



TUNNEL & UNDERGROUND WORKS FINANCING SYMPOSIUM,
ATHENS, 22-23 MARCH 2012

***INNOVATIVE FINANCING TECHNIQUES:
THE CASE OF ATHENS METRO EXTENSIONS***

**ALEXANDROS DELOUKAS
ATTIKO METPO A.E.**



WORLDWIDE FINANCIAL VOLUME SHARE OF PPP TRANSPORT INFRASTRUCTURE

- Airports	32%
- Roads & Tunnels	40%
- Urban Rail	2%
- Rail	14%
- Ports	12%
	100%

Source: Project Finance Transport Report



PPP FOR URBAN RAIL VS ROAD PROJECTS

Question: Why low urban rail share?

- Higher construction risk for capital intensive underground metros
- Higher regulatory risk for urban rail pricing and operation
- Unpaid car externality costs are hidden subsidies to car => unfair road vs. rail competition => rail cannot recover its total costs => government support needed => only limited recourse financing viable

BUT

- Urban rail market is monopolistic
- There are route alternatives to tolled roads
- Reliable rail service attracts modal choosers from congested roads

i.e. there is a potential for a higher share of urban rail, the latter containing generally less traffic risk than roads



FACTORS IMPACTING URBAN RAIL TRAFFIC RISK

- | | |
|---|--|
| <ul style="list-style-type: none">1. Road traffic congestion2. Service reliability3. Controlled competition regime4. System coverage5. Proven traffic streams6. Connection with urban gates7. Integrated transport services | <ul style="list-style-type: none">8. Strategic transportation plan9. Parking management & employment10. Road pricing and car access restrictions11. Integrated through ticketing12. Flat demand profile13. Availability of service14. Comfort of service |
|---|--|



EUROPEAN PPP URBAN RAIL PROJECTS

Project	Scope	Size (km)	Operation	Project costs (bi €)	Contract period (years)	Notes
Dockland Light Rail extension	DBFM	27	1987	n.a.	24	Grade-separated Lewisham extension; new extension to London City Airport by 2005
Manchester Metrolink	DBFMO	74 (Phase 3)	1992 (Phase 1)	0,75 (Phase 3)	15 (Phase 2)	LRT Phase 2: 2000 / Phase 3: 2003
Croydon Tramlink	DBFMO	28	2000	0,30	99	Capital grant only: full traffic risk transferred
Nottingham Express Transit	DBFMO	15	2003	0,36	30	Availability payment only: partial traffic risk transferred
South Hampshire LRT	DBFMO	14	2006	0,29	n.a.	Rapid Transit phase 1
Leeds Supertram	DBFMO	28	2007	0,75	31	Public grant + annual availability payment
Grenoble LRT	DBFT	6	1990	n.a.	not applicable	Line 2, direct awarding, pre-financed construction
Rouen Metrobus	DBFMO	16	1994	n.a.	30	LRT Line 1, competitive tender
Rennes Metro VAL	DBFMO	9	2002	0,53	n.a.	Automated driverless light metro system
Strasbourg LRT Line B	Joint Venture	10	2000	0,28	n.a.	Publicly controlled SPV, direct awarding
Madrid Metro Line 9	DBFMO	18	1999	0,12	30	Suburban at-grade/UG metro extension
Barcelona Light Rail	DBFMO	33	2004	0,43	25	Two lines / one concession per line
Seville Metro	DBFMO	19	Planned	0,36	35	LRT system
Lisbon South Tagus LRT	DBFMO	13	Planned	0,32	27	Phase 1 figures
Dublin Metro	DBFMO	70 (incl. 13km UG)	2013 (Phase 1)	2,5 (Phase 1)	n.a.	Full metro system by 2020

(n.a.: not available)

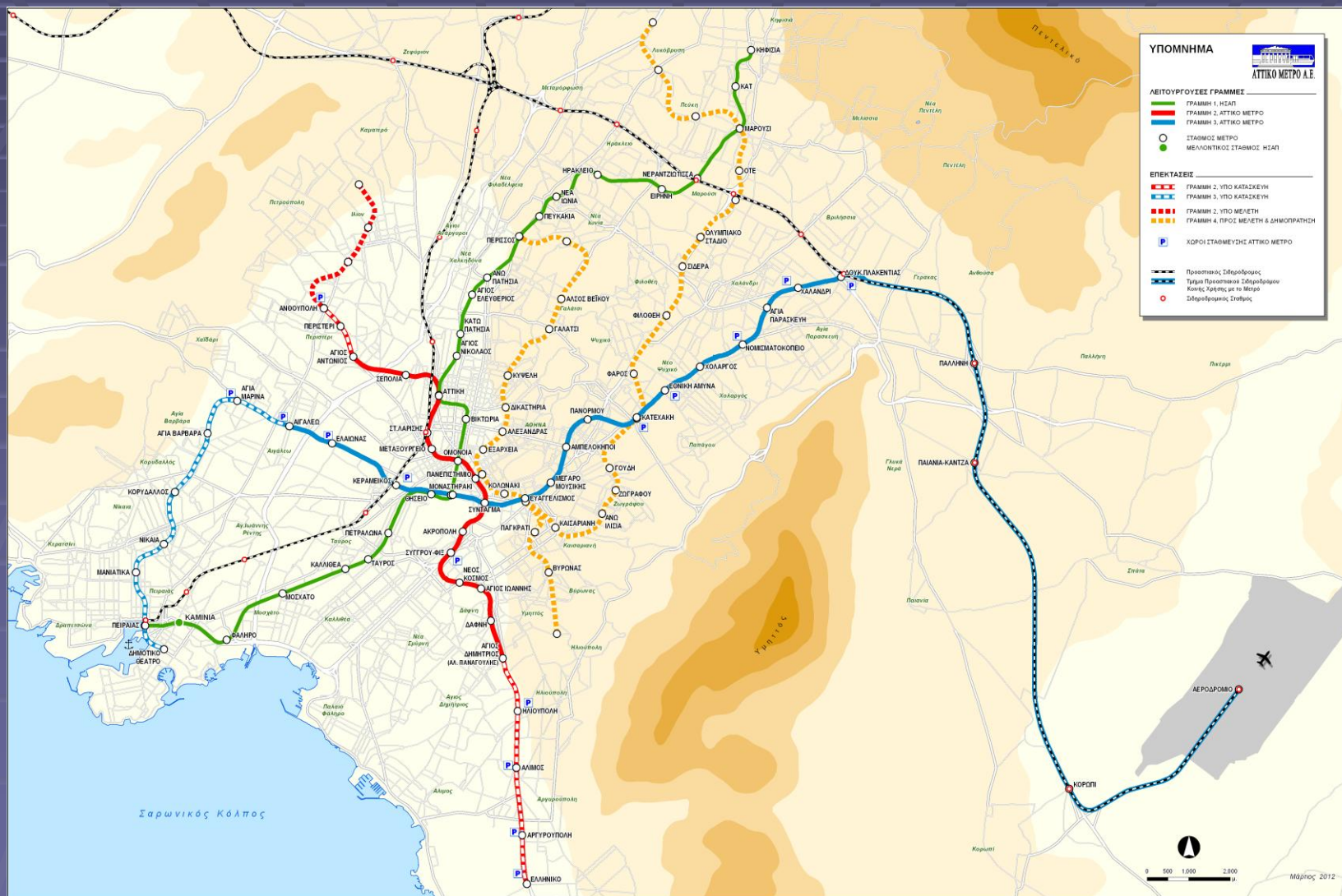
Table 2: European PPP urban rail projects



GREEK PPP TRANSPORT INFRASTRUCTURE PROJECTS

Project	Signing	Parliamentary ratification	Effectuation	Full operation	Contract period (years)	Construction period (years)	Volume 2010	Project costs (bi €)	Private equity share	Public sector share
New Athens Airport	Jul. 95	Sept. 95	Jul. 96	Jan. 01	30	6	6000pa/p.h.	2,10	8,6%	55,0%
Attiki Odos	May 96	Dec. 96	Mar. 00	Dec. 03	23	5	280.000 daily vehicles	1,40	11,4%	29,4%
Rio Bridge	Jan. 96	Apr. 96	Dec. 97	Aug. 04	42	7	10.000 daily vehicles	0,74	9,3%	41,7%

METRO DEVELOPMENT STUDY— TRANSPORTATION PLAN 2020





2nd Generation of Metro Extensions

- 1) L4 Northern Galatsi segment : 8,1kms, 9 new stations (all underground)
- 2) L4 Northern Kifissias segment: 6,1 kms, 7 new stations, with an 1,0 km extension to “Maroussi” station of ISAP Line 1 (all underground)
- 3) Southern Elliniko extension: 5,4 kms, 4 new stations (all underground)

Overall: additional 20 route kms, 21 new stations,
400.000 daily passengers

PPP structure for €2,1 bi cost of construction (incl. rolling stock)



PPP FOR THE DEVELOPMENT OF METRO EXTENSIONS

STRATEGIC QUESTIONS

1. Suitable form of public-private collaboration (financial comparison with net present costs of public procurement)
Aim: Minimize the direct or indirect financial burden of the state (public debt!)
=> Counter effect: increase of the cost of capital
2. Suitable scale of public-private collaboration
 - 2a. Extension tenders:
 - simultaneously (all-in-one tender package)
 - in-parallel up to three tenders
 - successive combinations of up to three tenders
(*preferred option*: competition stronger than scale effects)
 - 2b. Integration of existing or under construction infrastructure in the PPP scheme
(network effect, traffic risk spreading, interface risk, valuation risk)
3. Suitable length of the PPP
(function of private sector involvement, traffic level, tenor of loan capital)



SCOPE OF FINANCIAL ADVISORY SERVICES FOR METRO PPP - 1

- Commissioning of **HVB** and **KPMG** as Financial Advisors of AM
Stage A: Development of a strategy for the realization of the Metro extensions through mobilization of private funds
(strategy formulation/assessment/selection)

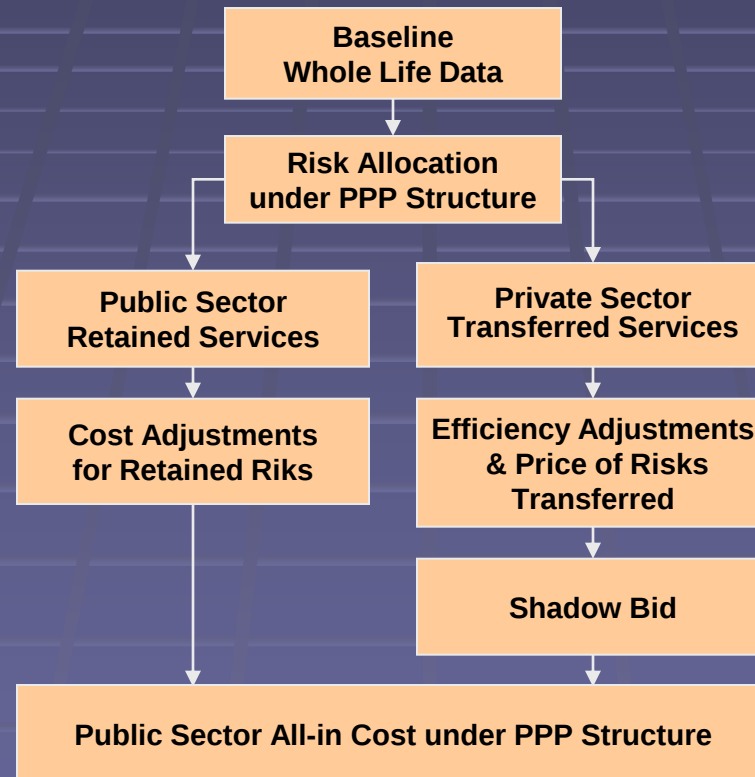
Scope of public-private collaboration (with declining complexity)

- DBFMO concession (all systems, with or w/o traffic risk)
- DBFM+O (all systems, availability payment for private operator w/o traffic risk)
- DBFM concession (Infra+Signalling for 3 extensions, with or w/o maintenance of existing network) as preferred option
- DBFT model (Infra + Signalling for 3 extensions)

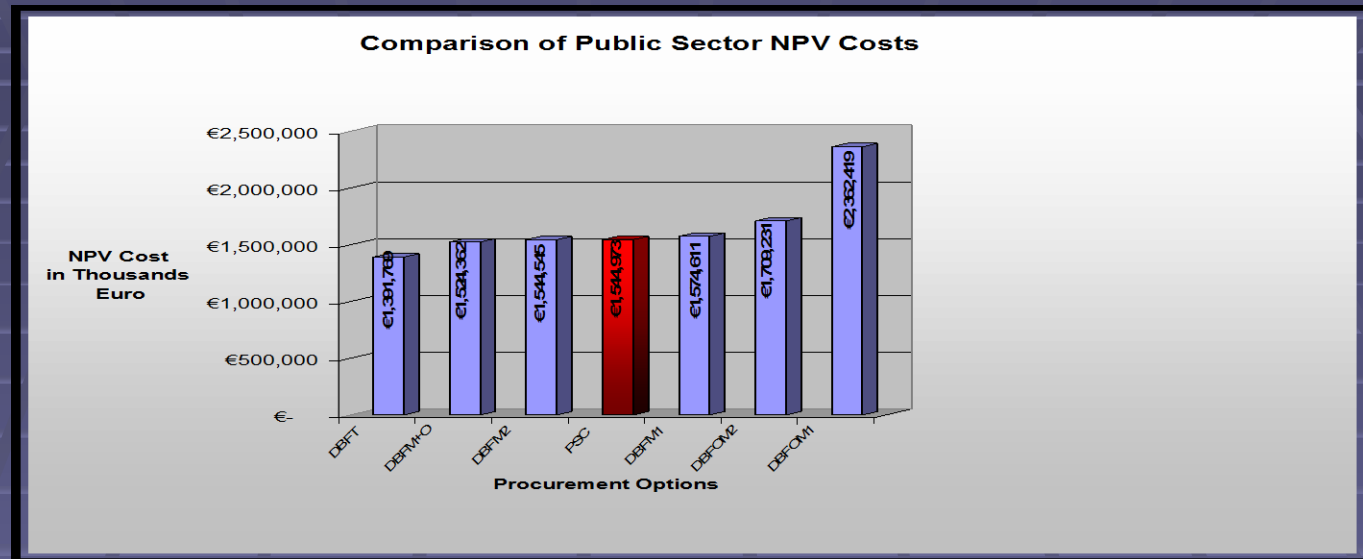
Vertical risk transfer

- Construction Risk (**D**esign and **B**uild)
- Availability Risk (System **M**aintenance)
- Operating Risk (System **O**peration)
- Demand Risk (Traffic Risk)

PUBLIC SECTOR COMPARATOR MODEL



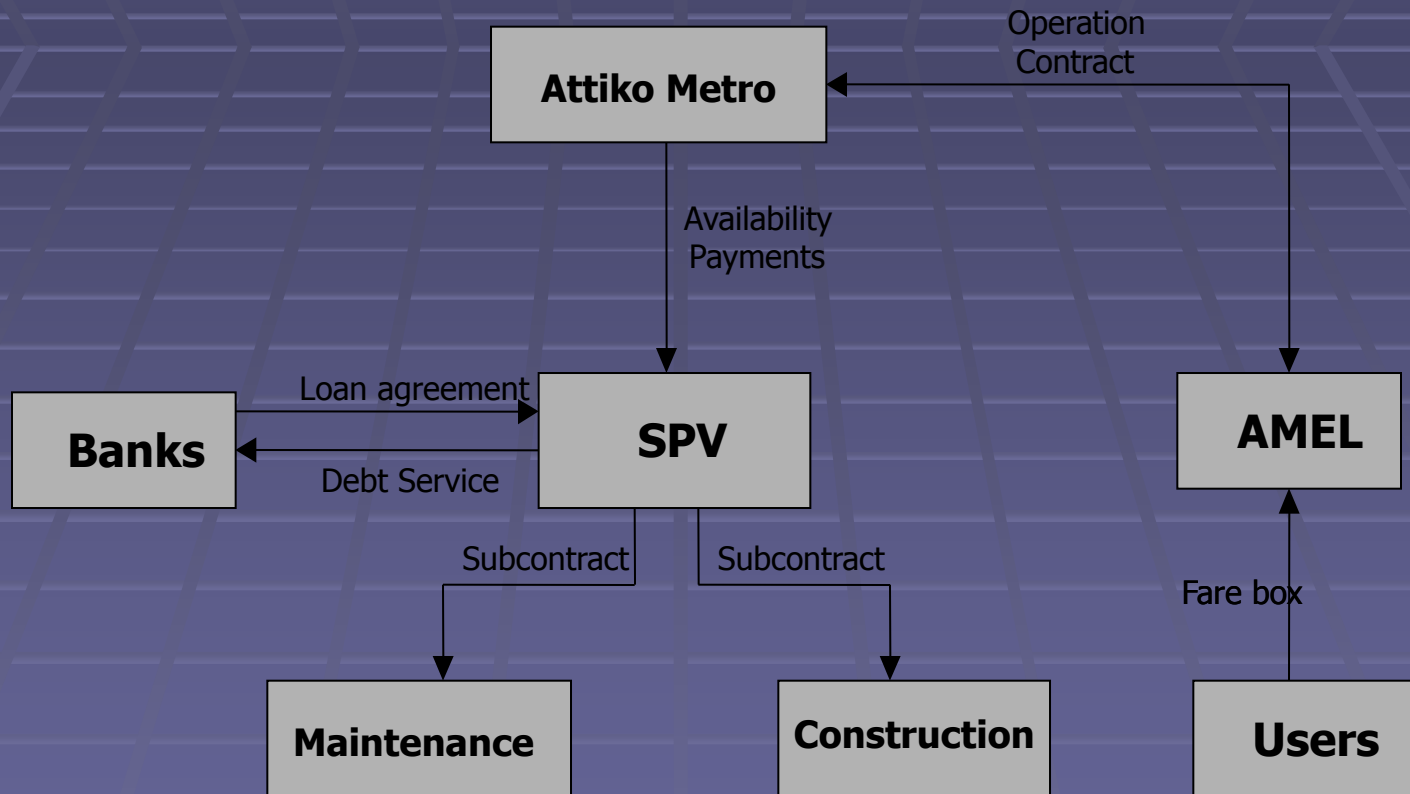
FINANCIAL MODEL RESULTS



- The public sector comparator (shown in red) ranks fourth
- DBFT results rank first. In practice, DBFT is an on-balance sheet option for the public sector. No LCC optimality.
- Two of the DBFM options rank next. Cost savings of DBFM vs. public sector comparator range up to 8.5% depending on required equity returns (problems: separation of O&M, interface risks)
- DBFOM options perform poorly (especially with transferred traffic risk)
- The Net Present Value of the all-in cost of new extensions is measured under each PPP option. The lower the net cost the better the option
- 6% discount rate



DBFM STRUCTURE



- Three DBFM contracts (one per extension)
- Separate tender for Rolling Stock (buy or lease)
- Separate tender for Transfer Stations with commercial uses (due to different risk profile than that for extensions)



SCOPE OF FINANCIAL ADVISORY SERVICES FOR METRO PPP-2

Stage B: Strategy implementation for the realization of Metro extensions would be phased as following:

Phase 1: Tender preparation and drafting of documents
(terms of tender and agreement invitation for the expression of interest, prequalification, call for submission of offers)

Phase 2: Evaluation of offers and selection of the preferred bidder
(50% quality-, 50% cost-based)

Phase 3: Finalization of agreements till coming into force
(signing, parliamentary bill, financial close)

Key issues:

- transport network integration
- Transfer Stations of the extensions as separate tender
- performance standards and monitoring mechanism
(additional scope of works for AM)



ACCOUNTING FOR THE ABANDONMENT OF THE PPP OPTION FOR THE METRO EXTENSIONS

- Only Stage A has been conducted after all,
a PPP tender has not taken place
- Line 4 is followed furthermore as a traditional public works project

REASONS FOR THE CHANGE OF COURSE CONCERNING THE TYPE OF PROCUREMENT

1. Vertical separation of the infrastructure owner (Attiko Metro) and the operating company (AMEL) using the infrastructure, emulated distinct ministerial jurisdictions. Jurisdictional frictions hindered a one and only stance towards the PPP procurement.
2. The future takeover of Line 4 O&M activities by the concessionaire could lead to industrial conflicts. The concern about potential conflicts has also been decisive in this respect.
3. At the mid of the last decade, political risks and lack of political support led to an abandonment of the PPP option.



LESSONS TO BE LEARNED IN GREECE – A NEW BEGINNING?

- A critical success factor for a PPP project in the Greek context is to be conceived from scratch as a concession within the jurisdiction of a single ministry.
That was the case for all 3 successful Greek concessions.
- The merging of Public Works and Transport ministries by 2009 neutralizes old sectoral frictions.
- The current downsizing of Public Transport operators neutralizes potential industrial conflicts.
- The above mentioned mitigation of risks and the current state of the Greek public debt make hereafter the PPP option much more viable.
- Attiko Metro has been built-up emulating private sector practices, so she can bear the responsibility to carry on this new type of procurement.