

Title: The Metro of Athens as a Complex and Wicked Planning

Problem of a Megaproject: the siting of some stations

Author: PANTOLEON SKAYANNIS

Source: Forum A+P 29 | Planning in the Polycrisies era

ISSN: 2227-7994

DOI: 10.37199/F40002902

Publisher: POLIS University Press

THE METRO OF ATHENS AS A COMPLEX AND WICKED PLANNING PROBLEM OF A MEGAPROJECT: THE SITING OF SOME STATIONS

PANTOLEON SKAYANNIS

University of Thessaly

Abstract

This paper investigates the physical planning issues related to the siting of stations on the Athens metro lines. Considering issues of problematic or conflictual siting that had arisen during the planning of the first phase of the metro (base project), it focuses on two current acute issues (of the metro Line [4]), those of the location and form of the Exarcheia and Evangelismos metro stations. Trying to see the problems under the light of mainly eco-environmental and social sustainability in combination with certain approaches to planning, such as those that utilise the concepts of wicked planning and clumsy solutions (Hartmann, 2012), and the discourse on mega projects and the complexity, uncertainty, and risk inherent in them (Dimitriou, 2014), would be instrumental. The intertwining of these concepts leads us to understand the deeper essence of the problems. The paper argues that if and whenever a solution is attempted, this never-perfect solution should at least be based on extensive consultation with all stakeholders, and that the course of such design events should be recorded to ensure institutional memory.

Methodologically, the paper is the product of many years of research on mega projects in Greece and internationally. This research is qualitative, based on discussions and interviews with stakeholders and key figures associated with the projects, as well as on events recorded in the mainstream electronic

and print media. The result of this research derives from the intersection of the conclusions of our previous extensive research on the Metro base project (OMEGA Centre 2012) and the research into the current real issues of Line [4] planning.

One of the research key conclusions is that there is an inherent negation in the Greek planning system to conduct substantial communication with the stakeholders if it is expected that they are going to ask 'difficult questions' or oppose a project. This runs in parallel with insufficient appraisal of the projects, especially in certain aspects of their eco-environmental and social dimensions. As solutions provided are 'over' clumsy, this results in a vicious cycle of problems leading (at least) to project delays.

From this research, it is highly recommended that future projects in Greece and internationally should utilise strong consultation procedures, and/or suitable forms of participatory planning or decision-making, and comprehensive appraisal so that they save time and resources and be more eco environmentally and socially sustainable and useful.

Introduction Wickedness and Complexity in Mega Projects

Every form of planning is 'inherently wicked' (Rittel and Weber, 1973: 160). If one looks at the ten reasons why planning is characterised as wicked by the above authors, one can conclude

that this is because the difficulty of the problems is mainly due to their social dimension (ibid) where the theories, approaches, and policies for dealing with social aspects of planning (especially its impact) are dependent on the subjects which stand against the process and the object of the application (of planning), and the position from which they are expressed. That is, in essence, from the *Weltanschauung*. This, in my opinion, is the source of the different rationalities invoked by Hartmann (2012) elaborating in his way on the now classic text of Rittel and Webber (ibid). The different rationalities reflect fundamentally different social values, expressed in types of organisations reflecting types of cultural bias (Douglas, 1999) and, of course, the consequent goals and policies. But policies are essentially proposals for the future, and each social group has its vision for the future and its futurist narrative. In this sense, the context can assume multiple dimensions and can be understood differently by different players. The various narratives rooted in the multiple understandings of the contexts indicate, amongst other things, the existence of uncertainties for the future.¹

And if spatial planning is 'inherently wicked', it [seems] also to be inherently complex. This is not only because of the uncertainty it entails as a future situation but also because different logics develop in its context and different conditions appear. It is also because, in large spatial planning projects, we encounter characteristics of complexity, such as those defined by theories for complex systems. These include a) unpredictable behaviour (Snowden and Boone, 2007, p.3, 6; Chester and Allenby, 2019, p.7; Oades, 2008, p.12-14), e.g., of eco-systems; b) social groups, markets, qualitative transformations, e.g., a technical problem develops into a social problem; c) emergent issues/emergent changes (Snowden and Boone, 2007 p.7), e.g., while a project is carried out, new goals become necessary; d) and not clearly defined solutions of generated problems or lack of solutions (infinite solutions), e.g., in resolving traffic problems in a congested city (Snowden and Boone, 2007; Chester and Allenby, 2019; Oades, 2008, p.12-14). All are closely related to the issue of 'unknown unknowns' (Kurtz and Snowden 2003, P. 468; Snowden and Boone, 2007, p.6) which figures as the fundamental characteristic of a complex context. In parallel, there are other key characteristics of complexity, such as simultaneous order and disorder, heterogeneity, chaos, and nonlinearity (Kurtz and Snowden 2003; Esposito and Terlizzi 2023). The interaction of independent factors in various ways creates uncertainty and risk (decision risk), e.g., in environmental issues.

These states have a close connection/relationship with the ten qualities of wickedness.² For example, the issue of qualitative transformations (e.g., a technical problem develops into a social problem) that characterizes complex planning problems/projects is linked with the fact that solutions to wicked problems are not true-or-false, but good-or-bad (since the measurement of social issues depends on the perspective – and archival

values – of what is measured). It is also connected to the fact that every wicked problem can be considered a symptom of another problem, characteristic of the domino of qualitative transformations and their development, as a result of differentiation. The last two are the 3rd and 8th characteristics of wicked planning, according to Rittel and Webber (1973).

My argument is that if planning, in general, is both complex and wicked, then the planning of **mega projects** will be complex and wicked par excellence, not only because it is planning, but also because the **mega projects** are complex and wicked.

In terms of complexity, mega projects:

Constitute rapidly changing environments and present fragmentation of objectives (difficulty of concurrent service), emergent issues, complex objectives, and sub-projects (Chester and Allenby, 2019).

Create unintended consequences that violate the **iron triangle** (law) in their socio-economic environments (Flyvbjerg et al., 2003; OMEGA, 2012; Flyvbjerg, 2017; Lehtonen, 2014; Gil, 2023).

Involve an abundance of uncertainties due to duration and evolving contexts (Oades, 2008; Flyvbjerg, 2023).

Due to the various groups of stakeholders, there is an interaction of factors that create contingencies, uncertainties, and conflicts (Esposito and Terlizzi, 2023).

In terms of 'wickedness', megaprojects have the following characteristics:

As intermediate goals and problems emerge, their complexity (to be solved) does not allow finalization of the solution.

Their effect or impact cannot be measured, compared or assessed (especially versus other solutions).

They are one-shot ventures.

To a large extent, mega projects are unique (Flyvbjerg, 2023) (not all, and under certain conditions, especially their multifaceted impacts).

They are parts of a sequence of complex problems.

They touch the social field that is eminently wicked.

The choices are usually made ad hoc and determine the solutions.³

So, we have the mega projects, the planning of which is both complex (in terms of the non-technical aspects, which are just complicated) and wicked.

In the next section, I will examine the Athens metro based on the above theoretical assumptions.

¹ See, for example, Low and Sturup (2013) for the significance of different storylines about the understanding of success of the Sidney Cross City Tunnel.

² There is a vast literature on 'wickedness' and 'wicked planning'. Among else see Crowley and Head, 2017; Head, 2022.32

³ See Strategic misinterpretation and other behavioural biases in Flyvbjerg, 2021.

The Metro of Athens: The Exarcheia and Evangelismos Stations

The assumption is that the metro of Athens is a mega project. This is evidenced by the fact that the base project cost \$4.61 billion. In parallel, it must be noted that the base project completed in April 2003 (a year before the Athens Olympics of 2004) served 20 stations with a total route of 17.6 km on Lines 2 and 3 that run through the centre of Athens and are connected to the pre-existing Line 1. The lines operated in three stages in 2000 and 2003. They were built 100% with public expenditure (of the European and Greek public, regardless of whether it was directly or through borrowing) (Skayannis, 2021:49; Kaparos and Skayannis, 2015). Now, the metro system of Athens consists of 47 stations (71 including the pre-existing Line 1 and counting the five interchange stations twice), with a network of 90.1 km, while Line 4 is under construction (due in 2028) and will comprise 15 stations, be 12.8 km long and will cost more than 1.5 billion \$. New extensions are already being planned, so the whole of Line 4 will reach a total length of 38.2 km with a total of 35 stations (<https://www.emetro.gr/?lang=en> and https://en.wikipedia.org/wiki/Athens_Metro).

Here, I will analyse the matter from the point of view of the siting of the stations of Exarcheia and Evangelismos (Line 4), focusing on the complexity and wickedness of the problems caused by them vis a vis the siting of these two stations already under construction. I will mainly refer to the social dimension, focusing on urban dispute/conflict with reference, where necessary, to its relationships with the other dimensions.

The Stations of Exarcheia and Evangelismos

EXARXEIA

Exarcheia is an old middle-class district of Athens, which, since the end of the 19th century, has developed into a haunt of intellectuals from the interwar years onwards, but especially during its recent history (mainly after 1974). In specific, its Square, where the station is planned, has been a point of activity for the youth, and mainly for extra-parliamentary left-wing organisations, anarchist groups, and a place of frequent clashes with the police to this day. This tradition is also related to the nearby presence of the School of Architecture of the National Technical University of Athens (NTUA).

The problem that has arisen is the location of the metro station in the Square, and it is as follows: According to N. Belavilas and N. Mylopoulos⁴, since the initial planning of the metro, the location of the station in Exarcheia was foreseen (at that time in a future Line, now Line 4). The public consultation process for the project lasted from 02/02/2017 to 06/10/2017, with no serious objections raised. In 2018, with the approval of the Environmental Impact Study, Exarcheia Square was announced as the precise location. Then, the first discussions and

reactions about it began. In this context, the ‘Anaplasti Athinas SA’ (Regeneration of Athens SA⁵) raised the issue of the station with Attiko Metro (AM⁶), and elaborated four scenarios for its location, concluding with its choice in May 2019, which was to move the station closer to the Archaeological Museum and the NTUA (intersection of Tositsa and Bouboulinas streets) two minutes away from the Square, on foot. The proposal was submitted before the public tender, and the proposed relocation did not present major technical problems. It certainly would incur some cost, but this would not be the first time in the history of the construction of the metro. Although the proposal was submitted after the public tender and while the process was ongoing, the planning at this level could still be modified. AM agreed with the proposal and was already working in this direction. However, the change of Government on July 7, 2019⁷ effectively cancelled the above actions and finalized the station in the original location, i.e., on the Square. Since then, the reactions of many intensified, which continued until recently (see interview of N. Belavilas in *Avgi* on 07/11/2023 and personal interview with N. Belavilas and G. Mylopoulos).

The reactions took many forms, including institutional with appeals to the Council of State (CoS), such as that of October 26, 2022, lawsuits, dynamic with rallies, demonstrations, and even clashes with the police. All were expressed in various phases of the subsequent effort for the project against the preliminary works (preparation of the field). However, it is characteristic that the most intense forms of reactions did not occur until construction was attempted to begin in 2021. As early as the beginning of the summer of 2021, the first crews that attempted the exact topographical mapping of the field were chased out by bystanders, and it was impossible to start the work until March 2022.

In fact, in August 2022, when a new intervention was attempted, a protest was organized by the Committee for the Defense of the Exarcheia, which led to police intervention. The work started suddenly at 4:30 in the morning, guarded by the police amid protest rallies (*Kathimerini*, Lialios, 10/8/2022). This was followed in November 2022 by another appeal to the Council of State by 50 residents, with a request to stop the execution of the project for environmental reasons, an appeal which the Council declined. In the meantime, a new suspension of works took place in May 2023 with another appeal to the Council of State. The trial was set for the end of September 2023 and resulted in saving the trees for the time being. It is important that to calm the situation, AM announced an architectural competition for various public squares and the areas of 7 stations among which Exarcheia. On October 30, 2023, the Council of State declined the appeal of the 50 residents, stating that the issue of greenery had been addressed by AM and the Municipality.

On November 6, the cutting of trees had already begun, and the transplantation to another part of the city was initiated. The

newly-elected mayor H.Doukas⁸ for the illegal cutting of trees. The persistent movement, however, finally managed on March 18, 2024 to cause a unanimous vote "in the EU petitions committee regarding the petition of 90 residents of Exarcheia for the illegalities, irregularities and violations that occur on the occasion of the destruction of Exarcheia square for the construction of a metro station. The committee decided to keep the case open, referring it to the relevant committees. Particular emphasis is placed on the fact that it was also referred to the Libe committee, committee for rights and freedoms"^{9,10}.

The points and categories of opponents are

- a) the ecological character of the Square will be destroyed (greenery cut) (the Municipality stated that it will do transplanting and agreed with AM);
- b) at the level of eco-environmental-urban planning in general, the Square is almost the only "green lung" in this highly dense urban area;
- c) culturally, the area, especially the Square, is a centre of alternative political expression as well as a point for many intellectuals of the city, as well as for students of architecture;
- d) for many, the Square is a centre of resistance to the corresponding established political power;
- e) the final plan constitutes a traffic and urban planning mistake;
- f) it is the beginning of the change in the economic character of the area with an 8–10-year upcoming problem for the stores. The physiognomy of the stores will change from relatively traditional to parts of market chains and
- g) that there will be a total upheaval of the physiognomy of the nearby area, with effects on the population composition and, more broadly, on land uses and values.

From the above, it seems that there is a cutthroat competition between the last Administrations of AM, the Mayors of Athens and the post-2019 governments on the one hand and opposing groups on the other. But who are these groups? According to Belavilas and Mylopoulos, one could categorise these groups as follows:

- a) a group of residents and intellectuals (and shopkeepers eventually allying with them);
- b) a group of students of the NTUA School of Architecture and related people (professors, etc.);
- c) political groups of ecology, of the Left, and others mainly of the extra-parliamentary Left;
- d) groups of anarcho-autonomists and a-political consistent troublemakers prone to constant conflicts with the police, with which they have a long-standing vendetta, with multiple social origins, from other 'poor' districts of Athens to indignant 'sons' of rich families in the northern suburbs;
- e) criminal groups in general, and drug dealers and traffickers

in particular. The first three groups are the ones that, in addition to physical mobilisations, also make significant institutional efforts (Council, European Parliament, etc.), while the latter two frequently find themselves in a weird coalition.

The issue, as both sides admit, has political dimensions and the solution given is essentially political. The side of AM, and the post-2019 national governments, as well as the municipal authorities, saw an opportunity through the intervention in the Square to get rid of the 'delinquent elements' that have been 'plaguing' the area for years.

It is a fact that the two main sides belong to different categories that developed into silos, and communication between them is difficult. Despite the bridges that were attempted to be built with arguments like 'both green and metro', the efforts collapsed, and the solution ended up being political. The efforts collapsed because the problem, despite the sincere prioritisation for green, was deeply political-cultural and, therefore, almost unbridgeable.

The clumsy¹¹ solution given (repression-enforcement) exactly resonates with the impossibility of understanding between the created silos (see Hartmann, 2012; Hartmann & Hengstermann, 2014).

⁴N.Belavilas is a professor at the School of Architecture of the NTUA and was the first President of the company 'Anaplasti Athens SA' from August 2018 until his replacement by the next Government in September 2019. G.Mylopoulos is a professor at the Department of Civil Engineering (and ex-Rector) of the Aristotle University of Thessaloniki (AUTH) and was President of 'Attiko Metro' from 01/03/2016 to 18/09/2019. The information attributed to them is based on their interviews in the press and on a personal interview with the author of this paper.

⁵'Anaplasti Athinas' ('Regeneration of Athens') was established as an SA, initially on 18/05/2018 to operate under the supervision of the Ministries of State, and Infrastructure & Transport. The purpose of 'Anaplasti' was to coordinate urban planning and the planning and implementation of regeneration within the boundaries of the Municipality of Athens. With the change of Government (2019), on August 10, 2020, the Mayor of Athens, K.Bakoyannis (in the Government party) was appointed President. At the end of December 2023, a few days before the new Mayor of Athens, H.Doukas (opponent of the Government) took over, 'Anaplasti' came back, by law, under the supervision of the government, with the Mayor of Athens abolished as its President!

⁶Attiko Metro' after taking over the Thessaloniki metro project was renamed 'Hellenic Metro'. To avoid confusion, in this text, it will be referred to as 'Attiko Metro' or AM regardless of the period.

⁷From the leftwing SYRIZA to the right-wing 'New Democracy'.

⁸It is noted that the elected Mayors take office on the first day of the year, so H.Doukas was not yet officially Mayor on October 30, 2023.

⁹<https://oximetrostinplateiaexarcheion.com/2024/03/19/%ce%b7-%cf%80%ce%bb%ce%bb1%cf%84%ce%bb5%ce%af%ce%bb1-%ce%b5%ce%be%ce%bb1%cf%81%cf%87%ce%bb5%ce%af%cf%89%ce%bd-%cf%83%cf%84%ce%bbf-%ce%bb5%cf%85%cf%81%cf%89%ce%ba%ce%bbf%ce%bb9%ce%bd%ce%bbf%ce%bb2%ce%bbf%cf%8d-2/>

¹⁰It should be noted that, at the time of the writing of this paper, another decision of the Council of State is pending.

¹¹Hartman (2012) and Hartman & Hengstermann (2014) draw their approach to 'clumsy solutions' from Douglas 1999.

Evangelismos

But do the same groups react in the case of the Evangelismos Station (on Rizari Street and at Rizari Grove)? And if there is a problem, who are the opponents, and what is the outcome of the ‘battle’ there?

Evangelismos Station is located at the Rizari Grove opposite Evangelismos Hospital, in the ‘best’ district of Athens (Kolonnaki), where the residents disagree with the project, which they claim will destroy the high greenery in the area (circa 200 trees). It is noted that there is already an underground station of Line [3] of the metro operating adjacently (i.e., an interchange will be created), while the configuration of the space and the grove comprising the surrounding area of the adjacent current station is a donation of the Pateras ship owning family via their homonymous foundation. For this reason, there has been a delay in the start of the projects (see also EFSYN, Hadjigeorgiou, 27/08/2022).

According to press releases, as early as September 2021, the first works had already started (Kathimerini, Lialios, 15/09/2021), but reactions were already on the way due to the imminent cutting of trees. By November, AM was already considering alternative solutions for the location of the construction site as, due to the reactions, the construction site had been disassembled (Kathimerini, Lialios, 23/11/2021).

By February 2022, the Ministry, under a more comprehensive consideration and pressure, through the company Anaplasti SA, decided to launch architectural competitions for the surface sections and public areas of certain stations (including Evangelismos) while publicizing a decision to purchase 2000 trees to plant in the crossing areas of Line 4.

Until the end of August 2022, the works for the destruction of the 200 trees had not yet started due to the reactions of the residents, and mainly of the Pateras Foundation (EFSYN, Hadjigeorgiou, 27/08/2022).

The appeal to the CoS was made by the Pateras Foundation in the second half of 2021. It was supported by the residents of the area and the Rizareion Foundation, as well as by several important political personalities and agencies, as it is also based on two university studies that highlight the importance of the park (see N.Pateras’s interview with Serafeimidis, in ‘mononews’ on 05/28/2023). According to Pateras, in January 2023, the company AVAX, from the consortium that has undertaken the construction of the metro, presented an alternative solution that was the result of a 10-month study in which it was proposed to relocate the station to an area of sparser green planting, with a cost of €5 million. Despite the acceptance of the proposal by the political and technical leadership, this option was cancelled, as the final estimate amounted to a cost of €50 million. Already, N.Pateras submitted an appeal to the Council of State, while stating that none of the residents of the area was ever informed about the actual plans for the Evangelismos station since 2017,

nor has a proper consultation ever taken place, an issue that is considered by the Council of State (‘mononews’, Serafeimidis, 28/05/2023).

A few months later, the Council of State, contradicting the decisions of the Municipality of Athens, stipulated that “Hellenic Metro” should prepare a new Technical Environmental Study (TEPEM) (since the first one already filed was pending following political interventions) to minimize the effects of the construction of the station on Rizari Park, without cancelling the initial environmental licensing of the project, nor stipulating that alternative solutions regarding its location be considered. In essence, the CoS calls on the Ministry of the Environment to revoke the submitted TEPEM and supports the Solomonian solution of ‘both metro and green’ (Kathimerini, Lialios, 12/15/2023).

Comments on the similarities and differences between the two cases and the emerging narratives of the different rationalities

As is evident from the above, the elements in the cases examined are common and different. However, here is argued that the various arguments are predominant and constitute distinct rationalities that do not communicate much with each other. These rationalities are linked with the corresponding narratives, and different silos are created. The question is if and what is the level of communication between the silos, if any.

From the subjective point of view, in both cases, distinct rationalities were developed. In the Exarcheia case, at least for the first three groups of the opponents, the basic line comprising a narrative was that “our community with all its shortcomings is under threat. The place will change dramatically; primarily, if we lose the few trees remaining in the area, we will be suffocated and lose our references. We will be kicked out of this place if we do not resist. We are a community, and we will resist in all legal ways”. At the same time, the latter two groups from the opponent's side would insist that “the Government(s) is using the case of the metro as a tool to kick us out from this Square that we have the right to use as we decide. They want to exterminate us using the riot police, escalating a series of police actions over the last decades. We will fight back on the streets”. These are two different silos having as a uniting principle the defence of the very basic lines of the character of the place, i.e., the protection of the greenery.

From the side of the Administration, the whole issue is perceived in the following way: “We gave the chance to everybody to participate in a consultation procedure, and there were no serious objections. The silent majority want the project which will regenerate a decadent area and bring new businesses and jobs while servicing the district and the city with modern transport. We examined the other proposals and found them economically expensive and technically problematic. So,

we stick to this one, and, of course, we clear the place from the anarchist and lumpen elements, a promise we gave before the elections. At the end of the day, this project is political, and we will show no signs of retreating from our political positions". The case of Evangelismos is quite different. Here, the opponents had almost a single issue, green, and they moved mainly legally but also with political pressure. Their narrative was "so much effort has been made to enrich the Centre of Athens with green, we cannot let this matter pass like this. We must defend the green, which, after all, we paid to plant it." At the same time, the Administration side, as we have shown, had a more negotiating attitude. "We have done everything we can, but unfortunately any other alternative solution is not economically viable; we will proceed carefully because the city needs the Line without further delay."

From a more objective (external) point of view, the common elements between the two cases are that the apparent priority was the eco-environmental factor, specifically the 'green'. In addition, the technical solutions were found in one or the other way and had a cost that was not unattainable. They involved technical modifications, the feasibility of which was shown but rejected. Both appealed to the Council of State with similar arguments (destruction of the natural environment) yet differing outcomes.

The differences between the two cases was that in the case of Exarcheia the stake was directly political, while in the case of Evangelismos not, in the sense that: a) the Exarcheia Square was considered to be 'under occupation' by marginal elements, while in the Evangelismos case no major physical mobilisation occurred, b) Exarcheia was an activity epicentre of radical groups, while Evangelismos grove was just a passing by or leisure walk site, c) the Exarcheia residents-opponents, though intellectuals and 'normal' citizens, did not include any 'big' names, while in Evangelismos the major (visible) figure of the opposing site was a well-known shipowner who had in earlier years made a significant donation for the recreation of the area, d) in terms of class composition, in Exarcheia the local residents were generally lower middle class and a good part of the movements was composed by lumpen elements, while in Evangelismos area the residents were upper middle class and the area was the part of the 'best' Athens district.

A discussion about complexity and wickedness in the case of the two metro stations

The Metro via a vis complexity

Rapidly changing environments and fragmentation of objectives (difficulty of concurrent service), emergent issues, complex objectives and sub-projects. The passage of the metro through various areas and the stations created change the local environments, and the residents themselves can only predict further changes in general terms. Areas are changing and

changes continue. While they can be regulated by legislation (e.g., land uses), there is constant interference of requests and various kinds of movements that make the data fluid. In particular, environmental sustainability is critical as, due to the climate crisis, the data daily worsens in an unpredictable way, so there is a degree of fluidity. At the same time, decisions of courts (e.g., Council of State) and institutional frameworks (e.g. change in legislation for the company "Anaplasi SA") are changing the political game. Social and institutional sustainability is at risk, as the prevailing order changes power relations and gives priority each time to specific silos. This is reflected in participation, which generally has a weak role.

The metro project is impossible to fit into the iron triangle of mega projects because time is violated almost by default. The State itself is unable to keep the deadlines. This has also been identified by the OMEGA Centre research (2012) and is attributed mainly to a weak appraisal where issues such as geology, archaeology, etc., are underestimated¹². Also, the weak consultation/participation creates time delays because the issues come back in the form of claims- requests, the solution of which is more time-consuming as it now requires judicial treatment (see appeals to the CoS, lawsuits in Exarcheia, etc.) or coercion, with unpredictable consequences. At the budget level, precisely because of the unforeseen situations, the costs rise, and, in addition, the nature of the construction involves unforeseen expenses. As for the specifications, they change with the changes in the design and with the progress of the technology that, due to the long duration of the work, sometimes imposes changes. At these levels, economic sustainability is problematic, but so is social sustainability in the sense of balance among important social actors.

The duration of evolving contexts within a time course includes significant changes of socio-economic, institutional, and eco-environmental conditions, e.g., changes in the population composition of areas due to the arrival of immigrants, changes in land values, or changes in eco-environmental requirements due to the climate crisis. The change of context also implies changes in the levels of dealing with sustainability, something that suffers from timing. A large part of these developments is not precisely predictable, forming a series of uncertainties where every decision entails a risk.

Due to the various stakeholder groups, there is an interaction of factors that create unpredictability, uncertainties and conflicts with risk-taking decisions. The conflict between the opposing parties in Exarcheia, but also the differences between the opposing silos, have an unpredictable effect due to the constant change of internal and external balances and are also vulnerable to more general political developments (e.g., a change of government or Municipality).

Social sustainability in the sense of balance between important social stakeholders is sensitive. For example, the op-

position block is created in Exarcheia between the small shopkeepers and the Administration, given upcoming changes. The balances also depend on the local contexts, for example, they have yielded different results in the cases of Exarcheia and Evangelismos where both appear to start from eco-environmental issues, but there are deeper causes.

The Metro vis a vis wickedness

The complexity of metro systems (like that of Athens), as intermediate goals and problems (toward a solution) emerge, impede the finalization of the 'solution'. Does the line really end 'there'? The evolution of the Athens metro shows us that we constantly have extensions (as well as changes), which take a long time to finalize. Also, emergent goals appear, e.g., to agree with the Municipality the purchase of 2000 trees to be planted somewhere else to appease the spirits or to launch architectural competitions. So, every time the problems are reset on a different basis.

The result (same versus other solutions) cannot be fully tested and compared or assessed. Example: Is Line 4 'better' than other possible 'Lines 4'? Would a 'surface project', e.g., tram or Bus Rapid Transit, be more efficient for the city in relation to a set of impacts? Impacts also reverberate into adjacent urban agglomerations and areas. Uncertainty about the outcome and the safe method of assessment poses a risk to decisions and raises questions regarding the various dimensions of sustainability while hampering participatory efforts.

Megaprojects are one-shot ventures. This fact does not help on an analytical level to deal with the problems with a perspective of generalized regulatory solutions. Therefore, according to Rittel and Webber (1973) in such difficult projects, there is no possibility of trial and error. A mistake in drawing a metro line is irreversible.

Megaprojects are largely unique (not all, and under conditions). Even each different metro line is unique in the sense that it passes through different places with particular socio-economic environments, particular land uses and values, different historical contexts, and different dynamics. So every route needs different analysis and solutions (specific analysis of the specific situation). This means that there are different contextualities that raise different issues of sustainability. Therefore, complicatedness becomes complexity and is not so much about the managerial and technical part but about the contexts, something that constitutes a serious parameter of wickedness.

Megaprojects and metros are complex and are parts of a sequence of problems that are also complex. The metro tries to solve the problem of traffic and, in turn, raises issues of the environment and social equality (it goes here and not there and favours spaces here and not there), resulting in the formation of the differential land rent [1]. Therefore, whatever solutions and interventions are necessary must be approached holistically.

But, at the level of design with a focus on sustainability, design is 'inherently wicked'.

Megaprojects touch the extremely wicked social field. The social impact of metros affects various categories, such as the socially and economically advantaged and the disadvantaged, touching on issues of social and economic sustainability. This also includes occupational categories, consumer groups, safe routes and more, constituting a set of problems with conflicting aspirations and logic that constitute a dimension of wickedness.

Choices are usually made *ad hoc* and determine the solutions (Flyvbjerg, 2021), like in the case of Exarcheia. This, in addition to the issue of eco-environmental sustainability that it reveals, also raises issues of social sustainability (especially the dimension of social equality) by changing the socio-political balances of the place, and, obviously, clearly violates any attempt to involve the interested parties and stakeholders in forms of participatory planning that, if done, become pretentious.

Instead of a Conclusion

The construction of a metro line is a complex and wicked project, deriving these characteristics from the fact that it is a planning effort and from the fact that it is a mega project. Complexity and wickedness are reflected in the design and construction of Line 4 in Athens, appearing mainly at the level of social relations and governance. So, we have seen that in two typical cases (there are others with different social coordinates), those of the location of the Exarcheia and Evangelismos stations, the social groups and stakeholders involved have such a cleavage between them that they self-place in distinct silos that make communication between them difficult to impossible (mainly in Exarcheia). They speak 'different languages', which results in 'clumsy solutions' that, in this case, are *ad hoc* decisions of the political leadership. It remains an open question whether more effective participatory planning could help bridge the silos, but this would require that at a higher level of abstraction, there would be a sharing of values and that all social actors could be lifted to that level, which is practically very difficult in the specific historical and spatial contexts.

Acknowledgements: This research is self-financed. I would like to thank N.Belavilas, G.Mylopoulos and G.Mademochritis for the useful discussions we had on these hot issues.

¹² This is also identified by Flyvbjerg in his (2023), (2021), especially in his discussion about biases.

References

- Chester, M., and B. Allenby. 2019. "Infrastructure as a wicked complex process." *Elementa Science of the Anthropocene* 7 (21).
- Crowley, K., and B. Head. n.d. "The enduring challenge of 'wicked problems': revisiting Rittel and Webber." *Policy Sci* 50: 539–547.
- Dimitriou, Harry. 2014. "What constitutes a 'successful' mega transport project?" *Planning Theory and Practice* (Taylor and Francis) 15 (3): 389–430.
- Douglas, M. 1999. "Four cultures: the evolution of a parsimonious model." *GeoJournal* 47: 411–415.
- Esposito, G., and A. Terlizzi. 2023. "Governing Wickedness in Megaprojects: Discursive Institutional Perspectives." *Policy and Society* 42 (2): 131–147.
- Flyvbjerg, B. 2017. "Introduction: The Iron Law of Megaproject Management." Chap. 1 in *The Oxford Handbook of Megaproject Management*, edited by B. Flyvbjerg, 1–18. Oxford: Oxford University Press.
- Flyvbjerg, B. 2021. "Top Ten Behavioural Biases in Project Management: an Overview". , vol. 52(6) ." *Project Management Journal* 52 (6): 531–546.
- Flyvbjerg, B., and D. Gardner. 2023. *How Big Things Get Done*. Macmillan. London: Macmillan.
- Flyvbjerg, Bent, Nils Bruzelius, and Werner Rothengatter. 2003. *Megaprojects and Risk: An Anatomy of Ambition*. New York: Cambridge University Press.
- Gil, N. 2023. "Cracking the megaproject puzzle: A stakeholder perspective? ." *International Journal of Project Management* 41/ 102455.
- Hadjigeorgiou, A. n.d. no. various issues. EFHMERIDA TON SYNTAKTON (EFSYN) (in Greek).
- Hartman, Th. 2012. "Wicked problems and clumsy solutions: Planning as expectation management 11(3) ." *Planning Theory* 11 (3): 242–256.
- Hartman, Th., and A. Hengstermann. 2014. "Territorial Cohesion through Spatial Policies: An Analysis with Cultural Theory and Clumsy Solutions." *Central European Journal of Public Policy* 8 (1): 30–49.
- Head, B. 2022. "The Rise of 'Wicked Problems'—Uncertainty, Complexity and Divergence." Chap. 2 in *Wicked Problems in Public Policy Understanding and Responding to Complex Challenges*, edited by B. Head, 21–35. Switzerland: Palgrave Macmillan.
- Kaparos, G., and P. Skayannis. 2015. "Large infrastructure projects." *Athens Social Atlas/ Built Environment, Infrastructures, Planning, Transports*. doi:https://doi.org/10.17902/20971.38.
- Kurtz, C., and D. Snowden. 2003. "The new dynamics of strategy: Sense-making in a complex and complicated world." *IBM Systems Journal*, 42 (3): 462–483.
- Lehtonen, M. 2014. "Evaluating Megaprojects: from the 'iron triangle' to network mapping." *Evaluation* 20 (3): 278–295.
- Lialios, G. n.d. no. various issues. Athens: Kathimerini (in Greek).
- Low, N., and S. Sturup. 2014. "Leadership, risk and story-lines: the case of the Sydney Cross City Tunnel. In Dimitriou H. (Ed) What constitutes a 'successful' mega transport project?" *Planning Theory and Practice* 15 (3): 389–430.
- Oades, R.S. 2008, June. "The significance of Concepts of Uncertainty, Risk and Complexity in Decision-making and Planning." Edited by H. Dimitriou and R. Oades. London.
- OMEGA Centre. 2012. OMEGA Centre – Centre for Mega Projects in Transport and Development. December. <http://www.omegacentre.bartlett.ucl.ac.uk>.
- OMEGA. 2012. "Mega projects. Lessons for decision-makers: an analysis of selected international largescale transport infrastructure projects." Executive Summary, Bartlett School of Planning, UCL, London.
- Rittel, H., and M. Webber. 1973. "Dilemmas in a General Theory of Planning." *Policy Sciences* (4): 155–169.
- Serafeimidis, G. n.d. Mononews (in Greek). <https://www.mononews.gr>.
- Skayannis, P. 2021. «Mega Infrastructure Projects in Greece After its Accession to the EU (1981–2021).» Region and Periphery (Review of Regional/Peripheral Economy and Policy) (12): 41–63 (in Greek).
- Snowden, D., and M. Boone. 2007. "A Leader's Framework for Decision Making." *Harvard Business Review*.
- Waldrop, M. 1993. *Complexity: The-Emerging-Science at Edge of Order and Chaos*. New York: Touchstone.