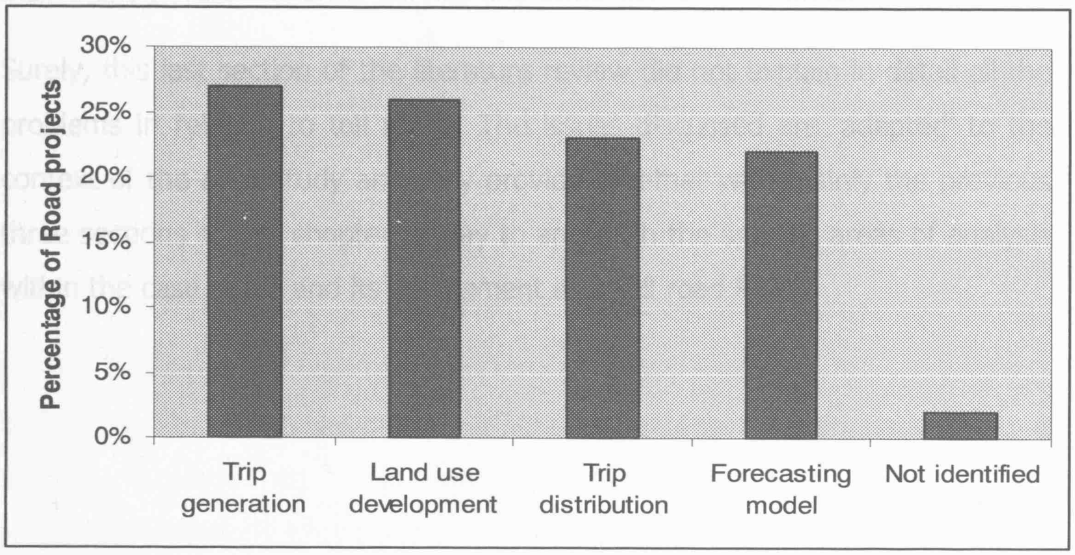

Figure 4. Stated causes of inaccuracies in road traffic forecasts (Flyvbjerg: 2005)

Finally, a feature of toll road concessions that is not often met in practice but literature and experience suggests that can be of critical importance is the flexible concession maturity. This should be a function of the change in the demand, as well as using other techniques such as the least present value of

(and overrun) and traffic demand inaccuracies are found in 20 nations on 5 continents and are

revenues where the concession terminates, when such value is achieved by the concessionaire[40] (Engel: 2001). Such mechanism can reduce demand risk and the need for state guarantees but it also enhances monitoring and management of project risks. In addition, renegotiations of contractual obligations or unexpectedly high cash flows may result in higher project benefits through the reduction of debts or the lowering of toll rates.(Cohen:2004). Flexible maturity mechanisms are best applicable to infrastructures (as toll roads) that the concessionaire can do little to increase demand other than maintenance for which standards can be set and checked fairly easily (Engel: 2001). In other cases, the concessionaire may be indifferent toward customer service and other demand-enhancement activities.

Surely, this last section of the literature review did not explain in detail all the problems in relation to toll roads. The issues discussed are 'adapted' to the context of the case study and they provide together with mainly the previous three sections of this chapter, a way to approach the specific areas of analysis within the case study and its assessment as a toll road PPP.

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constant for the past 70 years, estimates have not improved. (Flyvbjerg : 2004)

[40] As Engel et al describe, flexible maturity can be best applied together with auctioning in which bidders compete on the present value of revenue given a maximum toll.

3 Methodology

3.1 Aim and objectives of the research

In order to approach an answer for the main research question which is if the public interest has been safeguarded through the PPP for the development of ARR, we are going to put focus on a number of specific sub – questions that represent fundamental issues affecting the public interest and gain. In effect, the findings of the exploration of the following issues that constitute the objectives of this research will facilitate the test of the hypothesis:

1	Cost overruns and delivery delay of ARR
2	Unbalanced Risk Sharing in favor of the private sector
3	Excessive returns for the private sector
4	Barriers to public participation throughout the project development
5	The pricing and design of the tolls

Table 6. Main Research Questions

The selection of the above criteria (for the assessment of whether the public interest has been protected through the PPP or not) enables the incorporation of the most crucial technical, organizational, process-related, financing and implementation aspects of the project development into the analysis. And this is how this research aims to approach its aim in a robust and comprehensive manner.

3.2 Documentary analysis

An extensive media analysis of the Greek and international press media records revealed a number of issues of social concern that initiated the motivation of research on the above questions. The project has been a subject of discourse given that an investigation of the Supreme Court on the legitimacy of CC. Moreover, substantial discussion has taken place in the EU

commission concerning the amount and use of EU funding provided (CSF II, Cohesion Fund) and the tolling system. Therefore, an attempt to collect and study EC bulletins has been made in order to examine the relevance and validity of the media references to the issues but also to throw light into poorly explained details regarding the whole project. It is important to note that despite the importance of the project and the discourse that has generated, there is limited number of scholar work or comprehensive professional reporting done.

More importantly, the entire volumes of the contractual documents including the CC (and its appendixes and modifications) between the Greek state and Attiki Odos SA and the lending agreements (between Attiki Odos SA and the commercial banks) were studied so as valid and cross checked findings to be drawn. Another equally significant and helpful source of valid feedback regarding the economics of the project and the forecasts has been the Banks' financial model of the project. Also, the results of the cost / benefit appraisal of the project conducted by the Greek state has been a helpful input for the desktop analysis.

Desktop analysis included also the study of secondary data deriving from the traffic, pollution and safety measurements provided by Attiki Odos SA as well its balance sheets and profit and loss accounts since the beginning of the construction together with those from the operating company Attikes Diadromes S.A.

The combined desktop analysis of the official project documents with the references in the media and the secondary data enabled a clear outlook regarding the main research questions and contributed significantly to form a comprehensive and unbiased view on the facts and figures of the case. It was anticipated from the beginning of the research that there were serious inconsistencies and lack of critical details in all available references to the

project in the web-sites and reports of the ministry of public works and planning, Attiki Odos SA and the Banks.

3.3 Semi-structured Interviews

A number of interviews have been conducted for the purposes of this dissertation, each one of them contributing to the deeper insight into the main research objectives. Even after a careful analysis of available written material, there appeared some unclear issues that only deeply involved people could help resolve. Interviews contributed to a deeper understanding of the viewpoints of the different stakeholders but also of the power dynamics within the decision making processes during negotiations with the state.

Table 7 illustrates the persons interviewed and their relevant roles:

I	**Mr. Stelios Markianos**	CFO of AKTOR Group (the leader company of the concessionaire) during bidding, negotiations with the state and construction.
II	**Mr. Emmanuel Zozonakis**	Manager in Project Finance Division of Commercial Bank of Greece, account manager of ARR financing and chief participant in the lending negotiations with Attiki Odos S.A., the EIB and the Public Sector.
III	**Mr. George Tsolakis**	General Secretariat of the Association of Greek Environmental Scientists and Engineers.
IV	**Mr. Vassilis Dorovinis**	Lawyer of the Municipality of Ag. Paraskevi (one of the areas heavily affected by ARR), legal consultant and former chairman of Elliniki Etairia

		(one of the most active Greek NGOs concerning environment and heritage)
V	**Mr. Elias Tziritas**	Actions Coordinator, WWF Hellas

Table 7. Interviewees and their relevant roles

3.4 Linking Research Questions with Data Sources and Methods

The way that these interviews and documentary analysis relate to the main research areas of this dissertation is illustrated in table 8.

Research Questions	**Data Sources & Methods**
Cost overruns and delivery delay of ARR	Documentary Analysis: Media, Project Documents, Professional Reports, EC bulletins Interviews: Stelios Markianos, Emmanuel Zozonakis, George Tsolakis, Vassilis Dorovinis
Unbalanced Risk Sharing in favor of the private sector	Documentary Analysis: Media, Project documents, EC bulletins, Professional reports Interviews: Stelios Markianos, Emmanuel Zozonakis
Excessive returns for the private sector	Documentary Analysis: Media, Project documents, EC bulletins, Professional reports, Traffic measurements Interviews: Stelios Markianos, Emmanuel Zozonakis
Barriers to public participation throughout the project development	Documentary Analysis: Media, Project Documents, Professional reports Interviews: Stelios Markianos, Emmanuel

	Zozonakis, George Tsolakis, Vassilis Dorovinis, Elias Tziritas
The pricing and design of the tolls	Documentary Analysis: Media, Project Documents, Professional reports, Traffic/safety measurements. Interviews: Stelios Markianos, Emmanuel Zozonakis.

Table 8. Linking research questions with data sources and methods

4 Analysis

4.1 Athens Ring Road: Facts and Figures

The contribution of ARR to Athens' competitiveness and quality of life as well as its special development difficulties[41] had been pointed out since 1950s. The major advantages ARR would be (YPEHODE: 2003):

- Quicker and safer connection of distant areas of the metropolitan urban space
- Reduction of congestions in the centre
- Reduction of air & noise pollution and energy consumption
- Enhancement of a balanced development by giving opportunities to more downgraded and isolated areas

ARR, as an element of a general transport planning strategy, connects the new international airport at the area of Spata with the city and the two major national highways which as ARR were "high priority" TENs. Moreover, ARR approaches the new port facilities that are going to be developed in eastern coast of Attica to relieve the congested Piraeus port. In fact, the road connects thirty municipalities of the metropolitan area and provides a skeleton for the restructuring of the transport network of the city interconnecting the major road, air, sea and rail transport infrastructures (Appendix E). In addition, the required drainage and flood prevention works that have been carried out are the city's most important flood protection measure and a

[41] The project had to intervene into structured urban environment (such interventions are distinctively difficult and expensive in Greece since landed property rights are quite enhanced and land is divided to many small ownerships), cope with particular natural and historical characteristics of the area (mountains, forests, water beds, archeological sites)

significant step in a consolidated flood prevention system for the whole Attica[42].

The fact that the project's capital needs were considerably large for the constrained national budget together with the EU pressures to use PPPs schemes for the development of TENs projects led to the decision to implement ARR as on a BOT basis. The budget of the project as determined in the CC signed by the Greek state and the private concessionaire in 1996 was € 1.248,7 million. This cost (Lump Sum Price) does not include the costs of expropriations that were initially estimated and the supplementary & parallel works[43] which directly relate to the progress of construction and had a budget of € 791 million. Those works are directly awarded to the concessionaire (through the CC) and their costs as well as the expropriation and approvals costs[44] are funded by the state. Table 9 shows the sources of funds for the project as initially determined in the CC.

[42] To ensure the safety of vehicles and also to improve the run-off of rainwater in the Attica Basin, it was essential to carry out drainage and flood prevention works which collect surface water, transfer it to a drainage system that crosses through the road and carries it off to the sea. The flood prevention works are adequate not only to meet the present needs of land usage but also the expected changes in land usage which will have a major impact on water run-off and will be the most significant risk factor in Attica's flooding problem. (YPEHODE:2000)

[43] Under the CC the Concessionaire has taken on the obligations to built and operate ARR as well as to build certain other links to the existing road and utilities network (i.e. without operating them). In terms of payment there is a distinction between firstly the Lump Sum Object ("LSO") covering the highway and some links to the road network (the "Local Roads") and secondly other works which will be paid by the Greek State on a bill of quantities basis (the so-called "Parallel & Supplementary Works"). The LSO will be realised at a Lump Sum Price. The financing and guarantees to be raised on the basis of the project's financing are to provide the funding for the LSO.

[44] Estimated initially as € 440 million (EC/Barnier:2001, Ktirio:2002)

	(1994 prices)	€ mil.	% of Concessioned Object	% of total costs
Private funds	Long term loans mainly from EIB	637	51%	31%
	Revenues before end of construction	37	3%	2%
	Private Equity	162	13%	8%
Public funds	Eu Grants	225	18%	11%
	Greek state contribution	187	15%	9%
	Total Concessioned Object[45]	**1,249**	**100%**	**61%**
	Greek state funded Supplementary & Parallel works	791	63%	39%
	Total Costs	2,040	163%	100%

Table 9. Total Budget of ARR and sources of funds as determined in the CC

ARR is a four lanes (in each way) highway of 65 km length with two major components (see maps in Appendix E): the Elefsina-Stavros-Spata Airport corridor (52 km) and the western peripheral highway of Immitos mount (13 km). Basic construction features of the ARR include 32 interchanges, 165 road bridges, 35 railways bridges, 52 tunnels and a 32 km of supplementary road network (technical and operational features of ARR are illustrated in detail in Appendix D).

The CBA conducted in 1994 according to the EU guidelines showed a socioeconomic IRR of 18.75%. The crucial factor that determined such high rate despite the vast public capital needs is the time-savings generated for all the vehicles in the Athens road network. (Interviewee I)

4.2 Cost Overruns and Delays

In 1992, around 12 years before the beginning of the full operation of the road (August 2004), a first auction for the road had been initiated (Appendix

A). The auction was halted by the Supreme Administrative Court which cancelled the ministry's[46] Environmental Terms and Expropriations Plan for the development of the WPHI.(SAC:1993). The new Environmental Impact Assessment were seen as more protective for Immitos although as interviewees III and IV state were only slightly improved. As interview I states, there were only minor updates and improvements in all ministry's studies regarding the road development. However, despite the inadequate preparation, the strong political will for the realization of ARR, enabled the performance of the successful auction in 1994.

The auctioning and negotiation procedures lasted more than four years[47] leading to the signing of the CC (05/1996) and its ratification by the parliament (Appendix A). The delays were largely a result of the indecisiveness, lack of adequate preparation and inexperience of the public sector whose main concern was above all that the outcome of this PPP would have the least possible political cost (Interviewee I). The public sector showed uncertainty regarding the process and scale of expropriations needed and the selection method to be applied. All the bidders officially and justifiably objected on the selection procedures and various terms[48].

Despite the ratification of the CC in 1996, the concession commencement could not be signed before the bank finance was determined which eventually happened after almost four years (03/2000) due to various hesitations of the banks. The banks hesitated to lend or guarantee loans, as the budget and the

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[45] This is literally the part of the project that strictly corresponds according to the CC to the construction and operation responsibility of the concessionaire.

[46] Hellenic Ministry of the Environment, Physical Planning and Public Works [YPEHODE] was the principal state agent in the ARR development.

[47] A period of four years is regarded as long in relation to other similar projects especially in comparing to conventional procurements that are a usually faster.

[48] The objections had arisen because the selection terms had been changed during the negotiation process. A term added to the negotiation agreement on the second phase was that the public sector was not responsible for guaranteeing private loans in the beginning of tendering process. (Getimis:2005)

complexity of the project was increasing due to various issues that were emerging and had not been anticipated (Interviewee II). The EIB specifically had a special concern on ensuring by any means the delivery of the part of the road that would connect the city with AIA before 28/02/01 (the agreed opening of AIA) and this as Interviewee I states caused considerable delays in the financial close. Environmental and expropriation legal disputes emerged regarding the expropriation of land and the planned interventions in the "Natura" declared protected area of Immitos mount. The American College of Athens (the road would cross its campus at the foot of Immitos) and the municipality of Ag. Paraskevi[49] had appealed to SAC which after two years decided that the road could not go through the campus and asked for a redesign of the route so as to have the minimum possible impact to the environment and the property of the college (SAC 1679/1999, Interviewee IV, YPEHODE: 2001). The new route included extensive tunnelling and was much more expensive and time demanding than the initial one.[50]

In order for the financial close to take place the CC had to be amended two times[51] according to the requirements of the banks and in order to facilitate the inflow of capital (mostly state contribution) and progress of works despite the lack of bank finance (Interviewee I, II). Up to mid 2000 the progress of works accounted 14.64% of total budget but the concessionaire had to borrow money on corporate guarantees instead of the limited recourse finance (Interviewee II, Ktirio: 2001). A last issue to be settled was the direct awarding to the concessionaire of the works outside the initial CC that generated conflicts with the domestic public works legislation. However, an EEC directive allowed the state to award up to 50% of additional works outside the CC to the concessionaire under the same pricing determined in the

[49] Neighbouring borough having authority on parts of Immitos facing ecological threat
[50] The new route included 7 km instead of 700m of tunnels, 700 m instead of 200 m of bridges, noise reduction blocks of 2 km length and extensive planting. (YPEHODE:2001)
[51] The amendments were ratified by Law 3/98 and the Presidential Act 75/99.

CC and this showed the way eventually to the commencement of the concession.[52]

The state fully funded all non-initially anticipated budget increases and moreover (since it was responsible for the expropriations and the planning approvals) had to compensate the concessionaire for the delays of its responsibility and pay additional money to the concessionaire to speed up the delivery of the ARR part that would connect the city with AIA before 28/02/2001.[53]

In general, the major causes that led to further delays and additional costs for the public sector (Table 10) cannot be regarded as unpredictable and not preventable.

1	A modification of ARR in order to facilitate the development of a suburban railway line along the road. Not initially planned but absolutely necessary to provide a public transport access to the Airport. (EC/Barnier:2001, Interviewee I)
2	Additional cost of expropriations and compensations to the concessionaire due to their delay (EC/Barnier:2001, Ktirio:2002)
3	Penalties paid to the concessionaire for delays due to various legal disputes and late approvals (EC/Barnier:2001)
4	Costs due to modifications of the design and the subsequent additional construction works of specific routes for environmental and other reasons

[52] The initial CC assumed direct award of many additional and parallel works that did not fall into the Article 7.3b of the 93/37/EEC Directive that allows direct award of other works out of the concessioned object only when (among others) they do not exceed 50% of the total amount in the main concession contract.

[53] The development of ARR was an obligation of the Greek Government to its German co-partners in the Joint venture PPP for the construction and operation of AIA (Eleftherios Venizelos Airport). Had the road not been implemented in time and according to the specified quality standards, the successful, profitable and effective operation of the airport would have been compromised. So, clause penalties were included in the CC of AIA (Law 2338/1995).

	(YPEHODE: 2001, EC/Barnier:2001)
5	The posterior need for further drainage and flood protection works (G. Kitsos:2004)
6	Additional costs of non initially planned works done in affected municipalities in order to integrate the road into the urban environment (Interviewee I)

Table 10. Reasons for increased costs and delays

The state was obliged to fund the excessive costs without mentioning that a significant part of the costs for the public sector derived from compensations to the concessionaire. The total cost of the project for the state exceeded the sum of € 3.2 billion according to the European Commission's estimations[54]. The state aims to obtain an additional grant of €476 million from the EU structural aid[55] for its additional expenditures for the project but EC that re-examines whether P&S works have been tendered in conformity with Community law[56] has not replied positively yet.

Nevertheless, the concessioned object which does not include the P&S and additional works was built economically, with a deviation of only 8% from the estimates, without even the need of the standby loan that would cover extensive overruns. (HBV, Interviewee II)

As far as delays are concerned, besides the serious delay of the concession commencement there the end of construction period was within the determined timeframe (five years from the concession commencement). Nevertheless, there were some delays in relation to the determined delivery dates for specific parts of the project (Interviewee I, II). The concessionaire

[54] EC/Barnier: 2003
[55] ERDF in CSF 2000-2006
[56] EC/Barrot: 2004

had a strong motive to deliver critical parts of the road early since the CC provided the right to apply tolls and gain significant revenues before the end of the construction period. ARR certainly could be in full operation much earlier providing its benefits to the Athenians

The inability of the public sector to organize and prepare a PPP for the delivery of mega project like ARR is evident. Poor and outdated studies and inaccurate estimations together with lack of experience in the private – public interface and the common practices that govern PPPs proved certainly harmful for the public interest. The arrangements leveraged the benefit for the concessionaire and the cost for the Greek and EU taxpayer. It was crucial for the public sector to take the political, environmental and expropriation risks but that would presuppose that the public sector had done all the needed prior work to minimize them. It proved that this was not the case and consequently the taxpayers paid for the risky outcome.

4.3 Unbalanced Risk and Reward Sharing in favour of the private sector

Appendix G illustrates the allocation of major risks and (from the lender's perspective) the financial impact of the risky outcomes on the cash flows of the project. This risk matrix shows that most financial impacts of risks are well covered and the banks' risks are minimized (except the commercial banks' risks during construction). Design and construction risks and the risks associated with the operation and maintenance lie with the concessionaire that transfers these risks to its construction and O/M contractors as appropriate. There are strict deadlines in the CC for the partial and full delivery of ARR and penalties for non compliance with both dates and the O/M specifications. Certainly, the liability for adverse changes in legislation, delays in expropriations/approvals and other public policy changes remain the responsibility of the government and result in compensations if the project is

adversely affected. A number of obligatory insurances through which the concessionaire has to mitigate specific risks that undertakes during construction and operation are applied also in the CC[57]. Finally, all force majeure risk that are not insurable as war, nuclear risk, hostilities and terrorism are borne by the state. In general, the contractual framework reflects to some extent the risk allocation principles and this contributed to efficiency gains in terms of cost-effectiveness and speed of the concessioned object's construction and high quality in operation. The project is successfully insured against risks, but the question raised is if the agreed risk allocation minimizes the overall costs of potential risky outcomes that are transferred to the state despite the fact that it might not be able to handle those with minimum cost. In this sense, the risk sharing balance seems to favour the private sector due to the extensive provision of loan and traffic guarantees by the state and this could negatively affect the potential social benefits of the project if the actual traffic and economic conditions were not favorable.

As can be seen in Appendixes C, the commercial banks guarantee the loans during the construction period and the state guarantees them during operation.[58] This minimizes[59] the debt repayment risk and may potentially result to relaxed supervision and pressure on project performance during operation by the lenders. In order for the ARR viability to be ensured a much

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[57] Major insurances include: Faulty design, third party liabilities, equipment, property, personnel and Contactors All Risk insurance (CAR) that among others covers all insurable force majeure risks as earthquake, act of God, typhoon, Subsidence, landslide explosions, fire etc. (Law 2245/1996).

[58] When a part of the project is completed and starts operating, the percentage of commercial banks' guarantees associated with it is replaced by state guarantees of equal value.(Article 19, Law 2245/1996)

[59] Financial risks also involve currency and interest risk which are borne by the concessionaire. The currency risk that the concessionaire took was small since the forecasts of the macroeconomics of Greece were very positive and the country was about to enter EMU. The greatest part of the projects' funding was in euro and the EIB loan which is in GRD is mostly drawn in euro. As far as interest rate risk is concerned, all estimations and forecasts assumed very high interest rates than the actual which after Greece entered EMU are at very low levels (Interviewee II)

higher percentage private risk capital (not secured by state guarantees) would be required.[60] In ARR case the viability was not ensured through extensive private risk capital (less than 15%) but it was realized due to the actual very high traffic[61] (a reason for that could also be the delay of ARR delivery), the incentive of potential excessive returns for the private sector.

Moreover, the state undertakes a part of traffic risk by guaranteeing a certain level of traffic revenues (the level estimated in the traffic study i.e. 180.000 users/day) in case of delays in the opening of AIA, delays in opening of WPHI or reduce of traffic due to the operation of the suburban railway[62]. However, the operation of the suburban railway was a desirable transport policy objective unlike the other two that were undesirable so compensations would reasonably be provided. Moreover, only the scenario of more than 20% decrease[63] in relation to the estimations would consist a serious risk for the concessionaire. Despite the fact that actually ARR enjoys a higher than estimated traffic, the above guarantee in an opposite scenario (of up to 20% decrease in traffic) would limit the motivation of the concessionaire to increase traffic through decreasing toll rates since the losses would be covered by the state. This would limit the use of ARR and therefore its benefit (the estimated elasticities in 1994 are demonstrated in Figure 5).

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[60] of According to Flyvbjerg's study a minimum of one third of total financing requirements should be financed by private risk capital in order to ensure the acid test of viability and thereby protect the public interest. (Flyvbjerg: 2003:123).

[61] Almost 40% more than the traffic estimation (See Appendix H)

[62] The public transport link to the airport that was planned to be developed before the 2004 Olympics.

[63] According to the CC in the case all AIA, WPHI and rail link operate (which is what would eventually happen) the state compensates the concessionaire for revenue losses caused by up to 20% traffic decrease.

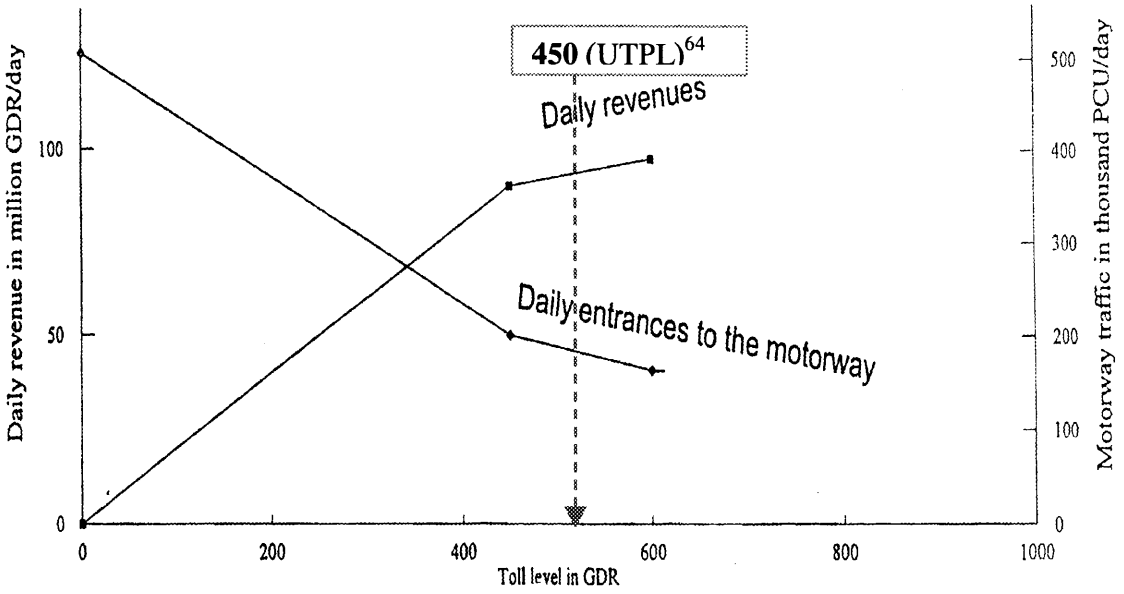

Figure 5. Estimated variation of daily traffic and revenues (Law 2445/1996, Addendum 7)

The poor Greek macroeconomic conditions at that age and the immaturity of the state to cope with the new procurement regime consisted obstacles in leading to a more fair risk and reward balance. In such context, the extensive public financing and the state guarantees were essential for limiting the hesitation of banks to lend on a limited recourse basis a consortium of Greek constructors whose financial strength was not sufficient (Interviewee II) The PPP type of procurement in Greece did not increase the competition in relation to conventional methods. Only three consortia passed the first phase[64] and the subsequent preferred one had to obtain long term lending by any means. However, state contribution and guarantees would not reduce the overall project risk or risk costs. They would only transfer it from lenders to taxpayers to make banks consent.

[64] The two of the three consortia merged to form the preferred concessionaire (Interviewee I, II)

4.4 Excessive returns for the private sector

The CC directly awarded all the S&P works to the concessionaire not mentioning the - furtherly needed for the realization of the project - additional works outside the CC that were similarly awarded to the concessionaire. The returns of Attiki Odos S.A only from the above were considered high and media noted that S&P works were overpriced so as to initially attract bidders despite the fact that one of the weighted auction criteria was the discount on P&S works prices (Eleftherotypia 14/01/03, 07/12/03).

The other major source of profit for the concessionaire is the concessioned object itself. The concessionaire's revenues are enhanced by the monopoly nature of the project, the considerable tax reductions and the exploitation commercial facilities along the road. Yet, a flexible maturity scheme has been applied through the CC fully justified by the reasons discussed in the end of chapter 2. This measure additionally serves in ARR case as an upside traffic risk insurer in favour of the public interest. The CC determines a maximum concession period of 23 years (i.e. 18 years of operation) which will be terminated earlier if the concessionaire achieves a ROE equal to 11,6%. The actual traffic indicates that the concession will be terminated earlier (See Appendix H) and this is something that the ministry recently admitted according to its updated forecasts (YPEHODE: 2005) but serious worries are expressed[65] about the ability of the ministry to monitor and supervise the economics of the concessionaire[66]. Although the ministry has formed a special division for the supervision of the current concessions, its overall ability is really threatened taken into account the bureaucratic, favouritism and nepotism characteristics of Greek public sector. Moreover, the fact that the

[65] P. Getimis: 2005, CPER: 2003, Kathimerini 22/04/05, Eleftherotypia 22/04/05, Eleftherotypia 24/04/05, Eleftherotypia 7/12/03

[66] The ministry also added in the same press release that the very tight and systematic supervision of the economics of the concessionaire guarantees the safeguarding of public interest (YPEHODE: 2005)

operator through which the traffic revenues and the O/M expenses are realized is owned by the same consortium as the concessionaire and this allows many accounting tricks that may enable the legitimate concealing of some of the actual shareholders' profits.(interviewee I, II).

Both the ability of the public sector to evaluate the realization of the terms of the CC and to organize, prepare and negotiate PPPs as discussed previously arise as very crucial conditions that they do not seem to be realized in our case in order for the public interest to be safeguarded.

4.5 Barriers to Public Participation throughout the Project Development

During the recent consultation period for the new legal framework for PPPs and its subsequent ratification by the parliament, there were numerous voices[67] referring to the lack of transparency and public participations in the development of PPPs until now underlining the need for establishing legal procedures that enable and promote effective community involvement. It is claimed[68] that the final draft of the law[69] still does not take into serious account the need for social scrutiny of the projects.

All interviewees III, IV and V state serious barriers to public participation in ARR's project development and present this as a general phenomenon in the Greek reality. More specifically, they refer to the following issues relevant to ARR that demonstrate barriers in public participation:

[67] Naftemporiki 06/08/05, Naftemporiki 02/09/05, TEE: 2005, The Greek Parliament:2005
[68] Technical Camber of Greece and Associations of Contractors (Naftemporiki: 02/09/05 , Naftemoriki:06/08/05)
[69] The parliamentary ratification procedure started on 06/09/05

Barrier	Result
Article 61 of the CC (Law 2445/1996) regarding 'confidentiality' prohibits the disclosure of information about the project from the period of negotiations until three years after the concession. (Interviewee IV, III)	▪ Article 61 circumvents with the directive 90/313/EEC[70]. Elliniki Etairia NGO appealed to the commission. (Interviewee IV, III) ▪ After long delays and when the project was already being constructed (there was little room for effective interventions any more) the commission obliged the Greek state to issue a circular that prohibits such articles in public works contracts and cancels certain clauses of CC article 61.(Interviewee IV, III) ▪ The disclosure of information became strictly a responsibility of the ministry from which it is still hard to obtain specific information due to its bureaucratic processes and lack of openness. (Interviewee IV, III)
There are not established effective procedures and legal framework for community involvement in the project development besides SAC and EC legal actions that prove to	▪ Poor and inadequate information disclosure and publicity about ARR. (Interviewee III, Interviewee V) ▪ The major means of information

[70] The adaptation of Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters led to the issuance of the improved directive 2003/4/EC which has not been yet incorporated into domestic laws.(Interviewee IV)

and EC legal actions that prove to be very time-consuming, politically influenced and distant from the citizen. (Interviewee III, Interviewee V)	disclosure by the concessionaire was the advertising in the various affected municipalities of the project and its benefits (Interviewee II) ▪ The time frames in which citizens would get informed about the project and study its immense documentation were too short (given also the inadequate disclosure of information and transparency climate) for them to form a documented opinion and effectively get involved.(Interviewee III, Interviewee V)
The EIA is part of the CC which is Law of the State. (Interviewee III). The EIA of all projects of national importance are approved through laws of the state (Law 2338/1995)	▪ Public participation and consultation stage was bypassed in the process of EIA approvals (according to EC[71], approvals adopted in detail by a specific national legislative act can bypass obligatory processes that the EIA directive implies). ▪ According to the Greek constitution, citizens cannot legally appeal against a ratified law of the state. Therefore during the implementation of the by-law approved EIA nothing could be

[71] EIA Directive 85/337/EEC (on the assessment of the effects of certain public and private projects on the environment) provides that it is not to apply "to projects the details of which are adopted by a specific act of national legislation, since the objectives of the Directive, including that of supplying information, are achieved through the legislative process.

	changed. (Interviewee III, Interviewee IV)

Table 11. Barriers to public participation

On the other hand a report by the Directorate General Transport and Energy[72] notes that ARR demonstrated positive signs of effective interest groups' involvement and consultations in relation to the conventional method of procuring infrastructure and this agrees with the views of Interviewee I as well. The latter adds that many of the municipalities (that were affected by the road development) and organizations within them were very active in obtaining various types of gains from the development of the project such as new public space in the broader area of the road. Though, in many cases such gains had the form of a gift in order for the municipality not to proceed to any action that would negatively affect the progress of the work (Interviewee II). Interviewee I states that the various organizations and groups that intervened during the highway development had rarely environmental and safety protection motives and they did not exactly follow any kind of established transparent procedures.

Definitely in the case of ARR, the involvement of community and interest groups was not an integral part of the PPP process as a whole. The consumer that is now paying for the transport service was not given the power to effectively influence nor design or operation under a transparent participation mechanism. Informing, consulting and encouraging the public to participate was not a concern of importance for the government. Its centralized and authoritarian nature together with the serious inconsistencies and inadequacies of the legal framework governing community involvement consist major reasons for that.

[72] EC:2005

As literature and empirical studies show, transparency and effective public participation would potentially help reducing the unjustified optimism concerning the project costs and its potential public benefits. All actions by politicians, ministerial executives and private-public lobbies that were aimed at making a profit – economic or political – regardless the overall benefits and costs of the project (such behaviour is clearly evidenced in every mega-project and also in ARR according to interviewee I) would potentially be minimized.

4.6 The Pricing and Design of the tolls

The toll rate of ARR is flat and paid in the entrances of the highway. The implemented tolling system was initially proposed by the studies of the ministry and the flat toll price was one of the awarding criteria[73]. The CC determines an upper toll price limit (UTPL) in GRD[74] 1994 prices which is adjusted every semester according to the Greek CPI and an indicative variation of the UTPL of the various vehicle types based on multipliers (see Appendix D). The CC gives the flexibility for the concessionaire to apply its pricing policy[75] within the UTPL despite the fact that the state has the option oblige the concessionaire to further limit toll prices if the difference between the actual and the expected yearly ROE[76] of the concessionaire is substantial. (Law 2445:par.49)

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[73] The preferred bidder would be the one that would achieve the best score in a mathematical function of four weighted factors (criteria): the concession maturity, the lamp sum price, the toll price and the discount on parallel & supplementary works. Obviously the bidders had to minimize the first three factors and to maximize the fourth in order to maximize the score.(Interviewee II, I)

[74] The exchange risk due to ECU/GRD fluctuations during operation period were therefore borne by the concessionaire that had to repay ECU loans (at that time it was not certain that Greece would be eligible to enter the EMU in 2001).

[75] Attiki Odos S.A may increase the number of vehicle types, decrease it if a category represents less than 5% of yearly traffic, and apply varying toll levels within the day / week / month / seasons and according to the entrance of the highway. (Law 2445: article 50)

[76] The CC determines an expected ROE for the concessionaire during the operation period (Law 1445/1996: par. 49.4) which derives from the financial bid of the concessionaire.

The fact that the toll price does not vary according to the distance traveled and therefore encourages the use of ARR for long distances and not for short and local urban routes[77]. This is actually evidenced in a survey of Attiki Odos S.A where more than 63% of users travel 21 km or more. (Figure 6) The traffic from the beginning of full operation approaches the capacity of ARR[78] during the morning hours of weekdays (figure 7 shows that 67% of routes are to/from work) and the mean daily traffic of approximately 250.000 is considerably higher than the 180.000 initially estimated (See Appendix H). This allows the concessionaire to achieve the desired revenues by applying a toll price that is 17% lower that the UTPL[79]. (Attiki Odos S.A). According to Attiki Odos and the ministry if the tolling system would encourage more short distances, ARR would be very congested especially in the peak times and therefore would not offer serious benefit to its road users. However, higher toll charges in the peak time[80] or in specific entrances would rather be a fairer traffic management measure than the flat rate.

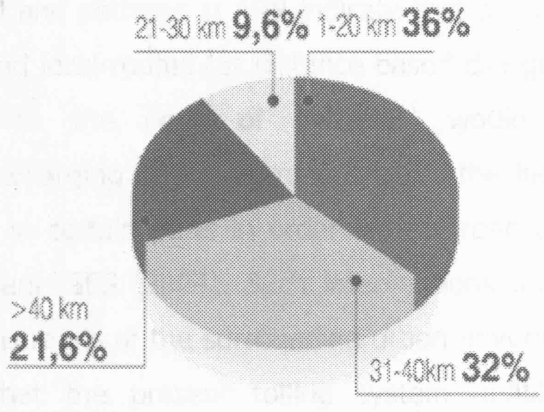

Figure 6. The distances traveled by ARR users (Invasion: 2005)

[77] The cost per km varies from 0,03 to 0,83 €.km depending on the length of the route on ARR (Association of Greek Transport Engineers:2004, Ta Nea 24/06/04)
[78] The daily capacity is 280.000 – 300.000 uses (Interviewee I)
[79] The current UTPL is € 3 while Attiki Odos S.A applies a toll of € 2,5 (Interviewee II, EC/Barnier:2003)
[80] The current tolling system and the relevant provisions in the CC facilitate variable tolling according to time of day, week etc (Association of Greek Transport Engineers:2004)

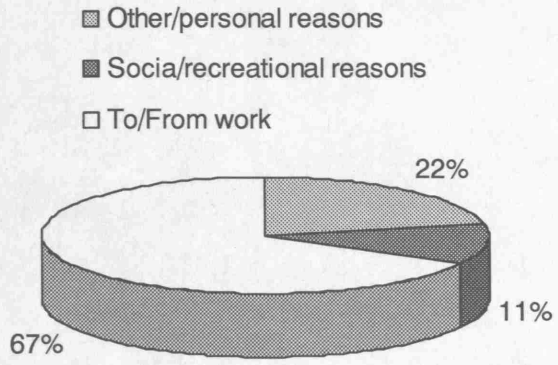

Figure 7. Reasons for using ARR (Invasion: 2005)

Many transport policy related voices[81] but also media and politicians claim that distance-based charging would be fairer and effective in both capturing external costs (pollution, congestion, etc) and reducing congestion in inner Athens. The government and the concessionaire examine the potential of such system especially after the general discourse on the issue[82] but technical, financial and CC constraints make it quite difficult to be fully implemented. Actual traffic levels and patterns in ARR indicate that any measure that would encourage short and local routes (as distance based charging or even variable tolling according to the point of entrance) would require extensive restructuring and enlarging of the entrances/exits, the interchanges and the width of the road in certain parts in order for the road to offer the desired benefits to the users (SES: 2004). Such interventions are almost unfeasible now, given the constraints of the surrounding urban environment (Interviewee I). So, despite that the present tolling system enables variable tolling

[81] Association of Greek Transport Engineers:2004, EC/De Palacio:2003

[82] Two Greek members of the EU parliament have questioned the compliance of flat tolls with the EU laws in the commission. The commission has stated that the flat toll of ARR do not infringe the provisions of 1999/62/EC that refers only to lorries of 12 tonnes but directive 1993/89/EEC defines tolls as "payment of a specified amount for a vehicle travelling the distance between two points on the infrastructure" where "the amount shall be based on the distance travelled and on the type of the vehicle". Therefore, it is clear that a flat rate irrespective of the distance travelled raises some issues from the point of view of Community legislation that need to be addressed. (EC/De palacio:2003, Ec/Barnier:2003)

according to the point of entrance or distance based charging for e-pass users[83], such measures would lead to severe congestion in the entrances and along some parts of the road.

All tolling system alternatives had to be studied initially in more depth taking into account the social, economic and institutional dimension of the project and its operation. It is probable that ARR would have a fairer and more effective - in capturing negative externalities - tolling system if an integrated study that would also consider the latest technological advancements and the use of surveys, simulation engines and other tools had taken place.

The general economic development of the city and the expansion of urban activity in the broader metropolitan area will increase the use of ARR. It is likely that the current charging system, particularly under a growth scenario, would put ARR in a strong monopoly position especially for short routes if no other transport alternatives are in place. The increase of car use would to some extent "force" the ARR use despite the tolls and this would cause regressive impact to low income car owners given also that toll levels can increase as high as inflation. The poor public transport network has to be improved to reduce the potential of further car use increase[84] in the metropolitan area and ensure that ARR will offer in the best way its valuable benefits to Athenians.

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[83] E-pass is based on tag and beacon technology and its users do not need to stop at the entrance booths but only 1 or 2 lanes at each entrance can be used for e-pass users. E-pass users account for the 1/3 of all ARR users (Invasion & Merton analysis:2004)

[84] Athens traffic moves at slower rate (8kms/hour on average), than other European cities (averaging 12-15kms/hour), due to the fact that only one in three Athenians take public transport versus two in three in the other cities. Tram and metro line construction are being offset by big increase in cars sales. (Athens News: 2004)

4.7 Conclusions and Recommendations

If we compare ARR with Greek national highways (public roads) in terms of construction and operation quality but also toll levels we may conclude that the involvement of the private sector was beneficial for the public interest. The construction and operation of ARR reflects the transport policy objectives set by the public sector and the benefits of public sector's efficiency have been realized to a large extent.

However, the central argument of this study is that the adopted PPP approach could serve the public interest to a much higher degree if the public sector was better prepared for entering this challenging type of project delivery and moreover if the planning and governance of project delivery was ruled by more transparent and accountable policies and procedures.

In this PPP, the government found itself 'trapped' into its poor project studies; the inefficient legal framework governing expropriations, the environment and other aspects of project development; its endemic lack of coordination and speed; and also into the lack of established procedures for effective public participation and democratic dialogue from the early stages of the project. The rules and requirements of a PPP were totally different from those that the government was used to. The incompetence and mistakes of the public sector became tangible burden to taxpayers in terms of cash, long term liabilities and delays in the realization of a necessary road. It is rather unclear if the efficiency and quality gains deriving from the involvement of the private sector offset the increased costs deriving from the fact that ARR has been delivered through a PPP in an 'immature' state. In other words, there is a high price paid by citizens for the private sector to involve and bear the required risks under this PPP.

The citizens' right to access the planning and finance details along with the clear specifications of the endorsed deal could have been much more enhanced. Effective democratic dialogue under transparent conditions would have contributed to a fairer PPP that serves better the public interest. In the absence of this, the 'political' purchase of this huge transport project left citizens unprotected to rent-seeking behaviour and political and commercial trade-offs.

Therefore, the public sector has to improve its competencies and institutional capacity in order to be a successful project promoter, manager, planner, contract developer and regulator but also establish effective policies that will support transparency and public participation. Moreover, an explicit and comprehensive legal framework would reduce project risks significantly by accelerating the time-consuming PPP processes and leaving less room for misinterpretations and potential unwanted variations of the intended objectives. In that way, private partners and banks would also be more willing to participate in PPPs under more favourable conditions for the public interest.

Besides the above general remarks and recommendations there is also a specific recommendation regarding the ARR concession in particular that this study proposes in case of a possible amendment of the CC. It is the removal of the state guarantees of the loans during operation period given the high actual traffic. A major benefit of such potential would be the tighter supervision and pressure on project performance by the lenders. This would also assist the ministry's job in auditing and supervising the economics of the concessionaire in order to terminate the concession on time. Furthermore the removal of the state guarantees would appear as a 'good practice' indication for the new massive programme of PPPs in Greece.

In any case, the PPP for the delivery of ARR has been a learning process for the public and private actors but also the civil society, which has not ended yet. The essential changes in the cultural and institutional context require long time and effort to be realized.

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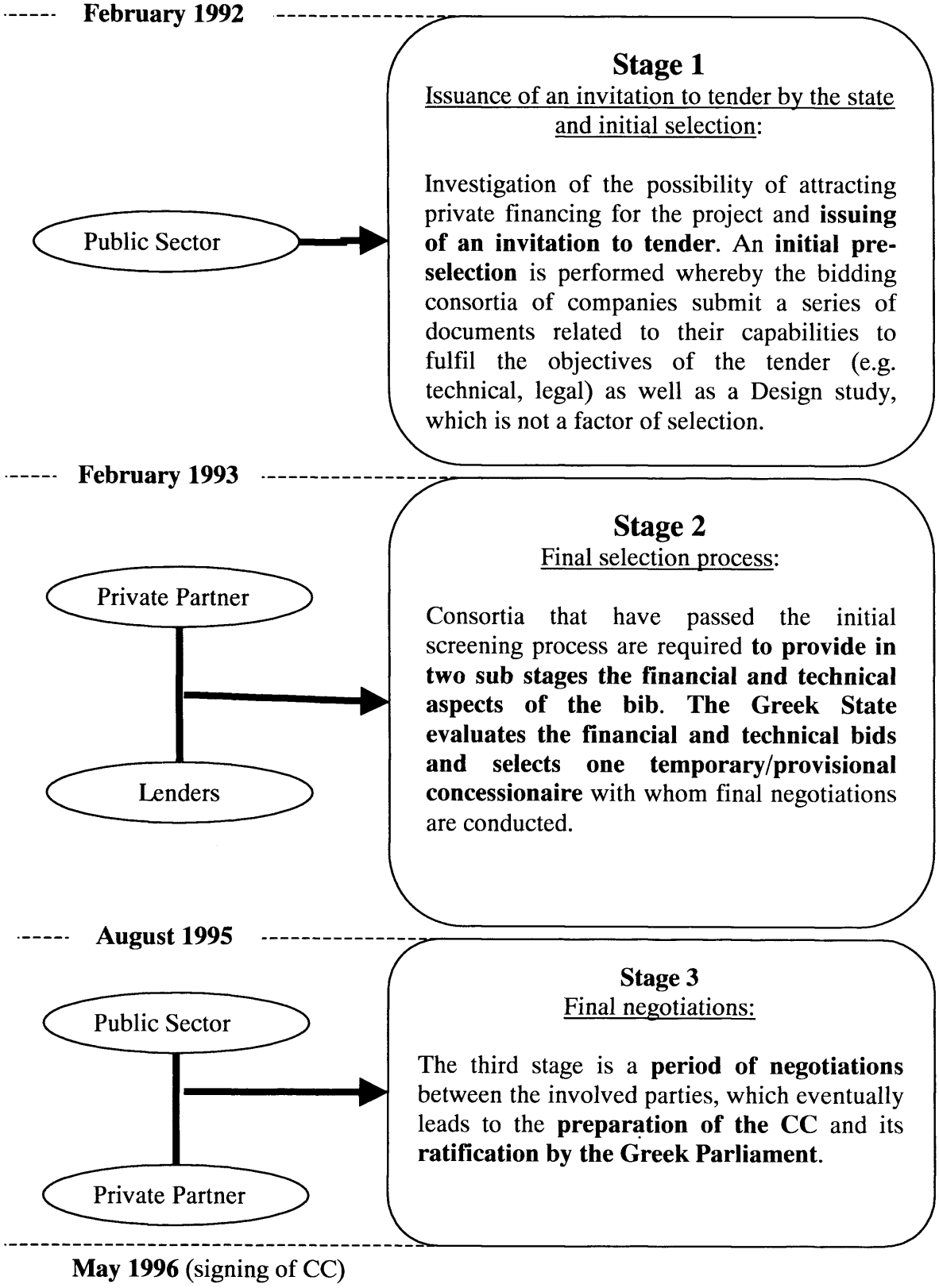
Appendix A

The selection process of the concessionaire

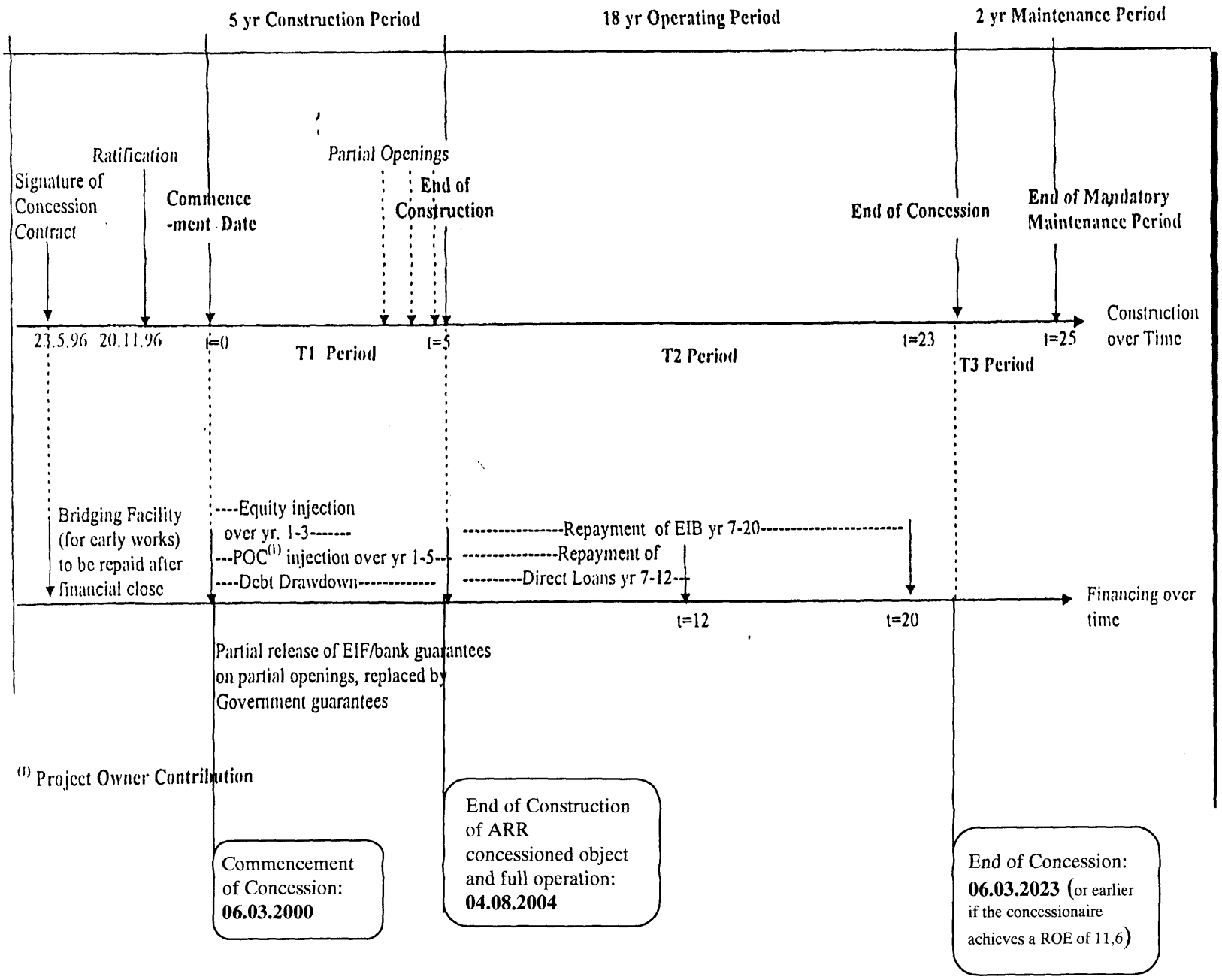


Sources: EC: 2005, MOF: 2005, Interviewee I, II

Appendix B

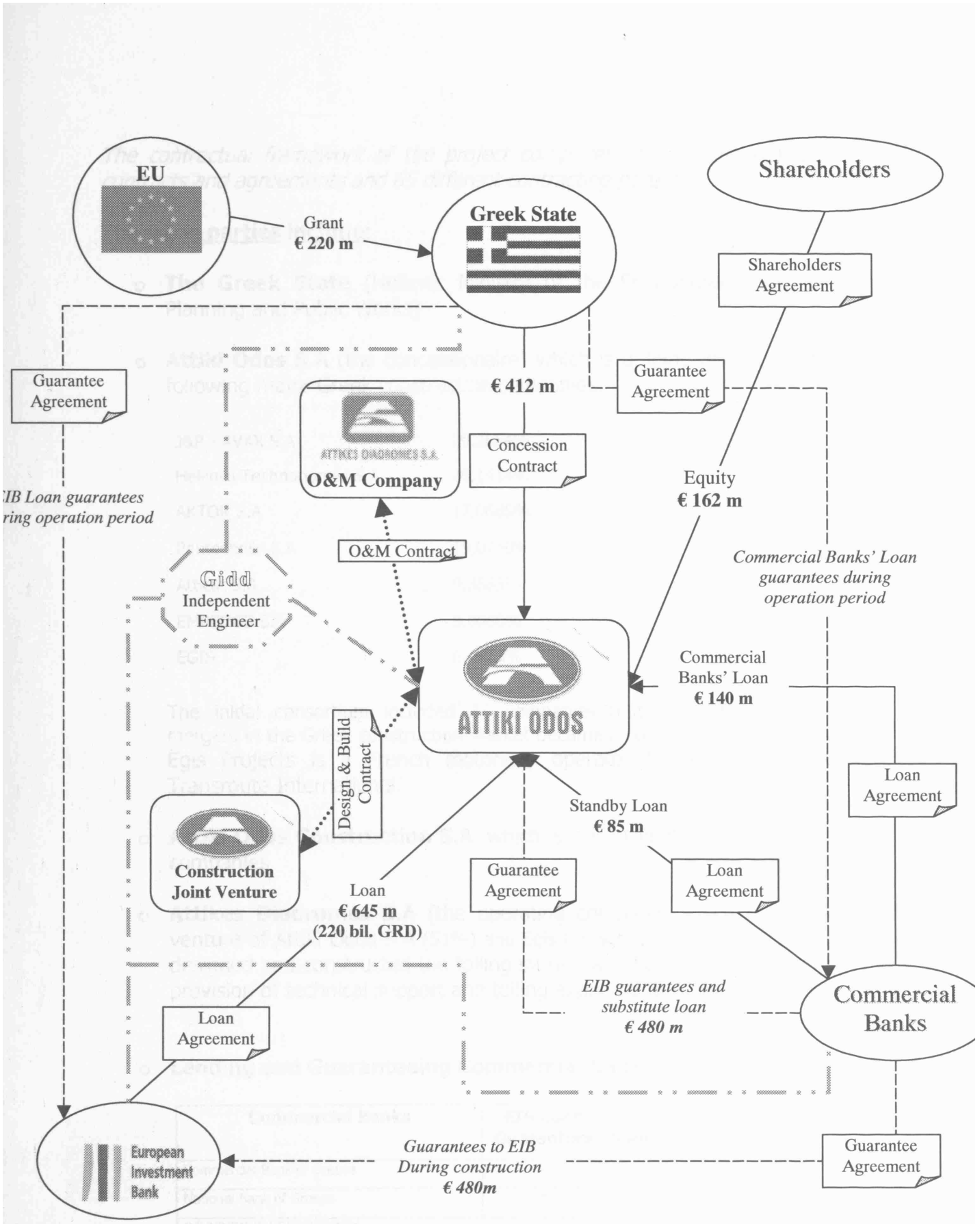
Project schedule & Basic inflows/outflows of the Concessionaire

Source: Law 2245/1996: addendum 8, Interviewee II, I



Appendix C

Financial and Contractual Structure



(Compiled by the author)

The contractual framework of the project comprises of approximately 138 contracts and agreements and 65 different contracting parties

The basic parties include:

- **The Greek State** (Hellenic Ministry of the Environment, Physical Planning and Public Works)

- **Attiki Odos S.A** (the concessionaire) which is a Joint venture of the following major Greek construction companies:

J&P - AVAX S.A	29,2854%
Helliniki Technodomiki S.A	20,1414%
AKTOR S.A	17,0685%
Pantechniki S.A	19,0760%
Atticat S.A	9,3865%
EMPEDOS S.A	5,0000%
EGIS	0,0423%

The initial consortium included 13 companies that after the extensive mergers in the Greek construction market became a consortium of 6 Groups. Egis Projects is a French motorway operator formerly known as Transroute International.

- **Attiki Odos Construction S.A**. which is a joint venture of the above companies

- **Attikes Diadromes S.A** (the operating company) which is a joint venture of Attiki Odos S.A (51%) and Egis Projects S.A. (49%) which has designed and constructed the tolling system and has an agreement for provision of technical support and tolling expertise to Attiki Odos. S.A

- **Lending and Guaranteeing Commercial Banks:**

Commercial Banks	EIB Loan Guarantors	Commercial Banks' Loan	Standby Loan
Commercial Bank of Greece	X	X	X
National Bank of Greece	X	X	X
BAYERISCHE VEREINSBANK	X		X
BANK OF TOKYO MITSUBISHI	X		X
SOCIETE GENERALE	X		X
European Investment Fund	X		

HSBC BANK Plc	X		X
ABN AMRO BANK NV	X		X
Agricultural Bank of Greece	X	X	X
Alpha Bank	X	X	X
BANCA MONTE DEI PASCHI DI SIENA S.p.A.	X		X
BANK OF SCOTLAND	X		X
DE NATIONALE INVESTERINGS BANK N.V.	X		X
Ergasias Bank	X	X	X
Pireus Bank.	X	X	X
ING BANK N.V.	X		X
BANCO BPI, S.A.	X		
BANK OF CYPRUS LTD.	X		
DEPFA BANK AG	X		
ENTENIAL	X		
EXPORT DEVELOPMENT CORPORATION	X		

- Sir Alexander Gibb & Partners Ltd. in association with SGI Ingenierie has been appointed as the Independent Engineer to carry project monitoring/certifications of works' progress/quality control etc. on behalf of the state, the concessionaire and the banks.

Loan facilities:

- Long term loan facility provided by the European Investment Bank ("EIB")
- Guarantee facilities in favour of the EIB to be provided by the "Guaranteeing Banks"
- Commercial Bank's loan to be provided by the "Lending Banks"
- Standby loan to be provided by the "Lending Banks"

	Maturity (years)	**Grace period (years)**
EIB Loan Facility	20.0	7.0
Guarantee for EIB facility	5 or 7	N/A
Commercial Banks' Direct Loans	12.0	7.0
Standby Facility	12.0	7.0

Source: Interviewee II

Appendix D

Technical features and charging system

Total Length of ARR	**65 Km**
Other Basic Roads	**31,33 Km**
Network of complimentary /adjacent roads	**150 Km**
Interchanges	**32**
Road bridges: - Over-ground	**108**
- Underground	**57**
Railway bridges	**35**
Pedestrian bridges	**9**
Tunnels	**52**
Total length of tunnels	**12,96 Km**
Motorists' Stations	**2**
Control and maintenance Centre	**1**
Support installation areas	**6 (122.000 sqm)**
Closed circuit cameras (CCTV)	**200**
Digital signing and messaging System (MVMS and AVMS)	**75 screens**
Emergency Roadside Telephones (ERT)	**600**
Traffic measurement system (VDS)	**600 detectors**
Lane control signals (LCS) and Variable speed limit signs (VSLS)	**1240**
Meteorological stations	**3**
Overheight vehicle detection system (OVDH)	**43 detectors**
CO/opacity detectors and automatic tunnel ventilation system	**52**

Supervision, intervention and maintenance Vehicle fleet

Patrol vans, sweepers, multi-purpose trucks, trucks, Signing trailers, mobile VMS

Communications

Fibre Optic Network:2 loops along motorway, 100% redundancy (data, video, audio)

TETRA (personnel communication personnel communication)

Wireless coverage for Police, Fire Brigade, Ambulances

Toll Collection System: Open system - Check on entry only - Flat rate

192 lanes: 35 plazas on access ramps (3 to 6 lanes each)

38 Plazas: 3 mainline plazas at extremities (15 lanes each)

Toll payment system: Cash,e-pass (transponder),Motocard

Source: B. Halkias: 2004, Attiki Odos S.A

Toll Pricing

The UCTL (Upper Contractual Toll Limit) for each semester of operation is calculated according to the formula below:

$$(UCTL)_i=(UCTL)_0 * (CPI)G_{I-1} * (1/IR)_{I-1}$$

Where:

$(1/IR)_{I-1}$ = (ECU rate in drachmas of 30.6.1993) / [(ECU rate in drachmas on the 30.6 of the year (1993+I)]

$(CPI)G_{I-1}$= "Consumer Price Index" of Greece, of the two months June-July of the year (1993+I years) in relation to base period of the same two months of 1993.

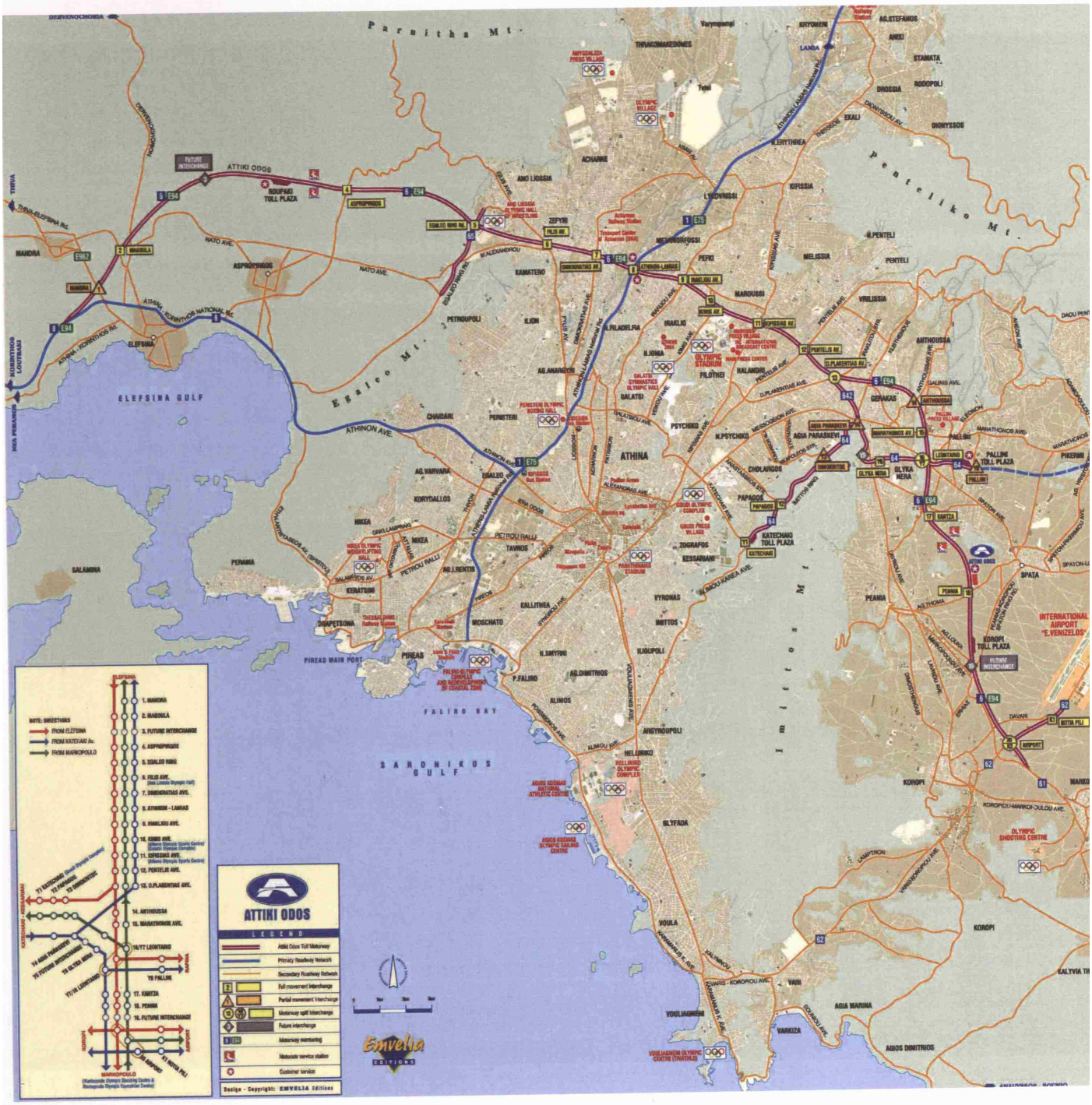
The Upper Limit Toll Price for various vehicle categories is calculated according to the following multiplier factors:

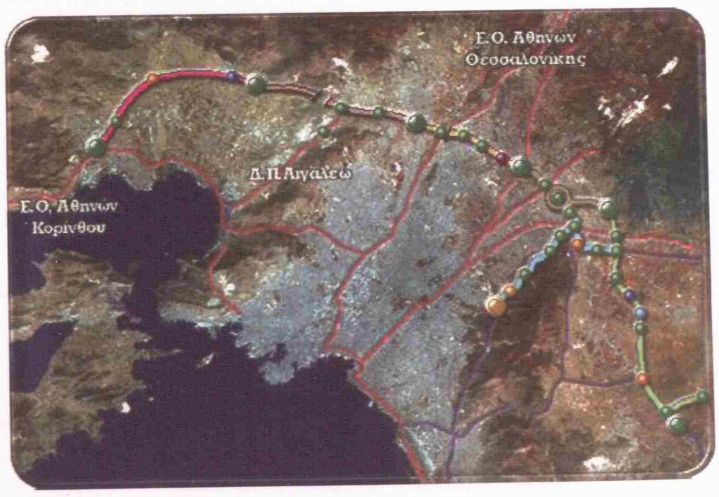
Vehicle category		Multiplier of UCTL
1	Motor bikes	0,5
2	**Cars**	**1,0**
3	Light vans	1,0
4	Συρόμενα και Ελαφρά Λεωφορεία	1,5
5	Small and medium trucks	2,5
6	Big trucks	4,0

Source: Law 2445/1996:par. 50.3

Appendix E

Maps and pictures


Parnitha Mt.
Penteliko Mt.
Egaleo Mt.
Imittos Mt.
ELEFSINA GULF
SARONIKOS GULF
FALIRO BAY
ATTIKI ODOS
ATHINON AVE.
ATHINA
PIREAS MAIN PORT
INTERNATIONAL AIRPORT "E.VENIZELOS"
ATTIKI ODOS
LEGEND
Attiki Odos Toll Motorway
Primary Roadway Network
Secondary Roadway Network
Full movement Interchange
Partial movement Interchange
Motorway split Interchange
Future Interchange
Motorway numbering
Motorists service station
Customer service
Design - Copyright: ENVELIA Editions
Envelia
EDITIONS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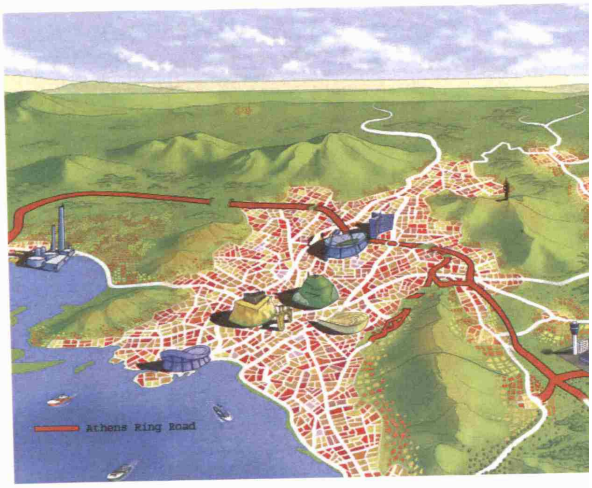
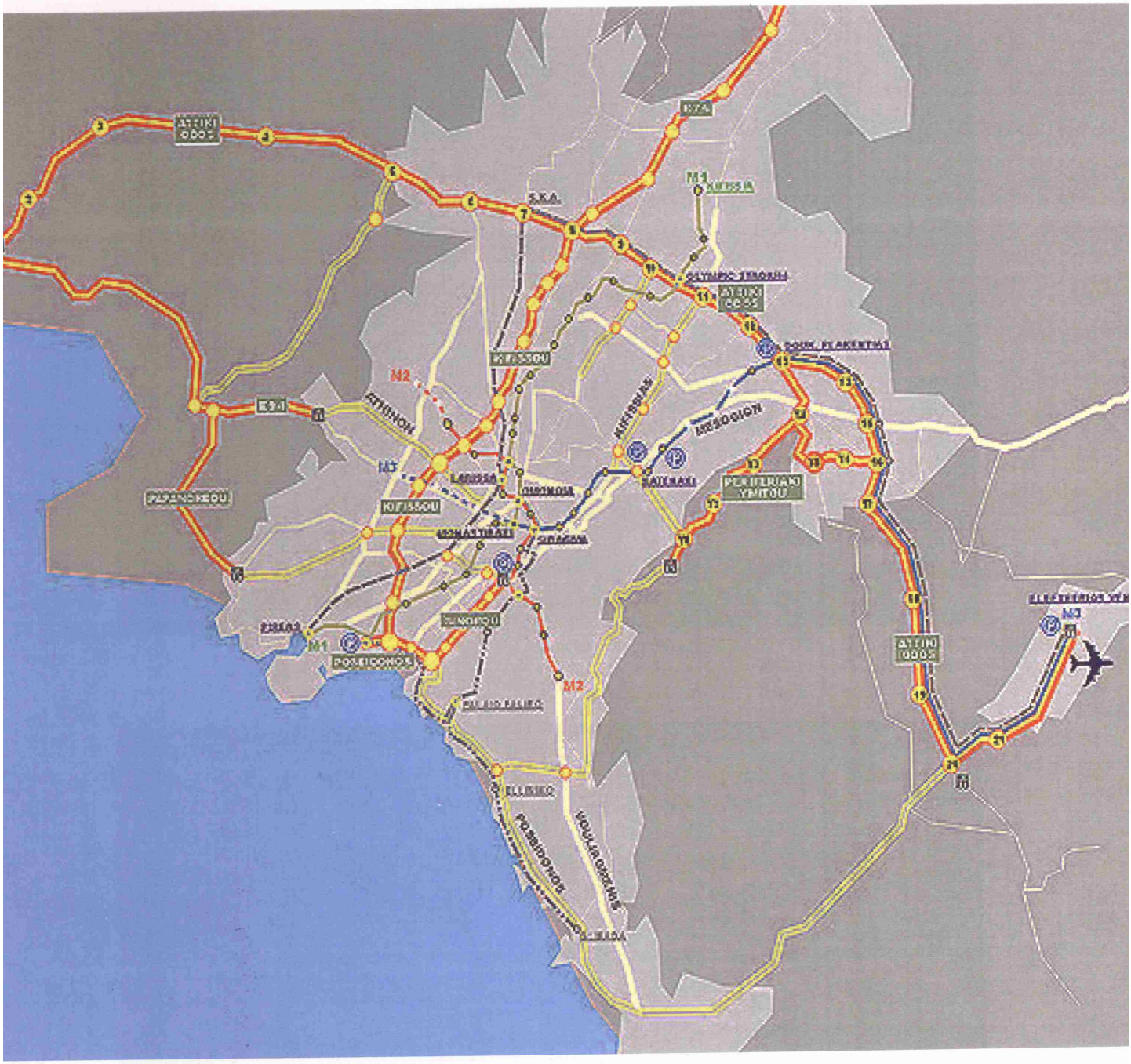
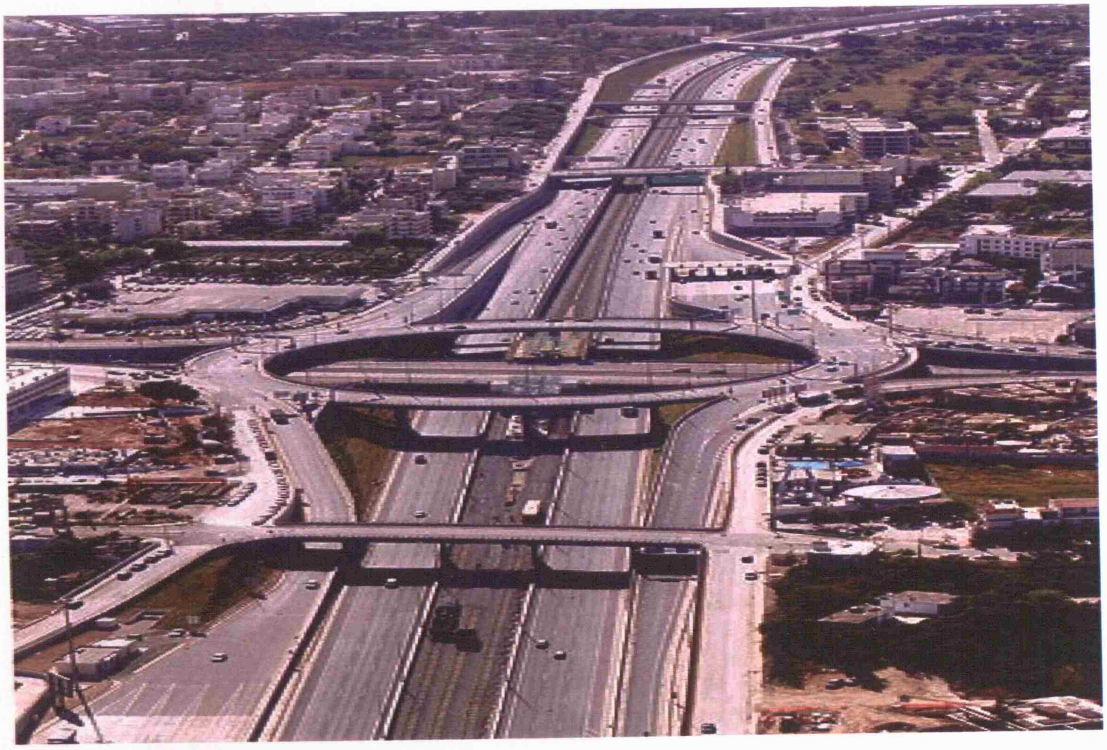
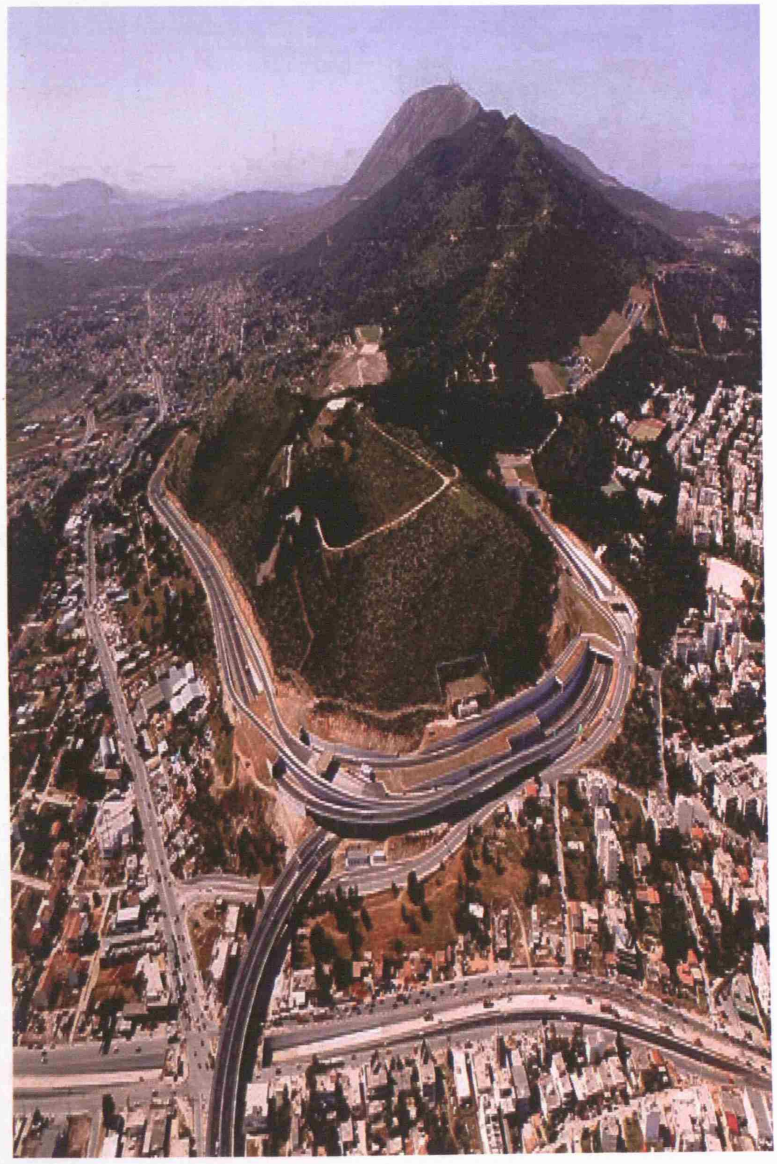
Δ.Π.Αιγαίου
Ε.Ο. Αθηνών Κορίνθου

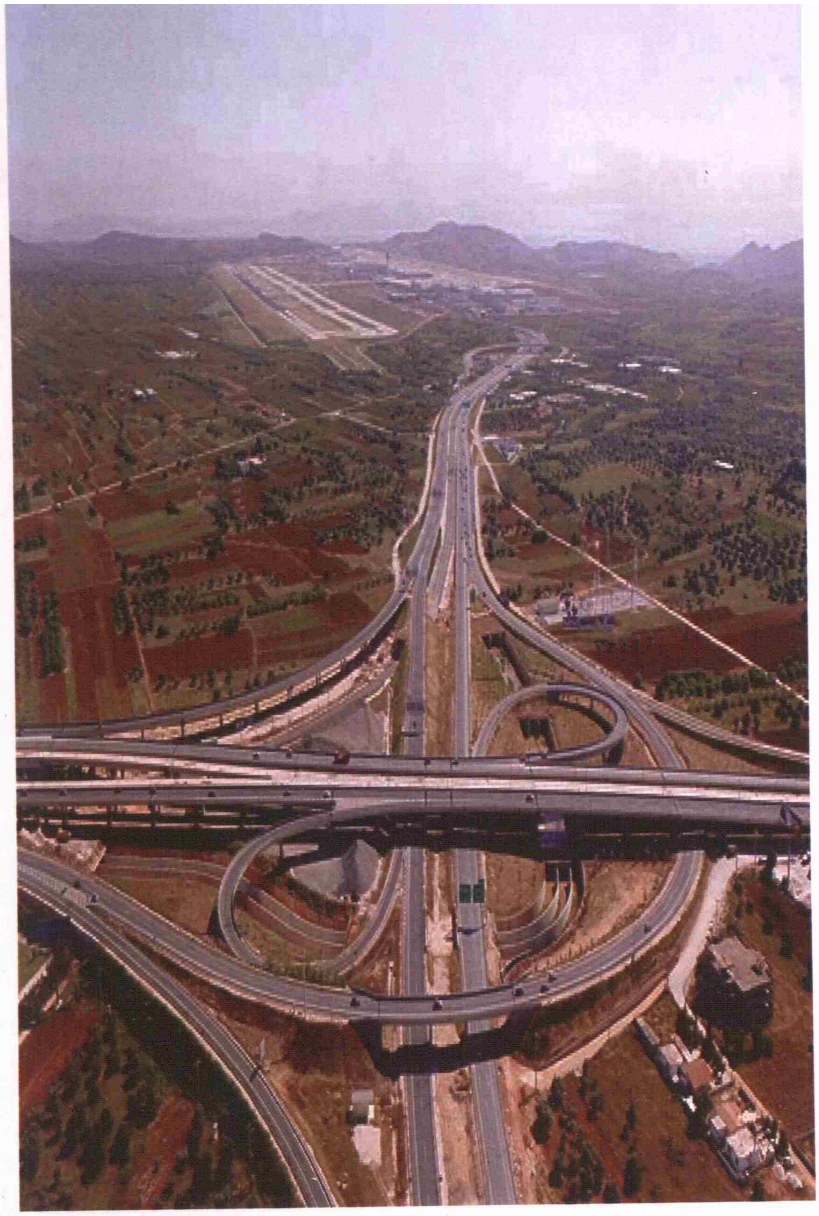

Athens Ring Road



Transport Map of Athens (Tram, metro and suburban railway lines are shown in red, green, black and blue thin lines)

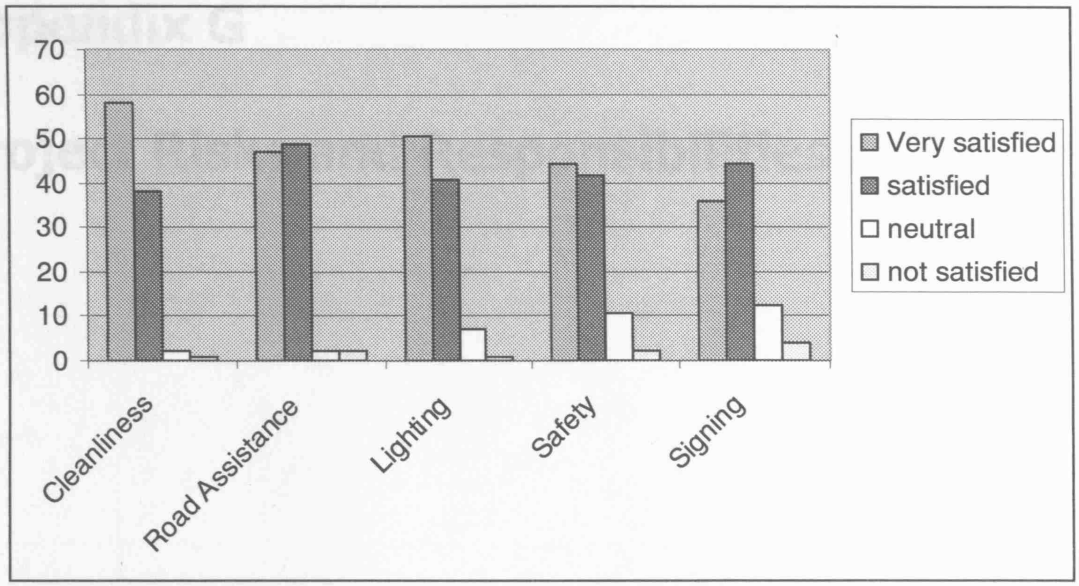




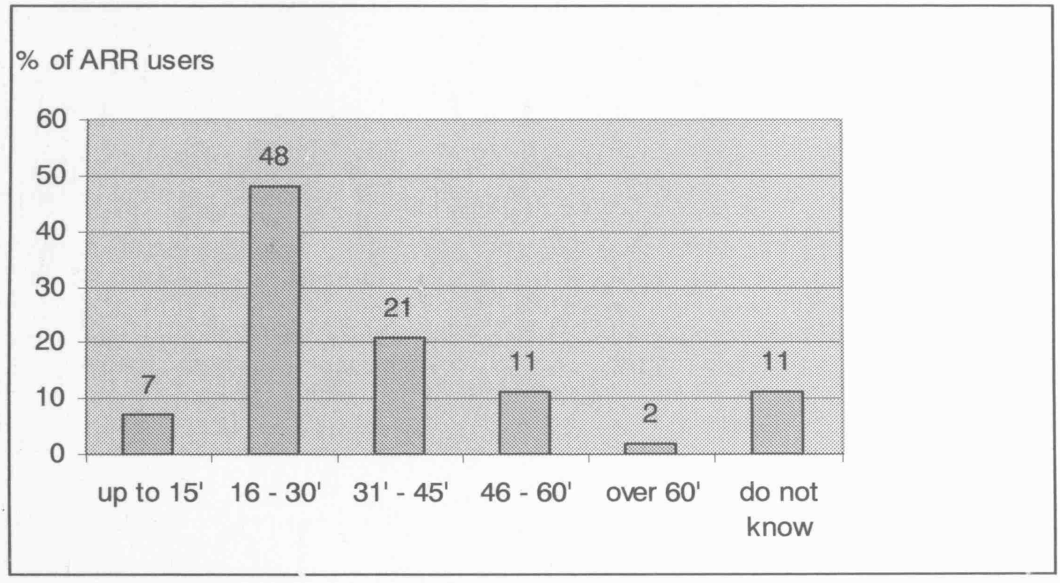


Appendix F

Quantified ARR benefits



Parentage of ARR users asked vs. level of satisfaction on 5 criteria
(Sample of 11.014 ARR users, Invasion & Metron Analysis: December 2004)



Time savings for ARR users asked
(Sample of 11.014 ARR users, Invasion & Metron Analysis: December 2004)

- Average time saving per use**: 30 minutes**
- Average daily time savings: **150.000 hours** (equals 18.750 daily wages)
- Yearly economic benefit: **€ 550.000.000**
- Effective road assistance interventions during 2004**: 26.712**

Source: Attiki Odos S.A, Invasion & Metron Analysis: 2004

Appendix G

Project Risks and Responsibilities

Risk Type	Reason	Main responsibility	Impact on Concession Company	Impact on shareholders	Impact on lenders	Doc. Ref.
Cost overrun in construction	Increased cost of environmental protection	Project Owner	Cost borne entirely by PO. AO compensated on the basis of quantities as per Parallel Works	No impact	No impact	CC 5.1.3; 29.4
	Change orders by PO	Project Owner	Cost borne entirely by PO. AO compensated on the basis of quantities as per Parallel Works	No impact	No impact	CC 34.1.1.3 DBC 20 SCC 19.1
	Due to the CJV (including underestimation of construction cost)	CJV	No impact. Cost overruns due to inefficient management, design, larger quantities of materials etc. are borne exclusively by the CJV	No impact	No impact	CC 31, 52 DBC 12.1, 18, 32.1
	Antiquities	PO	1) Delays up to 6 months have been provided for in the tender documents, the offer and the final timetable. 2) For delays beyond 6 months, AO and the CJV will receive an extension of deadlines and will receive compensation for increased costs. If delays extend construction beyond 5 years, AO will be granted an extension of the concession period.	1) No impact 2) No impact	1) No impact 2) No impact	1) CC 36.6-8 DBC 21 2) CC 38.1
	Utilities' diversions	CJV	No impact - Cost is included in LSP and PW. CJV is entirely responsible for construction related risks.	No impact	No impact	DBC 12.1, 32.1 CC 52.1, 52.2
	Unexpected ground conditions	CJV	No impact - CJV is entirely responsible for construction related risks.	No impact	No impact	DBC 12.1, 32.1 CC 52.1, 52.2
Faults due to the PO	Delays in design and other approvals	Project Owner or IE	AO and the CJV will be provided with deadline extensions and financial compensation for delays in excess of 2 months by the PO.	2) No impact	2) No impact	CC 38.1
	Delays in delivery of expropriated land	Project Owner	AO and the CJV will be provided with deadline extensions and financial compensation for delays by the PO.	2) No impact	2) No impact	CC 38.1

Increased costs/ loss of revenue due to delays in completion of construction	Due to the CJV (including underestimation of cost and time)	CJV	The CJV members have committed to cover any increased costs or loss of income. A 5% retention on all payments to the CJV will be held by the Banks and may be used to cover such costs. Any cash held for bonus payments to the CJV may also be used to cover such costs.			
	Delays in POC payments	Project Owner	1) interest will be payable for delays beyond 15 days. 2) If delays last more than 3 months and the delayed amount exceeds ECU 5 mln, then the Concessionaire may terminate the CC and the PO will assume all bank debt obligations of AO.	1) No impact. 2) Fully compensated by PO	1) No impact 2) Credit risk will become exclusively Greek state risk	CC 18.3 DBC 17
	Legislative changes	Concession Company	Changes in laws or regulations affecting costs, returns and taxation are borne by the Concessionaire with the exception of environmental regulation changes and change orders of the PO.	Affect returns	Possibly lower DSCR	
Cancellation	Change in Government Policy	Project Owner	Failure of the PO to meet any of its obligations under the Concession gives the Concessionaire the right to terminate. The concessionaire is indemnifies for by the PO for its costs.	Compensated	Early repayment	
Force Majeure	Force majeure lasting more than 12 months	Project Owner	Concessionaire and PO will negotiate new terms; or the contract is terminated, Concessionaire fully compensated and debt obligations assumed by PO.	Fully compensated	Risk transferred to PO	CC 52.3, 52.4
	Insurable force majeure	Concession Company	All insurable force majeure events will be fully insured by the Concessionaire, including loss of revenue.	Compensated by insurance	No impact	CC 52.4.1, 52.5.1
	Non insurable force majeure	Project Owner	Project Owner fully compensates Concessionaire	No impact	No impact	CC 52.4.2, 52.5.2
Revenues below projections	Incorrect traffic forecasts	Concession Company	Reduced revenues in real terms	Reduced returns	Reduced DSCR Increased reliance on government guarantee	CC 6.1, 50.3, 52.1.1,
	Changes in city planning, public transportation and traffic regulations.	Concession Company	Reduced revenues in real terms	Reduced returns	Reduced DSCR Increased reliance on government guarantee	CC 6.1, 50.3, 52.1.1,

	Delay in opening of Spata airport, or IWPM, or opening at all of suburban train	Project Owner	Concessionaire compensated for reduced revenues by PO	No impact	No impact	CC 10.3
	Failure to meet design or operating standards for tolling equipment	Equipment Subcontractor	Compensation of the Concessionaire by the Operator, compensation of the Operator by the Equipment Subcontractor, backed by professional liability insurance.	No impact	No impact	O&MC 12.4 TAA 7
Interruption of operation	Other works undertaken by the PO	Project Owner	If such works affect traffic on the motorway, the PO will compensate the Concessionaire for 70% or 100% of reduced revenues.	No impact.	No impact	CC 40.1.9
	Revocation of Licences or other interruption due to PO	Project Owner	Concessionaire compensated by PO in full	No impact	No impact	CC 45, 38
	Operator failure to meet standards	Operator and Concession Company	The Operator is required to correct faults within a short period, else the agreement may be denounced. Risk of call by the PO on the performance guarantee. Partial compensation of Concessionaire by Operator.	Temporarily reduced returns	Temporarily reduced DSCR, increased radiance on State guarantees	O&MC 12.7 & 12.8
Operating Cost Overruns	Any reason, except Concession Company cost overruns	Operator	The Operator bears all operating costs but is not compensated for cost overruns.	No impact	No impact	CC 9, 43.5 O&M A
	Concession Company cost overruns	Concession Company	Concessionaire bears costs, yet these are very small compared to project size.	Immaterially reduced returns	Limited reduced DSCR	CC 9, 43.5,
Macro-economic Risks	Higher inflation during construction or operation	Concession Company	Higher LSP. Revenue stream unaffected in real terms.	Possible need for additional equity	Use of standby facility. DSCR affected to the extent of use of the standby facility.	Financing plan, CC 15.1.3

	Stronger GRD parity against the ECU during construction	Concession Company, shareholders	POC and Equity amounts in current Drachma terms will be lower compared to financing plan.	Possible need for additional equity, lower returns	Use of standby facility. DSCR affected to the extent of use of the standby facility.	Financing plan, CC 14 and 16
	Weaker GRD against the ECU during operation	Concession Company	The debt service requirement of F/C denominated loans will increase	Lower returns	Lower DSCR	Financing plan
	Higher interest rates during construction	Concession Company	Financing needs and debt service payments will be increased. Hedging arrangements to be implemented to reduce risk.	Lower returns	Use of standby facility. DSCR affected by the use of the standby facility and higher interest payments	Financing plan
	Higher interest rates during operation, to the extent unhedged	Concession Company	Debt service payments will be increased. Hedging arrangements to be implemented to reduce risk.	Lower returns	Use of standby facility. DSCR affected by the use of the standby facility and higher interest payments	Financing plan

Source: Interviewee II

Appendix H

Estimated and Actual Traffic & Revenues

Traffic and Revenues Estimates

The ministry's traffic studies prepared by Halcrow Fox (UK) and Dromos (Greece) were the ones released to the tenders. Attiki Odos consortium developed also its own forecasts prepared by ISIS (France) and Impetus (Greece). The following figures correspond to the 2nd most updated study.

Assumptions:

- Flat toll rate paid at the entrances of the highway (as proposed in the preliminary studies of the Project Owner)
- Two toll rate categories: private cars (normal fare) and goods vehicles/buses (double fare)
- Full opening of the road in Jan. 2000

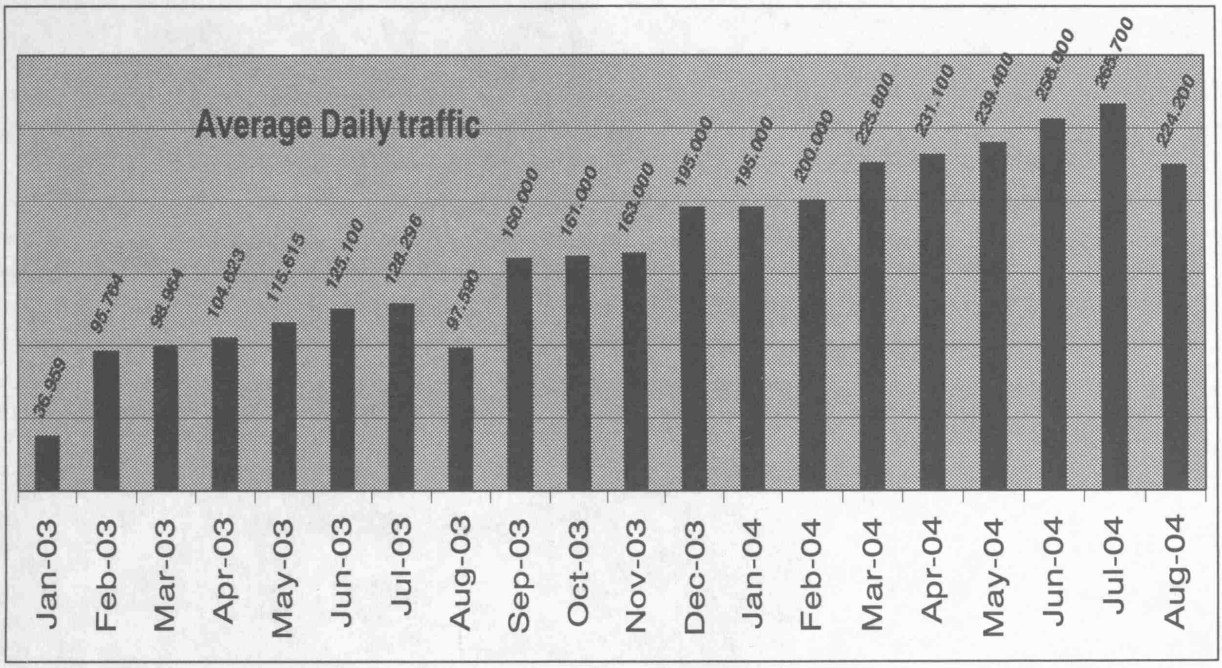
	2000 (first year of operation)	**2005**	**2015**
Toll level = 1,56 or 450 GRD at 1994 ECU Prices excl. VAT (288 GRD/ECU)			
Number of daily toll transactions	**182.977**	299.510	282.635
Annual Revenues (at current € rate : 340,75 GRD/ECU)	88.199.560	110.629.494	136.237.711
Annual Average Growth (%)		4,60	2,10
Toll level = 2 or 600 GRD at 1994 ECU Price excl. VAT (288 GRD/ECU)			
Number of daily toll transactions	148.091	193.475	244.927
Annual Revenues (at current € rate : 340,75 GRD/ECU)	95.178.283	124.346.295	157.414.527
Annual Average Growth (%)		5,50	2,40

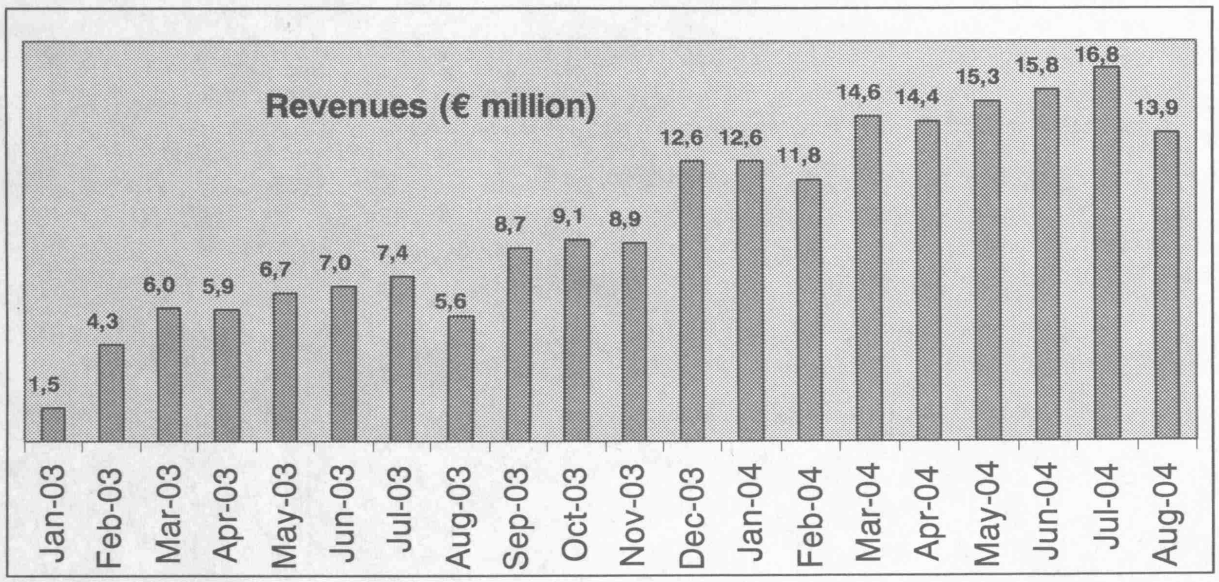
Source: Interviewee II

Estimated revenues before full operation: € 37 million (Interviewee II)

Actual Traffic and Revenues

Traffic (toll transactions) and Revenue figures before the beginning of full operation (Interviewee II):





- **Total revenues before full operation > € 200 million**
- **Total revenues of first year of operation 2004 > € 140 million**
- **The average daily traffic during full operation is 250.298 vehicles** (Attiki Odos S.A, Interviewee II)