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Land Use and Property Market Impacts of the Relocation of Athens International Airport

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Land Use and Property Market Impacts of the Relocation of Athens International Airport

This paper is an abbreviated version of a 2005 dissertation submitted to the Bartlett School of Planning, of University College London (UCL), in partial fulfilment of the assessment criteria for a Masters degree. The dissertation was successful and received commendation.

Abstract

The relocation of Athens International Airport (AIA) is one of the most significant urban developments in the modern history of the city. Airport relocations are in themselves relatively rare events. In this paper sources from a number of fields are brought to bear on this relocation case and its impact on local land uses and the property market. Finally, the opportunities being missed in development and planning terms, as a result of chronic weaknesses of the Greek planning system, are highlighted.

1 Introduction

The 2001 relocation of Athens International Airport (AIA) released the 530 Ha plot of the former airport site (FAS) within the dense urban fabric of Athens. The new Eleftherios Venizelos (EV) airport, was constructed on a 1,250 Ha Greenfield site of prime agricultural land. The relocation project is emblematic of the transformation Athens has undergone over the past decade.

The property market and corresponding land use patterns across the greater Athens area have been in a state of metamorphosis, since particularly the mid-1990s, for the following reasons. First, declining interest rates since 1996, a result of Greece's process of convergence with the Eurozone, have led to increases in the volume of mortgages (DB Real Estate, 2003: 12). Second, government reforms made the property sector more transparent and competitive. Finally, the most spectacular change can be seen in the large infrastructure projects in and around the city.¹ The 2004 Olympic Games in Athens only accelerated the speed with which these large projects materialised. The impact of the relocation of AIA can be examined in

¹ New Athens International Airport (AIA), Attiki Odos (AO) ring-road, metro, tram, regional rail-link (RR), Marathonos Avenue, Ymyttos ring-road, Olympic facilities. As part of the redevelopment of the FAS, a large Metropolitan Park, a museum of modern art and a convention/exhibition centre are planned; strategies typical of Olympic cities (Andranovich, Burbank and Heying, 2001: 115).

relative isolation from the other infrastructure projects, as a result of its sheer scale, particularly when considered jointly with the supporting infrastructure it has given rise to.²

2 The planning system and Athens' urban form

The Greek planning system

Since the late 1990s, efforts to consolidate the regional and local tiers have been undermined by regional General Secretariats for planning and regional development, effectively representing the Ministry of the Environment, Planning and Public Works (MEPPW) (OECD, 1997; Sapountzaki and Karka, 2001). The authority of elected regional and local government is undermined in the study areas, despite consultations, by the central government's control of planning and funding (Karka, Sapountzaki and Wassenhoven, 2000: 3). Governance reform should be and is rising in importance on the agenda (Getimis and Hlepas, 2002; Maloutas, 2003).

Horizontal coordination between economic, environmental and physical planning is poor (Sapountzaki and Karka, 2001). The Ministry of Finance is responsible for economic development policy, while the MEPPW is responsible for physical and environmental planning, two facets of planning often naturally in conflict with one another.

Planning instruments and institutions

The Attica 2000-2006 Regional Development Plan (RDP) guides the implementation of the Community Support Framework (CSF) in the region of Attica. Its central aim is the promotion of the capital's international role (Attica RDP, 2000 – 2006: 36). The new AIA is named as one of the major instruments for achieving this objective as are the supporting Attiki Odos (AO) ring-road and the Regional Rail (RR) network (Attica RDP, 2000 – 2006: 41).

Urban Development Control Zones (UDCZs) – One covers the whole of Attica and restricts the subdivision of land parcels to those parcels measuring at least 20,000 m² in area with the specific aim of restricting urban sprawl. In Section 5 we will examine the formulation of a new UDCZ, initiated by the ORSA³ in 1996, offering more explicit protection to the area around the new AIA.

² The Attiki Odos (AO), metro, tram, regional rail-link and Ymyttos ring-road.

³ Organisation for the Athens Master Plan and Protection of the Environment of Athens. The policy-formulating body of the MEPPW.

Athens: urban form and the property market

Athens expanded rapidly, particularly in the interwar period and again since the 1950s, along transport axes to form a metropolitan region of more than 4 million inhabitants sprawling out of its enclosing basin. Plans for Athens have been unable to keep up with the rate of expansion, and consequently neither has infrastructure provision.

Ownership is highly fragmented, land uses are often incompatibly mixed and traffic problems are common (Sapountzaki and Karka, 2001: 420). A non-interfering, "non-planning policy" became commonplace in Greek urban areas in the post-war period (Delladetsimas, 1999: 325).

In the property sector urban sprawl accelerated since the industrialisation of the 1950s and 60s, yet Athens has not strictly undergone a suburbanisation process (Emanouil, 1999). Four secondary Central Business Districts (CBDs) emerged outside the centre of Athens in the 1970s and 80s, one south-southwest along Syngrou Avenue, one southeast along Vouliagmenis Avenue, another north-northeast along Kiffissias Avenue, and the last northeast along Messogheion Avenue. Kiffissias and Syngrou Avenues are the principal ones. Large multinationals, banks based overseas and insurance firms have tended to agglomerate in these locations. Athens' original industrial areas to the west of the city developed mixed residential and light industrial uses. Industry, as a whole, is under official and market pressures to be excluded from urban areas.

3 An introduction to the study locations

The former airport and its surroundings

The Elliniko airport was established in 1937 on infertile flat land between Mt. Ymittos and the sea, which was previously cultivated non-intensively and had attracted Athenians' holiday homes.

As a result of the urban sprawl triggered by industrialisation in the 1950s and 60s many areas bordering on the FAS were included in their respective General Town Plans (GTPs), releasing their latent potential to become primary housing areas. The declining quality of the urban environment in central Athens expedited this process. By the 1970s, the area was developing into an Athenian suburb.

The FAS constitutes 83% of the land area of the municipality of Elliniko (Thaka and Mavrogonatou, 2002: 7), hence the name of the airport before and the FAS after the relocation. The site overlaps with three other municipalities: Alimos, Argyroupoli, and Glyfada. The municipality of Elliniko has borne the greatest impacts on account of the airport's proximity in terms of development pressures on the one hand, coupled with construction restraints, road traffic and environmental degradation effects on the other hand.

The population of the municipalities bordering the FAS have been rising since the time of the establishment of Elliniko airport (see Fig. 1 below).

Fig. 1: Population of municipalities bordering on the former airport site

Municipality	1981	1991	2001	1991-2001 Change	1991-2001 % Change
Alimos	27,193	32,024	38,196	6,172	19.27
Argyroupolis	26,224	31,530	33,310	1,780	5.65
Elliniko	11,865	13,517	15,378	1,861	13.77
Glyfada	43,748	63,306	79,842	16,536	26.12

(Source: Thaka and Mavrogonatou, 2002: 9)

The municipalities around the FAS have until now not developed into independent centres of commerce, administration and business: the lack of higher order services sends locals frequently to central Athens.

The transport infrastructure projects and the regeneration of the area around the FAS during the 1990s, particularly for the 2004 Olympic Games, have caused property values to rise in all sectors. Alimos, Argyroupoli and Elliniko have shown more moderate increases in residential property values than Glyfada. A significant retail sector emerged in the area in the mid 1990s with the establishment of two superstores close to Vouliagmenis Avenue. These aside, the retail sector centres on a couple of streets at the centre of each municipality. Alimou Avenue has developed over the past decade into an important location for retail as it links the inland Vouliagmenis Avenue and the coastal Posidonos Avenue, thus benefiting from traffic from both. The volume of retail activity in close proximity to Alimou Avenue has led recently to the attraction of higher order functions. While the centres of the municipalities around the FAS have been losing office sector occupants particularly over the last five years, Vouliagmenis Avenue is developing a substantial office stock resulting from the relocation of the largest shipping companies from the old, cramped office stock in Piraeus (MEPPW, 2001).

The Relocation

In 1938 the airport registered passenger traffic of 8,500. By its closing year (2001) the airport site had been extended 11 times from 21.5 Ha to a final 530 Ha, annual passenger traffic had risen to over 10 m and the airport was operating 4 m above its design capacity. Yet relocation proposals met with widespread opposition (Sarigiannis, 2001: 50).

Once the location on the Messogheia Plain was selected in the late 1960s as the site for the new airport and the first land expropriations took place, in the 70s, the move was hotly debated; many advocated other locations. Suggestions included the island of Makronissos off the southeast coast of Attica, the Tanagra air force base north of Athens, or extending Elliniko airport on land reclaimed from the sea (Romanos, 2004: 179; Sarigiannis, 2001).

Most objections⁴ to the selection of the Messogheia location relate to the encroachment upon one of Attica's last largely rural areas. Over the last decade over 300 Ha have been incorporated into GTPs and an estimated further 450 Ha have been encroached upon illegally (Polychronopoulos and Serraos, 2001). Localised development spurred by the relocation, has been accused of opposing decentralisation, adding economic weight to Greater Athens (Kondaratos, 2001: 69). Others cite this very effect as a benefit as Athens seeks to establish itself as a competitive global city and as the gateway to Greece and the broader region (Loukakis, 2001: 52).

The relocation began in earnest in 1991 with an amendment to the 1985 Athens Master Plan to make the relocation legal. In 1995 a consortium managed by *HOCHTIEF*, and with the Greek Government as majority shareholder, entered into a contract to build the airport and operate it for 30 years. Construction began in 1996 and the airport was inaugurated on schedule in March 2001.

A six-lane toll road, known as the Attiki Odos (AO) was constructed across Attica granting access to the new airport from across the region, interlinking with other transport axes and modes. It is planned to extend the AO southeast to the port of Lavrion. The AO has been complemented since 2004 with a branch known as the Ymittos Ring Road linking central and east Athens to the AO. Whereas a rail connection was missing from Elliniko, one was

⁴ Biris, 2001; Dima, Laina and Simaioforides, 2001; Kondaratos, 2001; Kotionis, 2001; Sarigiannis, 2001; Romanos, 2004.

provided for in the case of EV.⁵ The Regional Rail (RR) line operating between Athens train station and EV, has now been extended in the opposite direction to Corinth. Metro line 3 also provides access to EV from the centre of Athens sharing the RR track.⁶

The Messogheia Plain

The Messogheia plain has been known as a centre of viticulture since the classical period. Since the 1950s a profound change took place in the economic interest in the area. Industrialisation led to employment shifting from mainly primary sector to mainly tertiary sector. Landowners who previously aimed to expand their estates began to divide and sell them for residential development (note the population increase in Fig. 2) for large windfalls.

Fig. 2: Distribution and development of the Messogheia plain population (1951-91)

Municipalities and communities to be affected	1951	1961	1971	1981	1991	51-61 (%)	61-71 (%)	71-81 (%)	81-91 (%)
Koropi	7125	8029	9716	12893	17173	12.68	21.01	32.69	33.20
Markopoulo	5112	5341	5954	9388	10420	4.48	11.47	57.67	10.99
Paiania	4824	7431	6111	7278	9701	54.03	-17.70	19.10	33.29
Pallini	954	1909	3190	5475	10914	100.10	67.10	71.63	99.34
Pikermi	0	1213	262	509	1291	-	23.00	94.27	153.60
Rafina	1888	2137	2674	4994	8556	13.18	25.12	86.76	71.32
Spata	5024	5620	6425	6398	7775	11.86	19.32	-0.42	21.52
Total	27180	34079	43905	68065	101448	25.38	28.83	52.31	49.04

(RDI 2, 1998: 3, selected areas)

In the 1970s, secondary sector employment continued to grow at a much-reduced rate while tertiary sector employment grew vastly. This trend is expected to continue.

Fig. 3: Employment by sector for Messogheia in 1998 and 2020 (forecast)

Year	1998	2020 (forecast)
Total population employed	70,000	170,000
Primary sector	14.0%	1.8%
Secondary sector	46.5%	39.3%
Tertiary sector	39.5%	58.9%

(Konsolas and Karagiannis, 1996: 12; RDI 2, 1998: 4, 13; own processing)

Land use patterns have been changing fundamentally since the 1960s. In the 1971-91 period cultivated, forested, water-covered and grazing areas in the municipalities of Messogheia

⁵ Car ownership rose by 80% in Greece in the 1984-94 period, a rate second only to Portugal among the EU15 for the same decade (Banister and Berechman, 2000: 109); rail access (in addition to road) to the new AIA is fundamental for a sustainable transport strategy.

⁶ The delay of the metro compared to cars along the AO where the former can only reach 100 km/h compared with 120 km/h of the latter is made up for by the traffic cars have to face in Athens. On the same track, the RR is clearly faster than the car, reaching speeds of 150 km/h.

had, in most cases, been reduced. The growing area devoted to settlements and roads explains, at least in part, these reductions (NSSG, cited in Christophilaki, 1998: 29).

Development in the Messogheia Plain over the past 30-40 years has been characterised broadly by the breaching of land use regulations. Illegal construction takes the form of mainly primary and secondary housing and dispersed industrial units and is illegal as regards its density, building coefficients, not meeting minimum plot size regulations,⁷ illegally subdivided plots or having developed a different function to that dictated by the GTP for the area. (RDI 2, 1998: 8)

Urban functions have been well distributed between settlements by market forces. Koropi concentrates 24% of all enterprises including all the largest ones, as well as many administrative services (Konsolas and Karaganis, 1996: 4). The Prefecture of Eastern Attica is in Pallini while some other services are in Rafina (RDI 2, 1998: 3).

The Messogheia Plain has failed to become functionally autonomous, since policy affecting the area originates from the national level, and aims to enhance the capital's role as a metropolitan centre on the global stage (Karka, Sapountzaki and Wassenhoven, 2000: 1-2).

Finally, economic activity in the Messogheia Plain has a distinct geographical distribution: agriculture dominates the interior of the plain; holiday houses and domestic tourism are the mainstays of the coastline;⁸ permanent residential areas are found in the west and north-west of the plain and a mixture of manufacturing units, logistics, services and retail and recreational uses are located along the principal transport routes in the north, north-west, west and south-west of the plain; and there is a concentration of high-tech industries in Paiania, in the north-west (RDI, 1998).

More than half the enterprises in the area employ fewer than 6 people. Even large firms employ only 32 people on average (Konsolas and Karaganis, 1996: 3). Practically all (98.5%) the enterprises of the Messogheia Plain have only one site or address (Konsolas and Karaganis, 1996: 4). 80% of the production of enterprises goes to the Greater Athens area (Konsolas and Karaganis, 1996: 3).

⁷ Therefore in violation of UDCZ regulations.

⁸ In this sense, the Euboian Gulf coastline of Messogheia is developing in much a similar way as the Elliniko area of the former airport 50 years before it.

4 The economic impact of airports and other transport infrastructure

Air transport and its infrastructure are controversial because they generate large externalities, positive and negative. Thus, “planning for airport expansion, involves protracted 10-15 year lead times. The airport planning process involves forecasting demand, producing feasibility schemes and consulting upon alternatives. Generally a lengthy period of public inquiry is undertaken prior to detailed design or construction” (Andrew and Bailey, 1996).

The belief that infrastructure investment will always enhance economic development has been questioned if not disproved. Whereas at earlier points in the development process infrastructure can have a profound impact on economic growth, in more developed areas, its marginal impact can be negligible (Canaleta, Arzoz and Gárate, 2002; Phang, 2003: 32; Rodríguez-Pose and Fratesi, 2004) or even negative (Flyvbjerg, 2003). Contemporary development theories emphasise agglomeration economies, physical, ICT, business, and cooperation linkages (Banister and Berechman, 2000).

While Krugman’s ‘new economic geography’ theory argues that a lack of infrastructure investment can lead to “deconcentration” of economic activity (Krugman, 1991 cited in Banister and Berechman, 2000: 114), ‘new growth economics’ theory claims that transport costs make up only a small proportion of firms’ total costs and undue attention and expenditure is concentrated on them (Romer, 1986 cited in Banister and Berechman, 2000: 113).

Labour market impact

The impact of enhanced accessibility, although minor compared to wage rate effects, include higher participation rates, though the increase in employment varies by employment type⁹ (Banister and Berechman, 2000: 231). Labour market and other economic impacts are often subdivided into direct, indirect and induced.

The 1987-88 enlargement of Schipol airport generated a combined indirect and induced employment multiplier of approximately 2.0 (Hakfoort, Poot and Rietveld, 2001: 603). This is only indicative as the multiplier effects estimated for different West European airports vary widely (Hakfoort, Poot and Rietveld, 2001: 598).

⁹ Executive employment is most affected, followed by technicians, administrative employment and transport employment.

Land-use and property market impact

The arguments for investing in transport infrastructure are fundamentally linked to location theory. Opposing Krugman's 'new economic geography theory,' improved access to a nearby economic core can stimulate businesses to leave the peripheral location, as employees who live there will now be able to access the core more easily and it will be feasible to deliver finished products from the core to the peripheral location: this is the backwash effect (Myrdal, 1957 cited in Schmutzler, 1999: 4). The backwash effect aside, improved accessibility leads to an increase in demand for and thus rents of land and property, and hence the prevailing land use changes according to classical von-Thünen land use theory, from agriculture, to industrial, to residential, to offices and finally to retail.¹⁰

In the case of industrial property, Cohen and Paul (2003) employ a cost function based model to estimate the impacts of proximity to airports and highways on manufacturing firms. Their main finding of interest to the present study is that, the advantages of easy access to airports and highways are capitalised into asset values. In the case of industrial property the benefits of proximity to transport infrastructure outweigh disadvantages such as noise, traffic and pollution. They suggest that for every 1% increase in highway provision there is a 0.7% increase in the (shadow) value of property (2003: 20). Lastly, they conclude that private investment is attracted to such locations.¹¹

Capital values of land and property are likely to rise speculatively when the infrastructure's planned construction is announced, while rents are likely to rise more gradually with greater increases being noted after the commencement of operation.

Flyvbjerg (2003: 66-7) breaks down the economic impacts of improved accessibility resulting from infrastructure investment into short-term, medium-term and long-term effects:

- Short-run: contribution to economic growth
- Medium-term: relocation effects
- Long-run: if land is abundant for development, further economic growth may take place; if land is not abundant the only effect will be rising land and property values.

¹⁰ The enlargement of Schipol airport between 1987 and 1998 caused a 2.3% higher rate of construction in Amsterdam centre annually, while construction in the periphery was accelerated by 4.5% per annum (Hakfoort, Poot and Rietveld, 2001: 603).

¹¹ An airport nearby raises the marginal value of additional buildings and equipment invested in by the private sector.

Rapid transit networks tend to accelerate the prevailing property market trends (Walmsley and Perrett, 1992: 127). The retail property sector has been shown to be the sector most positively affected by rail access (Bowes and Ihlanfeldt, 2001 cited in Cohen and Paul, 2003: 1) and benefit from new transport infrastructure, in terms of value, more than residential properties do (Debrezion, Pels and Rietveld, 2003).

For developers, areas around rail transit stations in the network have natural commercial advantages. Developers may thus be persuaded to contribute to the construction of rapid transit and commuter rail networks or individual stations, if they are convinced of the resolve of the government to see the project through to its completion. After its completion the developers may be able to recoup their expenses through higher rentals and capital values (Walmsley and Perrett, 1992:126).

Finally, rail transport is considered a much more sustainable mode of transport than road transport and thus not only should it be provided but airport-related staff and passengers should be incentivised to use it (Humphreys and Ison, 2004).

Aircraft noise and its impact on property values

Fig. 4: Comparison of long-term average social costs for air and highway travel

Type of cost	Air travel (\$/pkt)	Highway travel (\$/pkt)
Air pollution	0.00090	0.00370
Noise	0.00430	0.00045
Accidents (safety)	0.00050	0.02000
Congestion	0.00170	0.00460
Total	0.00740	0.02888

(Source: Levinson et al., 1998 cited in Janic, 1999: 161)

Since noise is the most important external cost of airports (Fig. 4), it has been focused on by the research summarised in Fig. 5 below. Most research has found that significant noise levels (above 65 dB)¹² result in measurably lower sale values and rentals of residential properties. At the other end of the scale, properties in extremely quiet areas (below 40 dB) may command a measurable premium. A couple of the studies incorporate the benefits of proximity to an airport in terms of accessibility and employment opportunities and in doing so find that these benefits might outweigh the noise nuisance.

¹² “The FAA [Federal Aviation Authority], as well as HUD, defines areas exposed to L_{dn} levels of 65 or over as incompatible for residential housing uses” (Espey and Lopez, 2000: 411).

Fig. 5: The impact of airport noise and proximity on house prices

Case	Proximity/ Price relationship	House price impact
Manchester (Tomkins, Topham, Twomey and Ward, 1998)	+ ?	Higher noise levels are associated with lower property prices, but other positive benefits of airport proximity such as improved access and employment opportunities might outweigh the negative attributes of noise.
El Toro, Marine Base airport (Bell, 2000 cited in Lipscomb, 2003: 260)	-	Average single-family residence near the base has a market value 27.4% less than the average price of other single-family residences in nearby areas. Price decrease does not include pricing effects caused by noise mitigation measures that individual homeowners may undertake
Seattle-Tacoma (Helmuth, Obata & Kassabaum, 1997 cited in Lipscomb, 2003: 261)	-	Proximity to the airport has a negative effect on housing prices. On average the value of a house and lot increases by about 3.4% (\$4,450 on the average valued house of \$129,900) for every 1/4 mile the house is farther away from being directly underneath the flight track of departing/approaching jet aircraft
Schipol [Amsterdam] (Theebe, 2004)		In a rising residential property market, noise levels in excess of 65 dB depress capital values by on average 5%. If properties are located in very quiet areas, below 40 dB, they might command a premium of up to 6.5%.
Hartsfield International [Atlanta] (Lipscomb, 2003: 267-8)	+	Being 1 mile further from Hartsfield International Airport lowers the selling price of a house by \$36,332.24 at the mean <i>ceteris paribus</i> or a \$9,083 decrease in the selling price of a house for each 1/4 mile on an average valued house of \$101,708, assuming a constant decrease in price per 1/4 mile... the benefits of being near a large air transportation hub outweigh the liabilities. (NB: does not include variables such as proximity to interstate highways, distance from CBD etc.)
Reno-Sparks International Airport (Espey and Lopez, 2000)	-	House prices fall as proximity to airport increases. 2.4% lower market value of homes in areas where noise levels equal or exceed 65 decibels, in Reno-Sparks Nevada, US.

International experience

Three case studies are presented in the box below. The first presents the choices made regarding the use of the site of Munich's former Riem airport after the opening of Munich 2 airport and will benefit our understanding of the use of the FAS in Elliniko. The location decisions freight forwarders and logistics companies made following the airport relocation in Hong Kong in 1997, will grant us an insight which will promote our understanding and predictions of similar companies' actions in Messogheia and around the FAS in Elliniko. The strategies employed in Singapore to attract distribution centres will enrich our understanding of the preconditions for the attraction of a whole host of economic activities to the Messogheia plain.

Uses of a former airport site - Riem airport, Munich, 1992 (Avgouropoulou, 2001: 103)

The 562 Ha plot, similar in area to the 530 Ha FAS in Elliniko, was to be used as follows.

Land use	Area (Ha)	Proportion of total area (%)
Green/open space	265	47.1
Residential	110	19.5
Offices	80	14.2
Exhibition space	65	11.5
Special uses	18	3.2
Super-regional uses	12	2.1
Surrounding space	9	1.6
Built-up zone	3	0.53
<i>Total</i>	<i>562</i>	<i>100</i>

(Source: Avgouropoulou, 2001: 103)

The redevelopment zone is expected to become home to 30,000 new residents and to create 13,000 new jobs. High quality housing was prioritised. 40% social housing, 30% subsidised for low-income earners, while 30% is to be sold at market prices.

Airport relocations and freight forwarders' and logistics companies' location decisions - Kai Tak closure and relocation to Chek Lap Kok, Hong Kong, 1997

In August 1997, despite the fact that the CLK airport would start operating in a few months, the majority of forwarders were still using a wait-and-see strategy (57.5%). They were waiting for different things: the actual impact of the CLK airport on operations, more information possible warehouse locations, and the decisions of their peers for reference. Some might also be bounded by their current rental contracts.

(Wan, Cheung, Liu and Tong, 1998)

The opening of the new airport at Chek Lap Kok in 1998 triggered a number of warehousing and logistics operators to relocate from East Kowloon to Kwai Chung and Tsuen Wan areas. On the property front, the completion of the new airport has actually generated additional demand for quality industrial premises. This in turn has been reflected in the general growth in rental values... Growing demand for logistics functions from overseas and established domestic logistics operators is expected to translate into the demand for more logistics space in the industrial property market.

(Colliers International, 2004: 17-18)

Jones Lang LaSalle (2004: 5) notes the attraction of warehousing and logistics tenants to Kwai Chung, near the container port and with good access to the airport. Warehousing companies found half-way relocations a wise choice (Wan, Cheung, Liu and Tong, 1998: 206).

Strategies and policies for attracting distribution centres – Singapore, 1981 (Mark Goh)

The case of Singapore's airport relocation project highlighted the vital importance of the quality of area's transport infrastructure and its strategic development for attracting distribution centres (Mark Goh, pp 189; Phang, 2003).

Phang (2003: 29) emphasises the Singapore government and Changi airport strategy of "investing in capacity far in advance of actual need... to maximise long run growth." Changi airport opened in 1981 with a capacity of 12 m passengers per annum. Long before the first terminal approached its saturation level, the construction of terminal 2 began and was completed in 1990, raising passenger traffic capacity to 24 m p.a. Subsequent extensions to terminals 1 and 2 and the construction of terminal 3 beginning in 2000 (to be complete in 2006/7) will raise capacity to 64 m p.a. (Phang, 2003: 29). In addition, "it was felt that the MRT [Mass Rapid Transit] system would improve competitiveness in attracting the kind of higher value added investments desired by Singapore" (pp 29). "The explicitly stated target was to have 'as high a percentage of trips on a quality public transport system as Zurich,

where 75% of the trips into the city center are by public transport” (Phang, 2003: 30).

“The MRT had a significant impact on the spatial structure of the city – delivering workers not only to the center but also to some of the areas of employment that have grown up in outlying areas. It also made feasible the development of high-density new towns in outlying areas that would have been considered remote if not for the MRT” (Phang, 2003: 31).

Singapore’s success in attracting distribution centres has been a result of an integrated, dedicated, long-term effort to provide all the pre-conditions, conditions and incentives necessary (Mark Goh, 189).

Some of the main incentive measures implemented included the creation of:

- Free trade (tax-free) areas around the air freight centre
- Logistics parks were established close to the airport
- Good intermodal connectivity, e.g. to the port

An electronic paperwork process, known as *Trade Net*, has dramatically reduced the cost in time of red tape. This has been extremely beneficial as 40% of Singapore’s total imports are re-exported. 90% of sea cargo can be cleared by customs within 8 minutes, while 90% of air cargo can be cleared within 14 minutes.

5 The impact of the relocation and the planning reaction

The Regional Development Institute study and proposal (1995-1998)

Planning for the impact of the relocation on the Messogheia Plain began only in 1995, one year before construction commenced and just six before the inauguration of the airport. The impacts of the relocation were being felt before the planning for them had begun.

In 1995 the Regional Development Institute (RDI) of Panteion University was commissioned by the ORSA to produce a study of the EV airport area over the 1995-2020 period. This study presented the anticipated impact of the relocation and proposed planning measures to regulate it.

Alternative organisation scenarios suggested by the RDI

1. The *continuation of 1996 development tendencies* would lead to haphazard, linear, non-sustainable development along transport corridors. The problems of the former airport's area and the Athens basin would be repeated (Konsolas and Karaganis, 1996; TA NEA 24/4/1999).
2. *Limitation of 1996 development tendencies*
3. *Development distributed between the urban centres around EV* – Polycentric structure would be maintained and developed with orbital roads invested in to link the nodes.

The RDI (1996) proposed the pursuit of the third scenario, which would require the "restricting, shrinking or transposing" of 1996 urban development trends, the provision of the infrastructure necessary for regional development to take off, and the spatial concentration of similar economic activities

The RDI planning proposal delineated primary and secondary residential areas and proposed the incentivisation of businesses to locate or relocate to specially organised and serviced locations,¹³ (Loukakis, 2001). A “zero development” ASPZ (Airport Security and Protection Zone) meant to provide security to the airport and to mitigate the impact of aviation hazards, noise nuisance and low-level pollution on surrounding areas, was also proposed.

The Messogheia Urban Development Control Zone (MUDCZ) (2003)

Five years of formal and informal consultation led to a new UDCZ being legislated in 2003, two years after the inauguration of EV and nine years after the construction contract was signed in 1995. The MUDCZ supersedes the Attica UDCZ (pp 2) for the Messogheia plain.

Two important departures from the RDI proposal were made in the MUDCZ. First, the GTPs were extended significantly further than the RDI had suggested. This made the RDI's priorities harder to achieve.¹⁴ Second was the choice not to incorporate the ASPZ, with the argument that the existing Restricted Development Zone (RDZ)¹⁵ in conjunction with the Vravra archaeological protection zone would have the same net effect. Offices, commercial, industrial and warehousing uses are not allowed in this RDZ. Surprisingly, residential land uses, which are most likely to be disturbed by excessive noise, although not nominally allowed, may arise in the RDZ through exceptions (Karka, Sapountzaki and Wassenhoven, 2000: 10).¹⁶

The economic impact of EV international airport in Messogheia

Improving access to the Messogheia since the 1960s released latent tendencies for urban expansion (OECD, 2004; Romanos, 2004). As predicted by classical von-Thünen land use theory, rents increased accelerating the land use transition, from a primarily agricultural pattern to one that is mainly urban.

¹³ Industrial, retail, warehousing and logistics, business, business services and technology parks (RDI 2, 1998: 15).

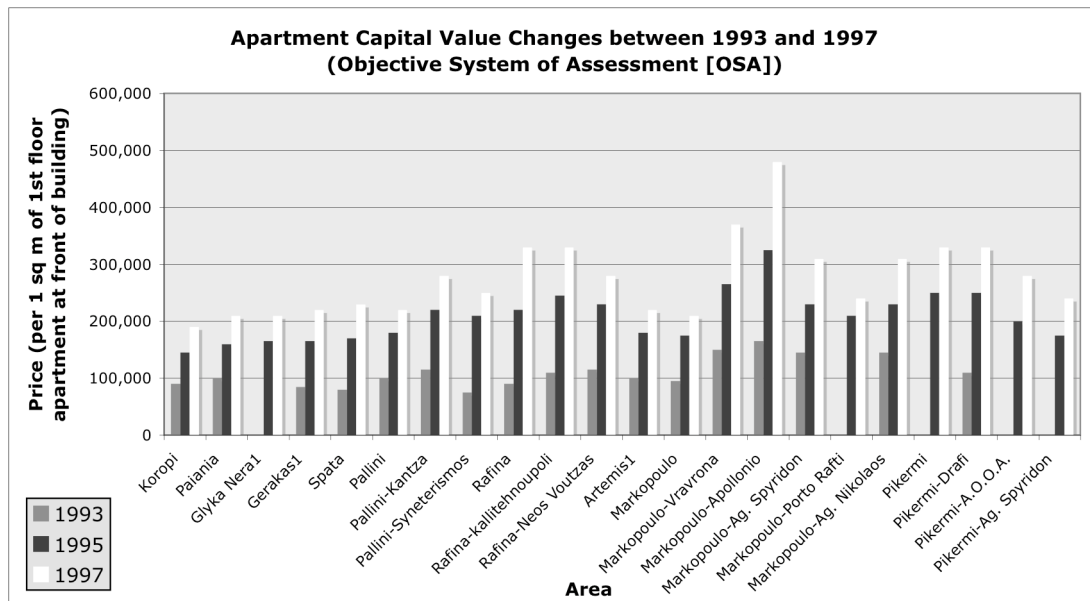
¹⁴ Based on its proposed GTP extensions, the RDI predicted the population of Messogheia would rise from 132,000 in 1996 to 300,000 in 2020 (RDI, 1998: 12). The larger GTP extensions included in the MUDCZ mean the population is now expected to exceed 500,000 in 2020 (Loukakis, 2004).

¹⁵ Defined in the Airport Development Agreement (ADA)

¹⁶ “Even the definition of the Restricted Development Control Zone was a result of the Airport Company’s will to avoid disturbances from urbanisation in the surrounding area” (Karka, Sapountzaki and Wassenhoven, 2000: 13).

Land uses intensification has also been a result of substantial agglomeration economies related to the proximity of an educated labour force and now the anticipated potential for businesses to share new transport infrastructure and to benefit from shared business service provision.¹⁷ The educated labour force predated the rapid urbanisation observed since the mid-1990s. Thus, Krugman's 'new economic geography' prediction, that improvements in transport infrastructure accelerate economic convergence, has been demonstrated.

Fig. 6: Capital values per sq m of apartments in Messogheia between 1993 and 1997



(Source: Sidiropoulos, 1998: 14)

Similar increases in capital values to those in Messogheia (Fig. 6) only began to be observed in the rest of the Greater Athens area after 1995. In Messogheia, land values rose by more than 330% and apartment prices by more than 125% between 1998 and 2003 in anticipation of EV's opening (Manolas, 2003: 20; Fidikakis, 2003: 21; Kotsikopoulos, 1998: 43).

The temporary effect on the demand side of the economy appears mainly in the employment of 3,500 people during construction, while the non-temporary effects include the employment of 14,000 people from the commencement of operation (www.aia.gr). If, as planned, EV is extended and achieves passenger traffic of 23 m p.a. in 2020, employment at the airport may be expected to reach 30,000.¹⁸ A combined indirect and induced employment multiplier of 2.0 was predicted in 1998 (Schill, 1998: 56 cited in Karka, Sapountzaki and Wassenhoven, 2001: 13) (Fig. 7). The jobs created in and around EV represent economic growth for the

¹⁷ The faltering of the project meant that people only started to act upon their intentions when the contract for EV's construction, which also made reference to the AO's construction, was signed in 1995.

¹⁸ In its first year EV registered a ratio of 750 passengers to each employee. If passenger traffic increases to 23 m in 2020 (Konsolas and Karaganis, 1996: 13) EV may employ 30,000 people in that year.

Messogheia plain and its municipalities, although in essence they may, in part constitute a transfer of jobs from in and around Elliniko AIA.

Fig. 7: Population and employment change in the Messogheia plain

Year	1996	2020	2020*
Population of the Messogheia plain	132,000	500,000	222,000
People employed in the Messogheia plain residing in the same area	40,100	152,000	67,000
People employed in the Messogheia plain residing in the Athens metropolitan area		68,400	
Total employment in the Messogheia plain		≈ 220,000	

*Counterfactual: if EV had not been built in the Messogheia plain
(Source: Konsolas and Karaganis, 1996: 12; RDI 2, 1998: 12; own processing)

Property market and spatial development impacts in Messogheia

Owing to Messogheia's constrained location, land and property values are expected, to continue to increase more swiftly than in the rest of Greater Athens (Romanos, 2004: 180; Flyvbjerg, 2003: 66-7).

EV and the AO have led a wave of development around Athens. The port of Piraeus is to become a dedicated cargo port and intermodal transfer point to road and rail networks. The port of Lavrion is to take over as Athens' primary passenger port (Sidiropoulos, 1998: 5). The RR network is being extended northeast to Chalkis, southeast to the port of Lavrion and has already reached west to Corinth: Athens is developing commuter towns and an East Attica development corridor is emerging.

The RR is one of the most positive aspects of the airport relocation project for the urban future of the Messogheia plain (Sarigiannis, 2001: 55), since the construction of more roads is unsustainable, leading only to more congestion (Banister and Lichfield, 1995; Banister and Berechman, 2000).

In the property market, if rapid, focused and organised development is to take off in the "parks" legislated, the importance of development and location incentives cannot be emphasised enough. Note should be taken of the under provision of high-speed ICT and even of basic infrastructure such as drainage and electricity and the poor maintenance of local roads. Combined with the dearth of measures to eliminate bureaucracy and provide incentives such as those implemented in Singapore to attract distribution centres, the attractiveness of the area for business and research interests, the stated goal according to the RDI and the MUDCZ may be compromised.

If these infrastructure deficiencies are overcome, incentives are offered to businesses and the MUDCZ is implemented, the current property boom in the area can be expected to continue.

The residential sector can be expected to do well in the northwest of the plain. The northeast will suffer the greatest noise nuisance. The southeast coastal areas should do very well out of the relocation, benefiting from greatly improved accessibility and not suffering much noise nuisance.

Undisturbed by noise, the industrial sector can be expected to excel in Koropi and Markopoulo benefiting from AO and RR access. If the infrastructure fundamental for industrial development is installed, one can expect the greatest industrial property values and rentals to emerge in the *industrial parks*: south of Koropi; between Koropi and Peania; and between Pallini and Pikermi.

Enhanced accessibility, large Greenfield plots and a growing population stand to cause a booming of the retail sector in the centres of settlements. The success of the retail park on the airport site¹⁹ bodes well for the retail parks of the MUDCZ provided they are also accessible by RR and metro.

The Peania office park is set to witness the greatest demand and values as it has direct access to the AO and RR/metro, is the closest to Athens and is furthest from the EV's noise footprint. However the other office parks south of Markopoulo, between Koropi and Peania and the two to the north of Spata also stand to do very well as offices are relatively insensitive to noise. Greenfield office locations, with poor infrastructure provision, particularly ICT, and few economic incentives are a risky venture compared with locations in one of the secondary Athens CBDs (Walmsley and Perrett, 1992: 128).

Airport-related office occupiers in Elliniko have not moved to Messogheia after 1995 as expected. Office occupiers similarly to freight forwarders in Hong Kong in 1997, have been following wait-and-see strategies and preferring half-way relocations within the Athens basin to areas with good access to EV, such as Messogheion and Kifissias Avenues (Kostikopoulos, 1998: 43; TA NEA, 24/4/1999: I32). Warehousing and logistics companies have been following the same strategy preferring to remain along Vouliagmenis Avenue or in

¹⁹ It is within EV airport's remit to develop specific parts of the airport site to stimulate development in the region.

Thriassio Pedio.²⁰ Relocating to Messogheia entails a number of uncertainties and disadvantages: the area lacks infrastructure and toll charges on the AO are a substantial cost.

Developers of the business, technology and innovation parks could contribute to the construction of RR/metro interchanges or to the integration of the stations into the parks in exchange for “air rights” allowing them to construct above a station (Walmsley and Perrett, 1992: 129).

The creation of a quasigovernmental local development agency²¹ to undertake the arduous task of consolidating land and property titles and acquiring pre-approval for developments (Walmsley and Perrett, 1992: 129, 136) and facilitating cooperation between businesses (Sapountzaki and Karka, 2001: 424-5) could stimulate development in the business parks. This agency could also stand for local interests in negotiations with large developers.

The redevelopment of the Former Airport Site (FAS)

Athens is among the world’s capital cities with the fewest square metres of communal green space per inhabitant.²² Article 9 of the 1995 Airport Development Agreement (ADA) stipulates that the majority of the FAS is to be converted into a Green Metropolitan Park after the relocation of AIA. Despite this during the 1995-2002 period the FAS was facing great development pressures to maximise its commercial exploitation (Koumoundouros, 2001; Biris, 1995 cited in Caves and Gosling, 1999: 361).²³ Others argue that more densely populated neighbourhoods stand to benefit much more from a park than the Elliniko area. These pressures attracted heavy criticism from planners, architects, environmentalists, local municipalities and the inhabitants of the area. Although the “park lobby” has been led by political and social, rather than planning and economic arguments, through support in numbers it has been remarkably effective.

²⁰ Thriassio Pedio is emerging as the principal intermodal freight and cargo interchange offering access to the P.A.T.H.E. motorway, the AO and the RR and thus gaining access to Eleftherios Venizelos airport and the port of Piraeus. This parallels the pattern observed in Hong Kong where warehousing and logistics tenants have been attracted to Kwai Chung, near the container port and with good access to the airport (Jones Lang LaSalle, 2004: 5).

²¹ Quangos and development agencies have been successful elsewhere in attracting distribution centres (Goh: 202); promoting business agglomeration; acting as liaisons between the government and non-government agencies; and, in some cases, in the field of rural development (Sapountzaki and Karka, 2001: 420). Stakeholder committees representing a number of local authorities have effectively defended local interests against powerful development pressures in the hinterland of Baltimore/Washington airport (Sidiropoulos, 2008: 6).

²² Just 2.5m², compared with 12m² in London and 50m² in Washington DC.

²³ ECOACTION showed that over a 4-8 year horizon, the social benefit of a green park covering the entire FAS would exceed the private benefit of selling it for development. However, unless a market is created (where the social cost is assigned to a group of actors in the economy, as with CO₂ emissions-trading) such theoretical results will remain theoretical (Koumoundouros, 2001).

In 2001, the MEPPW announced an open international tender for designs for the future use of the FAS, with the specifications that they should incorporate a large metropolitan park, a convention/exhibition centre and cultural/sporting facilities. DZO Architecture, Philippe Coignet, Ryosuke Shimoda and Erwin Redl submitted the winning tender (www.minenv.gr/hellinikon-competition).

In the run-up to the Athens 2004 Olympics, the regeneration of the FAS was deferred until after the games. The southern seaboard from the Aghios Kosmas sporting complex on the seaboard in front of the FAS north-westwards towards Piraeus, for the Olympics incorporating various sports venues. Several of these venues including the softball and canoeing facilities were constructed on the FAS. A tram network was constructed in the 2003-4 period granting access to the FAS and Faliro from central Athens along the coast. Metro line 2 is being extended south-eastwards and is planned to reach the FAS in 2009, making the site accessible from the centre of Athens in 14 minutes.

The debate as to the future of the FAS was in deadlock until after the Olympics. In early 2005, the winners of the 2001 design tender were invited to prepare an updated in-depth plan. Of the total 530 Ha, 100 Ha (20%) will be sold for luxury residential development,²⁴ the revenues from which are to be used to establish a 400 Ha²⁵ (75%) metropolitan park and a number of smaller parks in other Athenian municipalities lacking green space. The remaining 30 Ha, comprised mainly of the old east terminal and customs warehouses, under the management of *Greek Tourist Real Estate S.A.* since 2001, are to be converted into a convention/exhibition centre and luxury hotel. The exploitation of the Olympic sports facilities is the responsibility of Olympic Real Estate S.A.²⁶ The proportion of green space to the total area of the FAS is well in excess of that in the case of Munich Riem's redevelopment. Of course the priorities in each case were different: in Munich the site was to become a semi-autonomous satellite settlement for the city of Munich.

The proposed establishment of *ad hoc* agencies to take over Elliniko park project and other regeneration projects across Athens, such as the regeneration of Elaionas industrial district (NTUA, 1998), is a first for Greece (Sapountzaki and Karka, 2001: 422).

²⁴ Unlike the case of Munich's Messestadt Riem airport redevelopment where both expensive and affordable housing were provided (Avgouropoulou, 2001: 104).

²⁵ Making it the largest park within an urban area in (Daliani, 26/3/2005: N18).

²⁶ (Sources: www.in.gr/news/article.asp?IngEntityID=611021; www.business2005.gr/eC_NewsItem.asp?id=10900&Ig=GR; Paschalidou, 22/03/2005)

Observed and anticipated property market effects around the FAS

From the ceasing of airport operations, the creation of a park on a substantial portion of the FAS and the regeneration of the Saronic waterfront, we can safely anticipate a number of effects. The hazard, noise nuisance, low-level pollution and road traffic caused by the airport have been removed, (Janic, 1999).

The relocation of the airport away from Elliniko will likely make the municipalities bordering on the site more desirable locations at least for residential and commercial property. Thaka and Mavrogonatou (2002: 142) predict rises in house prices by between 5.9% and 18.9% in the municipality of Elliniko depending on whether 25% or 80% respectively of the FAS is developed into a park.

Even though apartment prices in the four municipalities bordering on the FAS increased by on average 84% between 1998 and 2001 partly as a result of a booming property market in general and partly in anticipation of the airport's closure and the regeneration of the area for the 2004 Olympic Games (Fig. 22), demand for residential property is expected to increase yet further beginning in 2005 (MEPPW, 2001). Small increases in values are expected even in the municipalities of Faliro, Glyfada, Voula, Vouliagmeni, Varkiza, and Vari, already amongst the most expensive areas in Greece and, apart from Glyfada, not immediately adjacent to the FAS. The greatest increases in values are expected in the municipalities of Elliniko,²⁷ followed by Alimos and Argyroupoli, where although values almost doubled in the 1998-2001 period they remain at significantly lower levels than those recorded in Glyfada. The residential property sector in these municipalities depends most closely on the nature of the FAS redevelopment. Capital values in Elliniko are anticipated to reach comparable levels to those in Glyfada (Thaka and Mavrogonatou, 2002: 142).

Fig. 8: Changes in population and residential property values around the FAS in the 1990s

Municipality	1991-2001 Population Increase	1998-2001 Residential Price Increase	Neighbourhoods within municipality with relatively low residential prices*
Elliniko	13.8%	83.2%	Northeastern Elliniko
Alimos	19.3%	74.1%	Kalamaki, Ano Kalamaki and Trachones
Argyroupoli	5.6%	92%	Kato Argyroupolis and close to boundaries with Ilioupolis and Elliniko
Glyfada	26.1%	84.9%	Terpsithea, Ano Glyfada

*These are the neighbourhoods likely to see the greatest increases in residential property prices as a result of the amelioration of the living environment resulting from the relocation of AIA, the potential creation of a Metropolitan Park, the regeneration of the waterfront and the improved access to the area by tram and metro. (Source: MEPPW, 2001 own processing)

²⁷ 83% of Elliniko municipality is part of the FAS, compared with 10% of Alimos and 5% of Argyroupoli, the last also being a rather densely built area without access to the seafront.

The retail and office sector is experiencing higher than usual vacancy rates. However, retail is expected to do particularly well out of the FAS redevelopment in Argyroupoli. Neighbouring Glyfada already has a more developed retail sector. Alimou Avenue, linking the coastal Posidonos Avenue with the inland Vouliagmenis Avenue is expected by the MEPPW (2001) to continue to rise in retail importance, despite showing 50% retail land use already, and has over the last couple of years been attracting much construction activity, particularly at the intersections with Posidonos and Vouliagmenis Avenues, as there are still plots available. In addition it lies between the metro line to arrive in 2009 and the existing coastal tram line, and thus stands to benefit substantially.

The section of Vouliagmenis Avenue just before the FAS on the way out of central Athens is expected by the MEPPW (2001) to continue to show moderate retail intensity, with a small number of hyperstores benefiting from good road access. The section of Vouliagmenis Avenue leading from the FAS further out of Athens is the most expensive and has the advantage of passing through high-income areas (MEPPW, 2001).

The currently declining property market is doing worst in the office sector because of overinvestment in new office space over the last five years. Vacancy rates are high and rents and values have dropped noticeably (DB Real Estate, 2003: 6-8). Airport related office occupiers began to move since 1995 from Posidonos and Vouliagmenis Avenues to Messogheion, Kifissias and other locations in the Athens basin with good access to the new AIA. Offices on Vouliagmenis however, are finding new occupants as many large office occupiers, such as shipping companies, are moving out of Piraeus in search of newer office stock with better access by car. The MEPPW (2001) expects Vouliagmenis Avenue to be competing in the office sector with the secondary CBD of Kifissias soon.

Decline can only be anticipated with some certainty in the logistics, warehousing and freight property sector. This sector is still showing some resilience along Vouliagmenis Avenue but competition can be expected to convince companies to relocate in the medium to long-term, whether to the Messogheia plain or Thriassio Pedio.

6 Conclusions

Numerous large infrastructure projects of the last decade are transforming metropolitan region. The project to relocate AIA, together with the AO and RR links to the rest of Attica, has been the most significant of these infrastructure projects for spatial development at all scales.

The replacement in 2001 of the airport at Elliniko by a state-of-the-art facility with a passenger and freight capacity well in excess of current levels agrees with the long-term strategic goals of the Attica RDP 2000-2006, namely national and metropolitan economic growth, as well as promoting Athens as the gateway to Greece and the eastern Mediterranean and as a Global City.

In Messogheia the residential property sector can be expected to continue to do well in the northwest of the plain and on the southeast coast. The northeast coast is likely to suffer from noise nuisance affecting values and rents. The industrial sector is likely to do very well around Koropi and Markopoulo, benefiting from excellent intermodal access to the airport, the ports of Piraeus and Lavrion and the motorway and rail networks to the rest of the country. Office occupiers directly or indirectly related to the airport have preferred half-way relocations since the late 1990s. Office sector growth based on the location in Messogheia of large corporate headquarters hinges on the provision of excellent ICT infrastructure, far from the case at the moment. Retail has been the most successful of the property sectors in Messogheia since the relocation. More retail development of this nature can be expected along the length of the AO and RR, particularly at RR stations if incentives and infrastructure are provided. The relocation of freight and logistics companies to Messogheia has not been as marked as anticipated, owing to the lack of infrastructure and the cost of tolls on the AO. Maintaining existing facilities is an attractive alternative.

Around the FAS, in the municipalities of Elliniko and Alimos the residential property sector is likely to rise to among the most expensive in southeast Athens. The luxury housing to be constructed on 20% of the FAS will contribute to the residential sector boom. Retail is expected to continue to do well along Posidonos Avenue and increasingly well on Alimou Avenue benefiting from access by tram and in the latter also by metro from 2009. Having suffered the worst of the property market downturn over the last couple of years, the office sector will pick up along Vouliagmenis Avenue as occupiers of old, poor quality offices in inaccessible Athens neighbourhoods seek better accommodation. Freight and logistics companies will continue to move to areas that are better intermodally connected.

Chronic weakness of the Greek planning system to legislate and enforce comprehensive plans and to limit urban expansion may be endangering the urban future of Messogheia, as well as hindering its economic take-off. Delays in planning and legislation are particular problems since the spatial and urban development effects of large infrastructure projects, thus take hold before the instruments are in place to regulate them.

What can the AIA relocation project learn from and contribute to international experience? Maybe the clearest lesson has been that just as in Hong Kong freight, logistics and warehousing companies take into serious consideration factors other than the location of international airports, such as well-connected intermodal exchanges, as proved by wait-and-see strategies and half-way relocations. Second, the hope to facilitate the development of the Messogheia plain concentrating activity in organised, serviced locations requires not only stringent enforcement of planning rules but also the employment of inventive economic incentives and the use of non-governmental development authorities, such as have been used in Hong Kong and Singapore. Third, the assertion that strategic investment in new transport infrastructure can accelerate a region's economic development is being supported. Hopefully, in future the upgrading of travel infrastructure such as extensions to EV airport and the RR network will take place with foresight in advance of the saturation of existing facilities, as in the case of Singapore, raising long-term economic growth rates. Finally and on a more optimistic note, the anticipated redevelopment of approximately 70% of the FAS as a metropolitan park suggests that sustainability priorities can stand up to development pressures even under the adverse planning conditions that have prevailed in the recent past in Greece.

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