

# Planning and Sustainable Urban Mobility Plans: Parallel Orbits or Incompatible Paths?

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**Abstract:** The paper that follows analyzes the basic directions of the Larissa's Sustainable Urban Mobility Plan and aims at developing a first kind of assessment in relation to whether the plan has achieved its main objectives and how it interacts with the existing urban plot. First results show that emphasis is given to "alternative and more environmentally friendly kinds of circulation" and the emergence of the "neighborhood" as the main spatial scale of reference. The plan tries to manage the traffic issue of the city center, unsuccessfully so far. However, it does not take into account the spatial dimension of land uses. The networking of important functions and service providers is not a priority and, as a general conclusion, the plan does not serve the principle of integration neither guarantees the universal access to basic destinations and services. The paper argues that the plan could be improved by introducing a "bottom-up" design process, incorporating elements of the new and emerging agenda of "urban problems" (e.g. resilience targets) and moving away from the unification of "embellishment" and face the main issues of the real city. Those should be the priorities of the so called "combined and integrated design and planning practices", which are now missing.

**Key words:** City, integration, sustainable mobility plan, urban planning.

## 1. Introduction

Modern societies face nowadays many challenges in terms of sustainability, ranging from youth unemployment to an ageing population, climate change, pollution, sustainable and alternative energy consumption and migration. In the context of sustainable development, there is also the need for more sustainable urban travel to combat the problems of climate change and reduce air pollution [1]. In Greece, an effort has been launched in recent years to restructure urban transport models with the aim of strengthening sustainable urban transport and promoting "green" means of transport, such as the use of public transport, walking and cycling. Several Greek cities, including Larissa, to which this work refers, have the concept of sustainable urban mobility in their priorities.

Sustainable Urban Mobility Plans (SVAK in Greek)

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are strategic projects aimed at meeting mobility needs in cities for a better quality of life. They "build" on existing planning practices taking into account the principles of integration, participation and evaluation [2]. The term "existing planning practice" obviously means existing urban planning, which expresses the basic way of carrying out urban planning policy, as well as transportation planning.

Urban planning is the most basic tool for regulating urban, peri-urban and extra-urban space at the level of a settlement, city or urban complex and aims at the rationalization of the area based on the principles of the science of Urban Planning [3]. Therefore, the interaction between urban planning and the Sustainable Urban Mobility Plan is obvious and self-evident, to the point where it is now necessary to promote combined and integrated design practices. However, to what extent are the above satisfied in Greece and in a city like Larissa taking into consideration that its urban plan has not yet been updated, since the corresponding urban planning study is from 1989. If current urban trends (e.g. population

density) and needs (e.g. land uses) of the city have not been studied and updated and the Sustainable Urban Mobility Plan should base on them, how successful can that plan be without reliable information. In other words, are planning and sustainable Urban Mobility Plans parallel orbits or incompatible Paths?

The following work deals with sustainable mobility in the city of Larissa. In terms of structure, the work is divided into the following main sections: the second section is that of historical flashback as well as the description of the basic theoretical framework of sustainable urban mobility. The basic features of these plans are also analyzed. The third section describes and analyses the plan of Larissa, its main objectives and its progress in terms of implementation so far. The fourth section deals with a first evaluation of the plan taking into account the existing urban plan of the city. Given that it is a plan that deeply intervenes in the city, changing it while also putting pressure on the existing urban structure, this kind of evaluation is necessary, as Larissa is a city with many peculiarities, direct and indirect “barriers” and “obstacles”, which will be described in Section 4. Last but not least, Section 5 concludes.

## **2. Sustainable Urban Mobility: Historical Flashback, Context, and Content**

### *2.1 Historical Flashback*

Transportation and mobility have always been a central issue in the development of a city and by extension in the implementation its urban planning: in ancient Greece, for example, transportation and mobility were free within cities characterized by irregular networks. According to Scully [4] transportation and mobility are better described in topological than in geometric terms. In roman times, the military criterion was central in characterizing the planning of the urban transportation network [5]. Both transportation and mobility followed the strict geometry of the Hippodamus of Miletus system, i.e. a web of parallel and vertical straight paths [6]. The

historical centers of many European cities inform us, even indirectly, of the transportation and mobility to the cities during the middle Ages. Any movement of the citizens at that time was carried out internally on the basis of a complex but unregulated system of narrow roads. This, of course, was also supported by the fact that cities were compact and small, both in size and in population [7]. In the Renaissance period, the city became symmetrical, and so did the engravings. The landmark of that time was the palace, which represented the power and grandeur of the city, so transportation and mobility were developed around it, which was actually the main reference point of the city. During the 16th century, the reversal and reaction to the homogeneity of the urban fabric took place. The first straight roads were opened inside the cities, making cities look more functional, while transportation and mobility acquired capacity elements [4].

In the following centuries, transportation and mobility were the main criterion for the design and planning of cities. Le Corbusier in 1960 [8], referring to the cities of the 17th and 18th centuries, argues that “architecture is transportation and mobility”. Cities are cut by multiple engravings and lose their unity [3]. A focal point in all this was the industrial revolution, during and especially after which the city changed shape and became functional in principle, the roads ceased to function as carriers of the “symbols of power” but were transformed into bodies of “space management”, gradually exceeding the external boundaries of the city and expanding towards all directions [5].

In the 19th century, the first “conflict” was recorded in terms of theoretical approach and concepts between urban and transportation planning. The first public transport means appear and change the organization of life in the city. In this context, Cerda in 1979 (the first urban planner of the modern era) argues that the target of urban planning is the absolute satisfaction of human needs [9]. Soria and Mata in 1979 support the

linear city model for the outskirts of Madrid and argue in favor of a “minimum transportation and mobility of inhabitants”, which they consider as a “basic parameter in a perfect city”. Therefore, they implicitly but clearly envision a city dependent on transportation and with a linear development. Throughout the 20th century and the invention of the car and the wide diffusion of its use, priority was given to the engine, speed and increased productivity. The car, apart from a symbol of freedom and power, enhances the “ego” in principle and brings out individuality. As a result, public transportation has been gradually bypassed; pedestrians and cyclists are limited, with direct adverse effects on both the urban environment and the quality of life. In the long term, this had further and more far-term consequences on both economy and society.

## 2.2 Definition and the European Context

The constantly degraded urban environment has led to a gradual change in the approach to the issue of sustainability. In this context, sustainable urban mobility has also emerged, which according to the World Business Council for Sustainable Development [2] is mobility that serves the society’s needs for free movement, accessibility, communication, activation and social contact, without compromising basic human or environmental requirements and prospects today or in the future. Sustainable mobility attempts to shift and change the philosophy that governs traditional transportation planning, which favors private car use at the expense of other means. Sustainable mobility develops around a framework of basic principles related to the natural environment (objective: protection), health (objective: safety and protection), transport system (objective: ensuring sustainability), energy (objective: low consumption solutions), infrastructure (objective: cost reduction), movement (objective: cost reduction), economic activity (objective: healthy and socially fair) and movement (objective: serving the needs of all groups of the population). The main pillars of sustainable

mobility are public transportation, walking and cycling, i.e. means and modes of transport that contribute to the environmental, social and economic sustainability of cities [10].

At the level of institutional actors, the European Commission as early as the 1990s, with the so-called “Green Papers” and a series of policy texts, has given rise to citizens’ and policies’ awareness of key issues around sustainable mobility. A number of texts were development towards that direction, such as “for the urban environment” [11], “on the quality of public space and the identity of the city”, “citizens’ networks” [12], “on the importance of the use of public transport and combined transport”, “fair costing’ transport” [13], “internalizing external transport costs and urban tolls”, “assessing and managing air quality” (Directive 9040/26.08.1996), “on the drafting and periodic publication by governments of action plans; with a view to raising citizens’ awareness of the future noise policy” [14], “for cities with fewer cars and low speeds”, “towards an urban policy in the European Union”, “on the importance of citizen participation in planning”, “towards a new culture of urban mobility” [15], “to shape another culture and culture relationships in everyday travel”.

In 2009 the “Action Plan for Urban Mobility” was published and in 2013 the European Commission (EU) made it a special one, publishing the proposal for The Sustainable Urban Mobility Plans in a communication to the European institutions. The main objective of the proposal was to shift to “accessibility” and the anthropocentric dimension in planning. According to the proposal, the term “mobility” is not only limited to the car, but includes all modes of travel, public transport, cycling and walking belong.

Accessibility is therefore a top issue. According to Bhat et al. [16], accessibility is calculated on the basis of a person’s “ease of carrying out desirable activities, using desirable means of transport and at the desired time”. Geurs and Ritsema Van Eck [17] on the same issue refer to the “degree of easiness to which a

hypothetical land use and a given transportation system allow persons or goods to reach activities or destinations by combining means of transport”.

### 2.3 Sustainable Mobility Plans: Definition and Main Features

A Sustainable Urban Mobility Plan is a strategic plan that strives to meet the needs of transportation and mobility to a city with the aim of creating conditions for a better quality of life. In that context it is more than just a mobility plan adapted to the urban scale of the site. On the contrary, it is considered to be a sustainable plan that emphasizes integration, participation and evaluation. The term “integration” means the coordination of policies between different urban parameters (e.g. urban planning, transport, environment, economic development, social policy, health, security, energy consumption, etc.). The term “participation” means the involvement of citizens in planning. Inhabitants of the city, such as entrepreneurs and consumers, as well as visitors to the city are part of the solution. In other words, uniform planning and participation also mean coordination between, the different levels of government, the neighboring geographical municipalities and regions and between groups of scientists of different specialties and not

only transport specialists, as is the case of conventional transportation studies. Finally, the term “assessment” presupposes in principle planning for a long period of time, taking into account social costs and the corresponding benefits and having as a basic principle that each mode of travel must internalize its costs and not transfer it to society. At the same time, the term “evaluation” implies a comparison between its future and the current performance of the transportation sector. Comparison is made through various indicators, through measurable targets, which obviously requires regular monitoring, examination and reporting.

Each Sustainable Urban Mobility Plan is part of the long-term strategy for the development of the city, i.e. it “cooperates” with other urban strategies. In this sense, it also includes a section of operational planning of priority projects with a timetable and sources of funding, as well as the allocation of actions to the various competent departments of every municipality. Finally, the Sustainable Urban Mobility Plan must be the product of cooperation between the various departments of the Municipality, which coordinate and implement it, and this can only be done through the institutionalization of structures, procedures and mechanisms of monitoring and evaluation.



Fig. 1 Larissa and its main transportation network.

### 3. The Sustainable Mobility Plan of Larissa

The Sustainable Urban Mobility Plan for the city of Larissa began in 2014, with the submission of the initial study, while the first interventions in terms of technical infrastructural works began in the summer of 2018. The total budget of the plan is estimated at 70 million Euros with a 10-year completion horizon. If, the “smart” interventions on parking, access to pavements and loading and unloading, which will be implemented in parallel with the basic plan, are added to the above, the total cost could exceed 100 million Euros.

Based on the initial study, the plan objectives are: first, the creation of a basic ring road system; secondly, the conversion of all local roads (in residential areas) into one-way roads, with frequent variations in direction, in order to prevent vertical movement through them; thirdly, the creation of an integrated pedestrian network (via pavements, light roads and widened pavements); fourthly, the increase of the use of bicycles by creating an extensive network in the city center; fifthly, the promotion of public transport.

According to the study, the proposals of the plan for the transportation network (Fig. 1) are the following:

- Connect the entrance-exit gates to the city by bypassing the central area.
- Prevent vertical movements through the urban fabric.
- Establishment of a basic ring road network for heavy vehicles, without delays and safely.
- Increase the density of the pedestrian network and roads marked “mild traffic”.
- Discourage the use of cars in the central area and increase the use of public transportation, bicycles and pedestrian travel.
- Adoption of soft traffic measures in neighborhoods to protect against traffic.
- Reducing air and noise pollution.
- Improving the image of the city and upgrading

historic-sensitive areas.

Within the framework of the study, a cycling network of 45 km is also planned, with the aim of allowing the cyclist to head safely from the urban districts both to the city center and to the other districts. According to the study, an effort has been made to make all important uses and activities accessible by bicycle throughout the city, as cycle paths cover the full range of daily travel needs (work, school, recreation, sports, training). In the city center cyclists will also be able to move on the extensive network of pedestrian and “mild” roads.

As part of the study, a consultation phase was also implemented on Feb. 20, 2015, in which 43 city bodies/agents, representing different sectors of the economy and bodies or organizations of specific groups of users with special interests and needs, either thematically or spatially, were invited to submit comments and proposals. In addition, citizens were given, starting on Feb. 20, 2015 and for one month, the opportunity, through the official website of the Municipality, to submit their concerns and opinions on transportation and mobility issues of the city. On May 05, 2015 the Municipal Consultation Committee met, which included 66 city and regional bodies, 7 citizens, the Mayor as president, the chairman of the Board of Directors and 8 Deputy Mayors and Municipal Councillors.

The most important issues raised during the first phase of the consultation were:

- The connection of peri-urban districts with the city center.
- The parameter of the historical and cultural elements of the city.
- The possibility of making wider pavements.
- The operation of the urban bus network.
- The accessibility and parking spaces.
- The network of cycle paths.
- The compatibility of other strategic plans already developed.



Fig. 2 Larissa and its urban plan.

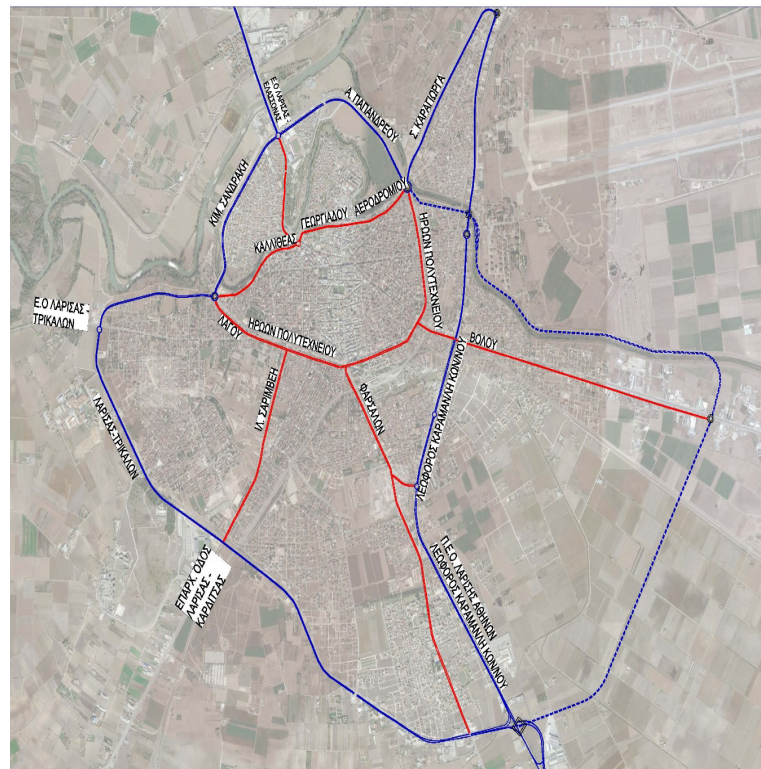


Fig. 3 Classification of the network.

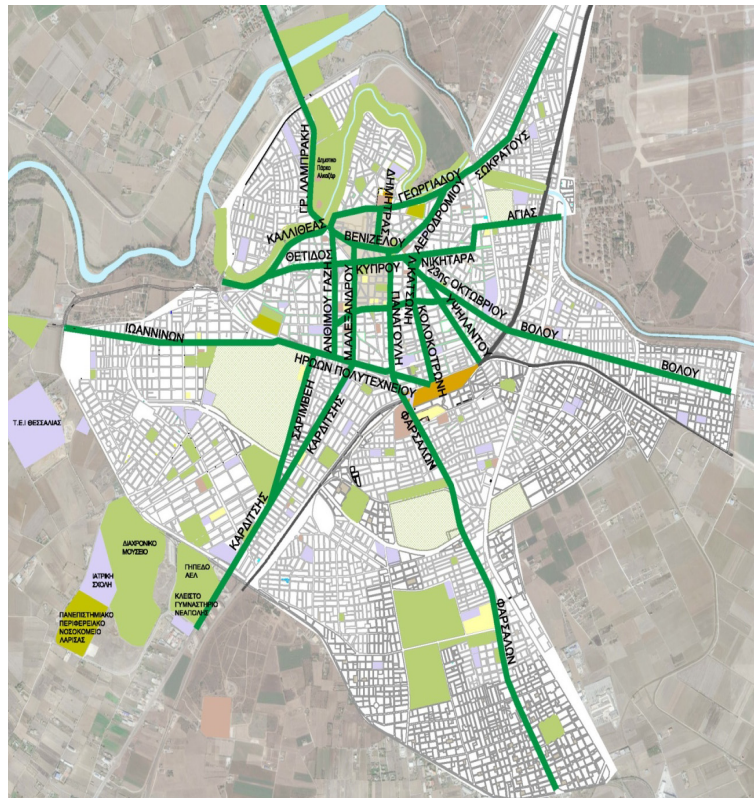


Fig. 4 The cycling network.

#### 4. Discussion and a First Assessment of the Plan

The Sustainable Mobility Plan for the city of Larissa is in progress. A first conclusion that can be drawn from its implementation is that till 2020 what the citizen can see through the on-site observation as he crosses the city is the completion of the “mild” road projects on 3 roads, “Venizelos” street and “M. Alexandros” street in the center of the city and part of “Asclapiou” street. All these after six years of technical works and 4 studies, in the first two cases (Venizelos street and M. Alexandros street) the aim was the further promotion of the 1st Ancient Theatre while on the “Asclapiou” street the goal was the promotion of the neighborhood. At the time of writing this work most if not all the issues raised during the two phases of the consultation have not been taken into account. As a general comment, the plan started from the simple and easy, i.e. the reconstruction of some roads and their transformation on roads of “mild” traffic.

However, the Sustainable Mobility Plan is a plan that intervenes in the city, changes it, thus puts pressure on the existing urban planning, in a city with many peculiarities, direct and indirect “barriers” and “obstacles”. One such “barrier” and “obstacle” is the Pinios river.

The Pinios river is not included in the Sustainable Mobility Plan, at least, in the first phase of implementation of the project and is classified as an “outside the study area”. The river has always been considered a “limit”. It was for many years the administrative border of the Municipality. It is still considered a “limit” and a “barrier” for the city. However, it is a very important natural resource, which could contribute to improving the quality of life (a key objective of every mobility plan). Pinios river is a central point of reference for Larissa, a landmark. The difficulties it creates in the development of a city to the north can be compensated by the construction of technical works exploiting its roads and connecting bridges, combined with the removal of lanterns on the

main bridge from turnabout. Nowadays, it is literally a lung of life that unites the inhabitants of the city. The exploitation of the land will continue until the bridge of “Nea Smirni” (eastern part of the city). The flood defense zone of the main bank of Pinios, which as far as the city of Larissa is concerned includes part of the district of “Agios Thomas” and the northern part of “Hippocratis” (western and northern part of the city) is a special area, in terms of the restrictions imposed. The Sustainable Mobility Plan should “exploit” this huge natural resource, which can determine the issues of quality of life and environmental upgrading, therefore sustainability.

A second important issue is that of the current urban land uses. The plan focuses on the creation of “mild” traffic routes on roads with traditional commercial activity of wholesale and craft activity (furniture shops). At the same time, there are many supermarkets within the intervention area (in squares, on sidewalks, etc.). All these activities require loading and unloading procedures, which are no longer officially permitted. However, what actually happens is constant violation and beyond the permitted hours provided for. A significant number of empty shops are also recorded in many of the above streets, which may lead to further shrinkage due to the current economic crisis [18]. The plan could lead to a forced change in land uses or an increase of shrinkage in some already problematic but central areas.

A third important issue is that of parking within the urban area. Many side parking spaces are lost in the city center, as a result of the implementation of the plan. Some of these are replenished through the short-term parking system, according to the study. However, no provision has been made for the creation and construction of organized parking spaces around the inner ring and at entry-exit hubs in the city. Under the existing urban planning there are no municipal properties available with or without the use “parking”, while the corresponding private parking spaces are all located in the city center. Therefore, in order to park,

one must enter the city and up to the center of it, so the original objective of the plan, that is to say, avoiding crossing through the city center, can not be achieved. Pressure is already recorded on more “distant” than central roads (distance 1-1.5 km from the city center), tension and congestion for a parking space at peak times. The plan should try to address and manage the above issue in reverse: first parking spaces had to be secured and then limitations to parking should be imposed.

Last but not least, the following points should be highlighted:

- the absence of parking spaces in the railway and bus station, which are located in completely different urban districts (the first being southern of the city and the second north).
- the absence of vertical and horizontal connection between the railway and the bus station, given that long-city bus stations are spatially dispersed in different locations, according to their final destination and exit of the city.
- the absence of bus connection among the main cultural attractions of the city, given that there are museums and recreation areas outside the city center.
- the need to parking in an organized private area with the simultaneous absence of public parking spaces, resulting in car traffic in the city center.
- the absence of vertical and horizontal bus connection between different public services, given that they are located in completely different urban districts.
- the absence of cycle paths as a way of connecting the city center with the existing educational units (e.g. University of Thessaly and their campuses of “Viopolis” and “Gaiopolis” on the outskirts of the city at a distance of 5 km from its center).
- the absence of connection between the railway and bus station and the above University campuses.
- the absence of connection between the railway and bus station and the existing public or private health units, resulting in the forced use of a private

means of transport. Larissa has a health cluster, consisting of two large public hospitals (including a University one), a large private one (called IASO), two rehabilitation units which two hospitals care for patients from all over the country and many smaller private health clinics.

Therefore, for a citizen, a visitor, a student, a non-resident employee, the use of car is necessary, as there are few connections between urban districts and no connection between the railway and bus station and the final destination.

## 5. Conclusions

Sustainable mobility is a design philosophy with the human parameter at the heart and aiming at a truly sustainable urban development of transportation and mobility. This is an integrated approach and balanced development of all modes of transport through alternative modes of transport. It requires the involvement of all competent bodies at all stages of planning and cooperation between the Municipality and other policy-pursuing authorities. Design and planning are in any case a complex process with conflicting requirements, for example maintaining a high standard of living while creating an attractive environment for businesses. Other requirements in this case are the restriction of traffic in sensitive areas and the unhindered movement of goods and people, the emphasis on public health, climate change, noise, air pollution, etc. England and France are seen as precursors to urban mobility planning approaches.

Sustainable mobility is a new approach to urban mobility planning unlike traditional transportation planning and prioritizes accessibility and quality of life, integrating planning taking into account land uses, economic development, social needs, environmental quality and health, long-term vision, operational boundaries mainly based on work-related areas, interdisciplinary planning, the combination of infrastructure, markets, services, information in order to achieve the most efficient solution and impact

assessment, through a process of learning and improvement.

Sustainable mobility in the city of Larissa is expressed and implemented through the Sustainable Urban Mobility Plan. It is a project which seeks to address and manage in principle the traffic issue of the city center. However, it does not interact with the existing urban planning, and it can not. The existing urban planning study for the city dates back to 1989. An “old” and out-of-date urban planning can not contribute to and enhance the effectiveness of any mobility plan. Take land uses for example. How much have they changed since the last recording in 1989? Is a detailed record of land use planned and carried out in the context of the design of the mobility plan and, if so, whether it is repeated? Was the corresponding public authority (e.g. Directorate of Urban Planning—Municipality of Larissa) called during the design of the plan? The answer to all three questions is no. Therefore, the Sustainable Urban Mobility Plan has not taken into account the static but also the dynamic spatial dimension of land uses.

On the contrary, it may lead to a forced and extortion changing of these, as has been recorded in the previous section. It emphasizes the “philosophy that dictates mild traffic” and tries to highlight the “importance of the neighborhood” at the level of the spatial reference scale and core of the city. However, networking of important functions and service providers is not a priority (public, education, health services) and, therefore, it does not serve the principle of integration since it does not ensure the universal access on key destinations and services.

A bottom-up planning process should be followed, in the sense that first “sensitive” areas and categories of population groups are identified and then specific mobility issues in a targeted way are addressed. In addition, the plan does not address or even take into account the new and emerging agenda of “urban problems” (e.g. urban shrinkage, climate change, urban resilience). In this context, there is a question of

resilience of the whole project in a city that has to be resilient but no one knows its limits. By definition, it tries to meet the mobility needs on the basis of the principle of integration and participation, but it effectively excludes, thereby raising objections to democracy in the whole plan. Nowadays, as planning has become mainly strategic (achieving objectives) and regulatory (imposing rules and specific settlements), indicating the transition to a new situation or “order of things”, the issues of “order of space” and “city structure” are still important but in most cases planning that covers them is outdated.

As the issues and the challenges for cities have changed, it is important to move away from the unilateralism of “niceness” (e.g. mild roads, nice and expensive pavements) and confront the real city in terms of urban democracy and governance. This is the only way that planning and sustainable urban mobility plans could move to parallel orbits and not to the nowadays incompatible paths.

## References

- [1] UN. 1987. *Our Common Future. Report of the World Commission on Environment and Development*. New York: Oxford University Press.
- [2] ELTIS. 2014. *Guidelines. Developing and Implementing a Sustainable Urban Mobility Plan*. Brussels: Directorate-General for Mobility and Transport.
- [3] Aravantinos, A. 2007. *Urban Planning: For a Sustainable Development of Urban Space*. Athens: Symmetria. (in Greek)
- [4] Siolas, A. 2015. *Urban Planning: For a Sustainable Methods, Applications and Tools of Urban Planning Development of Urban Space*. Athens: NTUA. (in Greek)
- [5] Vlastos, A., and Milakis, D. 2006. *Urban Planning vs. Transportation*. Athens: Papatotiriou. (in Greek)
- [6] Monoudi-Gavala, T. 2015. *The Greek City from Hippodamus to Kleanthis*. Athens: The Association of Greek Academic Libraries. (in Greek)
- [7] Pirenne, H. 2003. *The Cities of the Middle Ages—Essay on Economic and Social History*. Athens: Vivlioarama. (in Greek)
- [8] Vlastos, A., and Milakis, D. 2004. “Explore, with Geometric Criteria, the Possibility of Introducing Bicycle to the Greek City. The Example of Moschato.” *Technical Chronicles* 1-2: 35-46.
- [9] WDCSD. 2016. *Final Report—Integrated Sustainable Mobility in Cities, a Practical Guide*. Geneva: WDCSD.
- [10] EC. 2017. *EU Policy for Sustainable Urban Mobility*. Brussels: European Commission.
- [11] EC. 1990. *Green Book for the Urban Environment*. Brussels: European Commission.
- [12] EC. 1995. *Green Paper on “The Citizens’ Network”*. Brussels: European Commission.
- [13] EC. 2008. *Green Paper—Towards Fair and Efficient Pricing in Transport—Policy Options*. Brussels: European Commission.
- [14] EC. 1996. *Green Paper—Future Noise Policy*. Brussels: European Commission.
- [15] EC. 2007. *Green Paper towards a New Culture for Urban Mobility*. Brussels: European Commission.
- [16] Bhat, C., Handy, S., Kockelman, K., Mahmassani, H., Chen, Q., and Weston, L. 2000. *Accessibility Measures: Formulation Considerations and Current Applications*. Texas: Center for Transportation Research.
- [17] Geurs, K., and Ritsema van Eck, J. 2001. *Accessibility Measures: Review and Applications*. Utrecht: RIVM, 33-65.
- [18] Markatou, M., and Papandreou, K. 2018. “Cities in Crisis: Studying the Phenomenon of Shrinkage in the City of Larissa.” *Aeichoros*. Forthcoming.