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TRAFFIC

# Tirana Traffic

## The Mitigation of Traffic in Tirana through the Formal Reconceptualization of the City

**A Project of the**
**Joint International PhD Program IDAUP**
POLIS University Albania / University of Ferrara Italy

TIRANA

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*The publication collects practical and theoretical concepts gathered and elaborated in structured and thematic contributes by PhD student from IDAUP Program. Chapter 3 collects the IDAUP PhD researchers' contributions, which have undergone a process of double-blind review.*

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# Preface

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# Tirana Traffic

## The Mitigation of Traffic in Tirana through the Formal Reconceptualization of the City

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**Issue 1**

A project developed in the framework of the
International Doctorate in Architecture and Urban Planning IDAUP
POLIS University, Albania / University of Ferrara, Italy

# Tirana Traffic

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# 1
# Introduction

# **Urban Form as a Panacea:** Formal Reconceptualization of the City to Solve the Traffic Problem in the Case of Tirana.

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## Introduction

This research is funded by the National Agency for Scientific Research and Innovation (NASRI) in Albania within the framework of the National Research and Development Projects (PKKZH) for 2024-2025 and POLIS University (U_POLIS). Our sincere gratitude to the generous support of National Agency for Scientific Research and Innovation in Albania, which enabled us to carry out this study. The financial support received for our project "Lehtësimi i trafikut në Tiranë nëpërmjet rikonceptimit formal të qytetit " (Eng. "Traffic alleviation in Tirana through the formal reconfiguration of the city"), based on Decision No. 10, date 21.07.2023, "On the approval of the financing of winning projects of the National Research and Development Program for the Period 2023-2024", is responsible for the significant success of the study. As part of this research project, the editors of this Volume have organised an workshop with PhD students within the International Doctorate in Architecture and Urban Planning (IDAUP) om the first two weeks of December 2024 where they developed the same topic. The results of this workshop are showed in this volume.

Traffic in contemporary cities no longer represents a local problem of transport systems, but a complex manifestation of the mismatch between urban form and population density. In this context, Tirana, as the most important metropolitan center of Albania, faces a critical situation that requires not only infrastructural or managerial interventions of traffic, but a fundamental reconceptualization of the spatial structure of the city. The present volume of the Scientific Journal of the Observatory of Mediterranean Basin (SJOMB) focuses on this fundamental challenge and presents a collection of scientific research articles produced by an interdisciplinary group of researchers, which stem from the initial research initiative developed through a scientif ic workshop held in Tirana in the first 2 weeks of December 2024. This workshop was attended by students of the Joint PhD program that POLIS University organizes with the University of Ferrara in Italy, where the topic "Eliminating traffic in Tirana through formal city reconceptualization" was addressed.

The traffic problem in Tirana cannot be underestimated. The speed of urbanization, the increase in economic capacity, and the introduction of new inhabitants in the city have brought great pressure on the existing infrastructure. The city's road infrastructure, designed and built for a much smaller population, is now unable to cope with the huge volume of vehicles, especially during critical hours. This phenomenon not only brings about a waste of time, but also economic losses, especially due to fuel consumption. The loss of time and economic losses affect the psychological fatigue of residents and further worsens the indicators of quality of life and environmental protection in the city.

However, international experiences in solving this problem demonstrate that simple infrastructural solutions such as expanding the road network, strengthening public transport, or installing traffic control systems are not sufficient. Indeed, historical and contemporary cases show that the most successful interventions have been those that have reconfigured or reconceptualized the urban form in its entirety. Urban form plays a critical role in the way traffic is distributed and developed in the city.

In this context, the research work represented in this volume addresses the fundamental question: How should the city of Tirana be formally configured to avoid or alleviate chronic traffic? And more broadly, what are the formal urban principles and

strategies that, when applied in similar contexts, manage to eliminate or significantly reduce traffic congestion? These initial questions represented the starting points of an ambitious research initiative that combines theory with concrete case study of Tirana. This research combines also the engagement of students and doctoral candidates in practical research, and dialogue between different disciplines in the IDAUP workshop of Tirana mentioned before

This volume, which presents the publication of the research findings of this workshop, is structured around the fundamental themes that emerged during the research work. The main themes include: the historical and morphological analysis of Tirana's urban form; the relationship between transport infrastructure and spatial configuration; the identification of future innovative formal strategies; and the examination of international models of other cities that have managed to solve similar problems through the reconceptualization of urban form. The volume brings together a series of research that challenges the traditional logic of road expansion referring to the Mogridge Conjecture, proposing instead a reconceptualization of urban form through decentralization and technology.

In conclusion, these researches converge on a common vision: easing traffic in a developing metropolis like Tirana cannot be achieved with isolated interventions, but requires an organic combination of history, ecology and digital intelligence to guarantee the transition from a monocentric city vision to a multicentric city vision. The use of the word multicentric is intentional. The suggestion of the following materials goes directly towards this vision. The multicentric model presupposes that new city centers have an independence from the existing center. If these new centers were to depend on the existing center, then we would have a polycentric model. The difference between the multicentric and the polycentric model lies precisely in the dependence of the new poles on the existing center: if they depend on the center, then the model is polycentric, and if they are independent and function as independent cities with their center that structures their morphology, then we are dealing with a multicentric model.

The academic and practical relevance of this volume extends beyond the borders of Tirana. While the city has a unique importance as the Albanian capital, the urban processes it is experiencing such as rapid urbanization, migratory pressures towards it, lack of adequate infrastructure, and conflicts on the public space, are common problems for many cities in the Balkan region and in other developing urban areas in the world. Therefore, the research methods and proposals developed here have the potential to be applicable and appropriate in other similar contexts.

The volume includes contributions from more than 20 researchers and academics, including professors, doctors and doctoral candidates. This composition reflects the interdisciplinary nature of this research. The contributors come from diverse fields such as architecture, urban planning, engineering, urban geography, sociology and history. They offer in their writings new perspectives to address the complex issue of traffic in cities.

It should be emphasized that this volume does not claim to be a definitive solution to the traffic problem in Tirana. On the contrary, it represents a first morphological step to address this multifaceted challenge. The works presented here provide a solid basis for further debates, for deeper research and for pragmatic experiments. They demonstrate the commitment of POLIS University as an academic and research institution to study real problems and to offer innovative and serious solutions.

Finally, we hope that this volume will serve not only as a scientific document for the academic community, but also as an information and dialectical instrument for those involved in urban policies, architects, engineers, and all those interested in building more livable and just cities.The main message conveyed throughout these pages is that urban form is important for solving problems, as a Panacea, and especially that of traffic. Urban form affects not only traffic avoidance, but also the quality of life, the dignity of society and the creation of healthy and sustainable communities. The research presented here is, in this way, a contribution to a larger project of reconceptualizing and rebuilding Balkan cities as good and suitable spaces for all those who live in them.



*Fig 1 / Pustec View*
*source / author*

# 2
# Interdisciplinary exchanges

# **The Structure of Tirana from 1614 to 1943.** Continuities, Discontinuities and Relation with Western Cities

DOI:

**Genti AVDIJA,** *Polis University, Tirana*



**Abstract -** *This work explores the structural changes of the city of Tirana from its beginnings around the XVII century to the end of World War II, putting them in relation with the development and paradigms of the development and planning of the western civilisation urbanisation. In the development of Tirana in this period we have individuated three different phases of development of the city. In the first phase the development is characterised by the ottoman influences. In the second, that coincides with the creation of the state and the becoming of Tirana the capital of Albania, we can denote a certain tendency to westernisation. And lastly, the consolidation of the urban structure during WWII, under the Italian influence. The development of Tirana is not a linear development, but is characterised by fractures as a result of a complex interaction of cultural, political and geographic factors. These fractures contain elements that disappear, and elements that persist that characterise the structure of the city today. The development itself oscillates between spontaneity and plan, morphology and typology, urban and territorial. It is important to note that certain urban elements introduced during this period still persist in the structure of the city to this day, and therefore characterise the city. Precisely these elements should constitute a starting point for the future development of the city. The research output is a perspective on the development of Tirana until 1945 that extrapolates the urban elements of development and relates them with western cities. The relation of planning and urbanism in Tirana with the western civilisation is very peculiar, because of the early ottoman influence and the late application of western urban design principles. Lastly, the Italian plan (1939 – 1943) constitutes the first complex structuring of the city, and the last substantial structural modification of today.*

*Keywords - Urban structure, Medieval city, Modern urbanism, Resilience*

## Introduction

Tirana in the last thirty years has experienced first an extension of the boundaries, and then a radical transformation of many if not all the tissues of the city. The actual condition is one of a city in continuous and rapid transformation which brings a sense of alienation. The transformations in course are fragmented and gone through many phases during the last thirty years. Though there is a regulatory urban and territorial plan since 2016 it doesn't seem like the interventions are organic and cohesive. This plan is in line with the development of western cities in which Tirana aspires to be part of. Nonetheless Tirana has a peculiar development that renders it unique in the city development modalities. When everything is being considered anew maybe is time to reflect on the past. Tirana has a long history of proposals and planning interventions, different in character and scale, that have shaped the city through the years. Some of these interventions disappear some persist, and some return. Though the tissues of the city are being modified the most reliable resilient part of this chaotic city remains its structure. This is a critical investigation on the structural modifications of the city from its birth to the end of World War II. Hopefully this will be a starting point for a mirror reflection for the city in the future. Looking at the development of the city until 1945 we can recognize three different phases of transformation that coincide with huge political and social changes. These changes produce distinct views on the development of the city.

### Tirana from foundation to independence (1614 – 1912)

From the fourteenth century until 1912 when independence was declared, Albania, like all the

Balkans, was part of the Ottoman Empire. During this period Tirana was a small settlement, and the period of creation is uncertain. In the surrounding area there have been several archaeological finds. An example is the discovery of the mosaic of an early Christian church dated to the third century BC near the current center of Tirana (Korkuti, 2003). The date commonly accepted as the date of the city's founding is engraved on the Bargjini mausoleum, 1023 of the haxhiri [Muslim/Turkish] calendar which corresponds mainly to 1614. The city is constituted with the construction of a mosque, a hamam, an oven and an inn by Sulejman Pashe Bargjini (Frasheri 2004, p. 67), which subsequently led to the creation of the bazaar. Tirana was born as a crossroads of interregional merchant routes that had been consolidated since the sixteenth century. From Durres and Vlora, which were the two port cities, they led inland. From Dibra, Shkodra, Lezha in the north, they passed through the southern regions but also to reach Istanbul, Thessaloniki or Macedonia (Frasheri 2004, p. 71). The roads look more like paths. Where there are crossings or bridges, knots begin to develop appropriate for commerce and to offer services to travelers which is the way cities like Florence, Paris, Prague, etc. were born (Miho 1988, p. 86). In the first surveys of Tirana dating back to 1917 and 1918, carried out by Austrian technicians, these interregional routes are clearly visible.

## The new capital city (1920 – 1933)

At the end of the First Balkan War in 1912, which sanctioned the definitive fall of the Ottoman Empire, Albanian territories were disputed by Serbian and Montenegrin forces in the north, Greeks in the south and Italians on the coast. With the support of the Austro-Hungarian Empire, Albania he succeeds in proclaiming the independence recognized even by European nations. Despite this, the political situation remained unstable in the following years with three main factions vying for power: the party of the Young Turks; the pro-Italian movement; the pro-independence patriots. Albania, despite not taking sides during the First World War, becomes a disputed territory where this war is fought. During the war, Albanian territories were controlled by Austro-Hungary in the north, Italy in the coastal region from Durres to Vlora, and France in the region of Korçë in the south of the country. Austro-Hungarian forces withdrew from Albania in 1918 following the defeat in the war and at the end of the First World War and Albanian cities will be under the control of the Italian and French allied forces. In 1920 the Congress of Lushnje was held where a group of patriots from all parts of Albania formed a government that proclaimed Tirana temporarily the capital of Albania and during 1920 managed to have the most important cities handed over (Frasheri, 2003).

There was a definitive detachment from the period of Ottoman influence with obvious repercussions from an urban point of view where Tirana suddenly found itself in the condition of having to host the entire state apparatus, and all efforts were concentrated there, with the intention of enabling the new capital with the appropriate institutions and planning future developments. During the following decade, a number of planning proposals were developed.

## Tirana during the fascist occupation (1939 – 1943)

In 1939, in line with the expansionist policies of the time, Italy invaded Albania. King Zog I, had had economic relations and cultural exchanges with Italy since his coming to power (Lang 2024). Economic dependence, unconsolidated power within Zog's own Albania and inferiority of means meant that Zog did not oppose excessive resistance and went into exile. Vittorio Emanuele III of Savoy in this period was appointed King of Italy, Albania and Emperor of Ethiopia. Under the Italian administration, huge investments were made, especially in Tirana, with the intention of being accepted by the locals and starting a process of colonization. A few months

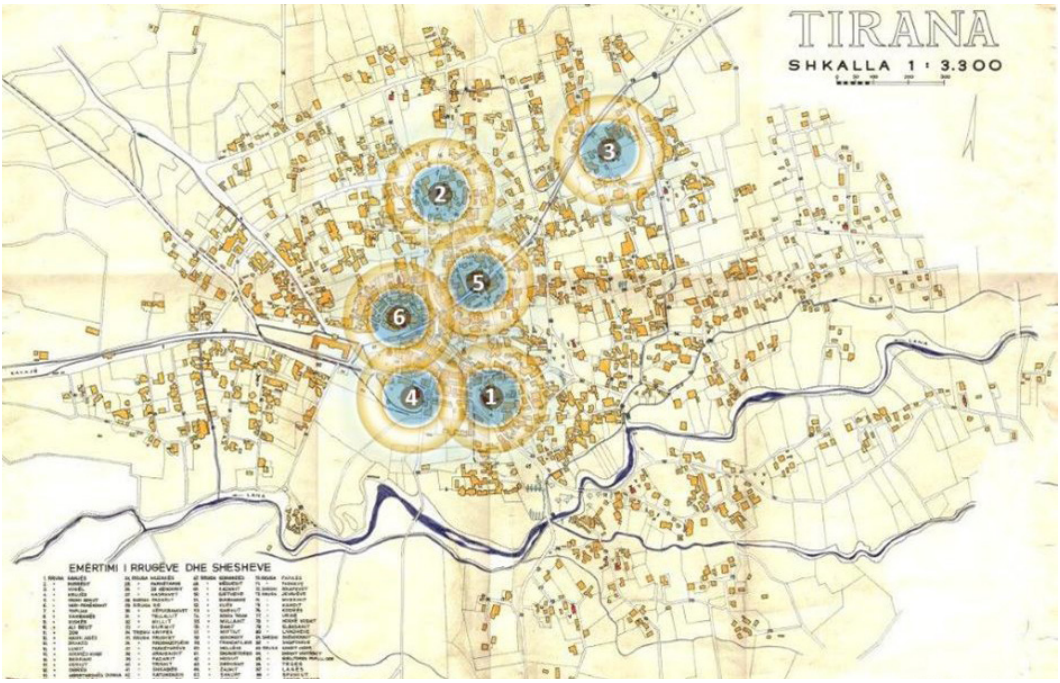


*Fig. 1. The first six nuclei of the expansion of Tirana on the 1921 map: 1) old mosque; 2) Fira; 3) Zajmi; 4) Ethemi; 5) Stermasi; 6) Karpaci. Source: Elaboration of the author on AQTN map.*



after the invasion, a new master plan for Tirana was thought of and the task was entrusted to the Florentine architect Gherardo Bosio. (Corsani 2017; Di Nardo 2018). The plan was completed in 1943. In 1941, due to Bosio's death, Ivo Lambertini and Ferdinando Poggi took his place.

## Methodology

The work is based on the historical analysis of the development of Tirana until the end of WWII. Taken in consideration the plans and drawings of the era, and also the primary and secondary relevant sources that explain the historical and urban changes of Tirana during that period, the study, through an interpretative and critical investigation determines the fractures of the development and identifies the urban elements, methods and tools used in the different eras of the city's development. The main focus is directed to the structural dimension of said urban proposals and how it relates with the political changes of the time. Through this analysis the study proposes a comparison with the development of western cities in the different phases of evolution in order to discover the relations between them. This will be expressed through a series of dualities that consider the type, the form, and the scale in a development that moves between spontaneity and plan, morphology and typology, urban and territorial.

The study will develop in a mirror structure where to the three different periods characterized by political changes correspond peculiar urban and developmental characteristics. According to the three periods individuated we can discern the particular modes and elements of development in each of the phases.

## Results and Discussion

We can start to note that in the first phase of development that extends from the creation of the city to the becoming of a capital city, structurally there is the emergence of medieval cities characteristics. Subsequently, in the period of independence and monarchy, there is a prevalence of mid 1800s urban elements. Finally, during the fascist occupation there is an application of contemporary (for the period) modes of intervention.

### Medieval Tirana

In the historical analysis of the settlement, Miho (1988, pp. 50-53) and Frasheri (2004), identify several nuclei in the formation of the historic center of Tirana until the beginning of the twentieth century. The first one of foundation by Sulejman Pashe Bargjini; a second nucleus created at the beginning of the eighteenth century with the construction of the mosque of Fira; a third that is created at the same time as the construction of the mosque of Zajmi in 1775; a fourth nucleus with the mosque of Haxhi Et'hem in the center which is located on today's Central Square of Tirana, and so on (fig. 1). During this period, the city expands in a centrifugal manner starting from these nuclei until they meet and clash. (Lambertini, Poggi, 1943).

Throughout the medieval period Tirana developed morphologically through spontaneous non-geometric fabrics. The dwellings consist of single-family houses for extended families that never overlook the street but are mediated by perimetral walls that create courtyards. Streets and lanes form randomly as the cores expand. Here the first differences between the medieval European city and Tirana with their oriental influences begin. The European model of urban development with 4 or 5-storey buildings in a period where there is no shortage of land is the result of the "materialization of social solidarity of belonging to the civitas in the compactness of the urbs" (Romano, 1992, p. 45). The concept of density, therefore, that we find in the birth of the city as we know it today according to Romano, we do not find it in Tirana in the Middle Ages.

Another characteristic that we find in the western medieval city is the division of the infinite


*Fig. 2. The first proposal of Brasini for the boulevard. Source: AQTN.*

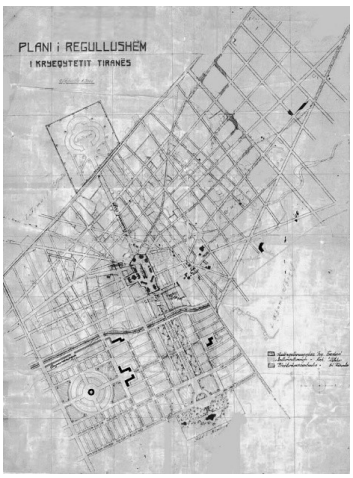


*Fig. 4. Plan of Tirana 1929. Source: AQTN*

*Fig. 3. Tirana urban condition in 1937. Source: Personal archive.*



countryside outside the walls from the collective life inside them. In eastern medieval cities, such was Tirana at the time, there were no walls, and a consequence no clear differentiation between urbs, suburbium e ager. Moreover, in eastern cities there is neither a public space representative of society as it can be in the medieval European city, much less a central organization that takes into account developments on a larger scale than the individual one. Thanks also to the prevalence of individual character, the density is lower than in medieval European towns.
Another aspect of differentiation between eastern and western medieval developments are the city functions and structure, related also to the top-down interventions on the city. As Enyedi points out, "The urban innovation of the multifunctional medieval city with regular street planning did not penetrate the Balkan Peninsula, as the region was incorporated into the Ottoman Empire for 500 years." (Enyedi, p. 106).

## Elements of 1800s urbanism

In 1923, the first Master Plan was drawn up by Austrian engineers and architects with the participation of the Albanian counterparts (Aliaj et al., 2003; Dhamo et al., 2016). The radial layout of the main streets on which the city was formed is preserved, providing for their enlargements, and the orthogonal layout is introduced for the first time by superimposing it on the pre-existing structure. In 1925 Tirana was proclaimed the capital definitively. Ahmet Zogu became prime minister and, for the nascent capital, commissioned the Italian architect Armando Brasini to develop a project for Tirana. Brasini proposes the introduction of a monumental axis on which to arrange the functions of the capital (fig. 2).

The project presented by Brasini was never implemented but the idea of the axis remained in the structure of the city and was proposed again later. The axis related only to the territorial scale [and not to a city that was missing at the time], it read the parallel of the existence of the city that was the mountain of Dajti, a kind of "axis mundi" for the Tirana plain (Dhamo et al. 2016, p. 20). It is therefore important to note that Brasini's intervention, beyond the idea of the axis itself, in a certain sense also dictates the orientation of the city. The following year a new plan was drawn up on the basis of the 1923 plan, making improvements and integrating the idea of the Brasini axis.

In 1928 Ahmet Zogu proclaimed himself King of Albania and commissioned the Austrian Kohler and the Albanian Frasheri to rework the 1926 plan by expanding the territory. To these was added the Italian Di Fausto in 1929, when a further version of the master plan was presented (fig. 3). The structure of the plan is coordinated by engineer Eshref Frasheri. Kohler was in charge of planning

*Fig. 5. Urban plan of the core of Tirana in 1943 by Bosio, Lambertini, Poggi. Source: AQTN*


*Fig. 6. Territorial Plan of Tirana in 1943 by Bosio, Lambertini, Poggi. Source: AQTN*

the southward extension of the city beyond the Lana stream, and Di Fausto planned the buildings in the center of Tirana. Subsequently, in 1930 and 1931, two other improved and more extensive proposals were prepared based on the 1929 plan (Dhamo et al., 2016). From the 1931 plan, the six buildings that still delimit the southern part of the central square of the city, designed by Di Fausto, conceived as ministries of the reign of Zog I, were implemented, and in the northern part the town hall building that was demolished in 1982, and also to the north a piece of boulevard that passes through the medieval city on the trail of Brasini's project, which today bears the name "Bulevardi Zog I".

In this decade full of events from an urban point of view, we can glimpse some common elements or, if we want, tools, belonging to nineteenth-century urban planning that emerge in the urban design interventions of this period: the boulevard and the grid. The use of the idea of boulevard, widely used from Haussmann onwards, can be revealed from the first interventions of widening the main arteries of the creation of the city, and in the idea of Brasini's central axis. The grid, used in a military

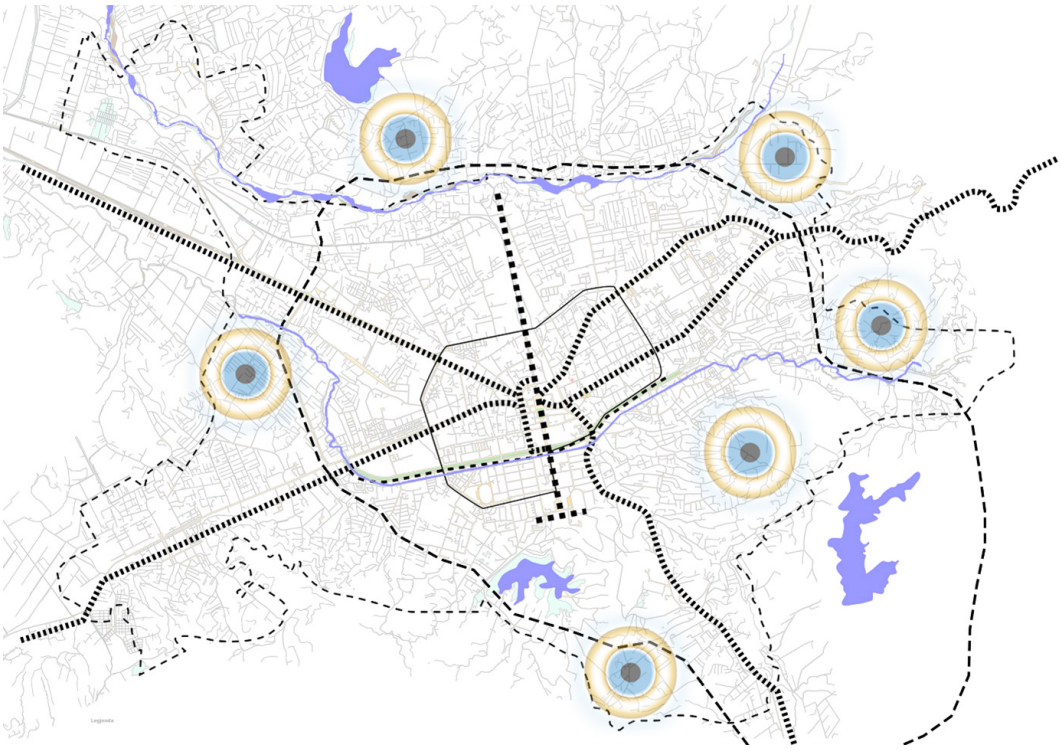

*Fig. 7. The current structure of Tirana with the most relevant nuclei of expansion (from left up, Astir, Paskuqan, Fresk, Shkoze, Ali Dem, Sauk). Source: Author.*



context since Roman times, lost relevance for many centuries during the Middle Ages and then came back into vogue in the 800s. The Manhattan plan in 1811 and Cerda's project for Barcelona in the mid-1800s are two examples. In Tirana, the grid has been proposed since the intervention of 1923 and later, as an overlay on the existing fabric and planning of territorial expansions. As we can note from the rendition of the urban condition of Tirana in 1937 (Fig. 4), the boulevard was actually the only element implemented structurally. The organic structure of Tirana still persists and it is clear (see Fig. 3 and Fig. 4) how the implementation of the grid in the existing city and the southern extension of the city could have dramatically changed the layout of Tirana. In 1937 there is the persistence of the radial foundational routes and the organic nature of the settlements. Contemporarily, there is the addition of the central boulevard and the definition of the central square that emerge as strong geometric signs that somehow are superimposed to the city.

## The consolidation of the urban structure

Bosio's plan of 1939 - 1943 will be the most advanced and complete plan made for Tirana, both for the in-depth study phase preliminary to the plan (fig. 5), and for the breadth and general unitary vision (fig. 6). Great attention was paid to private property, to the development of the city without undermining the already existing economic centers and therefore the investments of citizens. The plan envisaged planning for the following sixty years, and anticipating the increase in population, the existing nucleus was not considered suitable to accommodate the population. Howard's garden city was taken as a model for the new Tirana. The authors' considerations started from the love for nature of the citizens reflected in the courtyards of all the houses of Tirana with their vegetation that gave a picturesque character to the city (Lambertini, Poggi, 1943). As a result, the plan provides for an environmental system with large parks on the edge and a system of small parks within the city. Structurally, the plan maintains the existing radial roads, to which enlargements had been made in previous years, connecting them with an infrastructural ring with a diameter of about 3 km. The proper urban somewhat dense development is envisioned inside said ring (Fig. 6). The axis proposed by Brasini, conceived as the representative backbone of fascism, is maintained and the structure of the plan recalls the typical layout that we can find in newly founded cities of the fascist period, such as Latina for example. Bosio will personally take care of designing in meticulous detail the buildings overlooking the axis, many of which will be built and still represent a significant cultural legacy in Tirana. Stylistically, unlike Brasini who had a neoclassical approach to design, Bosio prefers the lictorian style, stylistically a mixture of monumentality and formal simplification and of the elements.

The plan was not implemented due to Italy's defeat in World War II after which it had to withdraw from Albania, but the concentric-radial structure with a marked central axis was the starting point of the urbanization of the communist period. During this period there are several structural elements that define the structure of Tirana and persist to the current condition (Fig. 7). The foundation of a cardo – decumanus system composed by the boulevard and the Lana torrent. The central dense core with a superimposition on the radial roads. The inner ring which together with the radial roads emphasize the radial character of the city. The territorial dimension also suggests somehow the current extension of the city.

If we consider the current structure of Tirana there is a clear resemblance with the Bosio plan. For the above-mentioned reasons, we can say that the

Bosio plan constitutes the fully formed backbone of the consolidated structural identity of Tirana. In fact, the future major structural modifications that appear are the creation of an outer ring and the extension of the boulevard on the North side, which are in continuity with Bosio's vision. An interesting element that we can notice in the current structure is the spontaneous creation of several nuclei starting from the 1990s that recall the modes of creation during the first phase of creation of the city.

## Conclusions

There is a series of considerations that we can make regarding the structural development of Tirana during this period. The first one is that the structure of Tirana is the only resilient part in the development of the city. The urban tissues, the functions, the typologies are constantly changing but the structure remains. Said structure was consolidated during the Second World War with the Bosio's Plan. This could be a starting point for the so longed identitarian future transformation of Tirana. The structure of today's Tirana has been formed through a series of continuities and discontinuities.
The first discontinuity is expressed through the three phases that we analyzed in which there are two fractures. The first, and more evident one, happens in the passage from the organic structure developed during the ottoman period and the introduction of western, though dated elements of western urbanism such are the grid and the boulevard during the independence and monarchic period. During this phase we can note a clear passage from spontaneity to plan. The second fracture is more subtle, but non the less expresses the differentiation of approaches from different regimes. During the fascist occupation, even though there is an influence of Italian architecture and urbanism, the approaches are different. Stylistically for example there is a passage from a sort of eclectism adoperated by Armando Brasini and Florestano Di Fausto to a more sober lictorian architecture of Gherardo Bosio, reflected also morphologically in the respective projects. Structurally, the grid adoperated in the 1929 plan is a bit irregular and superimposes drastically in the northeastern part of the city. The Brasini plan, even though erases the old city, paradoxically maintains a closer relation morphologically with the existing city. The reinforcement of the cardo – decumanus system, the reinforcement of the central nucleus through the ring, emphasize the radial nature of the city. There is also a strong typological imprint in the plan, expressed through the courtyards, but this part was not implemented. It is clear how the urban development is closely related to political power and how it manifests in the urban fabric.

As for the current structure, the introduction of the territorial scale in the Brasini plan and the return of the spontaneous morphological development, represent two major discontinuities. In the first case, during the communist regime until 1992, there were attempts to expand the city to a territorial scale, but de facto this never really happened. The real expansion to the territorial scale happened during the 1990s with the spontaneous internal uncontrolled migrations of the population. This takes us to the second discontinuity. It is interesting to notice how the uncontrolled movement of the population during the 1990s produced an almost identical development as the development until 1920. The prevalence of morphology differentiates only from the even more elimination of public space in current times, where in the medieval configuration there were the nuclei composed by the mosque, the bazar, the hamam, and the inn.

As for the continuities, the radial foundational roads represent the structural backbone of Tirana. During the creation of the republic, later monarchy, there is the consolidation of a univocal central square and the implementation of the boulevard that superimpose geometrically and typologically on the existing city. To these structural elements there is the addition of the inner ring, the completion of the boulevard with the reinforcement through the addition of the decumanus consisting in the Lana torrent, and the reinforcement of the radial nature of Tirana that are envisioned in the Brasini plan. The base of the current development on which the city is still expanding and modifying, is thus formed.

Lastly, there is an important topic that needs to be addressed. The aspiration of Albania and Tirana of being part of the western civilization, has brought dramatic urban changes which we cannot address fully in this research. The rapid transformation of the city is provoking an enormous fracture with city of the past, manifested in the urban fabric. These transformations bring a sense of displacement, and raise a doubt expressed in the dualism between globalism and regionalism. During the discussion we tackled the complexity of the structural development of the city, and would like to suggest that even though Tirana is a western city subjected to all the global factors of western development, the character of Tirana lays in the particular position between east and west, which is a richness that needs to be valorized.

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# Fragmented Densification and Urban Form in Contemporary Tirana

DOI:

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**Abstract -** *The transition from centrally planned systems to market-oriented development has profoundly reshaped the spatial structure of post-communist cities. In Albania, this transformation unfolded rapidly following the collapse of the socialist regime, resulting in profound discontinuities in planning practices, institutional frameworks, and the relationship between architecture and the city. Tirana, as the country's political and economic center, became the primary locus of these changes, experiencing intense demographic pressure, informal urbanisation, and speculative development.*

*This paper investigates the relationship between planning instruments, architectural practice, and urban form in post-communist Tirana. Through a qualitative morphological analysis of implementation plans and selected case studies across a spatial gradient from the suburban periphery to the city center, the study argues that fragmented densification is not an accidental outcome but a structurally produced condition.*

*The findings demonstrate that densification strategies which focus primarily on quantitative parameters—such as height, floor area ratio, and coverage—fail to articulate spatial relationships at the scale of streets, blocks, and public spaces. As a result, urban space is produced as a collection of autonomous architectural objects, undermining spatial continuity, legibility, and collective form. Drawing on theories of urban morphology and urban form, the paper highlights the critical role of architectural quality and the absence of a coherent urban project in the progressive disfiguration of the contemporary city. While grounded in the specific context of Tirana, the conclusions are relevant to a broader range of post-communist and rapidly transforming urban environments.*

*Keywords - Post-communist cities; Urban densification; Urban form; Planning instruments; Tirana; Architectural autonomy*

## Introduction

The transition from centrally planned systems to market-oriented development has fundamentally reshaped the spatial structure of many post-communist cities (Stanilov, 2007). In Albania, this transformation unfolded rapidly following the collapse of the communist regime, resulting profound disruptions in planning practices, institutional frameworks, and the relationship between architecture and the city. Tirana, as the country's primary political and economic center, became the principal laboratory of these transformations, experiencing unprecedented demographic pressure, private investment, and informal construction (Pojani, 2010).

During the early years of the transition, urban growth occurred largely in the absence of comprehensive territorial planning instruments. Informal settlements, unauthorized extensions, and speculative developments proliferated, superimposing themselves onto existing urban structures without shared principles or long-term coordination (Aliaj, Lulo & Myftiu, 2003). Planning legislation evolved gradually as a reaction to these processes, aiming primarily to regain control over expansion rather than to proactively guide urban form (Hirt, 2012). Within this context, densification has increasingly been promoted as a key planning strategy to counter urban sprawl and optimize land use (Neuman, 2005).

However, when densification is pursued primarily through regulatory parameters and quantitative indicators, detached from an overarching urban project, it risks reinforcing fragmentation rather than producing urban coherence (Secchi, 2010). In Tirana, formally approved architectural projects often develop as isolated objects, complying with planning regulations while remaining disconnected from their urban context. This condition contributes to the progressive loss of urban form, understood not merely as a visual or stylistic issue, but as the erosion of spatial continuity, hierarchy, and collective structure (Rossi, 1982).

## The Urban Planning Framework in Albania

Following the collapse of the communist regime, urban planning instruments and building regulations in Albania developed primarily as a response to the urgent need to control the expansion of existing cities. The absence of a comprehensive territorial planning document during the transition period facilitated the uncontrolled proliferation of informal and uncoordinated urban development. This process resulted in the superimposition of new structures onto pre-existing urban fabrics without adherence to coherent spatial principles. Even today, the implementation tools guiding densification frequently overlook the temporal dimension, neglecting time as a fundamental factor in the stratification and layered evolution of urban form.

Under the communist regime, urban development was centrally controlled and characterized by strict functional zoning, standardized architectural production, and limited urban expansion (French & Hamilton, 1979). Although ideologically rigid, this system maintained a relatively coherent relationship between planning and urban form. The collapse of this framework in the early 1990s generated an immediate institutional vacuum, coinciding with intense internal migration toward Tirana and accelerating urban growth under conditions of weak governance (Pojani, 2013).

During the first decade of transition, urban expansion occurred largely outside formal planning mechanisms. Informal settlements and unauthorized constructions spread rapidly, transforming both peripheral and central areas (De Soto, 2000; Aliaj, Lulo & Myftiu, 2003). Planning legislation initially focused on legalization and regularization rather than long-term spatial coordination. The absence of a comprehensive territorial plan encouraged fragmented decision-making and partial interventions, further undermining urban coherence.

In response, planning instruments gradually evolved to include local master plans and detailed implementation plans aimed at regulating density, land use, and building parameters (UN-Habitat, 2014). Densification emerged as a central strategy to counter dispersed development and optimize land consumption. However, these instruments often operated in isolation, privileging quantitative control over spatial principles and concentrating on individual parcels or limited zones rather than holistically addressing the city's structure.

As a result, planning in Tirana predominantly functions as an administrative apparatus that applies regulatory parameters to building form such as height limits, setback distances, and coverage ratios without articulating a coherent urban vision integrating streets, blocks, and public spaces. This regulatory approach has enabled private developments to proliferate legally

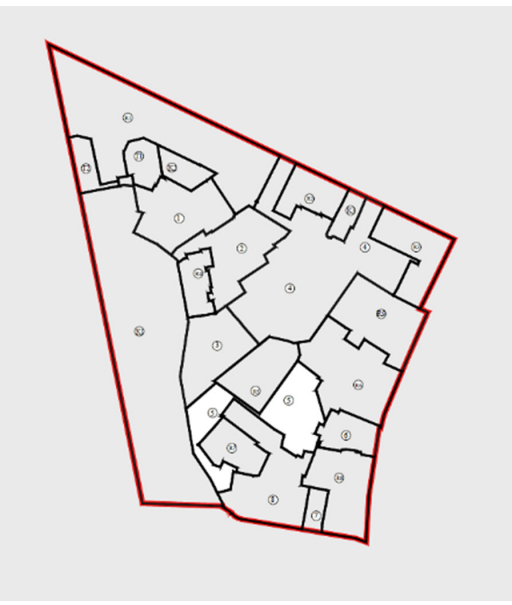

*Fig. N. Structural Unit TR 367 According to the Tirana General Local Plan (PPV): Subdivision into Sub-Units*

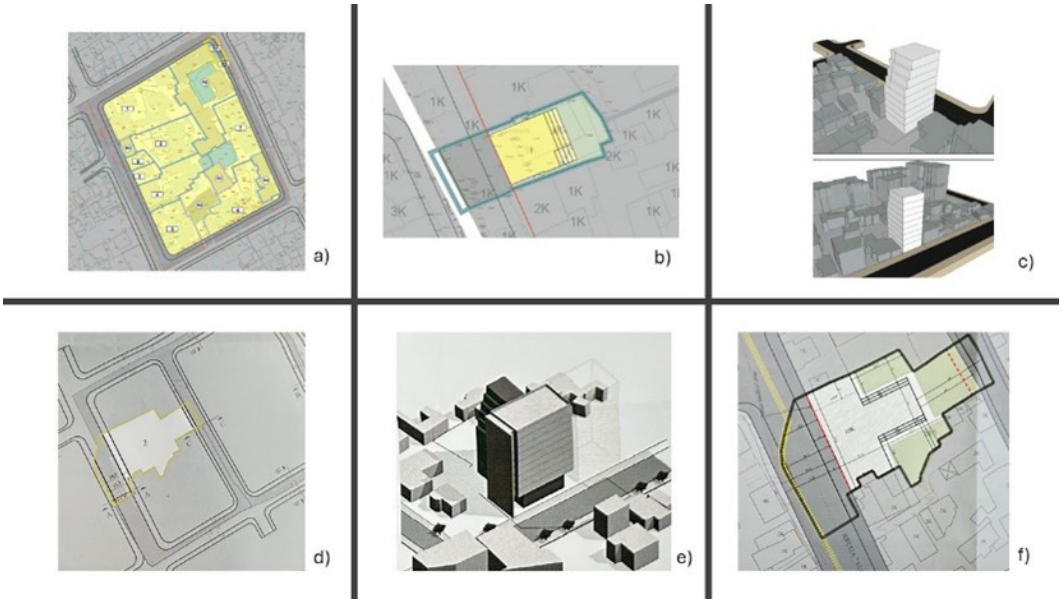


*Fig. 1 Structural Unit TR 325 dhe TR 332 According to PPV: development of sub-unit 2 (d,e,f) and 3 (b,c)*



without contributing to the collective spatial structure, thereby perpetuating fragmentation and progressively eroding the city's urban form (Healey, 2007).

## Methodology

This study employs a qualitative and analytical research design grounded in urban morphological analysis (Moudon, 1997; Kropf, 2009). A series of case studies was strategically selected along a spatial gradient extending from the urban periphery to the central areas of Tirana. This sampling strategy enables a comparative examination of how densification processes unfold across heterogeneous urban contexts and distinct historical strata (Stanilov, 2014).

The primary sources include detailed implementation plans, officially approved architectural projects, planning regulations, and cartographic documentation. The analytical process involved the reconstruction of urban blocks through comparative diagramming, figure–ground analysis, and volumetric modeling. These techniques facilitate a systematic assessment of the relationships between regulatory frameworks, design intentions, and built outcomes, allowing discrepancies between planned objectives and materialized forms to be critically identified (Groat & Wang, 2013).

Rather than assessing individual buildings as autonomous objects, the methodology evaluates their cumulative impact on block morphology, public space configuration, and spatial continuity. By foregrounding the relational and aggregated effects of architectural interventions, this approach conceptualizes urban form as a collectively produced structure. It is consistent with established case study methodologies widely employed in urban and architectural research.

## Urban Form, Temporality, and Densification

Urban form is not the immediate outcome of isolated design decisions, but rather the product of a cumulative and stratified process unfolding over time. Urban morphological theory emphasizes continuity, transformation, and layering as fundamental mechanisms in the construction of the city (Conzen, 1960; Muratori, 1960; Caniggia & Maffei, 2001). Streets, blocks, plots, and buildings interact through temporal sequences, generating coherent structures when guided by shared spatial principles.

When densification is understood merely as an increase in built volume or population density, it risks disregarding this temporal dimension. Quantitative approaches to density frequently privilege short-term efficiency over long-term urban coherence (Churchman, 1999; Berghauser Pont & Haupt, 2010). By contrast, a morphological interpretation of densification considers how new interventions relate to existing structures, reinforce spatial hierarchies, and contribute to the evolutionary logic of urban form (Secchi, 2010).

A central premise of this study is that architecture cannot be conceived as an isolated or purely private act. As Hermann Hertzberger observes, "Every building, no matter how private it is intended to be, has a role to play in the public realm, whether it likes it or not, and God knows it can become a permanent cultural irritant." This statement underscores the inherent social and spatial responsibility embedded in every architectural intervention.

Building upon this premise, the study reconstructs the urban form of selected blocks as the composite outcome of implementation plans and realized architectural projects, intending to identify significant mismatches between the intended urban project and the materialized urban form. This approach enables an examination of how fragmented densification processes and architectural autonomy contribute to the erosion of coherent urban form, reinforcing the understanding that each building—regardless of its private intent—inevitably shapes the public realm.

The relationship between architecture and

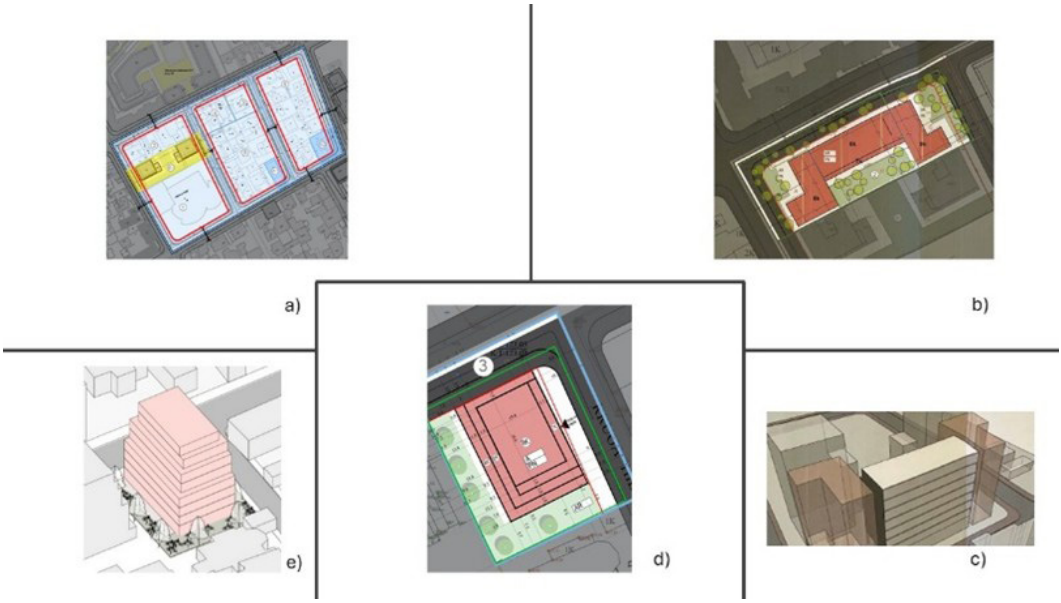


*Fig. 2 Structural Unit TR 326 (a) According to PPV: development of sub-unit 2 (b,c) dhe 3 (d,e)*



urban projects is therefore central to this inquiry. Architecture may either reinforce or undermine urban structure. When buildings are conceived as autonomous objects, responding primarily to market logic or individual expression, they may comply with regulatory parameters while remaining disengaged from their urban context (Koolhaas, 1995). Conversely, architecture that engages with the scale, rhythm, and continuity of the city contributes to the construction of collective form (Rossi, 1982; Rowe & Koetter, 1978).

In contexts where planning instruments fail to articulate a coherent urban project, architectural quality becomes a decisive factor. This study adopts this theoretical perspective to analyze how densification strategies in Tirana have interacted with architectural practice to produce fragmented urban outcomes.

The analyzed case studies reveal recurring patterns of fragmented densification across diverse urban contexts:

- *Urban Peripheries (Fig. 4).* Detailed implementation plans frequently prescribe higher densities without establishing a coherent relationship between new developments and pre-existing informal structures. As a result, large-scale residential or mixed-use complexes emerge as enclaves, spatially disconnected from surrounding street networks and public spaces (UN-Habitat, 2012; Pojani, 2016). Rather than consolidating the urban fabric, densification in these areas often reinforces spatial discontinuity.

- *Intermediate Zones (Fig. 2).* In areas where socialist-era blocks coexist with post-transition developments, densification typically takes the form of infill projects. While such interventions increase built volume, they frequently disregard the original block structure, disrupting established spatial hierarchies and fragmenting open spaces (Stanilov & Scheer, 2019). Although architecturally compliant in formal terms, these projects often fail to mediate between old and new morphological systems (Hirt & Petrović, 2011). The result is not morphological integration but layered incongruity.

- *Urban Centers (Figs. 1 and 3).* In central areas, densification is driven primarily by high land values and speculative investment dynamics. Implementation plans permit significant increases in height and floor area ratios, encouraging the replacement or overbuilding of existing blocks (Logan & Molotch, 1987). Architectural projects frequently emphasize autonomy, prioritizing iconic form or profit maximization over urban continuity. The cumulative effect is a decline in block legibility and the progressive privatization of formerly collective spaces (Harvey, 2001).

According to national planning legislation and related regulations, the Detailed Local Plan (Plani i Detajuar Vendor – PDV) constitutes a formal planning instrument intended to ensure the implementation of national and local planning frameworks within one or more structural units. It represents the most granular level of statutory planning and functions as the operational mechanism through which development parameters are defined and enforced. Within the PPV framework (General Local Plan), the structural unit serves as an intermediate territorial scale linking strategic citywide objectives to site-specific implementation mechanisms.

During the preparation of a PDV, the study area—typically corresponding to a structural unit (Fig. N)—is subdivided into a hierarchical system of sub-units for detailed planning purposes. This subdivision enables the allocation of development indicators, land-use designations, and regulatory parameters at a more granular level. Typically, the subdivision includes:

a) Development and restructuring sub-units, which serve as the primary territorial units for spatial analysis and the allocation of development indicators (e.g., density, floor area ratio, land use parameters);

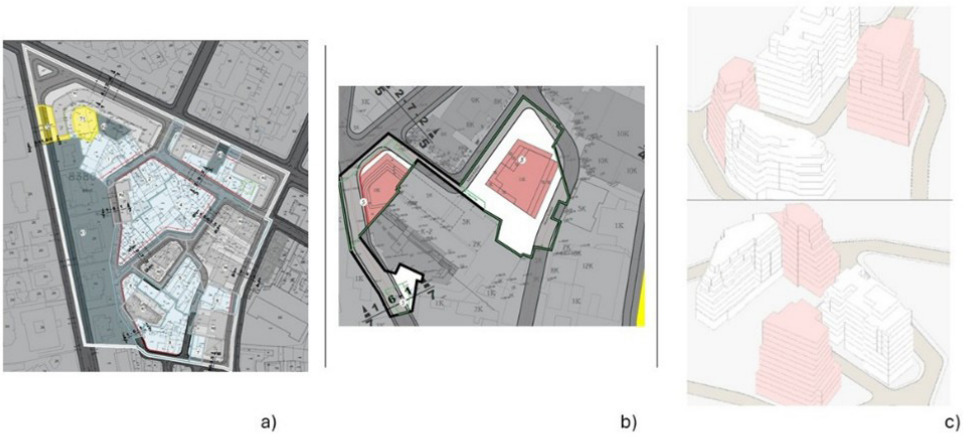


*Fig. 3 Structural Unit TR 367 (a) According to PPV: development of sub-unit 5 (b,c)*



b) Management sub-units, defined according to the urban design framework and property management plan, regulating implementation procedures and ownership-related considerations.
While the PDV provides a structured regulatory framework, the case studies indicate that its subdivision logic and parameter-based approach often prioritize quantitative development indicators over morphological coherence. Therefore, the instrument tends to facilitate parcel-based intensification rather than block-scale or citywide structural integration.

The PDV is intended to ensure the proportional distribution of development indicators across all development sub-units. In practice, however, territorial management through these sub-units has operated primarily as an administrative mechanism, focused on procedural requirements for obtaining building permits from the relevant authorities. This approach has led to the fragmentation of the PDV along the lines of private development interests, rather than fostering a shared vision for urban form. Therefore, the PDV has struggled to function as a coherent planning framework. When development is addressed at the scale of isolated sub-units, the relational qualities between buildings—such as spatial continuity, hierarchy, permeability, and collective form—are frequently overlooked. Urban space is thus produced as an assemblage of autonomous objects, lacking coordination in terms of scale, orientation, public space integration, and spatial sequencing. This object-based approach constrains the capacity of urban design to mediate adjacency and continuity between neighboring developments and to generate meaningful public spaces.

From the perspective of urban form theory, these findings conflict with Lynch's principles, which emphasize the legibility and coherence of the city as a product of interconnected spatial elements streets, edges, districts, nodes, and landmarks perceived as part of an integrated whole. When planning instruments fail to incorporate these relational structures, the urban environment risks becoming perceptually fragmented and functionally dispersed. The absence of a unified urban framework within the PDV undermines both the experiential quality of urban space and the city's long-term capacity to evolve as a coherent spatial system.
Comparative analysis of the case studies demonstrates that fragmented densification in Tirana is not an accidental phenomenon, but a structural condition produced by the interaction between planning instruments and architectural practice (Secchi & Viganò, 2011). Implementation plans regulate density without articulating form, allowing architectural projects to operate autonomously within prescribed parameters.
This condition results in a city composed of isolated buildings rather than integrated urban structures. Streets lose continuity, blocks disaggregate into clusters of objects, and public space becomes residual, reflecting broader processes of urban fragmentation observed in contemporary cities. Architecture plays a central role in this dynamic. When architectural quality is reduced to formal novelty or mere regulatory compliance, it fails to contribute to the collective dimension of the city. Mediocre architecture, replicated across multiple developments, has become a powerful driver of urban deformation (Frampton, 1983; Koolhaas, 1995).

## Toward an Urban Project

The analysis highlights the need for a fundamental shift from regulatory planning toward a project-oriented urban approach. Implementation plans must move beyond numerical parameters to incorporate clear spatial principles, addressing block structure, street continuity, and the quality of public spaces (Solà-Morales, 1997; Secchi, 2006).
Reintegrating time as a planning dimension is

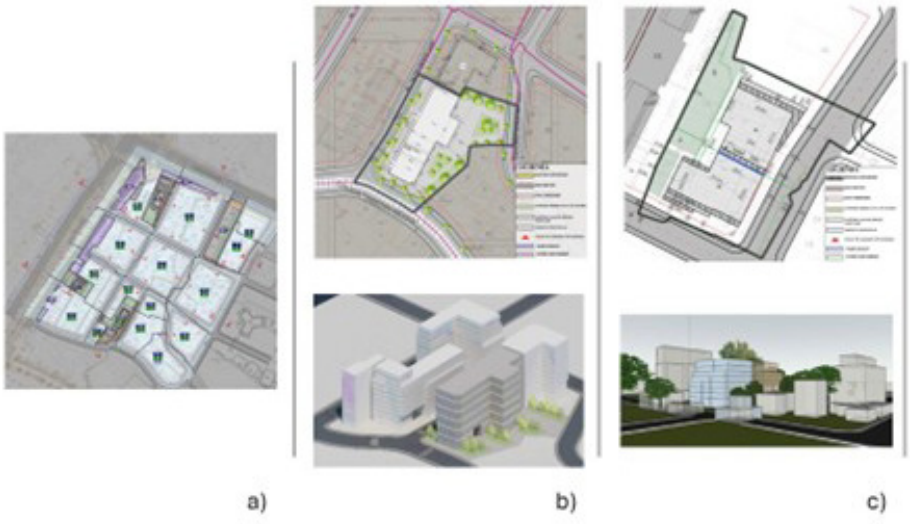


*Fig. 4 Structural Unit TR 437 (a) According to PPV: development of sub-unit 12 (b) dhe 17 (c)*



essential. Urban form should be understood as an evolving structure, capable of accommodating transformation without losing its coherence (Secchi, 2010). This requires planning instruments that guide incremental change rather than merely permitting isolated interventions.

Architectural practice must also be situated within a collective framework. Architectural quality should be assessed not only in terms of individual expression but also for its contribution to the shared urban form. In this sense, architecture becomes a civic act, an integral part of the city-building process rather than a separate entity operating independently (Sennett, 2018).

This model suggests several practical steps for Tirana and other post-communist cities:

-Implementation plans should include morphological guidelines, not just height and density limits;

-Flexible instruments for incremental transformation should be developed, allowing continuous growth while maintaining the coherence of urban structure;

-Evaluation of architectural projects should consider their impact on street networks, blocks, and public spaces, recognizing each building as part of a larger urban system.

In this way, the urban project becomes a driver of urban coherence, ensuring that densification does not lead to fragmentation but rather reinforces the city's structure and the continuity of public spaces.

## Conclusions

The study of post-communist urban developments in Tirana demonstrates that the city's densification has not occurred randomly but because of the complex interaction between planning instruments and architectural practice. Implementation plans, primarily guided by regulatory limits and quantitative parameters, have failed to provide an integrated urban vision, allowing buildings to emerge as autonomous objects, often disconnected from street networks, block structure, and public spaces. Within this framework, separated architectural building, replicated across multiple interventions, has played a decisive role in the erosion of spatial continuity and the fragmentation of the city.

The outcome is a city in which urban form is fragmented, streets lose their connective logic, blocks disaggregate into assemblies of isolated buildings, and public spaces become residual. This condition is not merely an aesthetic issue; it directly affects accessibility, social coexistence, and the way citizens experience the urban environment. From this perspective, the loss of urban coherence cannot be understood solely as a regulatory failure but as a complex cultural and disciplinary phenomenon, where market logic, architectural autonomy, and the absence of a shared urban vision exert cumulative effects.

The narrative of Tirana suggests that sustainable and integrated densification requires a fundamental shift in planning and design approaches. Implementation plans must move beyond numerical parameters to include clear spatial and morphological principles that guide the incremental evolution of the city. Architectural interventions cannot be assessed solely by their individual form; they must be understood as part of a broader urban ecosystem, in which each building contributes to collective structure, spatial coherence, and the quality of public space.

This study conveys a clear lesson for Tirana: a city that develops mostly according to market forces and regulatory parameters, without an integrated urban vision, will continue to fragment. Conversely, restoring urban coherence requires integrating time as a planning dimension, constructing structures capable of evolving without losing continuity, and recognizing architecture as a civic act. Such an approach not only recovers the city's lost form but also contributes to the creation of urban spaces that are functional, legible, and sustainable for future generations.

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# Impact of rapid private motorisation growth on Tirana's traffic. Possible solutions and international success stories

DOI:

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**Andia VLLAMASI,** *Polis University -Tirana, Albania*



**Abstract -** *The study analyses one of the major causes for Tirana's traffic congestion: the rapid growth of private motorisation.*
*The objective of the article is to provide part of the theoretical foundation for an initiative to develop a set of software tools for urban planners and to identify the requirements for this initiative.*
*The methodology is shaped by data scarcity and the need to identify best practices and case studies. Starting from these elements, a deep literature review has been conducted. Results have been analysed and discussed.*
*The most important result is evidence that motorisation is not the real cause to address; rather, it should be considered a trigger that has enabled system-level criticalities related to urban infrastructure and urban form.*
*Data scarcity has been confirmed, further underscoring the need for a reliable, advanced traffic measurement system.*
*Traffic congestion charging has been analysed as a potential solution, but it cannot be considered in isolation; it must be approached holistically alongside other measures operating on infrastructure and urban form. The success cases considered should not be implemented in Tirana without strong tailoring. The Tirana case could be a very interesting research field because, given its configuration, data scarcity, low capacity, and high informality coexist.*

*Keywords -*

## Introduction and Diagnosis of the Current Situation

The city of Tirana, Albania's capital, is plagued by serious traffic congestion. This condition is recent because, historically, it has almost always a low motorisation rate.
In 2023, Albania had between 300 and 330 private cars per 1,000 inhabitants (INSTAT, 2024b; Eurostat, 2024), which is among the lowest rates in Europe where the average (in 2024) was 570-576 cars per 1,000 inhabitants, placing Albania as third from last in Europe (ACEA, 2026; Eurostat, 2024), ahead only of Turkey (176-189) and North Macedonia (264-303). At the same time, in the Balkans, Albania is surpassed by Kosovo (349), Montenegro (417), Serbia (377), and Bosnia and Herzegovina (321).
Tirana, on the other hand, has completely different figures, with around 500-550 cars per thousand residents and accounting for roughly one third of the entire national vehicle fleet (Euronews Albania, 2025; Gazeta Express, 2025). This concentration of vehicles makes it the prefecture with the highest number of vehicles (approximately 34-35% of the national total) (INSTAT, 2024a; INSTAT, 2025).
Residents (ACQJ, 2024; Kumaraku et al., 2025) frequently report long travel times, confirmed by the evidence of an average bus speed of about 11 km/h (urban roads) (GIZ, 2024a; Balkanweb, 2024). This speed is significantly below the minimum threshold of 15 km/h, as set by international standards to define "normal operation" for mass bus transport services (GIZ, 2024b; APTA, 2010).
This article examines a major cause of Tirana's traffic problems and proposes potential solutions.

## Objectives and Methodology

This article is part of a theoretical framework of a larger project named UPT-Urban Planners' Toolset. The UPT project aims to develop a set of software tools to support urban planners in their work. It will be grounded in solid theoretical foundations in both urban planning and computer science.
In this article, a main analysis of the reasons for traffic in Tirana is conducted to support the definition of requirements for the traffic measurement module of the UPT project.
The objective is, then, to identify some potential causes of Tirana's traffic and analyse potential

solutions. This article focuses on the primary cause: the growth of private motorisation. The analysis of infrastructural causes has been deferred to another study. The methodology followed has been a deep literature review to identify both prior studies on issues and on solutions. This literature review has focused on research on motorisation growth in Tirana and potential solutions, while also considering the lack of available data at the outset of the research. After the literature review, the gathered information has been organised and summarised in the results section. Then a discussion of these results was held, and conclusions were drawn.

## Analysis

### The growth of private motorisation

Then a  Since the early 1990s, Tirana has experienced an explosion in private motorisation. Under communism, private car ownership was extremely limited, whereas in 2023, approximately 44% of households (336,000 out of 722,000) owned at least one car, according to Gazeta Tema (2024), citing the latest census (INSTAT, 2023).

INSTAT data (2024) report a national fleet of approximately 959,000 registered road vehicles, marking an increase of more than 10% over the previous year. Of these, passenger cars account for over 80% of the total (INSTAT, 2025a). In the same period, the Tirana region accounted for approximately 34.8% of the national vehicle stock (INSTAT, 2025b), highlighting a high concentration of vehicles in the capital, especially compared with the averages of other provinces.

The national vehicle fleet has a high percentage of older vehicles: European data indicate that a large proportion are over 10 years old, resulting in

| Prefettura | Q2-2023 | Q3-2023 | Q4-2023 | Q1-2024 | Q2-2024 |
|---|---|---|---|---|---|
| **Total** | 828,306 | 848,127 | 867,765 | 887,321 | 914,925 |
| **Berat** | 33,714 | 34,464 | 35,267 | 36,032 | 36,975 |
| **Dibër** | 23,037 | 23,685 | 24,362 | 25,043 | 25,650 |
| **Durrës** | 110,922 | 113,748 | 116,639 | 119,446 | 123,590 |
| **Elbasan** | 57,111 | 58,502 | 60,119 | 61,486 | 62,959 |
| **Fier** | 76,997 | 78,965 | 80,582 | 82,169 | 84,204 |
| **Gjirokastër** | 18,233 | 18,608 | 18,991 | 19,429 | 19,865 |
| **Korçë** | 41,338 | 42,299 | 43,459 | 44,473 | 45,462 |
| **Kukës** | 19,328 | 19,802 | 20,319 | 20,851 | 21,364 |
| **Lezhë** | 41,152 | 42,099 | 43,029 | 43,975 | 44,952 |
| **Shkodër** | 59,247 | 60,565 | 61,882 | 63,093 | 64,471 |
| **Tiranë** | 288,265 | 294,843 | 300,998 | 307,890 | 319,545 |
| **Vlorë** | 58,962 | 60,547 | 62,118 | 63,434 | 65,888 |

*Tab. 1. Motorisation growth in one year (data from the INSTAT report about Q2 2024)*

reduced performance in both emissions and safety (Euronews Albania, 2024).

This growth, which is not balanced by a proportionate expansion of public transport and road capacity, puts significant pressure on urban traffic and parking, especially on radial corridors and in central districts (City of Tirana, 2021).

## Congestion charges

A first solution would be to impose congestion charges to discourage vehicle access during peak hours (Tsay et al., 2013).

Successful experiences could inspire their implementation in London, Stockholm, and Singapore, where they have demonstrated significant technical effectiveness, resulting in 15%-30 % reductions in car traffic (Transport for London, 2008; Eliasson, 2009).

Despite their success abroad, these mechanisms could entail significant risks of failure in the Albanian context, particularly in Tirana, depending on institutional capacity, social acceptability and the availability of adequate alternative public transport (OECD, 2025). It is therefore advisable to assess the likelihood of success in advance through specific feasibility studies and risk analyses.

### *Risk of unpopularity*

A first risk is obviously political, because the introduction of peak-hour pricing generally provokes strong initial public opposition (Tsay et al., 2013; Schade & Schlag, 2003).

In London's case, the implementation of congestion charging required a lengthy preparation and political negotiation process that lasted several years before its launch in 2003, and it remains subject to periodic institutional review (Transport for London, 2008).

In Stockholm, too, an adequate trial period was necessary, followed by a referendum in 2006 that received relatively limited support, at 53% of voters (Eliasson, 2009).

For Tirana, the political risk is multiplied by limited experience (both institutional and civic) with highly complex urban policy interventions, the high fiscal sensitivity of the middle-income class, and the potential perception of an elitist policy favouring wealthier car owners. This last objection is supported by the fact that, in many similar contexts, users with greater spending power have not significantly reduced their car use during peak hours, even with tolls to access high-traffic areas (Goldman et al., 2006). Consequently, the adoption of congestion charging instruments should be accompanied by rebalancing and mitigation measures to ensure both effectiveness and distributive equity, for example, through progressive pricing systems, targeted exemptions, and the reinvestment of public transport revenues (Tsay et al., 2013).

### *Institutional and technological risk*

Another type of risk is institutional and technological. The imposition of congestion charging mechanisms requires automatic number plate recognition (ANPR) systems and integrated digital platforms (GIZ/Changing Transport, 2018).

In the Albanian context, the adoption of such technologies poses significant challenges for management capacities. First, the use of ANPR systems requires continuous monitoring, rapid and highly automated processing of violations, and an efficient collection infrastructure, all of which can put pressure on current models of governance and public management (OECD, 2025).

Additional critical factors include data integrity, security and, more generally, data protection. Video surveillance networks require high levels of maintenance, cybersecurity, and transparency in the management of both information and revenue to ensure the legitimacy and social acceptability of the system as a whole (ITF, 2018; Tsay et al., 2013).

Finally, there is an issue related to interoperability, i.e. the ability to integrate ANPR systems with vehicle registers, tax databases and existing payment systems. Interoperability shortcomings could cause serious technical delays and compromise effective implementation (European Commission, 2020; ITF, 2018).

*Fig. 1. Chaotic traffic in Tirana (image of the Author)*

### *Risk related to the informal economy*

Another risk factor concerns the informal economy. Tirana's transport system includes significant informal elements that require targeted policy responses in any congestion charging scheme. In Albania, the informal economy accounts for between 30% and 40% of GDP (OECD, 2025). The informal transport sector employs around 3% of informal workers (International Labour Organisation [ILO], 2018).

In Tirana's urban context, informality manifests in various ways that affect the design of charging mechanisms. Firstly, there are informal taxi services which, at certain times, have reached levels of use comparable to or higher than those of official services (Transformative Mobility Foundation, 2024; GIZ, 2023).

In recent years, digitisation through platforms such as Vrapon, Green Taxi, and Speed Taxi has encouraged a gradual formalisation of the market, alongside municipal policies that have promoted the spread of electric taxis (Transformative Mobility Foundation, 2024).

Despite this, a significant proportion of operators continue to operate informally. Such irregular activities include the exclusive use of cash payments, the employment of unauthorised drivers who use private vehicles for paid transport, and informal carpooling with monetary compensation (NTA, 2024).

Finally, many vehicles in Tirana serve multiple purposes, combining private, family, informal taxi, and commercial uses, making the application of congestion charges more complex, especially given the need for fairness and progress.

In this context, automatic number plate recognition systems could be integrated with procedures for contacting and regularising informal operators,

*Fig. 2. Traffic in Tirana (image courtesy of Dmitry Limonov)*

including grace periods, incentives for formalisation, and progressive compliance mechanisms. These processes should be accompanied by real-time monitoring tools that track formalisation rates, the spread of payment methods, and compliance levels (Tsay et al., 2013).

### *Risk associated with digital payments*

Another risk factor is access to payment systems. Although financial inclusion in Albania has grown significantly in recent years, with the proportion of adults with a bank account rising from 40% in 2017 to 78% in 2021 (World Bank, 2022), cash remains predominant (International Monetary Fund [IMF], 2023).

There are also significant gaps in terms of digital literacy and access to banking services, making the application of pricing systems more complex (International Labour Organisation [ILO], 2018).

### *Credit scoring-based charging systems*

Alongside monetary pricing, the literature also suggests adopting systems based on credits or access points for categories with specific work needs to mitigate the measure's regressive effects (ITF, 2018; Yang et al., 2011; Liu et al., 2024). These instruments are particularly effective when supported by improved public transport and integration with adaptive traffic management systems (Tsay et al., 2013).

### *Inadequacy of the exchange system at access points*

Finally, it is strategic to build park-and-ride facilities at the city's main access points, which must be closely connected to high-frequency public transport. The experience of many European cities shows that such systems can absorb thousands of daily journeys, especially when integrated with congestion charging and efficient public services (ITF, 2018; European Commission, 2021). Vehicle renewal and scrappage programmes can also help to reduce the environmental impact of urban traffic (European Environment Agency, 2020).

## Reasons for the persistence of problems

Why have these problems not been solved so far? The problems described above have long been recognised and well-documented in recent years. Unfortunately, significant progress has been very slow or even non-existent. This section will summarise the reasons these problems persist, despite everyone agreeing on their existence and urgency.

The analysis has been conducted taking into account both institutional and financial constraints.

## Institutional constraints

### Institutional capacity

Institutional capacity limits pose a serious problem: there is a chronic shortage of both personnel and technical expertise, which should not be underestimated. For example, until 2020 (GIZ, 2024a), the Tirana transport department operated with only six staff members responsible for managing public transport in a city of approximately 800,000 residents. This severe understaffing made proactive planning, effective management, and law enforcement virtually impossible. As evidenced by the GIZ report (2024a), the Department operated until 2020 in a reactive mode ('Reacting to issues as they arose'), managing various events, i.e. responding to crises rather than preventing them. Following a reform supported by GIZ, staff numbers were increased by 32% between 2020 and 2023, greatly improving the organisation ("We supported the enlargement of the transport department system by providing detailed job descriptions, operating procedures, process workflows, and on-the-job training.") Two new sectors were introduced: technical support and customer feedback), in particular technical support and customer feedback. During the same period, intensive training was conducted, which significantly improved staff expertise ("A 3-year-long training with UITP was carried out on topics such as public transport fundamentals, e-ticketing, IT & ITS technologies for public tran

### *Data and management systems*

A second element, also linked to institutional capacity constraints, is the absence of a robust data-collection infrastructure and automated management systems.

Again, according to the GIZ report (2024a), until 2020, Tirana's transport system operated essentially 'blind', without any systematic collection of data on passenger volumes, bus speeds and reliability, or on the performance of the various routes. Operators provided commercial data in non-standard formats, without any verification mechanism. The municipality lacked a GPS tracking system, an automatic passenger counting (APC) system or performance monitoring tools. This data gap made it virtually impossible to make decisions based on facts and allowed private operators to operate with little accountability (GIZ, 2024a). The GIZ intervention demonstrated that even implementing basic data collection systems and simple analysis capabilities required several years of development, specialised training, and significant institutional evolution.

### *Institutional fragmentation*

Another critical issue, at the institutional level, is coordinating a highly fragmented set of institutions (EBRD, 2016). According to Gora et al. (2024), institutional responsibilities in the metropolitan area are spread among:

- The three municipalities of Tirana, Vorë and Kamëz, which have a primary responsibility for road infrastructure management and certain aspects of public transport and urban planning
- The Ministry of Transport and Infrastructure (now Ministry of Infrastructure and Energy), which oversees transport policies and strategies at the

national level and may play a role in financing and supporting infrastructure projects
▪The private public transport operators, which are in charge of providing public transport services and managing bus fleets
In the early 2020s, there were 11 separate private operators (GIZ, 2024a; Bashkia Tiranë/Open Data), often characterised by potentially conflicting commercial interests. In 2025, according to journalistic sources, there were 12 (Brakaj, 2025) for 16 lines.
A further critical issue concerns the lack of integration among the planning for road infrastructure, land use, and urban mobility policies: in fact, historically, urban development and land-use decisions have not been systematically coordinated with transport strategies, often necessitating the introduction of sorts of integration planning tools, such as Tirana's Sustainable Urban Mobility Plan (SUMP) (City of Tirana, 2021; Transformative Mobility Foundation, 2024).
The GIZ document (2024a) emphasises the need for 'institutional development' and the support provided for 'improved management of new projects such as Bus Rapid Transit and the establishment of a Transport Authority in Tirana', confirming that such an authority did not yet exist at the time of its publication, i.e. that such coordination is still lacking. This serious lack of coordination can, once again, lead to reactive rather than proactive management and significant inefficiencies.

*Contracts and procurement*

Finally, again at the institutional level, the management of contracts and, more generally, of procurement processes has limited operational effectiveness.
Public transport contracts, in particular, are not integrated with systematic performance-related incentives. The GIZ document (2024a), referring to the period prior to 2022, confirms that operators received concessions for routes without any minimum service level requirements or effective enforcement mechanisms ('Although performance differed among the various operating companies, the system of checks and contractual measures was insufficient to ensure that the operators maintained and improved quality throughout the entire city', p.5). The EBRD (2018) also states that, in 2018, there was no direct subsidy system and therefore no compensation mechanism linked to service quality ("The MoT sets routes and fares, and there is no direct subsidy system."). The introduction in January 2022 of the first performance-based bus transport incentive scheme, with support from GIZ, marked a significant break with the past, as it represented the first structural change to the existing model and strengthened operator accountability.

## Financial issues

*Budget size*

Resources received every year by Albanian municipalities amount to about 1–2% of GDP, severely limiting their ability to implement new projects effectively (OECD, 2025). For example, until the early 2020s, the Tirana Department of Transport lacked sufficient resources to conduct systematic passenger satisfaction surveys, leaving a serious gap in user feedback and significantly reducing its ability to manage public transport. It was only in 2023, with support from GIZ, that the first user survey was conducted, and the value of this type of tool for improving the service became clear (Transformative Mobility Foundation, 2024; GIZ, 2023).

*Dependence on external donors*

The most significant reforms to Tirana's transport system have largely been implemented through donor-funded projects rather than through structured domestic policy initiatives (Transformative Mobility Foundation, 2024). For example, the process of reforming the public transport system gained significant momentum in 2020, when GIZ entered into a partnership with Tirana's municipality (GIZ, 2023; Transformative Mobility Foundation, 2024). The e-BRT project was also made possible mainly thanks to external financiers (KfW for €50 million and the EU for approximately €31 million) through the Western Balkans Investment Framework (KfW, 2021; WBIF, 2024).
This model creates at least two critical issues. Firstly, reforms advance at the pace and according to the priorities of donor programmes, rather than based on the actual urgency of local needs (OECD, 2025). Secondly, long-term sustainability is uncertain, as local institutions may lack the technical and financial capacity to sustain successful implementation independently after the projects end (Transformative Mobility Foundation, 2024).
Another critical issue concerns the process of European integration. In fact, there is competition between local infrastructure priorities and the conditions imposed by the European Union and European for accession. Albania's accession process to the European Union requires multiple, extensive reforms across areas such as the rule of law, governance, public procurement, and administrative capacity (European Commission, 2022, 2023). In this context, transport is just one of many areas requiring investment and institutional development. Consequently, with the European Union highlighting corruption in procurement and administrative weaknesses as priority issues, for example, problems of urban congestion and traffic are receiving secondary attention (European Commission, 2023).

# Discussion

In this analysis, only private motorisation growth has been analysed; however, as the literature review and results show, it was only a trigger for a set of issues that must be addressed. This set of issues is mainly composed of infrastructural deficits and inadequate urban form and will be addressed in a subsequent part of the study.
In this study, private motorisation growth is a system-issue amplifier rather than the real cause of the traffic congestion.
Regarding motorisation growth, the proposed solution was a congestion charge. However, it is clear that, on its own, it will not be effective and will instead mostly lead to social injustice, despite the measures proposed above to mitigate it. In a few words, congestion charges are a conditional measure, not an automatic one. They need to be implemented alongside other solutions to be effective. It is worth emphasising that, when implementing congestion charges, social equity should be treated as a design variable, not an optional outcome.
Another element that has emerged is institutional fragmentation. This issue must be addressed to ensure a smooth, coordinated approach to reducing traffic congestion.
A serious criticality has been detected in the data. The available data about traffic is insufficient, aggregated and of low quality. Data scarcity leaves Tirana operating in “blind” mode, with little or no feedback. This operational mode is far from any effective governance model and must be changed into a data-driven or data-aware one.

Many best practices have emerged from research, and they should be considered alongside success cases when proposing solutions. These solutions, anyway, must be strongly tailored to Tirana's context, which has made them completely different from those in other cities. Tirana offers a valuable opportunity to develop research about a context characterised by low capacity, high informality, and data scarcity.
In addition, informality is not a collateral issue: it is a factor that limits the feasibility of a serious fight against traffic congestion. For this reason, informality should be addressed. When addressing it, it is advisable to take a progressive, incentive-based approach rather than relying on law enforcement to avoid social injustice again and, more importantly, to avoid further backlash against the traffic-reduction initiatives.

## Conclusions

The rapid growth in motorisation must be considered the trigger that is enabling a systemic issue to emerge, rather than a stand-alone factor.
While the congestion charge has, in many cases, proven effective, its application in Tirana requires strong coordination with other initiatives and, at the institutional level, should be part of a larger programme of activities to address the traffic issue.
Social justice and informality have been identified as two important design variables for each measure.
The analysis needs to be strengthened by considering other emerging issues, such as public transport efficiency, parking availability, the impact of road construction, and urban form reshaping.
This will be done in successive research on the infrastructural causes of Tirana's traffic congestion.
Regarding the aim of supporting the UPT initiative, this first step has highlighted the need to gather more data on traffic to better analyse traffic flows, traffic density, and other metrics, underscoring the importance of a robust component to measure traffic parameters reliably.

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# 3
# Workshop Reports

# Stitching Together
## Unity and Mobility for Shkoza

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**Abstract -** *Tirana's rapid urban growth over the last century has brought about significant challenges, including traffic congestion, limited mobility, and unequal access to public resources. This study introduces a bold urban transformation: creating a new boulevard along the Tirana River while reimagining Shkoza as a vibrant urban hub. Drawing inspiration from the city's 1921 development map and the urban planning insights of Camillo Sitte and Kevin Lynch, the proposal focuses on decentralizing activity, enhancing connectivity, and encouraging sustainable mobility.*

*The envisioned boulevard, running parallel to Tirana's main artery, aims to ease traffic, link peripheral neighborhoods, and breathe life into underutilized spaces. Meanwhile, Shkoza is planned as a thriving new urban center, featuring public plazas, mixed-use areas, and eco-friendly infrastructure. The design is shaped by careful analysis of the city's morphology, including plazas, roads, and the Tirana River, ensuring the project balances functionality, aesthetics, and sustainability.*

*To complement this vision, an izohypse (contour line) analysis has been conducted to evaluate the terrain's potential for development. This analysis identifies opportunities for efficient construction, natural flood mitigation, and the creation of green buffers. By addressing these factors, the project aims to reduce traffic congestion on critical routes like Rruga e Elbasanit and Rruga Kavajës while strengthening connections across the metropolitan area.*

*By bridging the gaps in Tirana's urban fabric, this intervention leverages the city's natural and built environments to create a more resilient and human-centered future. It offers a roadmap for balanced growth, enhanced mobility, and an improved quality of life, presenting a forward-thinking vision for Tirana's development.*

*Keywords - Traffic congestion, morphological analysis, urban center, development*

## Introduction

The capital city of Albania, Tirana, has undergone rapid and often unstructured urban expansion over the past three decades, particularly following the socio-political transformations of the early 1990s. This accelerated growth has substantially altered the city's spatial configuration, demographic distribution, and functional organization. One of the most visible consequences of this expansion has been the intensification of vehicular traffic and the persistent congestion of key urban corridors. Increasing traffic volumes have not only extended commuting times and reduced overall urban accessibility but have also exacerbated environmental pressures, including elevated levels of air pollution, noise pollution, and greenhouse gas emissions. These dynamics collectively undermine urban liveability and pose significant challenges to sustainable development.

The concentration of activities within a historically centralized urban core has reinforced a monocentric spatial structure, generating radial mobility patterns that funnel daily movements toward a limited number of primary axes. This spatial imbalance has produced recurring bottlenecks and a structural dependency on a few critical infrastructural corridors. Addressing these challenges requires a strategic rethinking of Tirana's urban form, moving beyond short-term traffic management solutions toward systemic spatial interventions capable of redistributing flows, activities, and opportunities across the metropolitan territory. Within this framework, the establishment of a new urban center emerges as a viable strategy for decentralizing economic, social, and administrative functions from the congested city core. By introducing a complementary pole of activity, the proposed intervention seeks to foster

polycentric development, reduce pressure on existing infrastructures, and restructure mobility patterns in a more distributed and resilient manner. The reconfiguration of traffic flows through contemporary infrastructural integration including multimodal transport systems, improved public transit connectivity, and pedestrian-oriented design would aim not merely to alleviate congestion, but to enhance urban accessibility, spatial equity, and environmental performance. In this sense, the project aspires to serve as a model for sustainable urban mobility and forward-looking urban planning practices in rapidly transforming cities. The conceptual foundation of this proposal draws inspiration from the 1921 urban map of Tirana, which illustrates the early stages of the city's planned development. During this formative period, Tirana began consolidating around its principal boulevard, which functioned as both a spatial organizer and a symbolic axis of civic life. Over time, this boulevard evolved into a central spine accommodating administrative institutions, commercial activities, and cultural functions, thereby reinforcing the city's monocentric structure. While historically effective in shaping urban identity and coherence, the boulevard's increasing functional load has rendered it vulnerable to congestion and spatial saturation in the context of contemporary growth pressures. In response to these structural constraints, this paper proposes the construction of a new boulevard extending across the Tirana River and the strategic establishment of a secondary urban center in the area of Shkoza. This intervention seeks to reinterpret the historical logic of axial development while adapting it to present-day requirements for connectivity, decentralization, and sustainable mobility. By extending the city's spatial framework eastward and integrating underutilized territories into the urban network, the proposed boulevard would not only redistribute traffic flows but also stimulate new patterns of development and socio-economic activity. Ultimately, the project envisions a transition from a congested monocentric model toward a more balanced and polycentric urban configuration, capable of accommodating future growth while enhancing environmental quality and urban resilience.

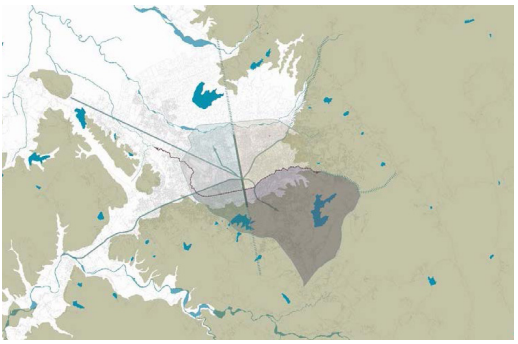
## Literature review

The theoretical underpinnings of the proposed intervention in Shkoza are informed by classical urban theory, particularly the work of Camillo Sitte and Kevin Lynch, whose conceptualizations of spatial organization, urban form, and perceptual structure remain highly relevant to contemporary planning discourse. In The Art of Building Cities (originally published in 1889), Camillo Sitte offers a critical reflection on nineteenth-century urban planning practices, emphasizing the importance of spatial composition, enclosure, and the experiential qualities of public space (Sitte, 1889/1945). Rather than privileging purely geometric or traffic-engineered solutions, Sitte argues for the design of squares, crossroads, and public nodes that are proportionate, human-scaled, and spatially articulated to foster social interaction and civic life. For Sitte, intersections and plazas are not merely points of circulation but places of encounter structured voids that organize movement while simultaneously generating urban identity. He critiques overly linear and rigid boulevard systems that prioritize vehicular efficiency at the expense of spatial richness, advocating instead for articulated nodes and carefully composed junctions that mediate flows and create meaningful urban experiences. This theoretical perspective aligns closely with the present proposal to transform Shkoza into a new urban hub. The intention is not solely to construct an infrastructural corridor across the Tirana River, but to embed within it a sequence of articulated nodes boulevard intersections, public squares, and mixed-use focal points that redistribute movement and activity in a deliberate and spatially coherent manner. In this sense, the intervention seeks to reinterpret the boulevard not as a traffic conduit

alone, but as an organizing civic spine capable of structuring a polycentric urban configuration. By dispersing activities away from the overloaded historic core and creating well-designed junctions along the new axis, the proposal echoes Sitte's call for cities composed of interconnected, human-centered urban hubs rather than monotonous, congestion-prone linear systems. Complementing Sitte's spatial theory, Kevin Lynch's seminal work The Image of the City (1960) provides a cognitive and perceptual framework for understanding how individuals navigate and internalize urban environments. Lynch identifies five key elements that structure the mental image of the city: paths, edges, districts, nodes, and landmarks (Lynch, 1960). Paths represent channels of movement; nodes are strategic focal points of convergence; edges define boundaries; districts are medium-to-large sections with recognizable character; and landmarks serve as visual reference points that anchor orientation and identity. According to Lynch, legibility the ease with which the urban environment can be read and understood is fundamental to a city's functionality and psychological comfort. The proposed boulevard along the Tirana River can be interpreted through Lynch's framework as a primary path an organizing linear element that connects peripheral territories to the broader metropolitan transport network. By integrating this new axis into existing mobility infrastructures, including arterial roads and potential public transport corridors, the project reinforces spatial continuity while relieving pressure from the historic center. Simultaneously, Shkoza is conceptualized as a node in Lynchian terms: a strategic point of convergence where movement intensifies and urban activity coalesces. Rather than functioning as a peripheral appendage, Shkoza would assume the role of an identifiable urban center, structured around accessible public spaces, mixed-use development, and multimodal connectivity. Furthermore, the deliberate introduction of architectural and landscape landmarks along the boulevard and within Shkoza strengthens the area's legibility and symbolic presence within the metropolitan structure. These landmarks whether civic buildings, cultural facilities, or spatially distinctive public spaces would provide visual anchors that contribute to orientation, identity formation, and a sense of place. In doing so, the intervention addresses not only the functional redistribution of traffic flows but also the perceptual reconfiguration of Tirana's urban image. By synthesizing Sitte's emphasis on spatial composition and civic nodes with Lynch's framework of urban legibility and structural clarity, the proposal positions Shkoza as both a spatial and cognitive rebalancing mechanism within Tirana's evolving urban system. The new boulevard and its associated urban center thus operate at multiple scales: mitigating congestion through decentralized activity patterns, enhancing environmental and mobility performance, and reinforcing a coherent and imageable metropolitan structure.

## Tools and Methodology

This research advances a multidimensional planning framework that positions Shkoza as a prospective secondary urban center capable of addressing



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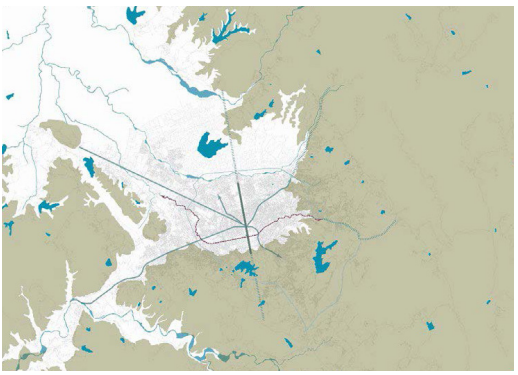

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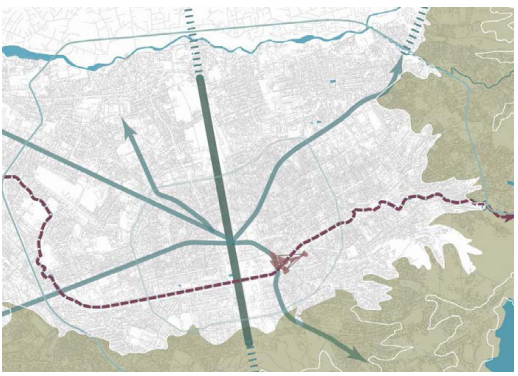

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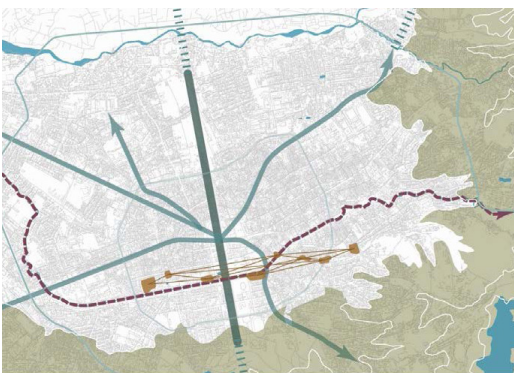

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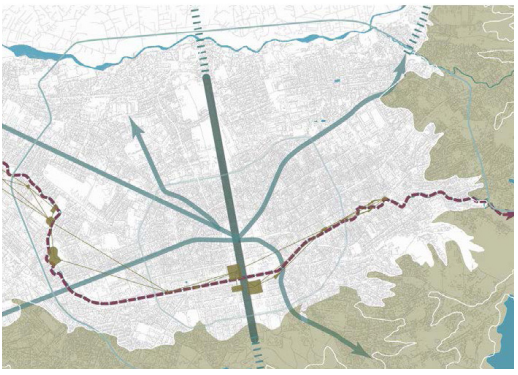

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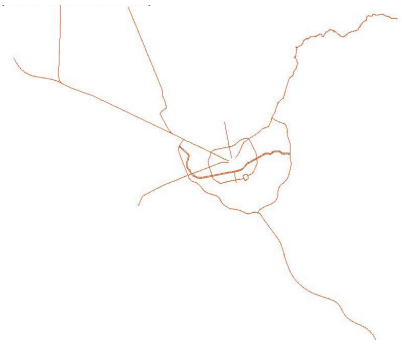

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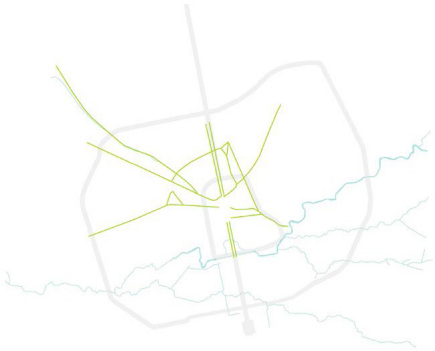

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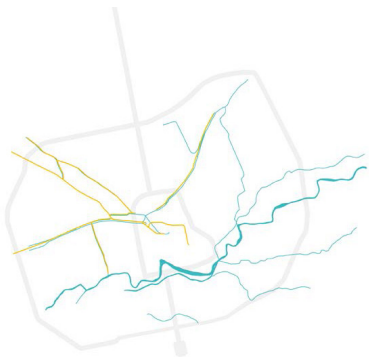

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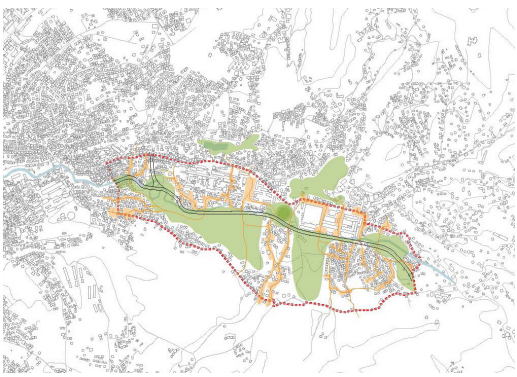

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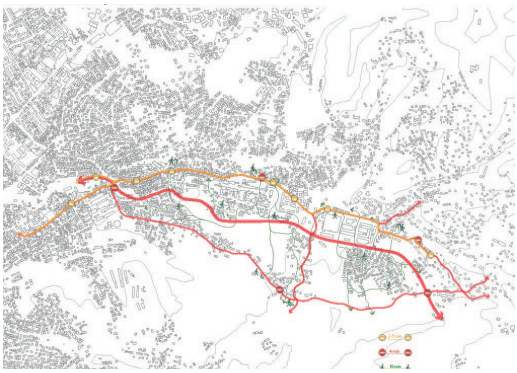

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both spatial fragmentation and traffic congestion in Tirana. Rather than approaching mobility as an isolated technical issue, the study integrates morphological, topographical, and infrastructural analyses in order to understand the structural drivers of congestion and uneven urban development.

The investigation commenced with a systematic morphological assessment of Tirana's contemporary urban fabric. Morphological analysis enables the interpretation of the spatial logic underlying street networks, block structures, density patterns, and land-use distribution. By examining the configuration of road hierarchies, intersection intensities, and functional clustering, the study identified the spatial relationships between built form and mobility flows. This approach revealed that traffic congestion in Tirana is closely linked to the concentration of urban functions along dominant corridors and within a historically centralized core, resulting in radial pressure on a limited number of arterial routes.

Through spatial mapping and field observation, several high-traffic nodes and potential intervention areas were identified. Particular attention was given to the structural role of roadways, intersections, and land-use patterns in shaping daily movement. The analysis demonstrated that the imbalance between residential expansion and employment or service distribution contributes to directional commuting patterns that overload specific infrastructural axes—especially those connecting peripheral neighborhoods to the central core.



**The morphological assessment further revealed the coexistence of four distinct development typologies within and around the Shkoza area:**
**a)** Planned block-based residential areas, characterized by relatively regular street grids, defined building alignments, and higher infrastructural coherence.
**b)** Unplanned and spontaneous residential zones, emerging primarily during the post-socialist transition, marked by irregular parcelization, limited infrastructural hierarchy, and fragmented connectivity.
**c)** Industrial zones, comprising logistics facilities, warehouses, and production spaces, often spatially segregated yet strategically located along mobility corridors.
**d)** Rural and peri-urban areas, consisting of dispersed housing patterns interwoven with agricultural land and open landscapes.

The coexistence of these typologies reflects Tirana's layered and often discontinuous urbanization process. The proposed urban hub in Shkoza is therefore conceived as a mediating structure—an integrative node that bridges formal and informal settlements, industrial territories, and rural landscapes. Rather than reinforcing spatial segregation, the project aspires to establish connective infrastructure and mixed-use development capable of fostering functional interdependence and balanced metropolitan growth.

Topographical analysis, conducted through an izohipse (contour-line) study, further clarified the spatial potential of the area. The findings indicate that territories located beyond the Unaza e Madhe (Tirana's Big Ring Road) exhibit flatter terrain, which has facilitated higher-density development due to reduced construction constraints and improved infrastructural feasibility. This geographic condition has encouraged concentrated growth patterns

outside the ring road, increasing population density and intensifying mobility demand along Shkoza's primary access routes. As a result, mitigating traffic along Shkoza's major corridor becomes a critical strategic priority within the broader urban restructuring framework.
In response to these findings, the research proposes a series of coordinated mobility interventions:

(1) Establishment of New Access Points to Unaza e Madhe
The creation of strategically positioned new exits connecting the proposed urban center directly to the Big Ring Road would redistribute traffic flows and reduce dependency on existing overloaded routes. These access points would enhance permeability, facilitate direct connectivity, and prevent congestion from concentrating along a single arterial spine. By integrating the new center into Tirana's primary mobility infrastructure, this intervention strengthens its role as a structurally embedded node within the metropolitan network.

(2) Integration and Upgrading of Secondary Routes
A complementary strategy involves identifying underutilized secondary roads and upgrading them to form an auxiliary network that connects Shkoza with adjacent neighborhoods and the wider metropolitan territory. Strengthening this fine-grained network would create alternative mobility options, alleviate pressure on main corridors, and promote distributed traffic patterns. This hierarchical diversification of the road system aligns with principles of resilient urban mobility, where redundancy enhances overall system performance.

(3) Comprehensive Network Connectivity
Ensuring that the new urban core is seamlessly integrated into the broader road hierarchy is essential for balanced spatial development. This includes coordinating arterial, collector, and local streets; incorporating multimodal transport solutions; and improving pedestrian and cycling infrastructure. By embedding the new center within the city's overall mobility matrix, the intervention supports equitable access, reduces travel distances, and encourages functional decentralization.
Beyond infrastructural reconfiguration, the proposal also identifies significant potential for urban regeneration through the adaptive reuse of the former industrial Uzina site. International precedents demonstrate how obsolete industrial



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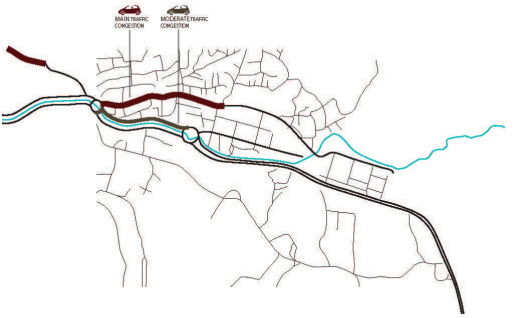


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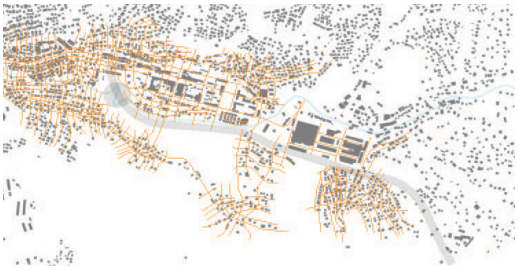

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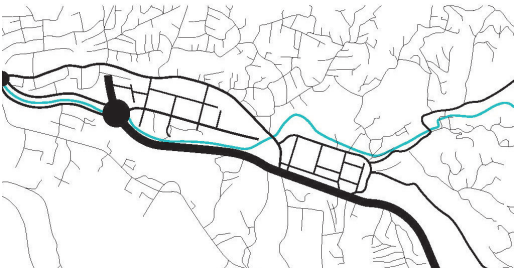

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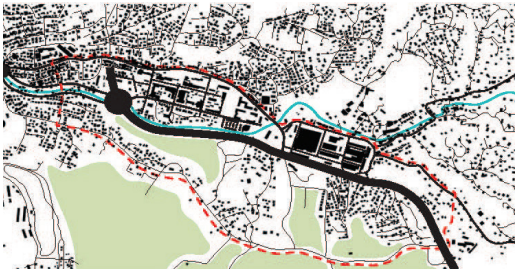

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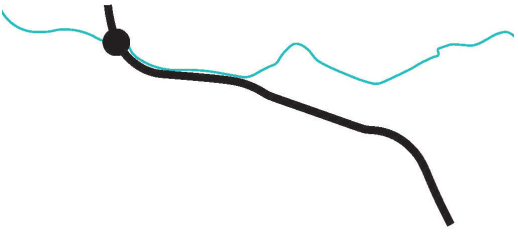

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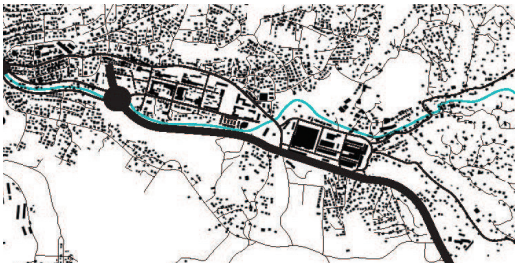

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territories can be transformed into dynamic mixed-use districts that catalyze economic revitalization and social activation. The regeneration of Germany's Ruhr industrial region and the redevelopment of Milan's Bovisa district exemplify how industrial restructuring can produce innovation clusters, cultural hubs, and high-quality public spaces. Drawing on such models, the redevelopment of Uzina could anchor Shkoza's transformation, integrating productive activities, housing, services, and public amenities within a cohesive urban framework.

Taken together, this integrated methodology combining morphological analysis, topographical evaluation, traffic assessment, and strategic infrastructural planning provides a robust foundation for reconfiguring Shkoza as a secondary urban center. The approach acknowledges Tirana's distinctive spatial conditions while addressing structural imbalances in mobility and development. By redistributing density, diversifying access points, and fostering polycentric growth, the proposed intervention aspires to mitigate congestion, enhance spatial coherence, and promote a more resilient and sustainable metropolitan structure.

## Conclusions and recommendations

A combination of approaches is presented in this study to handle Tirana's increasing mobility issues and encourage balanced urban growth. We hope to decentralize city activity, reduce traffic, and build a more resilient and sustainable urban network by developing Shkoza as a thriving urban hub and proposing a new boulevard along the Tirana River.
The main focus of this project has been the morphological study of Tirana's main urban features, including the river, highways, plazas, and topographical contours. It provided guidance for the integration of sustainable design concepts, the strategic placement of infrastructure, and the activation of unused spaces. Redistributing traffic flows, lessening the strain on extremely crowded roads like Rruga e Elbasanit and Rruga Kavajës, and creating new hubs for social and commercial activity are the goals of the suggested measures.
Furthermore, specific schemes like improved secondary roads, new ring road exits, and thorough connection planning will guarantee Shkoza's smooth integration into the larger urban network. In places beyond the ring road with larger population densities, this strategy promotes accessibility and balanced expansion while utilizing underutilized transportation infrastructure.
This plan aims to create a cohesive urban fabric that promotes sustainable growth, increases mobility, and raises the standard of living for citizens of Tirana. Some recommandations that we want to take in consideration in further analysis are:
(1) Create Sustainable Infrastructure: To improve environmental sustainability and resilience, include eco-friendly features like green embankments, permeable surfaces, and public areas.
(2) Improve Public Transportation: To promote less reliance on cars, incorporate effective public transportation options, such as bus routes and bike facilities, along the new boulevard.
(3) Use Phased Development: To guarantee seamless integration and adaptation, construct the Shkoza Center and the boulevard in stages, giving priority to high-impact regions.
(4) Involve Stakeholders: To make sure the project reflects the interests and goals of all stakeholders, work together with local communities, legislators, and urban planners.
(5) Track and Assess Traffic Patterns: Keep a close eye on traffic patterns to gauge the success of interventions and make necessary adjustments to tactics.

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# The Mitigation of Traffic in Tirana through the Formal Reconceptualization of the City

## Case study of Kashar area, Tirana.

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**Abstract -** *Tirana, a city devouring itself, spinning outward in circles an urban condition of congestion, collision, and expansion. At its core, the historic centre exists as a complex convergence of multiple realities: a geometric centre, a congestion centre, and a city centre all together forming a gravitational force that attracts the flow of traffic and human energy, suffocating under the weight of its own allure. Major and secondary roads radiate towards these overlapping centres like arteries in a cardiac arrest, pulsing life toward the centre but choking on its dependency.*

*This research uncovers a counter-geometry to address these challenging urban conditions through drawing out a series of already latent circles, inscribed in Tirana's peripheral veins, waiting to be closed. When drawn, these circles propose an alternative: a constellation of centres that are each disconnected but interdependent, forming a polycentric network. In this way, traffic flows are similar to the flow of water, redirected and absorbed, as the city expands in rings instead of lines.*

*The project shifts focus to look more closely at the scale of one such circle, the northwest edge of Tirana where the city fractures into congestion near "Casa Italia," to answer the question: how to design a new centre? This centre partially speculative, partially inevitable does not replace the historic core but competes with it, redistributing flows and recalibrating form. Anchored by infrastructure, it intercepts suburban axes and folds into a nexus of accessibility, equilibrium, and spatial justice. Geometry collapses into form. The circle's centre, once abstract, becomes real an urban node balancing the flow of cars, people, and potential.*

*What emerges is a master plan, not as a blueprint but as a system a flexible form that anticipates the city's next 50, 100, 150 years. A network of circles. A choreography of centres. Tirana no longer bends toward the singularity of its origin but radiates outward, forming an archipelago of possibilities its traffic mitigated, its form sustained, its expansion inevitable, but now logical.*

*Keywords - Traffic mitigation; Urban centre; Congested centres; Multimodal transportation; 'Archipuncture.'*

## Introduction

Reading Tirana's urban fabric shows a city struggling with centralization and congestion as a result of its rapid urban growth. The historic core, while rich in cultural and symbolic significance, has become a bottleneck for movement and development. Peripheral areas, however, are becoming prime targets for urban intervention. In these places, both opportunities and infrastructure converge, thus providing the power to change the course of Tirana's development.

Kashar, situated along the Tirana-Durrës corridor, holds a strategic position in the city's metropolitan network. Flanked by major infrastructural developments including the Tirana-Durrës highway, the Tirana International Airport link, and the Kashar-Kombinat highway this area is uniquely positioned to become a hub of accessibility and activity over the next decades. Its location bridges the urban core and surrounding suburban zones, making it a natural candidate for a new urban center that redistributes flows and mitigates existing traffic pressures on major highways leading to Tirana's historic centre.

Through envisioning Kashar as a new urban hub, this research considers the zone's existing assets and future potential. The research analysis included key factors such as Kashar's established residential and industrial areas, as well as its educational and healthcare institutions, which form the foundation of a self-sustaining urban node. Planned infrastructure projects, such as the construction of the Tirana-Rinas-Durrës railway and the connection of the

existing highway to Kombinat, further enhance Kashar's capacity to serve as a pivotal point within Tirana's polycentric network.
This research explores Kashar's potential to evolve into a dynamic urban node, anchoring a polycentric vision for Tirana. Here, flexibility and fluidity are prioritized above traditional master plans, which impose strict designs. The research offers a framework for equitable, accessible, and sustainable urban growth by utilizing Kashar's strategic location and planned infrastructure developments. In this approach, rethinking the connections between Tirana's center and its outskirts is more important than simply building a new center without consideration of urban growth patterns.
In the context of urban growth, Kashar represents more than a geographical area it embodies the possibility of a decentralized Tirana. This study aims to articulate this transformation through an interdisciplinary lens, combining urban planning, geometry, and transport infrastructure. It seeks to propose Tirana's evolution into a city of interconnected centers, where peripheral zones such as Kashar become catalysts for sustainable and equitable development.

## Literature review

From 1945 to 1990, Albania experienced one of the most rigid authoritarian regimes of the Cold War period. Following the collapse of this regime, the country embarked on a profound socio-economic transformation that restructured its political institutions, property relations, and spatial organization. Over the past three decades, Albania has achieved considerable growth compared to many countries in the Balkan region, particularly in terms of urban development and economic liberalization (Aliaj, 2015). Until the early 1990s, Albanian society maintained a predominantly rural structure, with only approximately 35% of the population residing in urban areas. Urban centers differ from rural settlements not merely in demographic scale but also in functional complexity (King, 2020). The functions of an urban center are intrinsically linked to diversified economic activities—agricultural, commercial, industrial—as well as to the presence of political, religious, and social institutions, and the provision of essential services such as healthcare, cultural facilities, and transportation infrastructure. In this sense, the urban center performs what may be described as a "pulling power" function, attracting population flows, capital, and services, while exerting influence over an extended territorial hinterland (King, 2020).

Since the 1990s, urban centers in Albania have experienced rapid expansion, with annual growth rates estimated between 5% and 10%, largely driven by the introduction of private property and market-based land development mechanisms (Aliaj, 2015). By 2015, nearly 60% of the national population resided in urban areas, while a significant proportion of Albanians—approximately one in four—lived abroad. This demographic restructuring has reshaped settlement patterns and intensified metropolitan concentration, particularly in the capital region. Today, through an evolving and increasingly complex urban planning process, Albania is positioning itself as an attractive destination for investors, which in turn contributes to rising flows of visitors and tourists and further pressures on urban infrastructure.

In recent decades, urban planning discourse in Albania has increasingly focused on the creation of new urban centers and the reinterpretation of vacant or underutilized territories through design-led interventions. The concept of design has contributed to assigning new spatial meaning to transitional and peripheral areas, transforming them into active components of the metropolitan structure (Stella, 2015). Although Tirana has consolidated its role as the dominant metropolitan pole within the national territory, it continues to exhibit significant potential for spatial reconfiguration and strategic expansion.

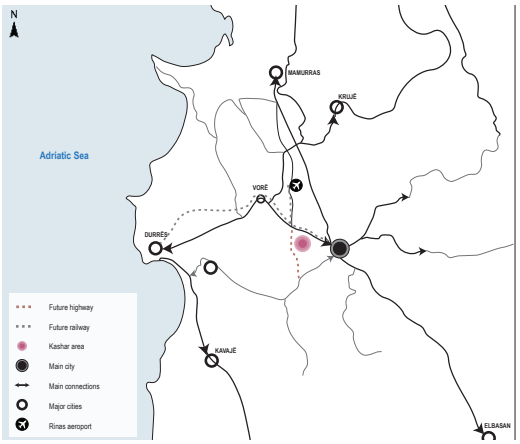


*Fig 1 / This diagram presents the area of Kashar in relation to the airport and the cities of Tirana and Durres.*
*Source/ authors (2025)*

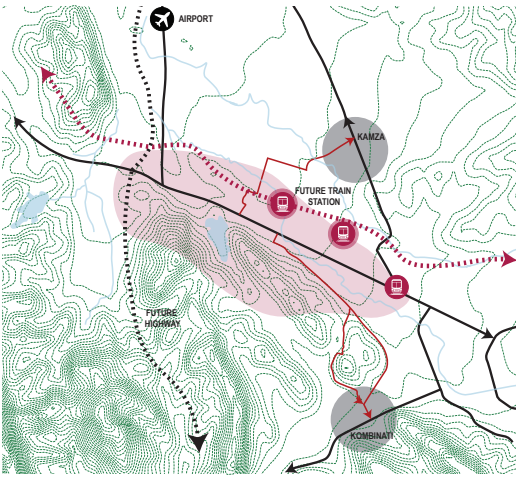


*Fig 2 / The second diagram describes Kashar in relation to the development of the area's infrastructure, the new highway and the railway line.*
*Source/ authors (2025)*

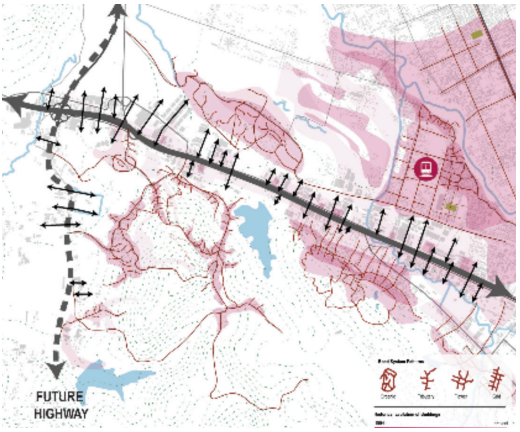


*Fig 3 / This third diagram describes the different road morphologies found in Kashar, and the historic evolution of building development.*
*Source/ authors (2025)*

*Fig 4 / Actual context of routs in Tirana*
*Source/ authors (2025)*

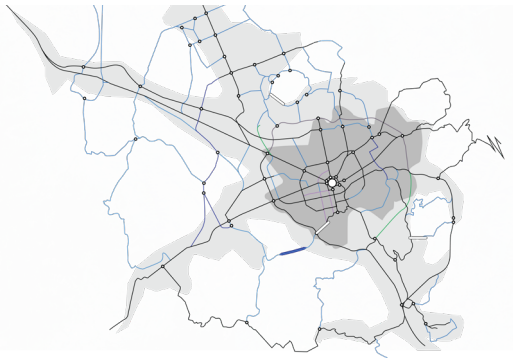

*Fig 5 / The routes that can be followed to get from point A to B are presented.*
*Source/ authors (2025)*

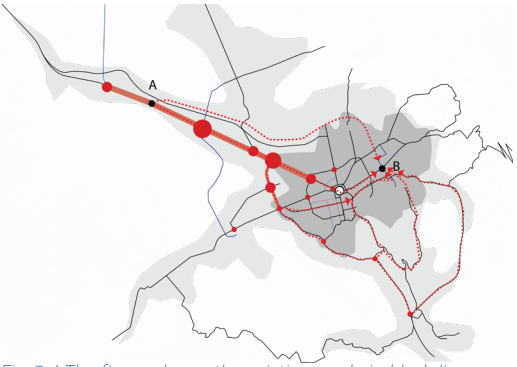


*Fig 6 / The figure shows the existing roads in black lines, our proposals for connecting existing roads in blue lines, and the red dashed lines show the roads that could be considered to get from point A to B.*
*Source/ authors (2025)*

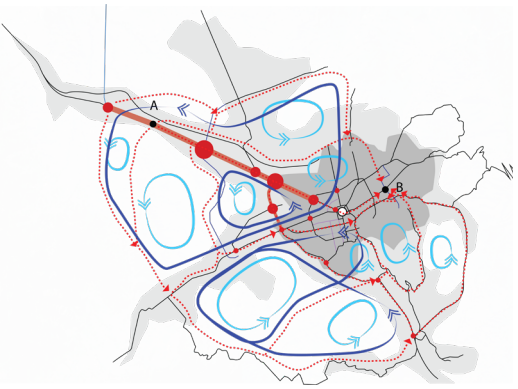


*Fig 7 / Diagram of circular systems and sub-systems.*
*Source/ authors (2025)*

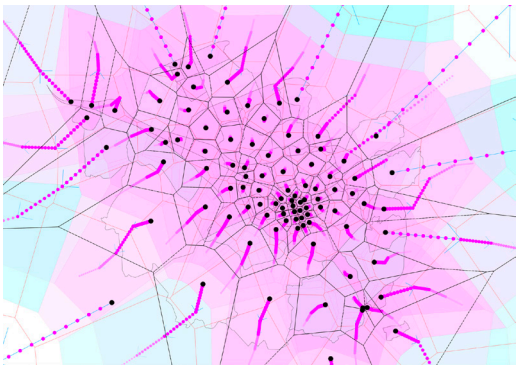

*Fig 8 / Projected Stabilization of Urban Forms' structure by mapping decoherence of Centralities based on Voronoi Spatial Relationship analysis.. Source/ authors (2025)*

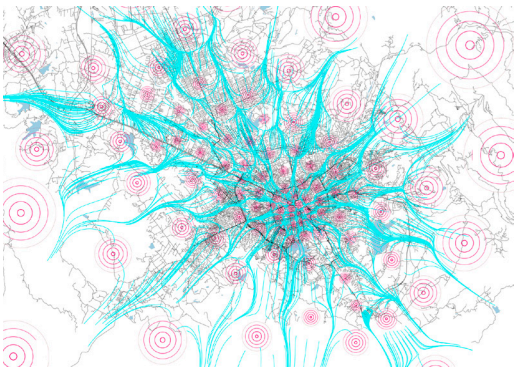

*Fig 9 / Potentiality of Mobility Connection to Create periodic and consistent System-Subsystem System of Mobility. Source/ authors (2025)*

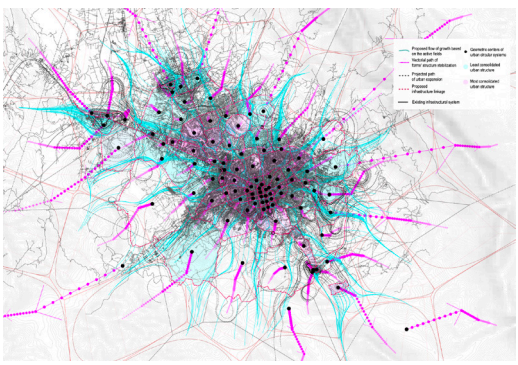

*Fig 10 / Map describing proposed flow of growth and proposed urban expansion with most and least consolidated urban structures. Source/ authors (2025)*

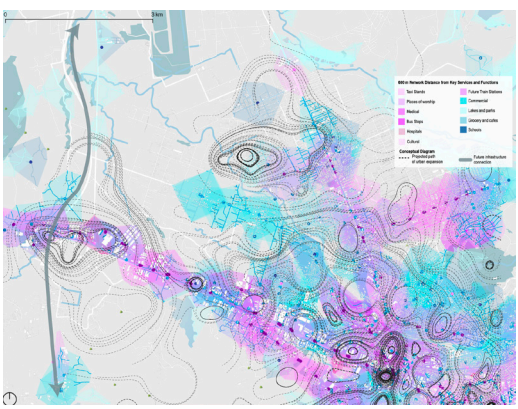

*Fig 11 / Synthesis map of walking network analysis of services and projected urban expansion. Source/ authors (2025)*

Tirana has developed along a distinct urban quadrant extending between the historic city center and the Rinas area adjacent to the international airport. The morphological characteristics of the territory surrounding Tirana have facilitated linear urban development along three major infrastructural corridors critical to the city's functioning: the Tirana–Durrës highway, the parallel railway network, and the northern quadrant extending beyond the airport. These infrastructures have acted as structural backbones guiding metropolitan expansion and spatial concentration. The road infrastructure mentioned above constitutes a focal point of the present analysis, particularly in light of two major forthcoming developments that are expected to intensify mobility flows. Peripheral areas of Tirana, including Kashar, are likely to become strategic zones for new development and may give rise to emerging urban centers. Such centers could significantly reinforce the "pulling power" dynamic, redistributing activities away from the congested historic core and promoting a more polycentric metropolitan configuration (King, 2020). The strengthening of secondary road networks through an integrated design approach combining urban planning and architectural interventions can facilitate this decentralization process. In this regard, the application of the concept of Archipuncture, which proposes targeted architectural interventions as catalysts for broader urban transformation, offers a relevant methodological framework. By selectively enhancing infrastructural nodes and spatial connections, it becomes possible to influence larger systemic reconfigurations within the urban fabric (Buš, 2016). Improving and diversifying the transport infrastructure is therefore not merely a technical upgrade but a structural strategy aimed at redistributing traffic loads currently concentrated in specific nodes of Tirana's road network. By decentralizing vehicular and pedestrian flows and redirecting them toward peripheral hubs, congestion pressures within the historic core can be mitigated. This spatial redistribution strategy responds to the marked increase in traffic congestion observed in recent years and aligns with broader metropolitan restructuring processes (Aliaj, 2015). Ultimately, decentralizing mobility patterns and reinforcing peripheral urban centers contributes to a more balanced metropolitan system. Through the coordinated reconfiguration of infrastructure, land use, and nodal intensities, Tirana can transition from a congestion-prone monocentric model toward a more resilient, polycentric urban structure capable of accommodating continued growth.

1. Improve Connectivity: This objective focuses on identifying and addressing gaps in Kashar's mobility network. By redefining the role of secondary roads and enhancing connections between primary access routes, the project aims to create a more efficient and cohesive transportation framework.
2. Develop Urban Centers: The project interventions will consolidate Kashar's dispersed urban fabric into well-structured centers that act as decentralized hubs. These centers will intercept and redistribute traffic before it reaches Tirana's congested core, alleviating pressure on the city's entry points. In addition to reducing traffic, these hubs will offer residential, commercial, and recreational

*Fig 12 / Master Plan of proposed interventions in Kashar, Tirana. Source/ authors (2025)*



opportunities, promoting a more balanced and sustainable urban lifestyle.

3. Support Sustainable Growth: This objective focuses on aligning Kashar's development with strategic infrastructure projects, such as the Tirana-Rinas-Durrës railway and new highway connections. By adopting a flexible and adaptable planning approach, the project ensures equitable, accessible, and sustainable urban expansion. The framework prioritizes long-term growth that balances social, economic, and environmental needs.

## Tools and Methodology

The methodology for the project involves several key steps to ensure effective analysis, planning and implementation. First, data collection and analysis were conducted to understand the current infrastructure, traffic patterns, and urban trends in Kashar.

To illustrate the current traffic issues in this area, we provided a specific example that affects many of us within the university community: the challenge of traveling from the university to the city center or vice versa. As shown in Figure 5, commuters take various routes from point A to point B, often covering additional kilometers in an attempt to save a few minutes in traffic.

Given the heavy traffic in Tirana and the area under study, we identified the most congested routes. Through an analysis of the existing infrastructure, we recognized the need to establish new centralities to expand the circular systems recently developed. These circular systems have a geometric center, which was used as input for conducting a Voronoi spatial analysis. The centers of the new Voronoi cells were used as inputs for generating a sequential Voronoi diagram. This iterative process, repeated in a loop, illustrates the stabilization of urban form structures, which are visualized through vectors and trace points (represented in figure 8). This projection represents a formal flow or shift in geometric centrality. The new geometric centralities, derived from the projected expansion, are interpreted as abstract attractive poles with varying magnetic values (state and attractor) that activate an Abstract Field. The state field layer is translated into projected flow diagrams, while the attractor field layer generates diagrams of hidden urban forces, highlighting their potential to connect disparate urban fabrics. This approach proposes an "infection" of segregated or less consolidated areas through the urban geometric structure, guided by the stability vector lengths of centralities from the Voronoi spatial analysis. This transformative process is termed Archipuncture, inspired by the concept of acupuncture, but realized as impactful architectural interventions. Archipuncture can take various forms, ranging from high-economic investment strategies to revitalization and architectural consolidation of the intervention area, densification, and more. The selected area represents a vacuum in the hidden fluidity of the city, as interpreted from synthesis diagrams. In this context, we aim to zoom in and analyse the diagrams on a smaller scale.

The analysis and interpretation from the Voronoi spatial analysis are overlaid with a walking distance network analysis of the service areas of various functions within Kashar, to understand the relationship between areas that are void of services and areas of projected urban expansion (see Figure 11). This interaction between existing and future context allows deeper understanding of where potential urban centers can be located, with respect to redirecting traffic flows from already congested nodes and axes.

## Results

Based on the studies and analyses conducted for Kashar, we propose a series of interventions at different scales and functions to form points of Archipuncture within the study area. Firstly, we propose a multimodal station that will address traffic congestion at the primary entry and exit points of the capital. This proposal integrates the Rinas-Tirana-Durrës railway line and extends the Thumanë-Kashar highway with the Kashar-Vaqarr

axis. At the existing Rinas overpass, an expanded circular system is envisioned, anchored by the multimodal station that reorganizes vehicular flows via a cross-overpass. This station will manage and distribute new intercity public transportation flows while serving as the main train station at the physical boundary of the Tirana-Kashar administrative unit.
Within this circular system, high-rise buildings with mixed-use functions, primarily for business, are proposed. These structures act as a physical "filter" for noise, protecting future residential developments planned along the secondary highway line.
Additionally, a preliminary development vision is proposed near the train station, positioned after the central multimodal station. This area is characterized by fluid architectural forms and circular infrastructural elements to facilitate seamless circulation with minimal traffic nodes that could impede vehicle flow. The multimodal station, strategically located near Kashar Lake, serves as a "gateway" to the New Kashar Park, marking the site of the proposed third archipuncture. The New Kashar Park will leverage the existing natural amenity that is not easily accessible and provide improved access for commuters and residents alike.
All three of these interventions, in addition to the proposed infrastructure redevelopment, create a new consolidated urban system, which has the potential to revitalize all surrounding areas in the sustainable future of the city. These interventions address the urban structure, with the ultimate goal of improving circulation by mitigating automobile traffic - in relation to the projections of growth and urban densification of the new centralities of Tirana 2050.

## Conclusions and Recommendations

The proposed interventions significantly improve mobility and connectivity by addressing traffic congestion through the development of a multimodal station and an enhanced road network, streamlining both vehicular and public transportation flows at key entry and exit points of the capital. These measures promote balanced urban development by integrating high-rise, mixed-use buildings alongside residential areas, creating a sustainable urban fabric that accommodates business, recreational, and residential needs. The strategic alignment of the Rinas-Tirana-Durrës railway and the Thumanë-Kashar highway with urban development establishes a multimodal transportation framework, enhancing regional connectivity and accessibility. Additionally, the project demonstrates a strong commitment to environmental and social impact through the introduction of the New Kashar Park and noise-reducing architectural strategies, which improve urban living standards while promoting ecological and recreational spaces. Lastly, the innovative use of Archipunctures as targeted architectural interventions showcases a forward-thinking approach to urban revitalization, effectively addressing underutilized or fragmented urban spaces.

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# 4
# Proposals for Infrastructure and facilities

# Counter-Geometries
## An Alternative Urban Lens to Address Congestion-Driven Singularities in Tirana

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**Abstract -** *The urban trajectory of Tirana speaks of a city both devouring and displacing itself in one entangled spiral of congestion, collision, and centrifugal growth. At its center, the mobility system is driven and affected by a set of triple singularities: geometric, economic, and cultural nexuses; magnetizing the lifeblood of the city, asphyxiated by the centralized pressures of its gravitational pull. A network of infrastructure and roads radiating from it ought to have the effect of diffusing such pressures. Collapsing inward, it amplifies systemic congestion and spatial inequities. This research proposes a methodological framework that constructs and maps counter-geometries as an alternative potential to reading and formalizing decentralized latent centralities. Rather than extending the city outward in straight lines, this approach reads its growth as a new interdependent recursive model. The research employs hybrid computational models and spatial analytics to develop the design of one such illustrative prototype, demonstrating its scalability across the north-west peripheries of Tirana. The circularities, both geometric and infrastructural, shift from abstraction into form, materializing as a matrix of systemic equilibrium by acknowledging the current asymmetries deriving from informal developments throughout the last three decades of transition. The paper concludes by arguing that these emerging methods offer a pragmatic potential, articulating as a visionary framework far beyond normative planning logic, ultimately recasting single-core congestion into an archipelago of flexible circulatory zones.*

*Keywords - Counter-Geometry, Latent Circles, Decentralized Polycentric Networks, Beyond-Parametricism, Urban Structure.*

## Introduction

The spatial morphology of Tirana reveals a topological condition wherein centripetal-ity perpetuates both economic intensity and mobility. Rooted in a radial order, the city's form has hardened into an over-coded diagram of convergence, where every arterial road folds inward towards the congested nucleus (Figure 1). This geometric insistence has rendered Tirana a living paradox: a city expanding in scale and density, yet collapsing in mobility.

As Alexander (1965) and Batty & Longley (1994) have argued in broader urban contexts, such centralization might transform into a morphological trap, a recursive feedback loop where access generates overload and overload breeds further centralization

Despite numerous investments, Tirana's major mobility networks remain dominated by such inward flows, reading its singularity as a triple-nexus: geometric, economic, and cultural; catalyzing congestion within the center (Dhamo, 2021; Pllumbi, 2013). This research started in late 2024, when the northern part of the Grand Ring of Tirana was still under construction (Figure 2-a). During 3 temporal frames (temporal frames: 6–9AM, 3–6PM, and 9–11PM), traffic data was observed daily along a 2 week period. Data was scrapped every 15 minutes across the temporal frames through Google Maps' API, getting color codes of live heatmaps at the Casa-Italia intersection point. The process of data scrapping was automated through AI agents running on n8n's cloud platform. A continuous temporal dataset was constructed. The dataset was post-processed and predicted across 24 hours per day, utilizing a stochastic simulation model for traffic analysis (Gaussian noise micro-fluctuations method) (Figure 3-a). The volume metric shown in the graphs (Figure 3), defined as the Congestion Index (CI), is the numerical remap of traffic heatmap density color on map/entry point (%) against the theoretical maximum throughput of the road segment (CI = 100%). Also informed by on-site surveys and local reports, it's clear that the daily mobility load far exceeds its infrastructural

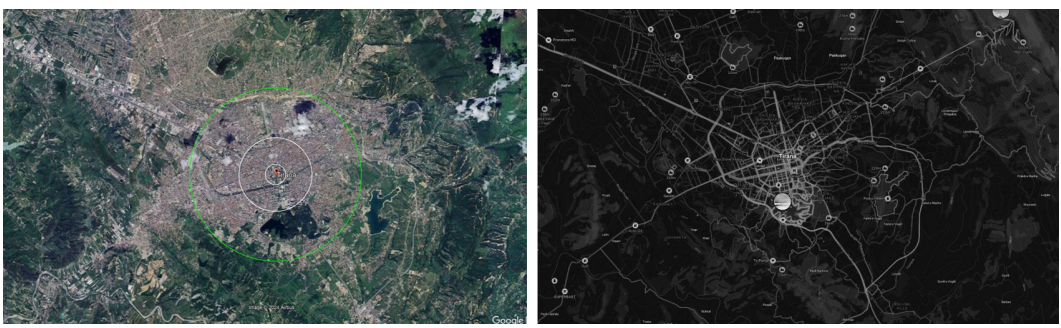


*Fig 1 / (a) Left / radial order of Tirana, on top of orthographic capture, retrieved from Google Earth, 2024; (b) Right / mobility heatmap for Tirana, retrieved from Strava, 2024*


*Fig 2 / (a) Capture of Tirana live-traffic on map, h-15.00, congestion (grey</white>), retrieved from Google Maps on November 20, 2024; (b) Capture of Tirana live-traffic on map, h-15.00, congestion (grey</white>), retrieved from Google Maps on November 20, 2025.*

capacities (Figure 3).

Driving into the city, talking to locals and in-situ observations suggest that the average driving speed of a car from point A to point B (Figure 4), would be 5-7 km/h, resulting in trips longer than 1.5h for distances of around 10 kilometers. In parallel, people who work and move daily toward the industrial area along Tirana-Durres highway (which is reported as the most congested one) prefer to undertake 25-kilometer distance loops to avoid 5-kilometer direct routes due to automobilistic congestion; not in pursuit of lower consumption, but in time-saving options and stability of daily driving experience. After the new Grand Ring officially opened in early 2025, congestion patterns still persist (Figure 2-b). Pressuring points in every exit of the ring during daily peak-hours suggest inadequate planning or integration of such a network (Figure 2-b). This phenomenon, where informal navigational behavior precedes mobility planning, serves as the empirical cornerstone for this inquiry.

Against this background, a framework of counter-geometries is introduced: a conceptual and computational apparatus which identifies and formalizes the peripheral latencies already embedded in Tirana's ad-hoc mobility networks. This research argues that these are not imaginary latencies, but emergent infrastructural needs, which

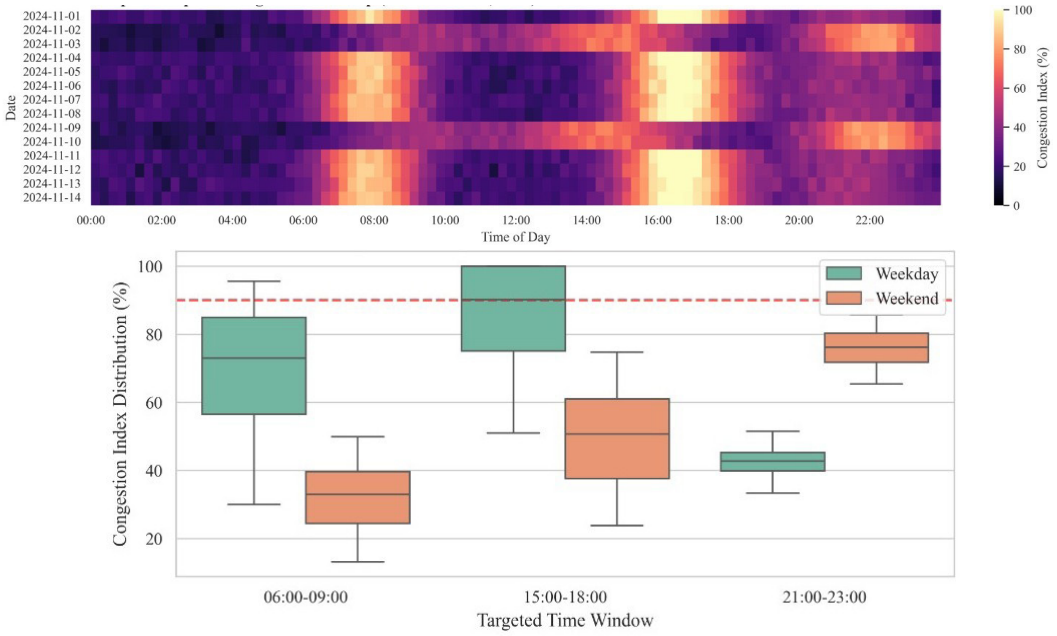



*Fig 3 / (a) UP / Spatiotemporal heatmap of traffic congestion, mapped hourly across 14 days (from November 01-14, 2024) through the Congestion Index (%). Monitoring point: Casa-Italia / Hygeia intersection point, entering Tirana-Durres Highway; (b) DOWN / Congestion Index Distribution (%) mapped via targeted time windows graph (weekends/daily); Source: processed (py3) by Joni Zguro, 2025.*



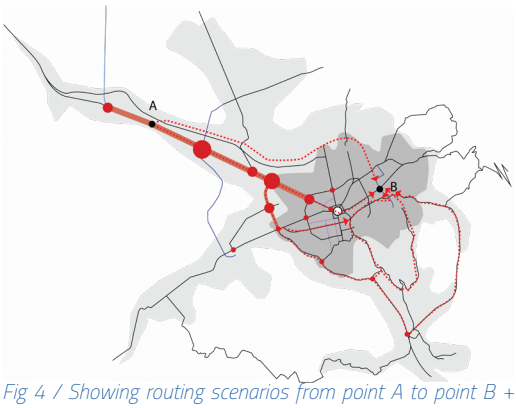



*Fig 4 / Showing routing scenarios from point A to point B + relevant cong. points.*

hold an alternative potential in resolving congestion patterns. By shifting from a radial bias toward a semi-lattice re-configuration, the framework aims to decentralize flows, not city centers alone, redistributing socio-spatial access, and challenge the dominance of the monocentric gridlock.

## Literature review

### Central Place Theory; Decoupling Geometrical and Urban Centers

The theoretical distinction between geometrical centers and urban centers has its roots in classical and post-classical urban theories dating since the early 30'. Figure 5, visualizes such differences. While traditional urban planning often equated the geometrical center with the urban core, contemporary urban theories recognize the emergence of multiple urban centers disassociated from strict geometric centrality.

The notion of a geometrical center, a point minimizing average distance to surrounding locations, finds its most rigorous formulation in the work of Walter Christaller (1933). In his Central Place Theory, Christaller conceptualized cities as hierarchical networks of central places organized in hexagonal spatial patterns to optimize service distribution relative to population thresholds and ranges (Christaller, 1933/1966). The geometrical

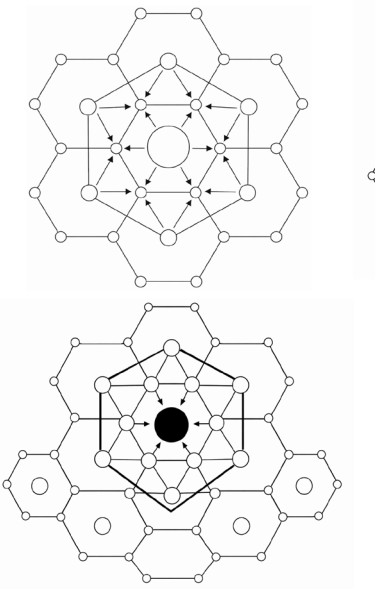


*Fig 5 / (a) Left / urban center coincides with the geometrical center of the system; (b) Right / urban center is not the geometrical center of the system. Source: Author's understanding of the Central Place Theory (as per Christaller, 1933) –simplified diagrams.*

center, in this framework, functions as the pivot of an idealized service region, aiming to minimize transport costs and maximize accessibility. (Figure 5-a). However, the simplification inherent in Christaller's model which assumes isotropic and uniform population distribution, has been extensively critiqued. Empirical urban systems reveal deviations where geometric centers and lived urban centers no longer coincide, undermined by topography, socio-economic gradients, and infrastructural constraints (Parr, 2002; Fujita, Krugman, & Mori, 1999).

### Asymmetric Centralities

Building upon and complicating Christaller's

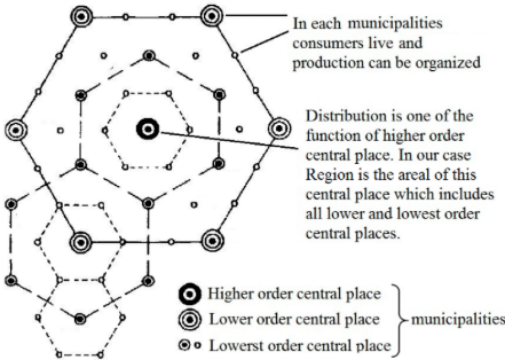



*Fig 6 / Hierarchy of central place. Note. Adapted from Figure 3 in Spatial Patterns of Production - Distribution - Consumption Cycle: The Specifics of Developing Russia, by V. Timiryanova et. al, 2020, Economies, 8(4), Article 87.*

legacy, Leslie J. King (1984) proposed a more dynamic understanding of urban centers as socio-economic condensations, irrespective of geometric positioning. According to King, an urban center is not merely defined by its physical centrality but by its economic, social, and cultural functions: commerce, governance, symbolic production, and institutional concentration. These centers differ from rural ones by exhibiting diversified hierarchical structures, higher levels of non-subsistence activities, and more intricate socio-spatial organizations. Urban centers, as King frames them, may multiply and shift over time, responding to evolving patterns of infrastructural investments, and demographic trends. Thus, the contemporary urban condition often displays multiple, decentralized centers, diverging sharply from the geometric purism of traditional models, which shall be differently mapped, understood and analyzed through various simulations in both space and time.

## Central Place Functions & Pulling Power

Further expanding this conceptual lineage, Mark Jefferson's early insight that: "cities do not grow on their own; it is the countryside that brings them into existence" (Jefferson, 1931) introduces a relational understanding of urban growth. Urban centers were the result of functional needs of hinterlands, performing central place functions that provided goods and services to surrounding rural areas (Berry & Garrison, 1958) (Figure 7-a). Almost a century ago, Tirana also emerged from such an accretion, where locals coming from all directions started moving across routes which intersected in the later-coming bazaar, near the historical Et'hem Beu Mosque (Figure 7-b). These functions were scaled according to: (1) threshold populations - the minimum population necessary to sustain a given service; and (2) range - the maximum distance consumers are willing to travel (an organic accretion which later started formalizing and quantifying). This relational dynamic gives rise to the pulling power; which shall be understood as the capacity of an urban center to attract populations, capital, and services from its surroundings. Pulling power is not only a function of distance but also of functional richness; the more diverse and specialized the services an urban center provides, the greater its gravitational influence (Parr, 2002).

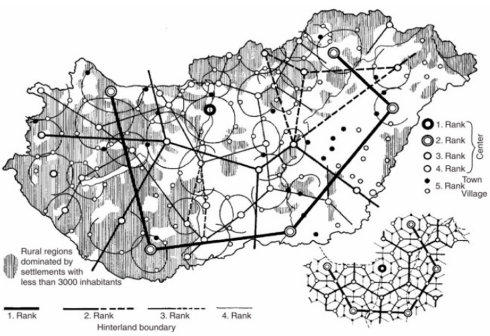
## Monocentric & Polycentric Paradigms

To speak of a purely monocentric city today is, perhaps, to speak in a language whose syllables are inherited from another epoch; one that still idealizes the centrality of the center. Historically convenient, yes, but its clarity has, in many urban conditions, given way to congestion, to ritualized delays, to a choreographed inefficiency whose choreography remains rigidly tethered to a single gravitational basin (Bertaud, 2003; Gordon & Richardson, 1997). promise of centralization becomes its pathology. Peripheral populations, navigating through centripetal-ity, are taxed not only in time and travelling costs, but in spatial indignity; caught within geometries of inequity that grow denser with each rush hour (Batty, 2013). Polycentricity does not so much resolve this as it reframes the question. It is a dispersal, but not always a liberation. Cities like Atlanta or the diffuse logics of outer Paris provide partial testimony of redistributed congestion (Figure 9-b). But in post-transitional growing cities like Tirana, a risk persists: the one of centers that are centers in name alone, unmoored from meaningful institutional presence or mobility support (Reid et al., 2023; Bertaud, 2003). And in cities undergoing that particular fever-dream of post-socialist or post-colonial transformation, the idea of the polycentric becomes precariously ornamental. Without synchronized land-use regimes and infrastructural intelligence, the city will be alienated from the metabolic realities of its urban life (Neto et al., 2025).

## Network Theory & Complexity Sciences

The city, in fact, should be understood as a terrain of entanglements, where what emerges is rarely what was predicted (Mitchel, 2009). It listens poorly to commands. It adapts, folds, resists, reshapes.





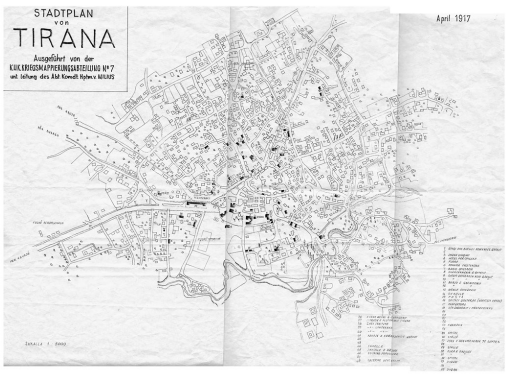




*Fig 7 / (a) LEFT / The hierarchical order of the urban network in Hungary. Note. Reproduced from A magyar városhálózatról [On the Hungarian urban network] (p. 57), by J. Major, 1964, Településtudományi Közlemények, 16, 32–65; (b) RIGHT / Tirana large scale old map - 1917 / city of Tirana, Albania.*

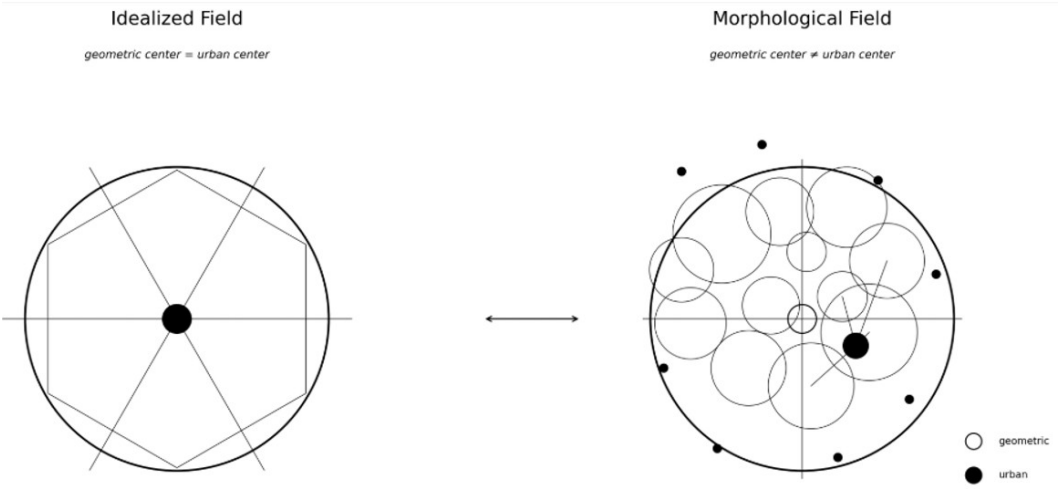



*Fig 8 / Scheme concept*
*Source/ Authors (2025)*

Within this framing, the conventional masterplan, particularly the one shaped through strict hierarchy, a tree diagram with limbs thinning as they branch, is not only outdated; it is epistemologically incompatible with how cities evolve. Alexander (1965), decades prior to the digital turn, named this limitation with remarkable precision: urban life does not obey the logic of separation. Instead, it functions through the overlapping of zones that are neither fully discrete nor wholly united, but entangled. He called this condition a semi-lattice, a structure more akin to a living nervous system.

From this, one might pivot to networks as operational frames. The radial form, visually compelling as it is, centralizes power and pressure. At its center: bottleneck. A known vulnerability. The metric of betweenness, as outlined by Batty and Longley (1994), becomes more than mathematical. Congestion is not incidental in such configurations; it is pre-encoded in its form. What follows, then, is a rethinking toward webs, toward topologies that interlace, that blur periphery and core, that allow movement to find alternate paths. In this landscape, the notion of counter-geometries arises not as a stylistic inversion but as a systemic recalibration. Tangents take precedence over radials. Peripheral loops become vital circulatory routes. It is, in many ways, a spatial version of the shift from central-server computation to decentralized swarm logic. The gain is not just about redundancy, but resilience; and the possibility of autonomous fragments, spatial units, to reduce codependence from the main urban center.

## Precedents of Decentralized Rings

If circular infrastructure has long been heralded as a theoretical antidote to the centripetal stress of radial urbanism, its real-world instantiations suggest a messier ledger. Let's take Beijing, a layered city in which concentric rings appear to be an infrastructural palimpsest (Figure 8). The form, at first glance, promises dispersal, a spatial release valve; but its condition, steeped in automobility, trades one pathology for another. Congestion is diffused horizontally, yet re-entrenched in spatial inequity (Gao & Kenworthy, 2017). London's M25 tells a subtler story. Its efficacy is conditional, in a sense. Where orbital arcs intersect with density and inter-modality, new centers flicker into being (Reid et al., 2023) (Figure 9-a). Paris, on the other hand, activates spider-web topologies, expanding its overall infrastructural level towards a more inclusive spatial access and function distribution (Figure 9-b). But this emergence is both a function of geometry and governance. What rings achieve, in fact, depends not merely on their curvature but on how they embed within land-use, transport diversity, and institutional foresight. And then, there is Tirana. Here, the issue is neither over-integration nor systemic overreach, but rather a chronic spatial disarticulation (Figure 1-b). Since the postwar period, the idea of rings has recurred, resurfaced, faded, proposed in plans, memorialized in political slogans, partially built, then abandoned or rerouted by shifting agendas (Aliaj et al., 2010). The opening of "Unaza e Madhe" (Grand Ring) was a step forward in resolving mobility issues; aspirational, yet uneven, tracing a loop whose coherence is undermined by the deeper gravitational pull of the centralized triple singularities (Figure 2). What's needed, then, is not another major bypass, but a re-reading of what is already there: latent geometries, informal flows, emergent patterns of movement. In this context, counter-geometries are not fantasies of planning speculation, but behaviors mapped spatially through subversive logics that evade


*Fig 9 / Beijing urban sprawl and mobility ring roads. Source: The Economist*

the common-sense, yet insist on legibility. They demand to be theorized and excavated; formalized, and then, carefully activated.

## Urban Futures Beyond Static

## Paradigms

They demand to be The shift from static masterplanning toward dynamic, speculative urbanism has gained increasing traction in contemporary urban theory. Scholars such as Bishop and Williams (2012) argue for an "urbanism of possibility," where cities are understood not as fixed forms but as evolving fields of emergent potentials. Similarly, resilient planning frameworks (Ahern, 2011; Meerow et al., 2016) advocate for urban systems designed to absorb shocks, adapt over time, and reorganize in the face of systemic disruptions. These discourses converge with complexity-informed urbanism (Batty, 2013), proposing that successful urban configurations must embrace indeterminacy rather than suppress it. Within this lineage, the concept of counter-geometries introduced here aligns closely in reframing urban planning as the

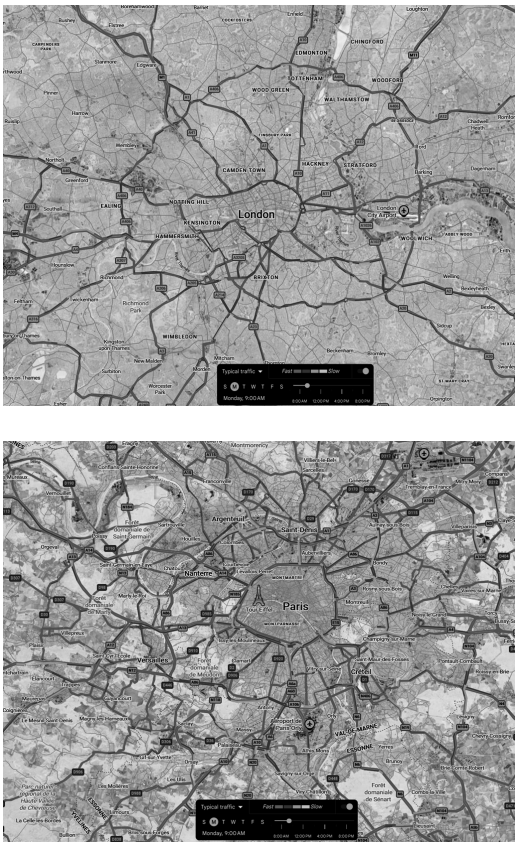



*Fig. 10 / (a) UP / London map with its typical traffic at 9AM. Retrieved from Google Maps November 2025. (b) DOWN / Paris map with its typical traffic at 9AM. Retrieved from Google Maps November 2025.*

management of fluctuating territorial fields, not the inscription of permanent boundaries (Cache, 1995). The integration of wave-based simulations and predictive field morphologies extends speculative and resilient paradigms into computational and actionable methodologies, offering new tools for navigating the unpredictable materializations of urban futures (Lynn, 1999).

# THEORETICAL UNDERPINNINGS

## Defining "Counter-Geometries"

The term counter-geometries, as developed in this paper, does not propose the erasure of the radial, but its strategic subversion in both scale and ontology. It designates a spatial logic that acknowledges the inevitability of centripetal urbanism while simultaneously constructing a set of infrastructural tactics to undermine its dominance. In contrast to additive planning interventions, counter-geometries are conceived here as both methodological apparatus and morphological critique. They offer not a diagram, but a generative principle: to read the city not through what we see, but through how it is navigated, skirted, and circumvented in practice. The concept emerges from a paranoid understanding and territorial mapping of Tirana citizens' tactics. While formal plans remain fixated on the centrality of Skanderbeg Square and its radial tributaries, the lived city has already begun to trace informal potential solutions at the periphery. These are not designed forms but infrastructural residues of adaptive behavior, seeking mobility not through the center, but around alternative centralities. They should be understood as circles of necessity, formed through repetitive deviations or loops, which are often inscribed in opposition to the formal diagram. Here, the semi-lattice logic of Alexander (1965) becomes foundational. While modernist urbanism favored the hierarchical tree-structure, the adoption of the semi-lattice permits intersection, contradiction, and overlap; it mirrors the city's lived condition more accurately than the radial ideal. Likewise, Mitchell's (2009) complexity theory reminds us that cities adapt not through command, but through constraint, feedback, and re-routing. Counter-geometry, in this sense, is an act of epistemic recognition of what already pulses at the edge.

# Methodology

The methodological corpus is constructed as a stratified system for detecting & projecting peripheral urban latencies. The methodology operates across four interrelated strata, each building upon the previous one, as follows:

## Stratum One: Behavioral Geometries and Territorial Mapping

This first stratum employs an ethnographic diagram, mapping how everyday mobility behavior inscribes latent territorial geometries that both expose infrastructural inadequacies and suggest alternative logics of urban connectivity networks (Figure 10). In parallel, Urban Structural Units (from now on will be referred to as USU) are retrieved as geojson., alongside corresponding centroids, to help better understand Tirana's morphogenetic relations (Figure 11). Special attention was dedicated to transition zones that have not yet been officially incorporated into the metropolitan plan but are already yielding counter-radial mobility logics. These are areas such as Kamza, Yzberisht, Farka, Tufina, etc. A final territorial mapping which closes circular tendencies is proposed for infrastructural consolidation (Figure 10-b).

## Stratum Two: Voronoi Tessellation as Morphogenetic Reading of USUs

The second stratum operationalizes Voronoi tessellation as a morphogenetic lens for reading gravitational tensions within the spatiality of the existing urban field. Formal and emergent sub-centers were internalized in a parametric environment (Rhino 7 + Grasshopper) to generate the initial Voronoi diagram. The resulting Voronoi's cell centroids are later used as inputs for recurring the Voronoi tessellation on the new displaced position of the centroids themselves. This recursion is computed for 4 sequential times, creating the vectors and rendering their energy levels through spread densities (Figure 12). The more the

gravitational pull centers coincide with their own USU's geometrical centers, the more consolidated the USU is, and more congestion is expected. It demonstrates how infrastructural injustices relate to potential new urban centralities. Through these iterations, centroid drift patterns were revealed, mapping not only the inertia of existing systems, but also the gravitational aspirations of the city's latent forces. This process challenges the Cartesian fixity of urban nodality, proposing instead a fluid ontology for urban attractors, understood as a collective swarm-like intelligence for reading dependencies and potentials. The longer the vector displacement, the higher the probability to be a future pressure point; and as a consequence, it needs to be addressed by near-serving network potentials.

## Stratum Three: Field-Based Simulations & Urban Flow Morphology

Moving beyond simple node-to-node simulations, this stratum introduces the field-based approach on urban morphology, treating the metropolitan region not as a collection of discrete artifacts, but as continuously differentiated energetic channels. Based on the recalibrated Voronoi frameworks and the empirical displacement patterns, a spatial field was generated where localized attractors (sub-centers) and repulsors (congested core zones) shape a dynamic, non-linear landscape of movement and influence.

In the constructed model, each emergent sub-center operates as a localized positive field emitter, generating a gravitational basin whose intensity is proportionate to its demographic and infrastructural potential (Figure 13). Conversely, zones of chronic congestion, particularly within the historical core, are modeled as negative field nodes, generating centrifugal repulsive forces that displace mobility outward along gradient vectors. (overlay, Figure 14)

A nodal expansion model can be visualized when new centralities redirect and distribute current centralization of triple singularities. The model serves as a detailed and rich visualization of the city through the lens of digital-density-drawing (ddd), assuming their correspondence with the triple singularities which we introduced in the beginning (Figure 15).

The superimposed interaction of these simulated



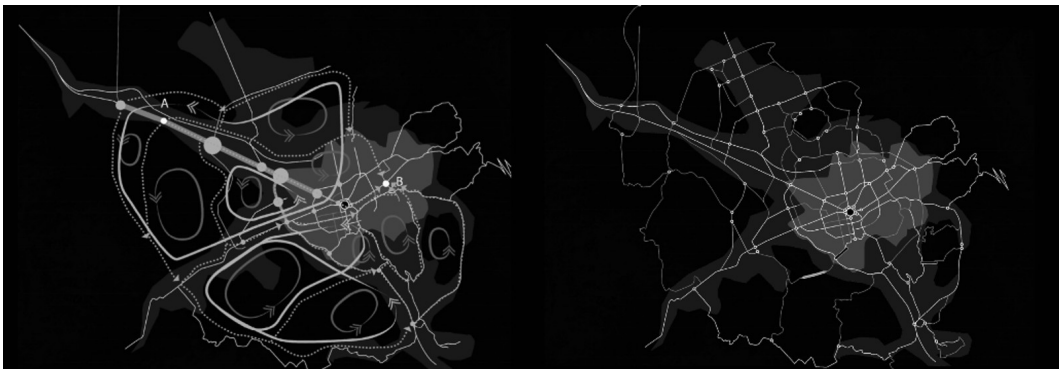



*Fig 11 / Ethnographic reading of mobility behavior. These traces were subjected to a reading as if they were city annotations; instructions of resident logic overlaid upon infrastructural inadequacy. (a) LEFT / Diagram of mobility behavior; (b) RIGHT / connectivity routes - proposal.*

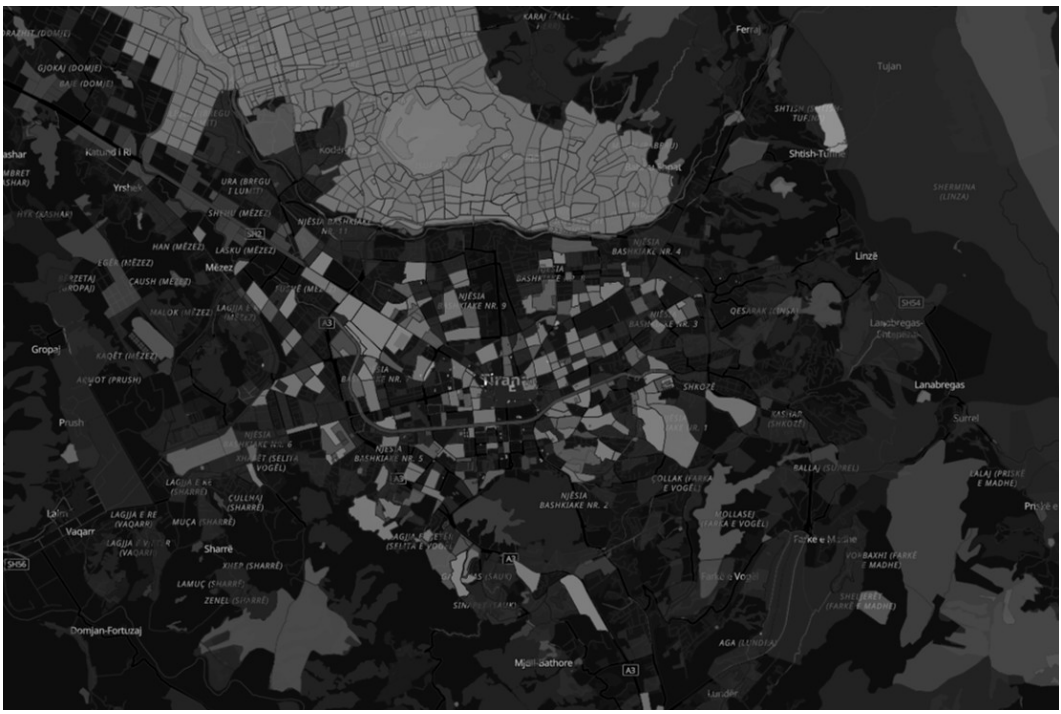



*Fig 12 / Tirana map. Overlay of (Urban Structural Units); retrieved from AKPT through API.*

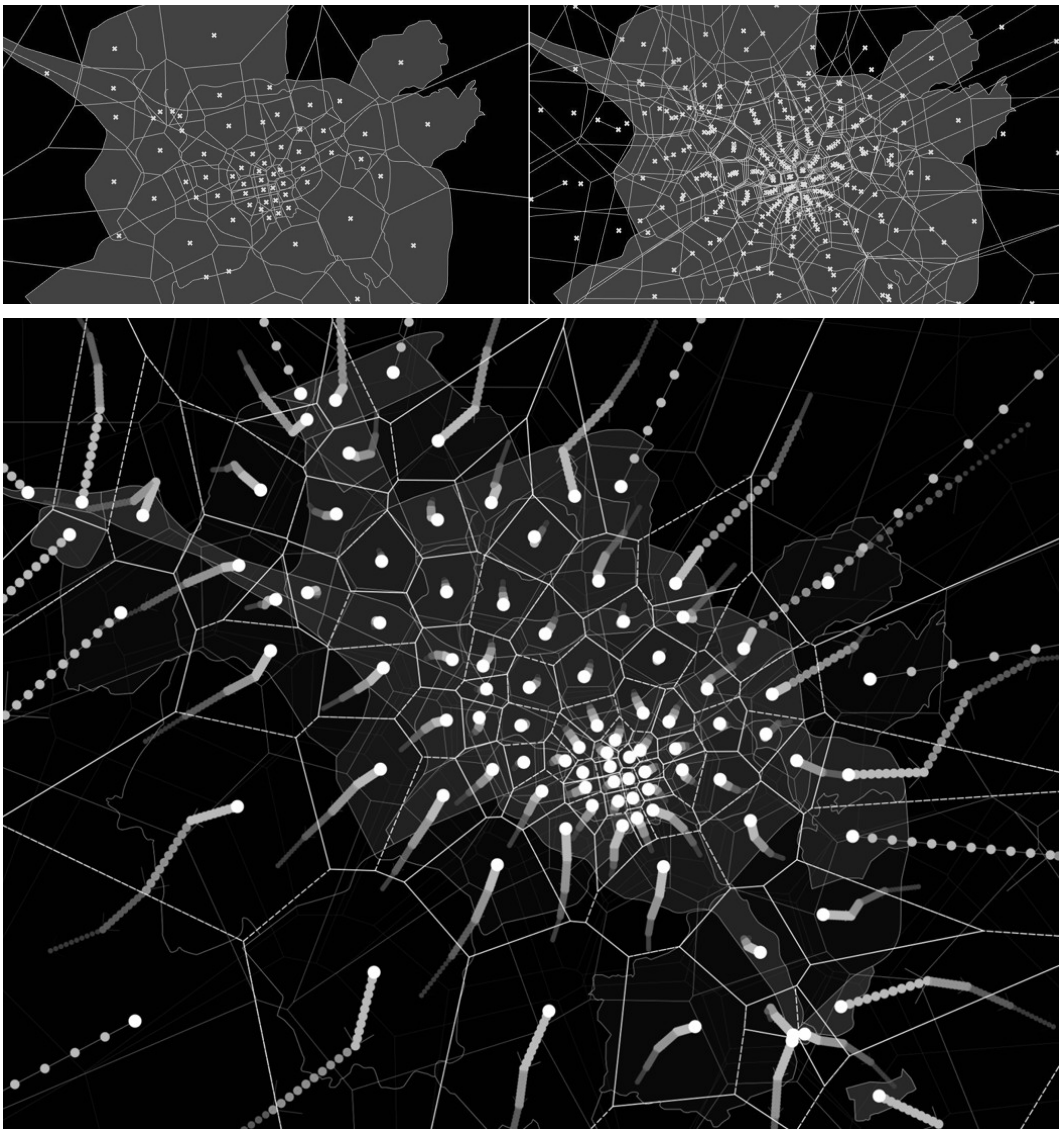




*Fig 13 / Voronoi Tessellation Recursion (4 steps) & Entropy Vectors from USUs' Centroids.*

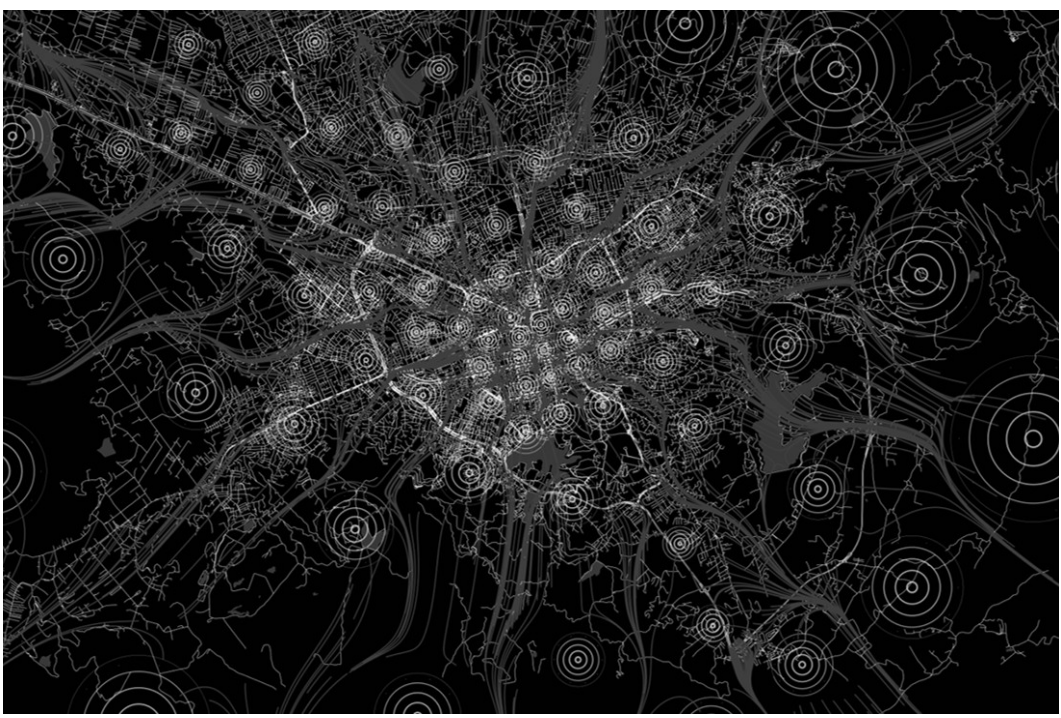


*Fig 14 / Repulsive weighted centralities (-) / Also referred to as Scenario A.*

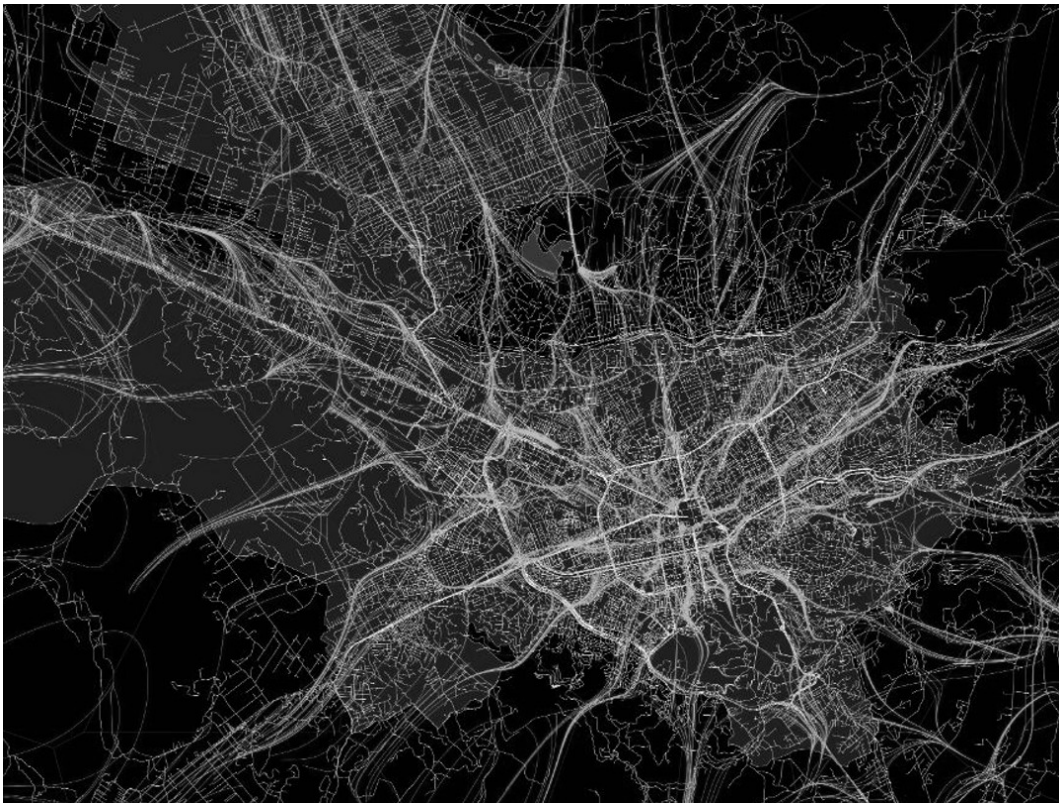


*Fig 15 / Field Activization // Overimposed Attractors (+) / also referred to as Scenario B. Source: Fulvio Papadhopulli*

*Fig 16 / Field Activization // Overimposed Attractors (+) / also referred to as Scenario B. Source: Fulvio Papadhopulli*

fields produced a complex morphology of stabilized flow corridors (illustrated through dynamic vectors), scalar orbital formations (interlinked rings of influence), and threshold fields (densification zones delineated by gradient shifts) (Figure 16). The diagrams reveal how Tirana's latent urban forces configure themselves into a new structure of patterns and flows; channeling energy into emergent peripheries, hinting nested circulation rings, and articulating differentiated zones of consolidation and expansion through different density lines.

Critical computational metrics include:

-Field Intensity Isolines: Mapping zones of highest attraction-repulsion gradients. (Figure 16. Black Isocurves)

-Stabilization Paths: Vectorial routes where energetic flows consistently converge, suggesting optimal corridors for infrastructural alignment. (Figure 16. Cyan Isocurves)

-Field Overlap Density: Measuring the resilience of orbital formations through the redundancy of converging flow fields. (Figure 16)

Rather than imposing linear solutions, the field simulation exposes the self-organizing tendencies inherent in Tirana's urban metabolism, illuminating where counter-geometrical interventions could be synchronized with the city's formalized spatial dynamics.

### Stratum Four: Urbs

The final layer of the methodological framework shifts from reading forces to strategically projecting their architectural consequences. Rather than forecasting through simulation, it operates through deduction: extrapolating from the energetic diagrams where attraction and repulsion fields expose the city's own tendencies toward alternative spatial organizations. The composite field (Figure 17) maps a terrain of functional dependencies and certain vacuum zones. Within this framework, they are visualized as heatmap fields, suggesting where and how to predict the city growth through an urbs model, as ontologically introduced by Ildefons Cerda. By proposing a formally divergent masterplan design emerging from field decoherence, the counter geometries affect and activate both artifacts and mobility networks, pushing the city towards new kinds of peri-urban formalization and growth strategy.

## Results

Scenario A, entails minimal and more short-term strategic insights about adjustments to the existing conditions. Repulsive forces continue to dictate expansion; peripheral attractors remain weak, often disconnected, and radial dispersal persists along primary infrastructural axes. Orbital articulations surface sporadically but fail to cohere into a supporting network. The gravitational imbalance seems to consolidate congestion at the core, offering little systemic release. (Figure 13)

Scenario B visualized potential activations of the latent networks, empowering existing mobility patterns. Emerging attractor basins are selectively reinforced, and infrastructural stitching along tangential corridors redirects centrifugal pressures into semi-structured orbital flows. This move dilutes the dominance of the historical center, allowing sub-centers to share the systemic load. A semi-polycentric pattern takes shape by redistribution, opening a differentiated urban order where peripheral nodes begin acting as gravitational anchors. (Figure 14)

Finally, Scenario C enacts a full model synchronization. Gravitational basins interlink through nested orbital systems; centrifugal movements are absorbed into structured circulation loops. The former radial logic dissolves into a gradient field of differentiated centers, each calibrating territorial flows locally while contributing to a broader metropolitan equilibrium. Rather than a centrality, Tirana becomes a constellation of a new urbs model: self-sustaining polycentric metabolism shaped directly by its latent energetic order. (Figure 15)

Each drawing (ddd) does not propose an isolated understanding of reconfiguration; they sequentially inform the model from the city's own emergent behaviors. The methodology thus culminates by revealing that the counter-geometries necessary for resilience and distributive balance are not external strategies, but already embedded within the city's DNA; awaiting alignment, amplification, and articulation.

"

## Discussion

### Discussion of Findings

The results indicate that Tirana's congestion is not only a question of overloaded infrastructure, but a manifestation of a deeper spatial misalignment between the city's inherited monocentric organization and its increasingly dispersed patterns of movement, access, and everyday territorial dependence. What emerges from the three scenarios is not a simple alternative network, but a different urban reading: one in which peripheral attractors, tangential relations, and intermediate service nodes begin to operate as structurally relevant components of metropolitan organization rather than as secondary by-products of expansion. In this respect, the value of the proposed framework lies in making visible a layer of urban order that conventional radial planning models tend to suppress or misrecognize.

This has two implications. First, it suggests that Tirana should be interpreted less as a city with one dominant center and more as a transitional urban field in which centrality is multiple, uneven, and behaviorally produced. Second, it repositions masterplanning from a practice of formal prescription toward a practice of strategic calibration, where the task is not to impose a definitive geometry but to identify where decentralized intensities are already forming and how they might be spatially reinforced. Within this logic, the scenarios are not final solutions; they function as analytical projections that clarify how redistribution may occur when circulation is reorganized beyond the gravitational pull of the historic core.

Methodologically, the study also demonstrates the relevance of combining ethnographic observation with computational abstraction. The recursive Voronoi operations and field-based simulations gain value precisely because they are not detached formal exercises; they are grounded in observed mobility frictions, territorial asymmetries, and the informal circumventions through which the city already reveals its latent structure. The discussion therefore supports a broader methodological claim: in rapidly transforming metropolitan contexts, urban analysis becomes more robust when empirical behavior, spatial deduction, and scenario-based computation are treated as mutually reinforcing modes of inquiry rather than separate domains of knowledge.

### Limitations

This study should be interpreted within the limits of its evidentiary and predictive scope. Although the simulations are informed by observed congestion patterns, territorial mapping, and deductive spatial

modeling, they have not yet been validated through longitudinal mobility datasets, real-time GPS traces, or post-implementation assessment. In addition, the framework does not fully model the temporal instability of infrastructure delivery, including political delay, funding discontinuity, or shifting socio-environmental conditions. The proposed scenarios should therefore be read as analytically grounded projections rather than deterministic forecasts.

### Future Research

Further research should extend the framework through longitudinal urban telemetry, including GPS-based mobility traces, traffic sensor data, and service-access datasets capable of testing whether the latent centralities identified here persist, intensify, or dissolve over time. A second line of inquiry should involve agent-based and scenario-sensitive simulations that incorporate behavioral adaptation, infrastructural phasing, and uncertainty in implementation, allowing the model to evaluate not only spatial reconfiguration but also temporal responsiveness. Finally, comparative application in other rapidly urbanizing and transition-driven metropolitan contexts would be essential for assessing the transferability of counter-geometries as a planning instrument beyond Tirana, particularly in cities where congestion, informal growth, and uneven centralization are similarly intertwined.



## Conclusions

This paper has not sought to solve Tirana's congestion through a definitive planning prescription, but to test whether an alternative methodological lens can reveal urban relations that conventional center-oriented readings tend to suppress. Its principal contribution therefore lies less in proposing a finished urban model than in demonstrating that congestion can be re-read as a spatial symptom of deeper organizational imbalance, and that such imbalance can be investigated through a layered analytical framework capable of tracing hidden peripheral intensities, non-radial dependencies, and emergent logics of redistribution. In this sense, the study positions counter-geometries not as a closed doctrine, but as an operative research construct through which urban form, movement, and territorial pressure may be examined beyond the inherited assumptions of monocentric planning. (Figure 19)

Rather than concluding with a universal claim, the research establishes a proof of methodological plausibility. The value of the work resides in showing that ethnographic observation, recursive geometric abstraction, field-based simulation, and deductive urban projection can be assembled into a coherent analytical sequence for reading latent spatial behavior. What has been validated here is not yet a policy instrument in its final form, but the feasibility of a method: a way of detecting whether the urban periphery already contains measurable tendencies toward sub-central reorganization that planning systems have not adequately recognized. This is particularly significant within the context of a broader doctoral investigation, where the aim is academic exploration, conceptual refinement, and the progressive testing of new analytical apparatuses before their translation into operational planning frameworks.

The findings therefore open a future pathway rather than close an argument. The methodology developed in this paper suggests potential scalability toward more robust decision-support environments, including policy-oriented urban diagnostics, mobility restructuring strategies, and decentralized planning scenarios capable of informing long-term metropolitan governance. Yet such future applicability depends on further validation through expanded datasets, longitudinal mobility evidence, comparative urban cases, and stronger calibration between simulated spatial tendencies and real institutional conditions. The present paper should thus be understood as a foundational step: not the final statement of a finished system, but the rigorous opening of a research agenda in which methodological validation becomes the necessary precondition for later policy relevance.

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# Exploring the Feasibility of Using GANs for Traffic Mitigation

## Reimagining Urban Planning for Tirana's Emerging City Center

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**Abstract -** *Tirana and other rapid growing cities are experiencing fast urbanization, which has increased traffic congestion and caused major delays and disruptions in transportation systems. In order to overcome these obstacles, network modeling and transportation indices have emerged as crucial instruments for comprehending and reducing urban traffic problems. Predicting these indices, however, becomes essential for sustainable urban planning and efficient traffic management as cities become increasingly complex.*

*Along with other recent advances in deep learning, the introduction of Generative Adversarial Networks (GANs) and their adaptations for spatial data analysis have provided urban planners with powerful tools to construct hyper-realistic urban layouts.*
*Presenting a methodology for using GANs to produce new suitable city layouts with an emphasis on traffic mitigation is the aim of this study, which also aims to explore and showcase the potential of AI, specifically GANs, in urban planning. This approach surpasses some of the traditional limitations in urban planning, particularly the ability to facilitate iterative upgrades and provide prompt performance feedback at the first stages of design.*

*This study investigates how the generative capabilities of GANs could speed up the design process and enable urban planners to dynamically alter layouts in response to shifting constraints and objectives. In order to create sustainable, ideal urban landscapes, this approach seeks to assess how well GANs support data-driven decision-making.*
*Urban planners will be able to precisely assess urban plans prior to implementation through analyzing the potential for providing traffic estimates in sequential time slots based on varying travel demands. The combination of GAN and traffic predictions will enable the generation of rapid scenarios to explore multiple design alternatives and their traffic impact.*
*These developments offer a revolutionary perspective to contemporary urban planning by facilitating the investigation of efficient city plans that not only reduce traffic jams but also encourage sustainable growth.*

*Keywords - traffic mitigation, GAN, challenges, layouts, data-driven urban planning, generative design*

## Introduction

According to United Nations projections, approximately 60% of the world's population, or 6 billion people, will reside in cities by 2050 . This indicates that the importance of creating high-quality urban environments is growing. The physical shape of the city, together with characteristics linked to physical form, diversity, accessibility, comfort, and aesthetic quality, all have an impact on the urban environment, which serves and should meet the needs of the inhabitants in a variety of ways. Urban design is the process of organizing physical features in urban environments, such as the shape and arrangement of buildings, the road network, public space, and green space, from the macro to the micro space, in order to create a better future environment for inhabitants. (Banerjee, 2014)
Professional urban design plans guide construction by reflecting the planner's vision for the future urban space. Numerous factors are involved since urban design solutions impact many significant facets of urban life, including transportation, pedestrian flows, social, ecological, and economic elements.

However, there are a number of issues with contemporary methods of urban spatial planning that make it difficult for them to effectively handle the complexity of urban systems. Conventional planning techniques frequently use oversimplified models that fall short in capturing the complexity of urban surroundings.

This issue presented a difficulty for the field of generative design since it required taking into account a large number of interrelated factors. The outcome of an urban project has a lasting impact on many aspects of life, and it should fulfill the demands of a rapidly growing city.

In Tirana, traffic congestion is still a major problem that calls for creative urban planning solutions. To address this issue, our objectives are:

The construction of a new, well-planned city center in Shkoza that would relieve pressure on the existing urban core and reroute traffic.

Using Generative Adversarial Networks (GANs) and other computational techniques, we aim to develop a new urban shape that incorporates a new urban core into the broader Shkoza zone makeover.

While training these models on local historical and spatial data, constraints will be applied to ensure resilient, sustainable, and functional urban development. This data-driven approach tends to encourage balanced urban expansion that minimizes traffic and enhances the city's livability by optimizing land use, transportation networks, and public spaces.

To achieve these goals, we tend to create a new framework or a methodology will step-by-step generate new urban layouts and stimulate the traffic in them, so that is can be tested before its actual execution. This will be a general framework that can be applied to different case studies.

## Urban Layout Generation

### Related Work

Goodfellow et al. (2014) introduced GANs, which are known for their capacity to produce synthetic data that closely mimics actual input data. They operate as two competing neural networks, a discriminator that assesses the authenticity of the data instances and a generator that generates new data instances, making it easier to create complex and realistic data. Starting with random noise, the generator creates data that resembles real-world examples. The discriminator, in the meantime, assigns these generated outputs a probability score—closer to 1 if it thinks the data is real, and closer to 0 if it thinks it's fake—by comparing them to real samples. In a feedback loop, both networks drive one another to get better: the discriminator sharpens its capacity to distinguish between fake and real, while the generator makes its creations more persuasive.

Even though GANs are widely used in computer science, urban planning is still a relatively new field to use this technique. Despite the success of generative AI in text and image generation, cities are a complex ecosystem with human, social, economic, and topographical components. Cognitive architecture, training algorithms, complex and inaccurate data, and processing have made it challenging to combine AI with urban planning. (Wang, Lu, & Fu, 2023)

From land-use optimization to street network development and architectural design, Generative Adversarial Networks (GANs) have been used more and more in urban planning in recent years. However, GANs frequently require customization or combination with other methods, such as graph-based models, reinforcement learning, or constraint-based optimization techniques, in order to obtain optimal performance. Through these modifications, GANs are able to handle the unique complexity of many urban planning problems, guaranteeing that the designs produced are not only aesthetically pleasing but also practical, sustainable, and in line with practical limitations. The potential of GAN architectures to create intelligent, data-driven urban solutions keeps growing as they are improved and integrated with domain-specific approaches. (Weiyu Zhang, 2022)

To enhance performance and adjust to various domain tasks, numerous GAN variants have been created, each with a unique model architecture, loss functions, and strategy for resolving the model collapse problem. One of the most significant of these is the DCGAN, which incorporates the DCNN into the GAN architecture (Alec Radford, 2016). The DCGAN has been widely used and referred to as a standard and reference architecture for other variations of GANs due to its extremely high

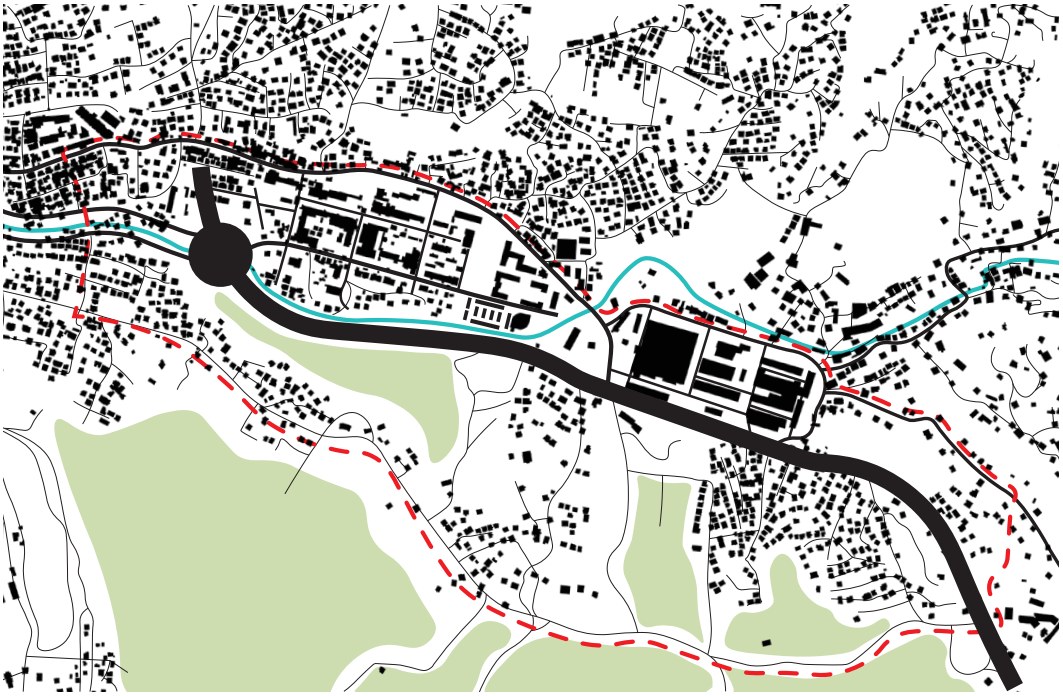

*Fig. 1. Area of Study*
*source/ author (2024)*



| Model | Application | Key Feature | Strength |
|---|---|---|---|
| DCGAN (Deep Convolutional GAN) | Image generation, feature learning, unsupervised representation learning | Uses deep convolutional layers instead of fully connected layers in both the generator and discriminator | Produces high-quality images, improves training stability, and enables meaningful latent space representations |
| cGAN | Street layout design | Integrates socioeconomic data | Generates realistic street networks |
| Rule-Based GAN | Urban layout automation | Automates dataset acquisition | Reduces manual workload in urban planning |
| Spatio-Temporal GAN | Traffic and mobility prediction | Handles time-series data | Improves accuracy of traffic modeling |
| Urban Block GAN | Urban morphology adaptation | Learns city structure patterns | Generates transferable city block designs |
| Urban-GAN | Participatory urban design | Democratizes urban planning | Enables citizen co-creation of urban spaces |
| UrbanGenoGAN | Large-scale urban planning | Integrates GA, GAN, and GIS | Optimizes urban plans under multiple constraints |
| MetroGAN | City expansion modeling | Uses hierarchical learning and geographical loss | Enhances urban morphology prediction |
| StackGAN | Produces realistic, high-resolution graphics from text-based descriptions. | Structure is created by two GANs, ADGAN and UrbanGAN Involves fine-tunning | Mimics the logical morphological control of human architects and learns historical layout traits. |

*Tab. 1. GAN architecutral combinations, application, key features and strengths*
*source/ author (2024)*

performance in image classification and other generation tasks with significantly improved training stability (Hong, 2019).
The street patterns, architectural plan layout, street views, and urbanization patterns (Adrian Albert, 2018) are just a few of the urban plans and design schemes that have been produced by several studies using GANs, and more especially DCGANs. A few of them had outstanding outcomes. The majority of these research, which primarily targeted planners and designers, employed GANs to create 2D plans or images in a manner similar to that of natural picture creation in computer science. Many of them, however, failed to adequately explain how GANs benefit specialists who are capable of completing the identical design assignment with a far higher degree of complexity and quality.
(Boim, 2022) illustrated the application of a conditional GAN known as Pix2Pix for predicting and modeling urban forms, integrating AI into the city design. Moreover, he constructed a Pix2Pix CGAN model for image-to-image translation. This


*Fig. 2. Main Traffic Congestion Road source/ author (2024)*



also serves to further highlight the importance of AI in visualization of urban changes.

CGAN has also contributed in street layout design, by integrating socioeconomic and natural contains such as elevation, population density and land use. The input data is first encoded by this model using an autoencoder that creates a feature map by combining socioeconomic and natural restrictions.
After that, a conditional GAN is trained on actual street networks to produce layouts that closely resemble real-world urban street configurations both structurally and aesthetically.
The produced image-based street layouts are transformed into vectorized street graphs for implementation using an extraction program. (Lehao Yang, 2023)

One interesting modification of GAN is a framework called Stack-GAN that uses a stacked approach. It consists of two GANs, the first of which uses the data as input to capture fundamental features, and the second of which uses the output to refine the data. This demonstrates the concept of fine-tunning that has been employed lately to improve a machine learning model's performance on a particular task. (Zhong, 2024)
These findings underscore the necessity of a hybrid approach in which GANs complement conventional planning tools to produce data-driven but realistic urban solutions.

The following table lists different GAN architectural combinations, emphasizing the variations in their application, key features and strength.

In one form or another these works demonstrate the expanding use of AI in urban planning and reaffirm the necessity of integrating GANs with real-world restrictions, optimization methods, and expert knowledge. Their results provide credence to the approach put forth in this study, which uses GANs to create a new, sustainable city core in Shkoza that will reduce traffic and encourage effective urban expansion.

## Potential Solution for Generation of New Urban Center

To illustrate how the suggested framework will function, this study used a Uzina hypothetical design project as a pilot case study.
Using GAN to generate urban design to improve connections and bring back the neighborhood is one of the major changes I tend to apply for Uzina. Based on some site analysis we decided to make some changes for the area.
First, instead of depending on just one access point, since Tirana's Big Ring has now become one of the more important connection roads in Tirana, we suggest setting up several connections to it. By minimizing congestion on the major arterial roads and facilitating more seamless mobility, this strategy will aid in the more efficient distribution of traffic flow. Second, the regeneration of the old Uzina and its potential conversion into a dynamic urban area that might serve as Tirana's second city center are at the core of this change.
We may rethink this traditionally industrial region as a mixed-use zone that integrates public, commercial, and cultural amenities, so we tend to increase its social and economic effect, rather than allowing it to remain unused. (Figure 3)
Other cities have successfully investigated this kind of AI-driven urban renewal. For example, Urban-GAN framework (Quan S. J., 2022) has demonstrated how AI can integrate past urban morphologies into contemporary designs, allowing cities to maintain their unique identity while meeting contemporary demands. Similar to this, Weiyu Zhang et al.'s (Zhang, 2022) MetroGAN has been used to model changes in urban morphology while making sure new construction complies with connectivity and infrastructure standards.
A similar example is the redevelopment of Milan's industrial district, where AI-aided urban modeling assisted in converting vanished industry areas into vibrant, multipurpose areas that enhanced accessibility and strengthened local identity. (Bergaglio, 2019). We can also mention a lot of other revitalized industrial areas like King's Cross (London, UK), Emscher Landscape Park (Ruhr Region, Germany), Nordhavn (Copenhagen, Denmark), making this a great idea for the developments of

this areas. (Bartsch, 2006)
We can create a more connected, useful, and lively urban environment by implementing these AI-driven urban planning approaches will make this transformation easier. This will optimize traffic patterns and turn the area from a bypassed industrial relic into a central destination. (Zahra Jaffari, 2020)

Through the use of these AI-powered urban planning techniques, Uzina's transformation may be historically informed, data-driven, and participatory. This strategy guarantees that traffic patterns are optimized, traditional urban morphologies are preserved, and the region is transformed from an overlooked industrial remnant into a major destination.
Policymakers can select the most sustainable, useful, and community-driven form of Uzina's second city core by using GAN models, which have been utilized in other regeneration initiatives to create numerous urban futures.

## Methodology

### Data Sources

Urban planning has benefited greatly from the use of Generative Adversarial Networks (GANs), which enable the creation of data-driven and realistic urban plans. Their capacity to identify patterns in preexisting city layouts and develop new shapes that resemble actual structures is what makes them strong.
One significant drawback of GANs is how heavily they rely on massive amounts of data for training. This is the main obstacles of using GAN-based urban planning especially in developing towns like Tirana were we have limited data available.
Tirana, like many cities in countries with limited resources, struggles with data scarcity in contrast to major metropolitan regions that have substantial GIS datasets, satellite imagery archives, and structured urban planning records. To train this algorithm, urban form database is needed that must consist of satellite images of the urban area, land cover, spatial layers, longitude and latitude data points and computed landscape metrics. GAN models need enormous volumes of training data to produce realistic urban layouts, but with the increasing availability of the data we tend to make this real. We must first will create a framework that permits gradual AI integration into the planning process rather than immediately producing a fully functional AI-driven city design.

### HybridGAN Framework

To ensure the achievement of all our goals, we have created a framework called HybridGan, name that reflects its hybrid nature, which involves the integration of different tools and methods into a unified structure. The framework workflow is also demonstrated at Figure 4.
After collecting and processing the data, an essential step for training the algorithm, the shortcomings of which were discussed above, the most important phase of this framework follows. The main part of this
framework is the generation of the city new urban areas layout. In order to generate city layouts where we will apply constrains relevant to planning goals, we should involve a detailed pipeline.
Some of the constrains that we will need to apply:
- Regulations governing: minimum and maximum amounts of green space or the width of roads
- Land use ratios: residential to commercial regions
- Sustainability Goals: the improvement of bike lanes and walkability, streamline traffic, and congestion reduction
- Accessibility: to transit hubs and key points of interest.
- Custom constraints: the intended connectivity between communities and the location of a new city center.
Despite the constrains, numerous researches have experimented with various GAN data labeling setting (DLS) approaches (Wei Li, 2023) to address the challenge of managing the GAN label process to enable the fulfillment of overriding design criteria.
DLS is a crucial GAN data processing procedure that might affect how individuals work with DL models. An improved DLS technique is required to incorporate the physical data that is currently available and the urban planners' hypothesis label as GAN input in order to improve the architect's decision-making in GAN applications.
After generating the new urban area, we continue with an essential step, that of traffic simulation, in order to analyze and evaluate the functionality of this new area.
- Advantages of combining traffic forecasting with GAN:
- Rapid Scenario Generation: Investigate several design options and their effects on traffic as soon as possible.
- Traffic Optimization: Put your attention on creating layouts that give priority to effective transit systems.
- Data-driven insights: assessing design prior to implementation by utilizing predictive models and historical data.
- Iterative Planning: improve urban layouts by adjusting designs in response to traffic performance.

### Tools and Libraries

Data collection and Processing: QGIS, ArcGIS for spatial analysis, OpenStreetMap for road network data
GAN: TensorFlow or PyTorch, frameworks like Pix2Pix/CycleGan for conditional tasks
Simulation tools: UrbanSim for development modeling, SUMO for traffic flow analysis

### Stakeholder Inclusion

Simul There is an important step after finding and testing the right GAN architecture for our purpose. This step is including public opinions in the design process. Professional designers and urban planners take the control of design generation with the assumption that they can represent the public, thereby completely ignoring public participation. We should address this problem and finding a way to use the increasing power of AI and allow the public without design expertise to generate their own physical schemes.
Through the integration of interactive digital tools (such as touchscreens, mobile apps, and web-based applications), the system enables users to engage with design concepts, transform components, and improve urban forms prior to their final approval.
When compared to conventional urban planning, where professionals specify city layouts, we want to encourage collaborative design creation, in which the general public actively shapes the cityscape rather than merely offering input. AI is included into the design creation process to automatically learn and represent communal design preferences from examples chosen by citizens.
Whenever the AI-generated design fails to satisfy the public, the system continues to modify and improve the urban form. A database containing the developed design schemes gradually accumulates

user-driven design knowledge.
The inclusion of public has a lot of limitation, since the system might need priority filtering techniques to conclude disagreements between various community demands because urban planning involves a wide range of stakeholders.
Although the approach gives residents more authority, professionals are needed to handle limitations including zoning regulations, environmental concerns, and infrastructure requirements. Policy-driven constraints could be incorporated into future iterations to guarantee that created designs comply with regulatory frameworks.

## Conclusions

This study investigates how Generative Adversarial Networks (GANs) might revolutionize urban planning. In addition to simulating new urban forms that are morphologically sound and spatially cohesive, the suggested method focuses on employing GANs to address urgent issues including traffic congestion, fractured connectivity, and the need for sustainable development in increasingly urbanizing areas. But difficulties still exist, particularly in settings with limited data, which are common in many developing cities. In order to set the groundwork for upcoming AI-driven planning projects, this study recommends a staged framework that begins with data preprocessing, progresses to hybrid GAN training, participative simulation and traffic simulation.
In the end, Uzina's transformation into a thriving, interconnected, and sustainable city core makes a strong argument for integrating the creativity of humans with machine intelligence, putting GANs at the epicenter of next-generation urban planning.

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# **Navigating Urban Complexity:** The Role of City Information Modeling, Enhancing Urban Planning Through Digital Integration

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**Abstract -** *Human behavior profoundly impacts urban form, shaping how cities develop and organize. As populations grow, their preferences and interactions transform spatial configuration. Travel behavior is a direct manifestation of how urban form is shaped by human needs. In areas characterized by urban sprawl and car-centric designs, there is often a strong preference for private vehicle use, resulting in increased traffic congestion and social isolation. This dynamic relationship illustrates how societal choices and urban designs continually impact one another.*

*The issue of traffic congestion was addressed during the International PhD Workshop-Project of the IDAUP International Doctorate Architecture and Urban Planning, which explored strategies for mitigating traffic in Tirana through a conceptual understanding of the city. In Tirana, the current urban landscape is a reflection of rapid and often unplanned urbanization with population growth resulting in disparate developments that lack cohesion. As a result, the built environment often does not align with the needs of its inhabitants. In many areas, the absence of adequate public spaces, pedestrian infrastructure, and efficient public transportation has made the city increasingly reliant on cars, contributing to significant traffic congestion.*

*Following recent studies that consider space not only in physical dimensions but also in how people perceive it as they move through it, an interdisciplinary approach is essential. In fact, the data collection methodology and their interpretation cannot omit the integration of multiple devices. This interdisciplinary effort promotes knowledge transfer and supports social innovation and resilience. The development of digital models offers a platform for merging diverse data types, highlighting the importance of City Information Modeling (CIM). CIM provides a comprehensive digital representation of a city's physical and functional characteristics, facilitating improved planning and decision-making. By capturing the complexity of urban environments, CIM enables planners to make informed decisions and develop more effective strategies for the future.*

*Keywords - Urban Form, Digital Data Management, CIM, Urban Resilience*

## Introduction

As urban populations expand at an extraordinary speed, cities are becoming increasingly complex systems shaped by a confluence of cultural, economic, and social dynamics. The urban environment is not a static backdrop to daily life but a living organism that evolves with human activity. In this context, the spatial structure of cities, its streets, buildings, and public spaces, deeply influences how people move, interact, and access resources. A pressing manifestation of this interplay is the growing reliance on private vehicles, resulting in widespread traffic congestion, environmental degradation, and diminished urban livability (Crane, 2000; Leck, 2006).

This issue is most evident in rapidly urbanizing cities such as Tirana, Albania. Over the past few decades, Tirana has undergone significant growth, much of it unregulated and fragmented. This has led to an urban form that struggles to meet the mobility needs of its residents (Aliaj, 2003). Limited public transportation options, inadequate pedestrian infrastructure, and the dominance of car-centric

planning have reduced the city's ability to support sustainable mobility and community interaction.
These challenges underscore a deeper problem: a misalignment between urban form and user needs. Traditional planning methods, often rooted in static representations of space, are inadequate to address the dynamic and interdependent nature of modern cities. They frequently overlook how people perceive, experience, and use urban spaces in real time (Urry, 2000).
City Information Modeling (CIM) offers a promising alternative. Building upon the principles of Building Information Modeling (BIM), CIM operates at the city scale, integrating diverse datasets, including mobility data, environmental conditions, infrastructure systems, and human behavior, into a comprehensive digital framework (Bianconi, 2024). This enables planners, designers, and policymakers to simulate scenarios, evaluate impacts, and collaboratively design solutions that are both functionally effective and socially responsive (Montanari, 2024).

## Objectives and Methodology

This paper aims to explore how City Information Modeling (CIM) can enhance urban planning practices by integrating spatial, environmental, infrastructural, and social data into a unified digital framework. Using Tirana as a case study, the research pursues three main objectives:
To identify the relationship between urban form, travel behavior, and perceptual experience;
To evaluate CIM as a multiscale and multisource digital platform for integrating spatial, environmental, infrastructural, and social data;
To propose a workflow for applying CIM to the Tirana case study to test potential planning interventions.
The methodology follows a mixed-method approach. First, a comprehensive literature review was conducted on CIM, urban form, and travel behavior. Second, a data collection and integration workflow was developed to combine quantitative data (GIS, satellite imagery, traffic counts) and qualitative data (surveys, participatory mapping, perceptual analysis) into a CIM platform to simulate alternative planning scenarios for Tirana, enabling evaluation of their spatial environmental, and social impacts.
This integrated approach allows for the simulation of alternative planning scenarios, enabling evaluation of their spatial, environmental, and social impacts. The proposed workflow operationalizes the methodology, showing how data collection, digital integration, scenario simulation, and stakeholder engagement collectively address the study's objectives.

## Literature Review

### Urban Form and Travel Behavior

The study of urban form and its influence on travel behavior has long been central to urban planning discourse. While the functional aspects of urban structure are often discussed in terms of infrastructure and zoning, research has increasingly emphasized how spatial organization can shape behavioral patterns. Crane (Crane, 2000) notes that the relationship between built form and mobility is complex and contingent, urban design does not rigidly determine movement, but it establishes a set of conditions that encourage or discourage certain travel choices.
Empirical studies (Leck, 2006) further highlight that factors like street connectivity, land-use mix, and residential density significantly influence transport behavior. These factors create spatial environments that either facilitate or constrain non-motorized mobility options. However, these effects are not universal, they interact with cultural, economic, and institutional variables. In post-socialist cities like Tirana, historical development patterns and policy gaps have produced a form of urban growth that resists traditional models of compactness and integration (Aliaj, 2003). As a result, the potential for urban form to encourage sustainable behavior is diminished by fragmented spatial layouts and unequal access.
What becomes evident is that urban form, while important, must be understood as part of a wider network of influences rather than as an isolated force of change. The literature encourages a move away from purely morphological analyses toward more integrated approaches that account for temporal, behavioral, and experiential dynamics in the urban environment.

## Perception and Urban Experience

The literature encourages a move away from While mobility studies often emphasize metrics like travel time or mode choice, they can overlook the affective and perceptual aspects of spatial experience. Kevin Lynch's (Lynch, 1960) foundational work reframed urban space as something navigated not only physically but also cognitively. His concepts of legibility and imageability laid the groundwork for understanding cities as mental maps, shaped by landmarks, edges, and paths that help individuals orient themselves and feel grounded.

More recent studies critiques the over-reliance on vision in architecture and planning, advocating for a multisensory approach (Pallasmaa, 2005). Understanding the city requires attention to visual, auditory, and tactile stimuli, elements tha influence how people interpret space, even if unconsciously (Montanari, 2024). This "sensory understanding" pushes the field toward more immersive forms of spatial analysis.

Other studies also explore how identity and memory are anchored in specific urban contexts, particularly in regeneration efforts (Ujang, 2012). When these qualities are overlooked, even well-designed spaces can fail to foster belonging or long-term engagement. These insights argue for planning methods that acknowledge perception, narrative, and symbolic meaning alongside physical layout.

In rapidly evolving urban environments, this subjective layer becomes especially important. When urban transformations occur without regard for existing place meanings, they risk alienating residents or erasing valuable cultural layers. Therefore, perception should not be seen as a soft issue, but rather as a foundational element of spatial equity and inclusion.

## Digital Tools and City Information Modeling (CIM)

As cities become more dynamic and data-rich, digital tools have evolved to accommodate the increasing need for integrative and responsive planning. City Information Modeling (CIM) represents a significant advancement in this space, offering a platform that synthesizes diverse urban datasets into a single, interactive model. Unlike traditional GIS or CAD systems, CIM incorporates real-time data, 3D modeling, and simulation tools to visualize and analyze city systems holistically (Bianconi, 2024).

What sets CIM apart is not just its technical capacity, but its ability to bridge physical structure and human experience. Such tools can mediate between the abstract and the perceptual, providing planners with insights into how users interact with and feel about their environments. These systems can incorporate environmental variables, behavioral trends, and sensory data to model not only what a space is, but how it is lived.

Furthermore, CIM supports participatory design by making spatial data accessible to non-experts. Through visualization and scenario testing, stakeholders can engage in dialogue about future urban changes. CIM, in this light, becomes more than a management tool, it becomes a medium for inclusive and adaptive planning.

Integrating it into urban practice allows for a deeper alignment between form, function, and feeling. By simulating spatial use, testing interventions, and embedding user feedback, planners can design not just efficient cities, but empathetic ones, spaces that respond to how people move, perceive, and inhabit them.

# Tools and Workflow

## Interdisciplinary Data Integration

City Information Modeling (CIM) represents a transformative shift in urban analysis and planning, moving beyond static mapping toward the dynamic simulation of complex urban systems. At its core, CIM is an integrative platform that connects spatial, environmental, infrastructural, and social data to support real-time, evidence-based decision-making. Its strength lies not only in its interoperability but also in its ability to operate across different urban scales, from the architectural detail of a single building to the infrastructural systems of an entire city (Cheshmehzangi, Baty, Allam & Jones, 2024; Carlucci, 2022).

Functionally, CIM draws from and extends tools such as GIS and BIM. GIS provides foundational geospatial data and analysis, while BIM offers precise building-level information in 3D, including geometry, materials, and energy performance. These are then integrated into multiscale CIM environments capable of modeling interactions between built form, land use, environmental conditions, and human behavior (Bolognesi & D'Uva, 2023). Unlike traditional GIS-BIM overlays, CIM platforms introduce a multiscalar logic that allows planners to examine mutual influences, how neighborhood-level design impacts citywide mobility patterns or how infrastructure resilience affects social equity (Zhang, 2024).

Modern CIM platforms incorporate real-time data streams from IoT sensors and digital twins. These include traffic sensors, environmental monitoring devices, and pedestrian tracking systems. When overlaid with socio-behavioral datasets, such as survey results, participatory mapping, or mobile tracking logs, CIM becomes a responsive tool capable of adjusting simulations based on user needs and behavior (Najafi et al., 2023; Souza & Bueno, 2022). This allows decision-makers to test the spatial, social, and environmental consequences of different policy scenarios before physical implementation.

Critically, CIM is not merely a visualization tool. It supports predictive analytics, scenario simulation, and collaborative governance through multi-user interfaces. In this regard, CIM functions as both a technological infrastructure and a participatory platform, aligning technical modeling with the values of transparency, inclusivity, and adaptability.

Recent research underscores how CIM integrates emerging technologies such as AI and machine learning to enhance pattern recognition, automate classification of spatial data, and optimize planning recommendations (Giordano et al., 2022). The use of semantic point clouds and hierarchical classification models further enhances the precision of urban analysis, particularly when working with historical or informal urban fabrics (Croce et al., 2021). Additionally, CIM's interoperability with blockchain technologies is being explored to increase transparency in data governance and secure data provenance (Huang et al., 2022).

The multiscalar and multiverse potential of CIM suggests that urban planning is moving toward a paradigm where models are not singular representations but parallel, evolving "versions" of the city.

In this sense it allows urban planning to become iterative, performative, and perceptually attuned, capable of representing not just infrastructure, but also how citizens experience and co-create urban space (Xu et al., 2021).

## The Tirana Case Study

The urban trajectory of Tirana provides a compelling ground for testing CIM methodologies. Since the early 1990s, Tirana has undergone rapid and unregulated development, shaped by informal settlements, weak land-use enforcement, and a transportation system strongly oriented toward private vehicles (Aliaj, 2003). This has resulted in spatial incoherence, fragmented neighborhoods, inconsistent street hierarchies, and an imbalance between built density and open space.

During the International PhD Workshop-Project, held in Tirana, at the Polis University, in December 2024 as part of the International Doctorate in Architecture and Urban Planning (IDAUP) program, scholars analyzed Tirana's spatial discontinuities, noting how disconnected infrastructural nodes reduce walkability and social cohesion. Participants observed that despite an increase in new constructions, many zones lack functional integration, public spaces are poorly connected, and transport solutions are rarely calibrated to local needs.

CIM offers a strategic response to these complexities. One application could involve simulating the introduction of pedestrian corridors through traffic-heavy zones. By feeding traffic data and movement patterns into a CIM platform, planners can test the implications of redirecting vehicular flow, implementing car-free zones, or expanding bike-sharing infrastructure. These simulations allow for proactive planning, forecasting outcomes before committing to physical interventions. Additionally, spatial reallocation can be modeled: for example, the creation of a new urban center intended to decentralize activities, improve mobility, reduce bottlenecks, and boost social and commercial activities by rearranging traffic flows and incorporating contemporary infrastructure. The flexibility of CIM enables iterative processes, allowing planners to test and refine proposals based on performance indicators and community feedback.

## Data Collection and Visualization

A core strength of CIM lies in its ability to synthesize varied forms of urban data, quantitative, qualitative, and perceptual. Spatial data acquisition typically involves high-resolution tools such as 3D laser scans, drone imagery, and GIS mapping.

Behavioral and perceptual data, however, require more participatory methods. Mobile tracking (e.g., GPS logs) can reveal commuting paths and activity hotspots, while interviews and structured surveys can offer insights into how people emotionally engage with different urban zones. Participatory mapping platforms empower communities to identify locations of value or concern, helping to ground models in lived realities (Ujang, 2012).

To translate this wealth of data into actionable insight, visualization becomes essential. Tools such as VR environments and interactive dashboards allow stakeholders to experience proposed scenarios, facilitating more democratic planning processes. Heatmaps can reveal activity concentrations or social inequalities in access, while multi-layered simulations allow for evaluation of environmental, economic, and perceptual impacts. (Figure 1)

A suggested worflow for adopting CIM in Tirana could proceed as follows:

1. Diagnostic Mapping: Using GIS and satellite imagery to assess urban density, land-use conflicts, and green space distribution.
2. Behavioral and Perceptual Data Collection: Conduct mobile tracking, resident surveys, and participatory mapping workshops to understand movement patterns and emotional landscapes.

Digital Integration and Modeling: Merge collected data within a CIM platform. Incorporate traffic simulations, 3D architectural models, and social data layers to form a comprehensive urban model.

Scenario Simulation: Test interventions such as new pedestrian routes, green networks, or mixed-use developments. Measure potential outcomes using environmental metrics, mobility indicators, and participatory feedback.

Stakeholder Engagement: Use VR tools and interactive simulations to present outcomes. Collect responses and refine models accordingly.

This approach does not merely address form but embraces the urban experience as a design parameter.

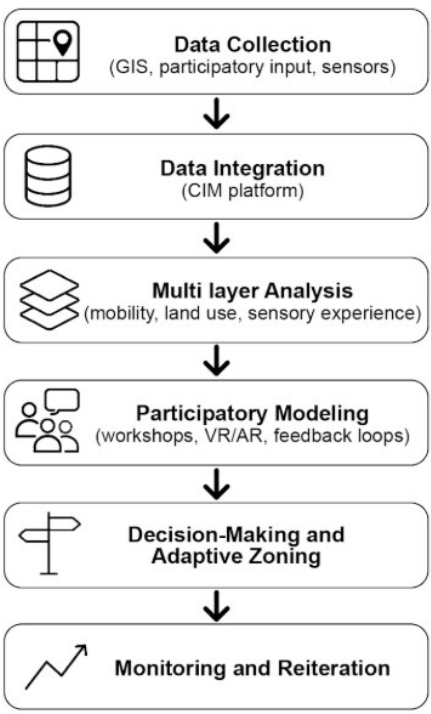


*Fig. 1. City Information Modeling (CIM) Workflow. source/ Graphic elaboration by the author.(2025)*

## Conclusions and Recommendations

City Information Modeling (CIM) represents a powerful and transformative approach in urban planning, offering a holistic framework for integrating various forms of urban data, spatial, environmental, infrastructural, and social. By moving beyond static representations of cities and embracing dynamic, multiscale models, CIM has the potential to significantly enhance how urban environments are planned, designed, and experienced. This integration of diverse data types allows CIM to more closely align urban form with the lived experiences and needs of residents, thus fostering more sustainable and resilient cities.

One of CIM's core strengths is its ability to bridge the gap between the physical and perceived dimensions of urban spaces. Traditional planning often prioritizes infrastructural considerations, such as road networks and building density, while overlooking the perceptual and emotional dimensions of space. However, the perception of a city, shaped by individual and collective experiences, is just as crucial as its physical structure in determining its livability. As highlighted throughout the literature, cities are not merely containers of human activity but are environments that people

inhabit with their senses, emotions, and memories. Therefore, CIM's capacity to model not only the built environment but also the way people interact with and experience these spaces is key to creating cities that are both functional and meaningful.

In light of these capabilities, the findings suggest several policy and planning strategies that could improve urban planning practices. First, adaptive zoning should be prioritized. Rather than adhering to rigid zoning categories, urban planning policies could be more fluid, adapting to real-time data on mobility, environmental conditions, and social behavior. This flexibility would allow cities to evolve more naturally in response to changing needs. CIM platforms could play a central role here, providing planners with the tools to test and refine zoning changes before implementation, ensuring that interventions are effective and responsive to the realities of the urban environment.

Second, participatory design processes should be integrated into the structure of urban planning. As cities become more complex and data-driven, involving communities in the decision-making process becomes even more essential. Participatory mapping, surveys, and community workshops are invaluable tools for understanding the subjective experiences of city dwellers.

Finally, data-driven planning must be a cornerstone of contemporary urban strategies. Decision-makers should invest in data infrastructure that supports the collection of real-time information. This data, sourced from IoT sensors and behavioral tracking, can provide invaluable insights into how people move through cities. Policymakers should encourage the development of open-access urban data platforms, ensuring that relevant stakeholders, citizens, planners, designers, and academics, have access to the data needed to inform their decisions. This would foster a more transparent urban planning process.

To fully realize CIM's potential, interdisciplinary collaboration is essential. Urban planning, architecture, environmental science, sociology, and data science must work together more closely to ensure that CIM platforms accurately capture the diverse factors shaping cities. Such collaborations would ensure that the models reflect also the social, cultural, and economic realities of urban life.

In conclusion, CIM holds significant promise as a tool for creating more adaptive cities. It could provide a more comprehensive approach to urban planning that is crucial to building environments that are not only functional but also meaningful and responsive to the needs of their inhabitants.



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# A vision for Tirana's Traffic Mitigation
## Theoretical Approach to Traffic Decongestion through Decentralization

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**Abstract -** *Recent economic, social, and political transformations have significantly reshaped Tirana's urban landscape. Rapid urban expansion has created emerging challenges related to sustainability in construction, urbanisation, and socio-economic and environmental development. Mobility plays a central role in establishing a resilient urban network and supporting the future growth of both infrastructure and the city itself. In Tirana, deficiencies in public transport and mobility infrastructure, combined with the concentration of vehicular traffic towards the historic city centre, have resulted in persistent congestion zones.*

*This study proposes a theoretical framework to mitigate traffic congestion in Tirana, exploring decentralisation as a strategy to reduce reliance on the city centre. The approach envisions a network of connections between multiple points and neighbourhoods, integrating peripheral areas into a more compact urban fabric, fostering the development of new decentralized urban centres, and offering solutions for traffic decongestion.*

*To illustrate the practical potential of this framework, the urban core and surrounding suburban areas are examined as candidate locations for new centres, functioning as "pulling powers" capable of redistributing flows and alleviating pressure on the main highways leading to the historic centre.*

*Overall, the paper highlights innovative urban planning and design strategies aimed at addressing the complexities of Tirana's growth, supporting sustainable mobility, and guiding the city towards a more balanced and resilient urban future.*

*Keywords - Traffic Mitigation, Decongestion, Decentralization, Urban Center, Pulling Power.*

## Introduction

This study explores traffic mitigation in Tirana through a formal reconceptualisation of the city's urban structure. Adopting an interdisciplinary approach, it addresses housing, planning, and land development within the broader context of urban history, architectural typologies, innovation, energy efficiency, resilience, and environmental sustainability.Tirana's historical core, centred on the old bazar, shaped the urban fabric later formalised through Gherardo Bosio's Piano Regolatore, which established the city centre as the main attractor for economic, institutional, cultural, and social activities. Originally designed for a smaller population, the existing infrastructure is now insufficient. Concentrated urbanisation, combined with limited public transport, has generated unsustainable traffic congestion. The axis linking Tirana to Rinas International Airport, part of the Tirana–Durrës corridor, constitutes a strategic route for business, commercial, and touristic flows. Intersections with secondary roads along this axis create major congestion points, particularly during peak hours. The concentration of vehicular flows toward the city centre reflects a highly centralised settlement pattern, intensifying pressure on central areas. This critical route underscores the need for targeted interventions to strengthen the road network, reduce travel times, and mitigate $CO_2$ emissions.
Alongside population growth and increased vehicle use, Tirana is expanding into its peripheries. Supporting this development requires infrastructure and urban projects that integrate socio-economic, cultural, and morphological considerations. Addressing traffic congestion, therefore, demands the design of an efficient and sustainable mobility system aligned with anticipated patterns of urban growth. The concept of urban requalification, enhancing existing mobility infrastructure while

establishing new centres in peripheral areas, offers a pathway to decentralise flows of people and services. This strategy consolidates new territorial nodes as emerging centres of attraction. Future interventions should aim to expand the network of connections between neighbourhoods, integrate peripheral areas into a more compact urban fabric, and provide sustainable solutions for traffic decongestion. To guide this investigation, the following research question is posed: "How can the implementation of new functional nodes and a polycentric urban model redistribute traffic flows in Tirana and reduce congestion pressure on the historic city centre?" This question frames the study's focus on decentralisation as a strategic approach to mitigate traffic, integrate peripheral areas, and promote a more balanced and sustainable urban structure.

## Literature review

From 1945 to 1990, Albania endured one of the harshest authoritarian regimes of the Cold War era. In the aftermath, the country embarked on a process of transformation that reshaped its socio-economic structure, achieving significant growth over the past decades compared to many Balkan states (Aliaj, 2015). Until the 1990s, Albanian society largely adhered to a rural model, with only 35% of the population residing in urban areas. Urban centres differ from rural settlements not only in demographic scale but also in function (King, 2020). Their functions are linked to diverse economic activities, agricultural, commercial, and industrial, as well as to the presence of political, religious, and social organisations and the provision of cultural, healthcare, and transport services. Consequently, the urban centre exerts a strong pulling power, attracting people, resources, and capital, and extending its influence over a wide surrounding area. Since the 1990s, Albania's urban centres have experienced significant growth, with annual rates ranging from 5% to 10%. This process was driven by the introduction of private property, which triggered a major wave of urbanisation (Aliaj, 2015). Tirana, in particular, underwent rapid and largely unregulated expansion between the late 20th and early 21st centuries, disrupting the relationship between infrastructure and urban form. This connection was effectively broken, giving rise to new neighbourhoods lacking a coherent architectural identity. The evolving interaction between infrastructure systems and urban morphology has eroded the formal identity of linear urban settlements while simultaneously reinforcing the consolidation of nucleated urban aggregates (Kumaraku, 2023). Tirana's urban development has taken shape as a quadrant extending from the city centre towards the Rinas area near the international airport. The morphological features of the territory (Figure 1) have favoured expansion along three main infrastructural corridors: the Tirana–Durrës highway, the parallel railway, and the Kamza axis extending north of the airport (Stella, 2015). Within this system, the Tirana–Durrës corridor has emerged as a strategic axis, particularly for its role in urban mobility and its direct connection to the international airport (Ymeri, 2015). Current railway plans include the construction of a new multimodal station and a light rail link to the airport, intended to improve passenger mobility and connectivity (Municipality of Tirana, 2014). At the same time, the peripheral areas of Kashar and Kamza are projected to become new urban centres, supporting decentralisation through the reinforcement of the secondary road network and the application of integrated planning and architectural strategies informed by the concept of Archipuncture, defined as small-scale interventions with large urban impacts (Hoogduyn, 2014). Today, Albania is navigating a complex and evolving urban planning process while simultaneously positioning itself as an attractive destination for investors and experiencing a steady increase in tourism. According to Thomson, urban structure is shaped by four main factors: geographical morphology, relative accessibility, development control, and dynamic processes. Geographical configuration provides the structural foundation, accessibility determines spatial attractiveness, development control is effective only in contexts of strong governance, and dynamic processes include both the evolution of the urban core and the self-reinforcing tendencies of residential and commercial locations. Within this framework, the transport system plays a decisive

*Fig. 1. Area of Tirana*
*source/ National Council of the Territory*



role in shaping relative accessibility (Thomson, 1977). Building on these structural determinants, the concept of the urban project offers a framework for careful design, aimed at ensuring both variety and quality in urban morphology. Morales defines it as a process through which urban geography can be critically examined, engaging with the city's complexity via an inductive approach that transforms local specificities into broader strategic and generative principles (Morales, 1989).

The implementation of urban planning strategies is crucial to promoting sustainable development over time. This can be illustrated by the case of Athens. Chorianopoulos argues that the intervention agenda promoted through infrastructural investments for the 2004 Olympic Games intensified unsustainable development dynamics, thereby compromising the city's sustainability and long-term growth. These dynamics are currently evident in uncoordinated urban expansion, low-quality infrastructure, and a strong reliance on private cars (Chorianopoulos, 2015).

In Singapore, commercial decentralisation was introduced with the 1991 Concept Plan as a land-use policy designed to alleviate urban congestion by bringing economic activities closer to residential areas, balancing jobs and housing, reducing transport costs, and enhancing the use of suburban resources within a complex urban system (De Souza, 2016).

In Barcelona, polycentrism has been conceived as an alternative strategy to urban sprawl, replacing the monocentric model with multiple interconnected employment centres supported by coherent transport and land-use policies. Subcentres emerging from recent decentralisation display limited self-sufficiency, whereas those with historical roots are more consolidated and exert a stronger influence on the urban structure (Muñiz, 2005).

Masip-Tresserra examines decentralisation in the Barcelona Metropolitan Region, demonstrating its effectiveness as a planning strategy. Empirical evidence shows that polycentrism enhances urban performance: proximity to centres reduces mobility-related externalities, such as travel distance, commuting time, and $CO_2$ emissions, while encouraging the use of sustainable transport modes. This evidence-based approach is therefore essential for achieving the social, economic, and environmental objectives of territorial planning (Masip-Tresserra, 2017).

Li analyses urban patterns in China, highlighting the population's tendency to concentrate in city centres, reflecting a predominantly monocentric model. In contrast, a decentralised and polycentric strategy distributes population and employment more evenly between the main centre and subcentres. Comparing these models, Li concludes that the most effective form of development, both economically and demographically, is one that combines the advantages of concentration, by reducing dispersion, with those of decentralisation, marked by a strong degree of polycentricity (Li, 2020).In recent decades, urban planning has increasingly focused on the creation of new urban centres, with urban design playing a key role in redefining vacant spaces. Although Tirana has now consolidated its status as a metropolitan area within the Albanian national territory, it continues to present significant potential for further development (Stella, 2015).

In "The Image of the City", Kevin Lynch observes that the urban environment is often perceived as a collection of sequential parts, arranged to avoid interference and linked by a sense of continuity. Within this framework, particular zones may hold greater meaning for individuals, yet the region as a whole remains mentally traversable in any order. A city, he argues, is inherently multipurpose: its urban form must remain flexible, adaptable to the evolving needs and perceptions of its inhabitants (Lynch, 1960).

Building on this perspective, the redesign of transport infrastructure and the development of new urban centres offer effective means of alleviating congestion within Tirana's road network. By decentralising traffic flows, services, and activities towards peripheral neighbourhoods, and by redistributing vehicular and pedestrian movements away from critical nodes, the city can more effectively address its escalating traffic problems, which have intensified significantly in recent years.

*Fig. 2. Aerial view of Tirana settlement*
*source/ Tommaso Paolo Emiliano Randazzo*



## Tools and methodology

This study follows a structured, step-by-step approach to explore traffic mitigation in Tirana from a theoretical perspective. The methodology is organised into sequential stages:

*- Urban Structure and Settlement Analysis: Assessing the morphological and typological characteristics of Tirana to understand the spatial configuration and identify areas of centrality and peripherality.*
*- Traffic Congestion Assessment: Identifying key congestion nodes and understanding the main factors driving traffic, based on theoretical evaluation and urban patterns.*
*- Decentralisation Strategy: Proposing mobility redistribution and the establishment of peripheral urban centres based on the urban and traffic analyses.*
*- Decongestion Strategy: Optimising traffic flows through secondary road integration, subcentre development, and strategies tailored to radial and nucleated settlement patterns.*
*- Strategic Objectives: Synthesising the aims of the proposed interventions within the framework of sustainable urban growth.*
*- Kashar Case-Study: Applying the decentralisation strategy to a specific area to illustrate potential interventions and spatial organisation.*

The framework can be operationalized using analytical tools such as GIS mapping (Campbell, 2019), Voronoi diagrams (Nowak, 2015), and transport modelling (Willumsen, 1981) for future empirical validation.

### Analysis of Tirana Urban structure and settlement

This step, aligned with the general methodological framework, examines Tirana's morphological and settlement typologies to provide insight into the city's spatial structure. Strategically located in a valley near the Adriatic Sea at the intersection of major trade routes, Tirana became Albania's capital in 1920 (Figure 2). Bosio's urban plan established a formal city layout, with the historic centre, centred on Skanderbeg Square, serving as the main hub for economic, cultural, social, and religious activities. This centrality generates significant flows of traffic and people, with surrounding streets forming a radial, "pizza-slice" pattern that reflects the legacy of past architectural design. The historic centre exhibits a linear settlement pattern. Prior to Bosio's intervention, development was largely informal and unplanned, with construction concentrated along main routes. Today, the urban fabric, particularly along the Tirana-Durrës highway from Kamza to Yrshek, predominantly accommodates commercial and service functions rather than residential uses (Kumaraku, 2023). Fundamentally, Tirana's urban structure developed before the advent of the automobile. Its layout aligns with Thomson's description of a city with a radial road network serving a small urban core, where a relatively high proportion of workers commute by car (Thomson, 1977). Most employment is located in suburban and peripheral areas, accessed primarily by private vehicles and supported by high-capacity ring roads. This strategy can be considered transitional and exhibits hybrid characteristics: while the city centre remains stable and activity is concentrated there, growth simultaneously extends into peripheral areas, generating urban sprawl. The approach is predominantly car-oriented, offering limited opportunities for public transport (Banister, 2015).
In parallel, the city developed a nucleated settlement pattern, characterised by clusters of small urban centres connected via interurban roads. The design of this infrastructure did not anticipate the high traffic volumes of today. Consequently, the nucleated layout, defining areas beyond the historic centre, features streets perpendicular to the main road, creating small-scale built-up concentrations that form localised centres and interrupt the otherwise linear urban pattern (Kumaraku, 2023).

### Analysis of Key elements of Traffic congestion in Tirana

Within the methodological framework, this stage identifies critical congestion nodes and the key factors influencing traffic flow in Tirana.
Traffic congestion in the Albanian capital arises from multiple factors. Tirana attracts flows from cities across the country and functions as a central hub at the intersection of interregional routes. Additionally, a high volume of vehicles converges on the city centre, while most public institutions and private

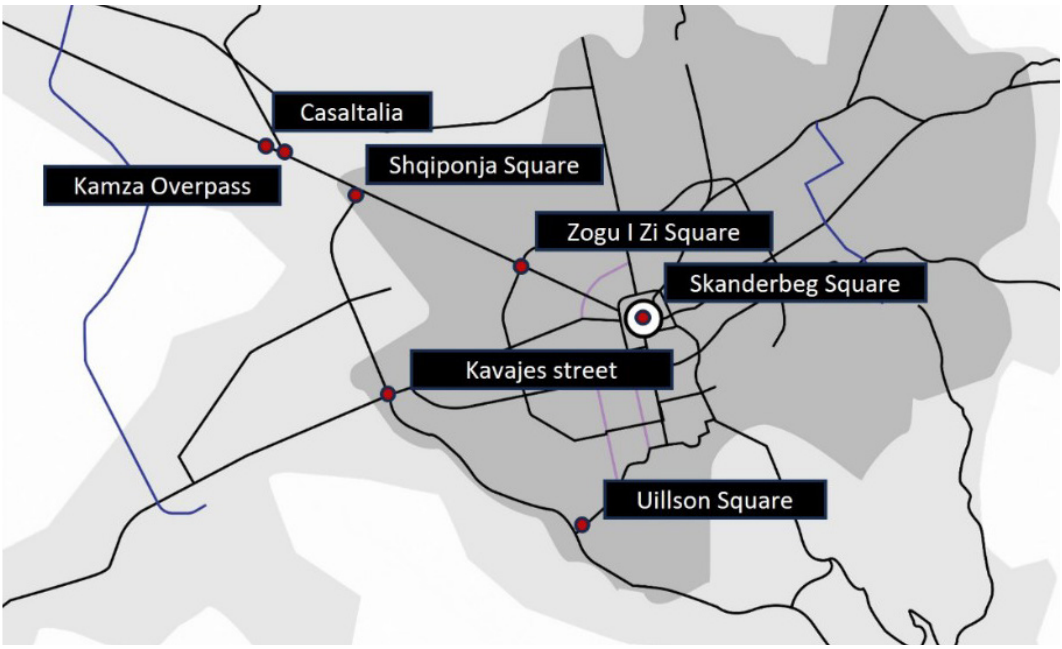


*Fig. 3. Congestion node of Tirana*
*source/ Tommaso Paolo Emiliano Randazzo, Morika Kakinuma DeAngelis, Ersi Rryci, Fulvio Papadhopulli*



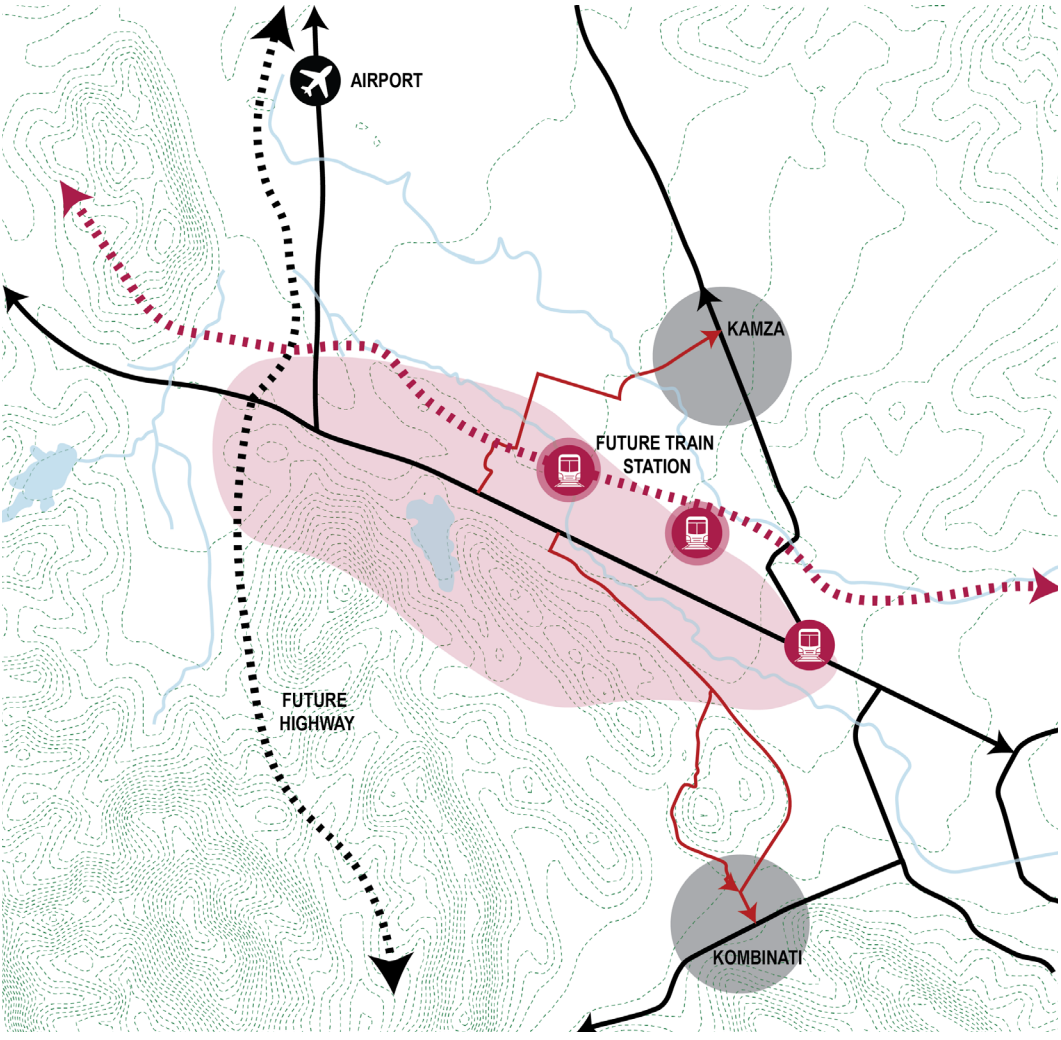


*Fig. 4. Decongestion strategy of Tiran- intervention in the radial urban layout*
*source/ Tommaso Paolo Emiliano Randazzo, Morika Kakinuma DeAngelis, Ersi Rryci, Fulvio Papadhopulli*

workplaces open simultaneously, generating intense flows of people in specific areas. Current public transport and mobility infrastructure exhibit significant deficiencies and require comprehensive upgrades to provide adequate service and support sustainable urban development. The urban layout, characterised by numerous intersections, further concentrates flows at specific points, exacerbating congestion. Key congestion nodes (Figure 3) include Skanderbeg Square, Zogu I Zi Square, Shqiponja Square, Uillson Square, Casa Italia, and the Kamza overpass. Despite the opening of the new Tirana Ring Road, designed to divert traffic from the city centre, congestion persists, partly due to incomplete connections to neighbourhoods such as Kinostudio, Babrruna, Paskuqan, and Laprakë. The relationship between public transport and private mobility is central to urban dynamics. The expansion of the road network encourages car use, reducing the attractiveness of public transport and intensifying congestion. According to the Mogridge Conjecture, "the average speed of the road network is conditioned by the speed of public transport" (SACTRA, 1994): as public transport slows down, users initially switch to private cars, perceiving them as more advantageous (Mogridge, 1990). However, rising traffic progressively erodes this benefit, eventually reaching a new equilibrium between the two systems, which is often inefficient (Banister, 2015). This analysis is based on traffic assessment and theoretical evaluation in order to identify critical congestion points and understand the underlying causes and patterns that most strongly influence the concentration of vehicular flow at specific times of the day.

## Decentralization strategy

Building on the structural and congestion analyses, this step proposes theoretical strategies for redistributing mobility and urban functions. By directing flows toward alternative urban centres, the approach fosters the development of functional peripheral hubs and supports Tirana's transformation into a polycentric city, reinforcing the broader metropolitan framework. Decentralisation is preferred over purely monocentric or ad-hoc interventions because it distributes activities and mobility across multiple centres, mitigates congestion, promotes balanced urban growth, and draws on lessons from successful polycentric and hybrid models in cities such as Barcelona, Singapore, and China. The proposed strategy establishes a flexible and adaptive framework prioritising fluidity and responsiveness over rigid master plans. It facilitates equitable, accessible, and sustainable growth, coordinating the development of multiple areas of Tirana through strategic infrastructural interventions. Urban decentralisation involves redistributing functions and resources from the city centre to surrounding neighbourhoods, improving governance, service efficiency, and citizen participation within an integrated urban fabric. Traffic mitigation is thus achieved through the reallocation of flows, identification of new development nodes, and enhancement of connectivity. Spatial, morphological, and geometric analysis of the urban fabric is essential to identify potential new centres. According to Purini, road axes function as "vectors of visual and energetic flows," creating a dialectical relationship between streets and buildings that defines the character of the traditional city (Purini, 2000). Voronoi diagrams ( (Nowak, 2015) can support this analysis by identifying areas of geometric centrality, capable of redistributing flows and guiding the development of new urban centres based on the spatial distribution of services and travel distances.

## Decongestion strategy

Aligned with the methodology, this stage focuses on optimising traffic flows and integrating secondary roads to mitigate congestion. By analysing key congestion nodes and the factors driving traffic, targeted strategies can be designed. Adopting



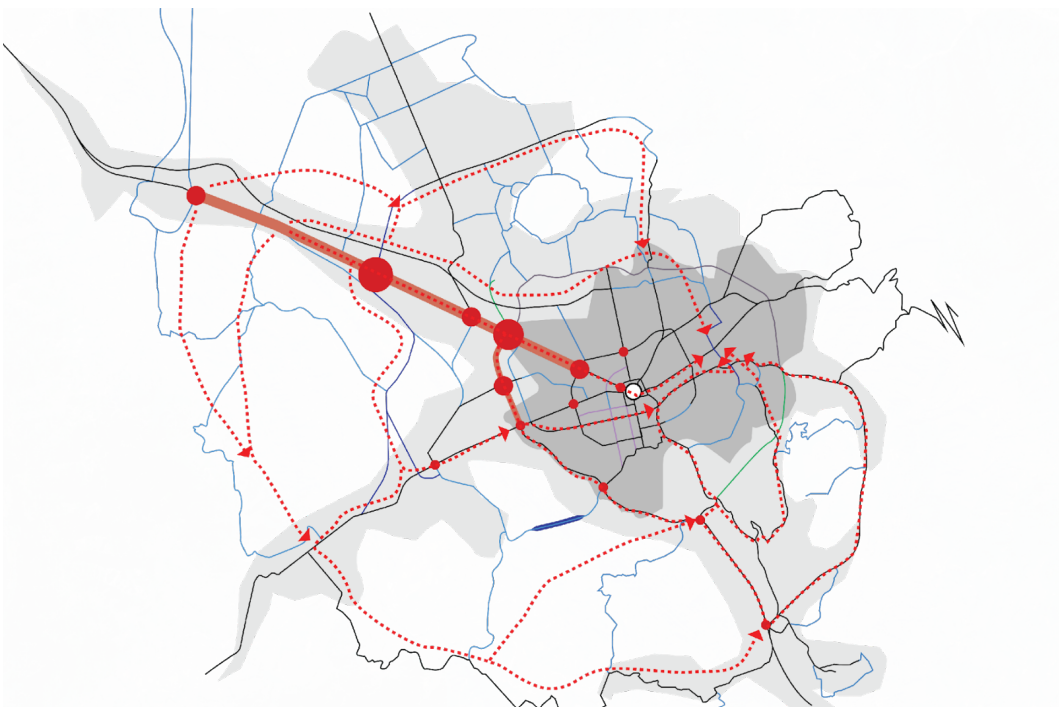

*Fig. 5. Decongestion strategy of Tiran- intervention in the nucleated urban layout*
*source/ Tommaso Paolo Emiliano Randazzo, Morika Kakinuma DeAngelis, Ersi Rryci, Fulvio Papadhopulli*

a human-centred perspective, it is evident that Tirana's residents often rely on alternative and secondary routes to avoid bottlenecks. Improving connections between primary access routes and redefining the role of secondary roads can establish a more efficient and cohesive transport network, optimising natural traffic flows.

In areas with a strong radial network (Figure 4), introducing public transport services can enhance development at key intersections and subcentres along the main axes. These points can host multiple similarly sized subcentres, accommodating economic activities while functioning as local hubs (Banister, 2015). In districts of Tirana with a nucleated settlement pattern, a skipping-settlement approach (Figure 5) is applicable. Here, road infrastructures are designed to allow traffic to bypass the urban core, alleviating congestion within inhabited areas and reducing long travel distances. This approach reflects an urban planning strategy aimed at minimising travel times to destinations (Kumaraku, 2023). Integrating the secondary road network also improves the organisation of the adjacent urban fabric, currently fragmented relative to the historic centre. The establishment of new urban centres further supports the redistribution of traffic, reducing pressure on the city's main access routes. Beyond mitigating congestion, these centres provide residential, commercial, recreational, and cultural spaces, fostering a more balanced and sustainable urban development model that acts as a pulling power for both mobility and urban activity.



### Objective of Decentralization

This part synthesizes the aims of the proposed interventions within the overall framework of sustainable urban growth. The main objective is to promote resilient and adaptable spatial expansion through strategic infrastructure projects that integrate social equity, economic viability, and environmental sustainability. Within this framework, the creation of new functional nodes capable of generating urban centrality is essential. These nodes act as catalysts for a broader, more integrated network of urban connections, supporting a decentralised model of expansion.

This approach prioritises the redevelopment and revitalisation of underutilised or segregated areas through high-impact architectural interventions, enabling the redistribution of essential services across zones with high growth potential. Precise identification and spatial placement of these emerging urban centres is therefore pivotal for achieving effective traffic mitigation while advancing balanced and inclusive urban development.

### Kashar Case-Study

Building on the strategic objectives outlined in 3.5, this section applies the decentralisation framework to the Kashar area. Strategically located along the Tirana–Durrës corridor, Kashar is identified as a potential peripheral hub capable of redistributing mobility flows and supporting polycentric development. Proposed interventions include a multimodal station integrating regional rail lines and local transport, along with mixed-use, multi-storey developments and circular road infrastructure. These measures aim to alleviate pressure on central nodes, enhance connectivity, and foster a sustainable urban fabric accommodating residential, commercial, and recreational functions.

The multimodal station could integrate the Rinas–Tirana–Durrës railway line and connect Thumanë–Kashar with the Kashar–Vaqarr axis, establishing Kashar as a strategic infrastructural node. Surrounding development should feature continuous architectural forms and circular infrastructure to promote circulation that avoids the urban core. Existing nucleated settlements could be integrated through mixed-use multi-storey buildings with residential areas and expanded services. Preliminary theoretical estimates suggest activating decentralized urban centres, including Kashar, could reduce traffic at critical nodes (e.g., Zogu I Zi Square) by 10–15%, providing a basis for future quantitative validation using traffic modelling and GIS analysis.

This approach positions Kashar as a strategic element in Tirana's metropolitan development and decentralisation strategy, capable of regulating flows while supporting residential, commercial, and recreational functions.

## Conclusions and recommendations

Tirana is evolving toward a flexible urban system, supported by the creation of distributed centres that reduce overconcentration in the city core, enhance mobility, and promote a balanced, strategically planned expansion.

Planned interventions aim to preserve territorial identity, safeguard cultural and landscape values, and improve connectivity through infrastructure such as the Great Ring Road, which also stimulates economic and social development while alleviating congestion.

Effective traffic mitigation requires not only improved transport infrastructure but also the creation of new urban centres that redistribute flows and integrate residential, commercial, and recreational functions within a sustainable urban fabric.

However, the practical implementation of decentralization may face political and logistical challenges, including institutional coordination, stakeholder resistance, and administrative fragmentation. Addressing these barriers is crucial to ensure that the proposed interventions achieve their intended objectives and foster long-term, sustainable urban development.

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# Proposals for the protection and conservation of biodiversity and the Environment.

# Green Transition and Urban Requalification
## Cost and Benefit Analysis of an Integrated Urban Project in Paskuqan

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**Abstract -** *This study examines the economic, social, and environmental impacts of a potential urban renewal project in the Paskuqan area, a potential inter-municipal development zone in suburban Tirana. Part of the municipality of Kamëz (Albania), Paskuqan has emerged as a rapidly growing suburban area over the past decade. Previously marginalised, it is now undergoing a significant transformation driven by public and private investments. The area extends along the banks of the Tirana River and is adjacent to Paskuqan Lake, presenting a unique opportunity for urban renewal. This involves enhancing infrastructure to reduce pressure on the city centre by encouraging a more polycentric growth pattern and improving connectivity to peripheral areas. The proposed requalification project aims to develop a green corridor along the river and the surrounding lake, establishing an essential ecological and recreational public space that enhances the quality of life for existing and new communities, promoting wellbeing and resilience. This study employs a simplified Social Cost-Benefit Analysis (SCBA) as an exploratory ex-ante planning tool to qualitatively evaluate the project's expected costs and benefits within a conceptual methodological framework. Due to limited data availability, the SCBA is applied at a conceptual level (qualitative), without calculating the quantitative viability indicators. Nevertheless, the transition to a more sustainable urban environment through integrated place-based urban projects is anticipated to alleviate the adverse effects of rapid urbanisation and foster green transition. While focused on an Albanian case, the findings contribute to broader discussions on integrated urban planning and green urbanism in transitional city contexts.*

*Keywords - Green Transition, Urban Growth, Urban Requalification, Cost and Benefit Analysis, Integrated Planning, Green Infrastructure*

## Introduction

Post-socialist Albania presents a unique model of unregulated development driven by informal activity, income inequality, and disparities, characterised by a weak public authority over land, planning, and construction alongside limited public investment capacities (Shutina, 2015; Dino & Griffiths, 2023). The land and real estate markets have been heavily dominated by informality, with more than 350,000 informal buildings as reported by Shutina (2015), demonstrating weak public governance of urban developments. Meanwhile, development pressure from the formal construction sector has surged in cities like Tirana, extending beyond the city centre into suburban areas where land costs are lower, and access to building permits (when under the administration of former communes neighbouring Tirana) was easier. Proximity to main roads and urban areas has also contributed to this trend. Shutina (2015) notes that a free-riding mechanism has emerged – private interests (intensive construction with significant profit margins) have often taken precedence over public interests (sustainable resource use, urban planning, and service provision through strategic infrastructure). This situation is evident in the case of two neighbouring but distinct municipalities, Tiranë and Kamëz, which function as a cohesive urban region despite their formal territorial boundary. The need for coordinated planning across such boundaries has become increasingly apparent in the face of these challenges (Shutina, 2015).

Merging fourteen administrative units (following the Territorial and Administrative Reform of 2015), the Municipality of Tiranë accounts for approximately one-third of Albania's total population (according to civil register data). It spans an area of 1,110 square kilometres and has an average population density of 682 inhabitants per square kilometre. Contrary to the declining population trend in Albania since the 1990s (Hansen et al., 2023; INSTAT, 2025), the municipality of Tirana has witnessed positive net migration and natural population growth over the last two decades, according to INSTAT (2023). This growth has spurred accelerated urbanisation

(both formal and informal), presenting significant infrastructural, social, economic, and environmental challenges for public authorities and communities.

Dino and Griffiths (2023) regard Tirana as a unique post-socialist example of rapid and uncontrolled growth. The first regulatory plan for Tirana was developed by Austrian architects in 1923, aiming to establish a clean, rectangular street network with the city centre centred around the bazaar (Aliaj, Lulo, & Myftiu, 2003; Kera, 2004). Two years later, the Italian architect Brasini proposed a master plan for rearranging the city centre, and in 1926, a second regulatory plan for Tirana was created. This plan delineated Tirana's boundaries, introduced a grid-like street system (a combination of an orthogonal network and a series of concentric rings), and promoted functional zoning to accommodate urban growth, an increasing population, and improved urban livability. Over the decades, as noted in Dhamo, Aliaj, & Thomai (2016), subsequent regulatory plans have transformed the city's landscape, form, and functions, evolving into a political and administrative gravitational centre. Urban development patterns, characterised by strong centralisation and functional concentration, an increasing population, and insufficient infrastructure, particularly in informal areas, have put additional pressure on the city's road infrastructure, resulting in frequent traffic congestion and heightened environmental concerns. The latest General Local Plan for Tirana, the primary planning and development instrument of the municipality of Tiranë, was approved in December 2016 by the Municipal Council and in April 2017 by the National Territorial Council (Decision of the National Council of the Territory No 1 dated 14.04.2017). It envisions a gradual shift from the monocentric city conceived by architect Brasini in 1926 to a polycentric one, aimed at reducing the centre-periphery dichotomy and developing new urban centres (Municipality of Tiranë, 2017). The containment of urban sprawl and land consumption is part of the Tirana 2030 vision, facilitating an "open city with multiple access points, evolving through the renewal, replacement, and reuse of existing resource endowment" (Municipality of Tiranë, 2017, p. 18). Tirana's 2030 vision is operationalised through a card of 22 main rules and an atlas of 13 strategic "projects" (intervention areas), which will be further developed over the next 15 years.

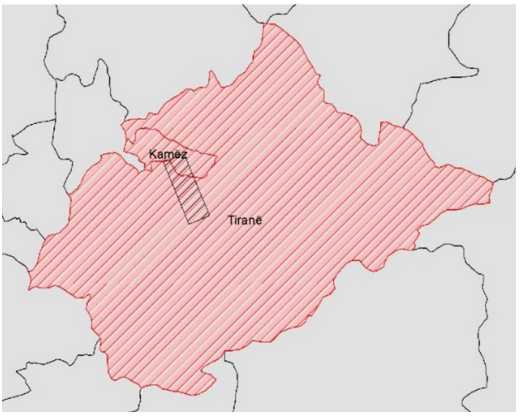
The neighbouring municipality of Kamëz represents a more recent reality, having been officially established in 1996. The municipality has a population density of approximately 3,260 inhabitants per square kilometre and a total area of approximately 37 square kilometres. Previously an agricultural area, it served as a refuge for individuals from various regions of Albania seeking improved opportunities during the early 1990s. Following the 2015 territorial and administrative reform, the municipality of Kamëz was integrated with the former commune of Paskuqan, forming the current municipality of Kamëz. The amalgamation of Paskuqan into Kamëz was controversial, not least because Paskuqan is geographically an enclave within Tirana's metropolitan area. The General Local Plan of Kamëz sets a vision for the municipality as "an urban and logistic centre, part of the metropolitan capital, fulfilling the needs for housing, employment and services of this metropolis. The municipality of Kamëz contributes to the creation of Tirana's green crown with the Lake of Paskuqan, the surrounding hills and rivers" (AKPT, 2022, p. 81). Despite its administrative inclusion in the municipality of Kamëz since 2015, Paskuqan currently plays a crucial role in the road infrastructure and transport network, with both Lot 5 and Lot 6 of the Tirana Ring Road traversing through Paskuqan. Furthermore, Paskuqan has garnered attention in recent years due to its potential integration within Tirana's metropolitan framework, particularly along the newly extended main boulevard, its proximity to the new train station, and the prospect of a connection to Tirana Airport. Historically characterised as a suburban settlement, Paskuqan has transformed into a mixed-use zone marked by intensive residential and commercial construction activities. There is an ongoing formalisation process for the informal structures, facilitated by coordinated efforts between central and local authorities. While different in many aspects, the municipalities of Tiranë and Kamëz share similar problems and face similar challenges. In particular, and relevant to the scope of the study, both suffer from exploding traffic and massive congestion, as

well as air and noise pollution, and a lack of public spaces.

From a development perspective – and for the purposes of this research – Paskuqan is considered an inter-municipal development area subject to concurrent pressures from both Kamëz and Tiranë. Both municipalities suffer from exploding traffic congestion, air and noise pollution, and a lack of public green spaces in their urbanised parts, underscoring the need for collaborative solutions. In this context, we propose an integrated inter-municipal urban requalification project to alleviate development pressures in both jurisdictions. Integrating urban transformations through a place-based requalification strategy (an incremental approach) may serve as a tool to promote a green transition and enhance community livability (Hansen et al., 2023; Nepravishta, Maliqari, & Cuedari, 2015). This integrated urban planning approach views urban projects as intersectoral challenges. For instance, a mobility problem cannot be resolved solely through transport planning; it necessitates consideration of additional factors such as the conceptualisation of public space, land use, the socio-economic fabric of the communities, and other elements. Moreover, some urban projects operate at different spatial scales and may require collaboration among various government units at the same level and/or across multiple governance levels to develop integrated solutions. Consequently, an integrated planning process encompasses all these scales and stakeholders (vertically and horizontally) when tackling an urban challenge through an urban project. The place-based approach is crucial in addressing the local context, accounting for the socio-economic conditions of communities and other site-specific factors that affect the area's requalification.

This case study contributes to broader debates on sustainable urban transitions by illustrating how integrated planning and green urbanism can be applied in a peri-urban, post-socialist context. Similar challenges are observed in other Eastern European and Balkan cities undergoing rapid suburban growth. Investing in green infrastructure and urban renewal can transform cities by enhancing the quality of life, strengthening the local economy, and mitigating environmental impacts. Thus, lessons from Paskuqan's requalification are pertinent beyond Albania, offering insights for managing urban growth and green transitions in transitional and fast-urbanising regions. In particular, the study is positioned as a first framework for using SCBA to



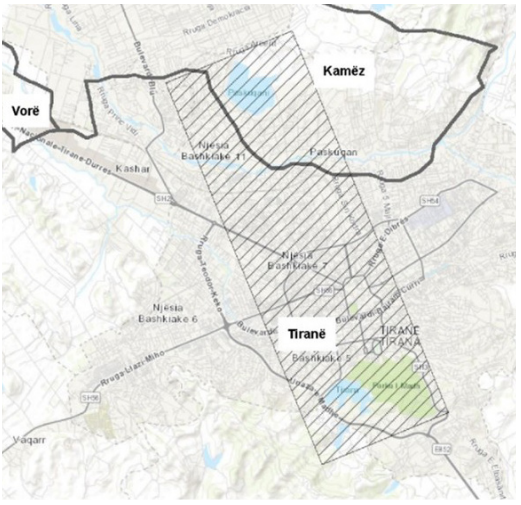




*Fig 1/ : Territorial division in Albania at the municipal level.* *source/ author's processing (2025)*

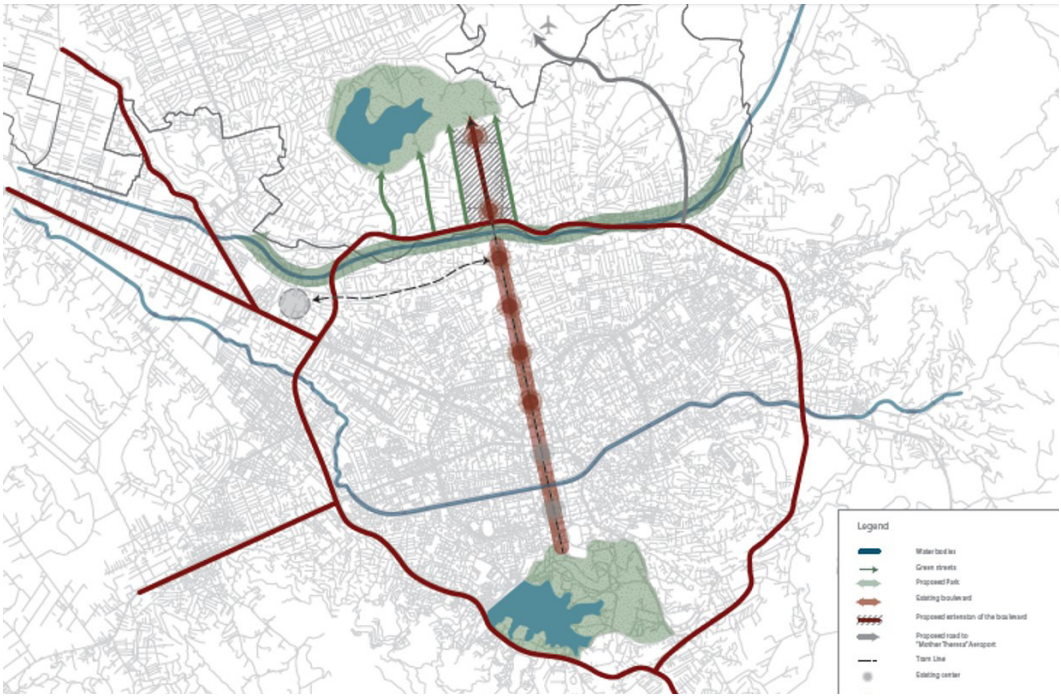



*Fig 2/ : Paskuqan integrated urban project proposal (1)* *source/ author Pustec (2023)*



evaluate integrated urban projects in data-scarce situations, emphasising a qualitative approach. The objectives are framed exploratorily: rather than delivering a complete empirical cost-benefit analysis with precise figures, the study presents an approach to identify and conceptually assess the social, economic, and environmental costs and benefits of the proposed project. The following sections outline the methodology, results (proposed project and anticipated impacts), and conclusions with recommendations, including discussions on governance and community inclusion.

## Methodology

The study employs an exploratory methodological approach to analyse how the proposed integrated, place-based urban project in Paskuqan might affect the area's socio-economic landscape and generate spillover effects in the adjacent municipality of Tirana. We adopt a Social and Environmental Cost-Benefit Analysis (SCBA) framework based on existing information and secondary data (from official sources), supplemented by international best practices and insights from desk research on comparable urban projects. The SE-CBA is an extension of the conventional CBA, accounting for the costs and benefits to a greater extent, including economic, social, and environmental impacts. This approach is widely used as an ex-ante decision-support tool for infrastructure and urban development projects in Europe and beyond (Valenza & Vignetti, 2006; Wilbers et al., 2022). The information regarding costs and benefits enables decision-makers to determine the viability of an investment project and compare competing investment projects in terms of value-added beyond the interests of shareholders.

However, it is important to note that in early-stage or exploratory studies, not all impacts can be readily quantified. "Indicative" SCBA approaches have been proposed for such situations, which rely on informed assumptions to estimate costs and benefits when complete data are lacking. In our study, given the limited availability of context-specific data for Paskuqan, the SCBA remains qualitative and conceptual in nature. This limitation is acknowledged upfront: no economic performance indicators (ENPV, EIRR, BCR) are computed due to the insufficient availability of quantitative data. Instead, the SCBA framework serves to outline qualitatively how the proposed intervention could create value (or incur costs) across different dimensions, and what data would be needed in the future to evaluate the project's viability fully.

From a technical point of view, the ES-CBA preparation process involves the following steps:

Identification of the expected outcomes (positive and/or negative) resulting from project implementation, integrating information from desk reviews, technical projects, expert judgement, and international practices and benchmarks.

Quantifying and monetising the expected outcomes associated with the costs and benefits of project implementation (when possible, dependent on data availability and/or benchmarks) is strongly influenced by the project's development stage and the resources and data available.

Assessment of net impacts involves the difference between the "with the project" and "without the project" scenarios (the counterfactual). The counterfactual (without the project scenario) considers the change that might have occurred, irrespective of the intervention. This approach captures the "net change" that can be explicitly attributed to the proposed intervention.

Assessment of cost and benefit behaviour over the reference period – evaluate how costs and benefits will change over time (using average growth rates, trends when available, or introducing assumptions); Discounting costs and benefits to obtain present values (converting future costs and benefits into present value using a social discount rate.

The computation of the economic performance indicators, namely ENPV - Economic Net Present Value, EIRR - Economic Internal Rate of Return, and BCR - Benefits to Costs, is essential. The ENPV is calculated as the difference between the discounted benefits and costs from the project over the reference period. A positive ENPV suggests a viable intervention, while a negative ENPV indicates a non-viable intervention. The EIRR is the ratio that results in a zero ENPV. Generally, for an intervention to be viable, the EIRR should exceed the social discount rate utilised in the analysis (therefore,

*Fig 3/ : Paskuqan integrated urban project proposal (2)* *source/ author Pustec (2023)*



the proposed intervention creates added value). The intervention does not produce added value if the EIRR falls below the social discount rate. The benefits-to-cost ratio (BCR) is a straightforward indicator calculated as the ratio of the sum of discounted economic benefits to the costs considered in the analysis. The BCR reveals how many euros are generated by the intervention for each euro invested over the project's time horizon. If the BCR is less than one, the project's costs outweigh its benefits over the reference period (no value is created). Conversely, if the BCR exceeds one, the benefits surpass the costs over the reference period, indicating that the intervention creates value for each euro invested. A BCR equal to zero implies that the intervention does not generate value, and its viability remains uncertain. In this exploratory study, we did not calculate ENPV, EIRR, or BCR, due to the aforementioned lack of quantitative data. We explicitly acknowledge that this is a limitation – without these metrics, the analysis stops short of a definitive economic viability assessment. Instead, the study provides a template for what would be needed to calculate these indicators in the future (data on costs, beneficiaries, monetizable benefits, etc.).

The approach serves as a conceptual SCBA model that policymakers and researchers can build upon once more data becomes available. The methodology is less about computing exact figures and more about mapping out the expected costs and benefits in a systematic way, highlighting where the project's value lies and what uncertainties exist. This exploratory SCBA thus guides decision-makers by identifying key factors that would affect the project's desirability and pointing out information gaps to be addressed in future studies.

## Results

### The proposed project

The proposed integrated urban project will reconceptualise the Paskuqan area as a new urban pole through urban regeneration. It envisions establishing a vital ecological and recreational public space that enhances the quality of life for existing and new communities and simultaneously alleviates pressure from the urban centres of Kamëz and Tiranë. Through the proposed case, this work aims to advance research on whether green transitions can effectively address the rapid urbanisation and environmental challenges faced by modern cities, while promoting wellbeing and resilience.

The proposed integrated requalification and urban renewal project for Paskuqan includes the construction of pedestrian-friendly zones, green spaces, and better accessibility to the city centre of Tirana through the main new boulevard. The area's future vision prioritises environmental harmony, including parks, riverside pathways, and energy-efficient architecture. The integrated urban project includes a series of strategic interventions. First, the proposal extends the existing new boulevard of Tirana leading to Paskuqan Lake. This extension will create a new peripheral urban hub that mirrors Tirana's artificial lake, improving accessibility and mobility for the concerned municipalities. Second, the transformation redesigns the existing roadways, facilitating multiple access points to the new configuration while introducing an additional ring connected to the current ring road and directing toward the Tirana International Airport. In turn, such interventions are assessed as reducing GHG emissions, a substantial contributor to deteriorating air quality and climate change.

Thirdly, the proposal includes regenerative interventions along the Tirana River, such as enhancements to the riverbed and the creation of green spaces, pedestrian pathways, and cycling lanes (the river is highly polluted from industrial waste (AKPT, 2022). Fourth, the lake's surroundings in Paskuqan should be redesigned to offer a high-quality green public space for recreational purposes for the local communities. The Lake of Paskuqan is one of the most important water resources in the municipality, covering approximately 90 ha, and

contains some informal buildings (built after the 90s). The interventions along the river and Tirana Lake have two objectives. The primary objective is to enhance greenery in the area, contributing to the health of the population and thereby improving their quality of life, while counterbalancing the adverse effects of intensive construction activity in the region. The second objective pertains to reducing natural disaster risk. The Paskuqan area faces an increased risk of flooding and landslides, as noted in the General Local Plan – Environmental Strategic Assessment document (AKPT, 2022).

## Costs and benefits: identification and monetisation

The proposed investment project is anticipated to encompass various costs and benefits. In light of the SE CBA, it is imperative to identify the sources of costs and benefits and integrate strategies for mitigating adverse impacts during the initial planning stages. Below, we outline the main anticipated cost categories (investment and beyond) and benefit categories. For each category, we indicate qualitatively its nature and potential magnitude, noting where quantification would be possible if data were available.

*A. Sources of costs*

- Initial investment costs (CAPEX). The proposed integrated urban project will require significant upfront capital to cover capital expenditures for land acquisition (and/or expropriation costs), project design, construction at all phases, and other unforeseen capital costs. Beyond financial resources, for the proposed project to work in practice, it is necessary to negotiate and sign an inter-municipal cooperation agreement (particularly emphasised in Law No. 139/2015 "For the Local Self-Government") and share the associated costs and benefits between the municipalities of Tirana and Kamëz. Such coordination may involve transaction costs and political negotiations (not quantified in this study)
- Operating and maintenance costs (OM). Once built, the new infrastructure and public spaces will incur recurring costs. These include road maintenance (resurfacing, cleaning, and winter services), park maintenance (landscaping, security, and waste collection), and the operation of any facilities (lighting, water management for lake/river features, etc.). The managing authorities (likely both municipalities, or a jointly created entity) must budget for these long-term O&M costs to ensure the project's sustainability. If not adequately planned, inadequate maintenance could undermine the project's benefits (e.g. parks falling into disrepair). There are two ways OM costs can be estimated: (i) item-based cost estimation, which is more accurate and detailed, and (ii) as a percentage of the overall investment value (ex., ranging from 5 to 20% of the investment value), which is less accurate but easier to apply.
- Environmental costs (construction and externalities). The implementation of the proposed project is expected to have a significant environmental impact, including natural habitat disruption, increased pollution during and post-construction phase due to increased traffic in the area, resource consumption during and after project implementation, increased noise pollution (during the construction phase), increased amount of waste generated and mobility problems during (particularly during the construction phase). Post-construction, if the project generates more traffic in the area (at least temporarily or as new development emerges), there may be increases in pollution (air and noise) until greener mobility becomes more effective. Additionally, new roads could encourage more car use (the classic induced demand concern), though mitigation through public transport and cycling infrastructure is possible. There is also the risk of ecological disruption – for example, paving and building could contribute to urban runoff unless properly managed. These environmental costs are real but difficult to monetise without detailed environmental impact data.
- Parking costs. The new infrastructure is expected to generate additional costs and inconvenience for residents and businesses in the area affected by the project, especially during the implementation phase. For instance, roadworks can cause temporary road closures or detours, leading to longer travel times and inconvenience ("time cost" to commuters). There will be noise and vibration that may affect nearby homes. Access to properties might be temporarily restricted. While these disruptions are temporary, they can strain community relations.
- Costs associated with support and services infrastructure are vital. Establishing a new urban hub is anticipated to attract more residents to the area. This trend can be observed and supported by a rise in construction permits for residential and service purposes (observation during field visits). The intervention will necessitate local authorities to rethink and reconceptualise the delivery of public services, including nurseries, kindergartens, health centres, public lighting, schools (9-year and high schools), transport services, waste management, and other local services. As development accelerates, failing to provide these services could lead to quality-of-life issues. Therefore, the project implies indirect costs to ensure that supporting infrastructure and services keep pace.
- Affordability and gentrification. As Paskuqan becomes more attractive and accessible, property values and rents are expected to rise (this is also listed as a benefit, but it has a flip side). Long-time lower-income residents, including vulnerable groups that have historically settled in the area due to its affordability, may find themselves priced out. Displacement can occur when rents rise above what local households can afford, forcing them to relocate to more peripheral or underserved areas. This is a socio-economic cost: it undermines community cohesion, can increase commuting if people move farther away, and raises equity concerns. Gentrification can erode the social diversity and

inclusivity of the community. While increased property values are a sign of economic success, unmanaged gentrification can create social costs that are hard to quantify (loss of social networks, cultural displacement, etc.). Mitigating this might involve policies like inclusionary zoning (ensuring a portion of new development is affordable), rent control measures, or providing support for vulnerable residents.

- Community disruption. Beyond economic displacement, the project could disrupt the existing community in other ways. Construction itself, as noted, causes temporary disturbances. If new developments emerge (e.g., upscale housing or commercial projects along the new boulevard), the character of the neighbourhood may change. Long-time residents may feel a sense of loss of place or identity as new populations move in. There may also be perceived social costs, such as increased insecurity, if construction sites or new vacant buildings (during the transition) create hazards or attract petty crime. Ensuring continuous community engagement is critical – residents should feel they have a stake in the new developments to minimise resentment or distrust. Some costs in this category include the need for community liaison officers, public meetings, and possibly compensation or assistance programs (for those severely affected by, say, expropriations or relocations.

*B. Sources of benefits*

Economic growth. Requalification investment projects are evaluated to stimulate economic growth in the affected area and its surroundings. The local economy is expected to benefit from direct investment, and land values are anticipated to rise. An example is the increasing land value and real estate prices following the construction of the new boulevard and in the nearby areas of the new ring road. Additionally, indirect positive effects triggered by the intervention include job creation during and after construction, as these projects require staff for operation, maintenance, security, and other services.

- Increased property value. The requalification and creation of the new urban pole of Paskuqan are expected to increase property values in the surrounding area. Upscale buildings may



| Category | Nature | Dimension | Quantified in the study |
|---|---|---|---|
| Initial investment costs (CAPEX) | Cost | Economic (financial) | No (qualitative discussion only; data needed for exact figure) |
| Operating & maintenance costs (O&M) | Cost | Economic | No (qualitative) |
| Environmental disruption (construction) | Cost | Environmental | No (qualitative) |
| Construction-phase disturbances (e.g., traffic, parking loss) | Cost | Social/Economic | No (qualitative) |
| Public service expansion (infrastructure, schools, etc.) | Cost | Economic/Social | No (qualitative) |
| Gentrification & affordability loss | Cost | Social | No (qualitative) |
| Community disruption (relocations, nuisance) | Cost | Social | No (qualitative) |
| Economic growth & jobs | Benefit | Economic | No (qualitative, with anecdotal evidence) |
| Increased property values | Benefit | Economic | No (qualitative, trend observed but not measured) |
| Improved infrastructure & mobility | Benefit | Social/Economic | No (qualitative) |
| Higher local tax revenues | Benefit | Economic | No (qualitative) |
| Attraction of private investment | Benefit | Economic | No (qualitative) |
| Environmental gains (GHG reduction, flood mitigation | Benefit | Environmental | No (qualitative) |
| Enhanced public health and safety | Benefit | Social | No (qualitative) |

*Tab. 1. Summary of the costs and benefits associated with the Paskuqan Project source/ author (2025)*

attract higher-income residents and businesses, contributing to a more affluent neighbourhood.

Improved infrastructure and services. The requalification of the Paskuqan area may stimulate additional investment in infrastructure, including roads, utilities, services, and public spaces, improving living conditions for residents. Moreover, the extra financial resources generated by the local infrastructure impact tax (derived from construction activity) empower local authorities to upgrade essential infrastructure needs.

- Increased local government revenues. Increased real estate prices and values can lead to higher property tax revenue for local governments. This additional revenue can be allocated to fund public services and improve infrastructure. Additionally, new developments are subject to various local taxes and fees, particularly the waste management fee. Additionally, if new businesses open, employment rises, and consumption increases, there may be indirect fiscal benefits (although income and Social contributions go to the central government, local economies benefit). We can foresee that, over time, the intervention could enhance the fiscal capacity of Kamëz, which currently has limited revenue, thereby enabling it to further invest in services.

- Attracting new potential private investments. The requalification of the Paskuqan area through public investment might also spark the interest of private investors, drawing in additional investment and development. Businesses may be more inclined to establish themselves in an upscale neighbourhood, resulting in further economic growth for the area. From an SCBA perspective, private investment drawn to the area is not a benefit per se (since it is essentially a transfer of where investment happens). However, the additional value created by those investments can be considered (like higher-quality housing, new jobs, etc., beyond what would have happened without the project).

- Environmental benefits. Increased green space and tree cover help sequester carbon dioxide and improve air quality (particularly important in an area currently lacking in greenery). Improved accessibility and new walking/cycling infrastructure may encourage a modal shift away from cars for some local trips, reducing vehicle emissions and noise, and contributing to a healthier environment. Importantly, the interventions on the river and lake have risk reduction benefits: improved flood management (fewer flood damages to property, reduced disaster risk costs) and reduced landslide risk on slopes (which protects both lives and assets). Such benefits can be significant; for example, avoided flood damage can save communities and governments substantial money over time. Although we have not monetised these, they contribute to our resilience. Additionally, the presence of nature has well-documented benefits for mental and physical health (lower stress, opportunities for exercise, etc.). In the long run, the project could lead to fewer health expenditures by promoting an active lifestyle and cleaner air.

- Increased safety and security. Urban regeneration can improve safety in two ways. First, better infrastructure (e.g., well-lit streets, proper sidewalks) reduces accidents and injuries – for instance, currently unsafe pedestrian crossings would be replaced by safer designs, lowering traffic accidents. Second, creating active public spaces and eliminating derelict areas can reduce crime and anti-social behaviour. A park that is frequented by families and patrolled is safer than an abandoned riverside used for illegal dumping or informal activities. The project's holistic approach aims to "design out" crime by providing legitimate uses for spaces (a concept in environmental design). A more vibrant, well-maintained neighbourhood tends to have higher informal surveillance (the "eyes on the street" effect), deterring crime. Although it is difficult to measure, an increase in perceived security and actual safety is a genuine social benefit. It increases the area's desirability and quality of life. (Social benefit; qualitative.)

For clarity, Table 1 below summarises the main economic, social, and environmental costs and benefits discussed, and notes whether each category has been quantified or remains qualitative in our analysis.



The qualitative SCBA matrix serves as a checklist of expected impacts, highlighting where data are required for a complete analysis. For instance, to monetise benefits such as travel time savings or carbon emission reductions, one would need baseline traffic data and emission factors; to monetise flood risk reduction, one would need flood models and damage functions; to quantify gentrification, one might analyse demographic and price trends. Identifying these needs is an outcome of our methodological approach. Because the necessary quantitative information (traffic counts, real estate market data, environmental measurements, etc.) was not available or is beyond the scope of this exploratory study, we have not estimated the specific economic indicators introduced in the methodology. In other words, we do not report an Economic Net Present Value (ENPV), Economic Internal Rate of Return (EIRR), or Benefit-Cost Ratio (BCR) for the project. These would generally be the bottom-line metrics indicating viability (with ENPV > 0, EIRR > discount rate, BCR > 1 being favourable outcomes). The absence of such results is an acknowledged limitation. The lack of ENPV/EIRR/BCR does not mean the project lacks merit; rather, it reflects the absence of data to prove the project's merit in numerical terms rigorously. Further research and data collection are needed to fill this gap.

## Conclusions and recommendations

The proposed integrated place-based urban project in Paskuqan is a forward-looking intervention designed to transform a rapidly growing peri-urban enclave into a sustainable and well-served urban node. By extending Tirana's main boulevard to Paskuqan, improving multimodal accessibility to the Ring Road and airport highway, rehabilitating

the Tirana River into a green corridor, and creating a large urban park around Paskuqan Lake, the project addresses multiple urban challenges simultaneously. This case advances the idea that green transition strategies – combining infrastructure upgrades with environmental restoration – can be an effective way to tackle the negative externalities of rapid urbanisation (such as sprawl, congestion, and pollution) while fostering urban resilience and improving quality of life. It effectively operationalises, at the project scale, the broader Tirana metropolitan vision of polycentric, sustainable growth. In essence, this study serves as a preliminary planning tool, guiding where further feasibility studies should focus.

The municipalities of Tirana and Kamëz have markedly different financial capacities and administrative resources – Tirana being the wealthier and more institutionalised, Kamëz having more constrained means. However, both stand to benefit from the project (and indeed, both suffer from the current problems the project aims to solve). We strongly recommend establishing a formal governance model for the project that ensures joint ownership and fair distribution of costs and benefits. One potential model would be the creation of a metropolitan coordinating committee or agency dedicated to the development of Paskuqan. This could be a joint planning authority with representatives from both Tirana and Kamëz. Such a body would be responsible for integrated planning, implementation oversight, and maintenance of the project. A cost-sharing arrangement should be devised – for example, the upfront capital costs might be co-financed through a special agreement where Tirana contributes a larger share (reflecting its greater budget and the metropolitan significance of the project). In comparison, Kamëz contributes in kind (land or facilitation) or a smaller share, with the understanding that both municipalities will share the resulting increases in revenue (perhaps through tax revenue sharing in the project area or other compensation). The Albanian legal framework (Law 139/2015 "On Local Self-Government) already provides for inter-local cooperation; this project could pilot an innovative application of that law. In an international context, metropolitan regions often establish special-purpose entities for cross-border projects – a similar approach here could mitigate the "free-rider" problem noted by Shutina (2015), ensuring neither municipality free-rides on the other's investments. External funding sources (such as EU structural funds, international development banks, or national government grants) should also be pursued to ease the local financial burden; these higher-level funds often require evidence of cooperative governance as a condition, which again underscores setting up a joint governance structure. Particular attention must be given to housing affordability, gentrification, and community disruption. The best international practices suggest integrating the community through extensive consultation during the planning and implementation of any urban project. Additionally, evaluating the project's actual impact in the local context is crucial for guiding similar interventions in the future.

In conclusion, the Paskuqan integrated urban project represents a bold initiative aligned with contemporary principles of sustainable urban development, as it seeks to decentralise growth, integrate land use with green infrastructure, and involve multiple stakeholders in a shared vision. The exploratory SCBA conducted offers a comprehensive look at the spectrum of expected impacts, despite its qualitative nature. We find that the project holds promise in delivering significant social and environmental benefits, in addition to economic development. However, successful implementation will depend on proactive governance arrangements and the safeguarding of inclusivity. The study's primary contribution is methodological – demonstrating how SCBA thinking can be applied ex ante in a data-poor setting to structure decision-making – and contextual, highlighting the importance of inter-municipal coordination for metropolitan projects.



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# Integrated Energy Methodologies for Urban Ecological Transition

## Transforming Kombinat into a Model of Renewable Energy Communities

DOI:

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**Abstract -** *Kombinat, in Tirana, is an area historically shaped by the urban planning of the communist regime, centered around the old textile factory. Originally designed as an industrial community, the region reflects the vision of industrialization and urban expansion from the 1950s and 1960s. Today, its strategic location and diverse urban characteristics make it a promising site for sustainable redevelopment initiatives and energy transition projects.*

*The methodology was defined based on criteria of urban relevance, availability of open geospatial datasets, and suitability for remote processing through Google Earth Engine (GEE). The analytical workflow followed six main steps: study area definition, conceptual framework, data search and validation, preprocessing, individual modeling of renewable sources, and integration of results. This structured process ensured transparency and reproducibility of the analysis. The research employed a methodology based on cartographic analyses and Geographic Information Systems (GIS) tools to study the urban, rural, and industrial fabrics of Kombinat. Land use, energy potential, and demand were mapped, considering the life cycle of materials and local energy reserves. Three primary fabrics were identified: the urban fabric, characterized by high density and energy consumption; the rural fabric, suitable for biomass generation; and the industrial fabric, optimal for solar energy and the recovery. Renewable Energy Communities (RECs) were proposed as an integrated solution, defined as citizen-driven associations that jointly produce, consume, and manage renewable energy, reinvesting benefits locally.*

*The analysis revealed that solar potential is high on rooftops and open surfaces, biomass can be derived from agricultural residues and organic waste, and small-scale hydro and wind have complementary though limited contributions. The results demonstrate that Kombinat has the capacity to host hybrid energy systems that link productive land use with conservation practices. By establishing RECs, the neighborhood can move towards energy self-sufficiency, environmental resilience, and local empowerment.*

*In conclusion, the study highlights that an integrated spatial methodology, combining open data, GIS tools, and participatory energy models, can transform Kombinat into a replicable example of urban ecological transition.*

*Keywords - Sustainable Redevelopment, Renewable Energy Communities (RECs), Urban Ecological Transition*

## Introduction

Global urbanization has intensified the challenges related to energy sustainability in cities. The dependence on fossil fuels, combined with population concentration and the disorderly expansion of urban centers, has pressured existing energy systems, requiring innovative and integrated solutions. In this context, the pursuit of energy self-sufficiency in urban territories emerges as a key strategy to promote resilience, reduce greenhouse gas emissions, and ensure equitable access to energy. The energy transition is not only a technological matter but also a question of social justice and territorial governance. In this sense, renewable energy is recognized as a key factor in promoting climate mitigation and local resilience (IRENA, 2020).

The transition to renewable energy sources in cities is not only a technological issue but also a territorial one. Understanding the specifics of each neighborhood, its social dynamics, land use, and existing infrastructure is essential to identifying opportunities and challenges in implementing sustainable energy systems. The integration of geospatial data and remote sensing tools has proven to be an effective approach to map and analyze the energy potential of urban areas, providing a holistic and detailed view of the territory. This approach is increasingly applied in the study of Renewable

Energy Communities (RECs), which, according to the European Directive RED II (2018/2001), are legal entities where citizens, local authorities, and small enterprises jointly produce, consume, and manage renewable energy, ensuring that benefits remain in the community. Beyond energy generation, RECs embody a form of social innovation, strengthening energy justice and local empowerment.

The capital and largest city of Albania, Tirana, is home to about 33.5% of the national population, which totaled 2,761,785 inhabitants according to the latest census published by INSTAT in January 2023. Due to rapid population growth and accelerated urban expansion in recent decades, the city is now facing a scenario of intense congestion, particularly in the mobility of people and vehicles. Traffic jams have become increasingly frequent, raising the number of accidents, daily delays, and compromising the urban environment. The absence of a multimodal public transport system significantly worsens the situation, making urban mobility one of Tirana's most pressing challenges. Such dynamics illustrate the vulnerability of Albanian cities, while the European Environment Agency (2019) identifies transport and air pollution as critical factors for urban sustainability across Europe.

In this context, this study aims to contribute to the construction of a spatial analysis methodology that considers multiple criteria—morphological, functional, social, and environmental—in the formulation of a project approach coherent with the local urban and environmental structure. The goal is to investigate the potential for renewable energy production and the formation of RECs as a vector for energy self-sufficiency and the sustainable transformation of the Kombinat area in Tirana. The focus on RECs is particularly relevant in Albania, where energy transition policies remain centralized, and community-based initiatives could provide a decentralized and inclusive alternative. This methodology aims to provide technical and conceptual support for urban interventions that link territorial regeneration and energy innovation, based on geospatial data and urban decentralization strategies.

The Kombinat area holds undeniable symbolic and strategic value. Historically, this area is anchored by the old textile factory, built during the Albanian communist regime and named after Stalin. Located to the west of Tirana, the factory was not only an industrial production center but also the central piece of a satellite city designed to integrate work, housing, and social life for the working class. With the intensification of urbanization and the saturation of central Tirana, there is an urgent need to reconsider the role of peripheral neighborhoods like Kombinat in the metropolitan urban structure. Today, Tirana lacks an integrated territorial approach that considers the interactions between the city and its surroundings and the potential for functional decentralization. Kombinat was chosen as a case study precisely because of these characteristics: the coexistence of abandoned industrial infrastructures, surrounding agricultural land, and residential areas offers both challenges and opportunities for sustainable redevelopment. Its hybrid nature makes it an ideal site to test integrated models of energy transition and urban regeneration.

In this regard, the proposal to reconceptualize urban nodes around the center of Tirana presents itself as an effective strategy to redistribute urban flows, reduce congestion, and diversify development hubs. The Kombinat area emerges as a natural candidate for this transformation. Its strategic location and the legacy of existing infrastructure provide both material and symbolic foundations for an urban reconfiguration focused on sustainability.

However, this transformation requires an approach that articulates spatial, energy, and social parameters. The reuse of built heritage, combined with the introduction of renewable energy production systems, can form a platform for urban regeneration with a focus on self-sufficiency. Such a project demands a critical understanding of urban morphology and local socioeconomic dynamics, considering current uses, rehabilitation possibilities, and integration with sustainable mobility systems.

This perspective resonates with the broader literature on urban regeneration and sustainability, which emphasizes the importance of linking energy innovation to territorial and social dynamics (Bertolini, 2022). By transforming Kombinat into a vibrant urban center, it is possible to activate an alternative model of metropolitan growth: less concentrated, more resilient, and environmentally

responsible. The construction of a spatial analysis methodology that enables this transition is, therefore, a fundamental theoretical and practical contribution to the challenges of contemporary urbanization in Albania.

## Methodology

The study area is the Kombinat neighborhood, located in the city of Tirana, Albania. The choice of this location is due to its industrial history, its strong potential for urban development, and its relevance as a representative space for contemporary urban transformations. Kombinat was selected instead of other possible zones in Tirana because of its hybrid character: the coexistence of abandoned industrial infrastructures, surrounding agricultural land, and residential areas creates a unique laboratory for testing integrated renewable energy solutions. Its symbolic value as a former socialist satellite city, combined with its strategic location on the western edge of Tirana, makes it a significant area to evaluate how Renewable Energy Communities (RECs) can activate post-industrial neighborhoods as drivers of the energy transition.

The territorial analysis process to assess the renewable energy generation potential in Kombinat began with the definition of the study area, which was delimited based on criteria of urban relevance and the availability of spatial data. Below is the workflow for this work.

Next, the conceptual framework of the research was established, identifying the main categories of analysis: energy resources, land use context, analysis of physical energy infrastructure, and social structure. Within this framework, each category is directly connected to energy planning: energy resources define natural and technological potentials; land use highlights synergies and conflicts between urban, agricultural, and ecological functions; infrastructure refers to the technical capacity for distribution and connectivity; and social structure emphasizes the potential for community governance, in line with the REC model.

With the structure defined, the data search phase began. The collection prioritized open, global-reaching datasets compatible with remote processing platforms, such as Google Earth Engine (GEE). Datasets used include Sentinel-2, ERA5-Land, Copernicus Land Monitoring Service, WorldPop, Global Wind Atlas, and MERIT Hydro. Institutional sources, such as the International Renewable Energy Agency (IRENA), the Institute of Statistics of Albania (INSTAT), and government platforms from the city of Tirana, were also consulted. During this phase, a meticulous curation process took place, validating the spatial resolution, temporal period, and coherence of the data with the analyzed territory. Some data required conversion or reprojection to ensure compatibility in the GEE environment. This phase revealed some challenges regarding official data sources from the Albanian government, with many datasets being absent, and in some cases, the primary available data source was the WMS service, which doesn't allow for extensive data manipulation. To ensure transparency and reproducibility, all datasets and processing steps were documented, and the scripts implemented in GEE are available in a GitHub repository.

Subsequently, the data preparation and analysis process began. First, the spatial data were reviewed and organized according to a hierarchical model that would facilitate the use of scripts in GEE. The logic of the scripts consisted of importing datasets, applying spatial masks (e.g., NDVI > 0.1 for biomass), reprojection, and raster algebra to

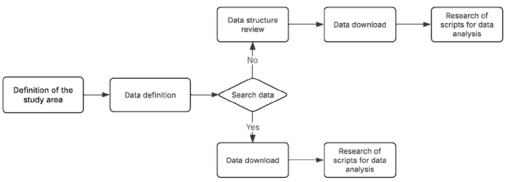


*Fig 1/ : Workflow source/ author (2025*

| Main Categories | Subcategories | Spatial Data Reference |
|---|---|---|
| 1. Resources | Solar efficiency zones | Potential zones for solar energy investment |
| | Wind efficiency zones | Potential zones for wind energy investment |
| | Water resources | Potential surface water resources for hydropower generation |
| | Biomass | Potential areas for biomass energy generation |
| 2.Land Use Context | Land cover | Residential and mixed-use areas |
| | | Commercial areas |
| | | Active/open green parking areas |
| | | Public administration areas |
| | | Social/cultural/educational/sports areas |
| 3.Physical Energy Infrastructure Analysis | Energy infrastructure | Electric mobility/Heat Network infrastructure |
| | High/low voltage electricity grid and its area of impact | Existing EV chargers and their areas of impact |
| 4.Social Structure | Population | Population density identified through spatial data |
| | | Population projections for new development zones |

*Tab. 1. Categorie and subcategorie source/ author (2025)*

calculate potentials per renewable source. Each script generated a standardized raster dataset in kWh, MWh, or feasibility classes, which were then compared with population and land-use layers.

Regarding generation estimation, each renewable energy source was modeled individually. The solar potential was calculated from the annual sum of direct solar radiation (SSRD) from ERA5-Land, converted to kWh/m², and adjusted based on terrain slope and orientation, using data from the digital elevation model (SRTM). Expected productivity (PVOUT) was expressed in kWh/m²/year. The analysis also considered the total available surface for PV panel installation, distinguishing between rooftops, abandoned industrial sites, and open spaces. This enabled an estimation of the maximum deployable PV capacity in Kombinat.

For wind, the annual average wind speed data at 100 meters height from the Global Wind Atlas was projected over the study area and classified according to feasibility ranges. Wind speed analysis was conducted to evaluate whether microturbine implementation could complement other energy sources. The purpose of this analysis was therefore to test diversification scenarios rather than propose industrial-scale wind farms.

The biomass index was calculated from soil composition combined with the average annual NDVI derived from Sentinel-2, limited to values above 0.1 to exclude unproductive areas. This index was multiplied by an empirical factor to obtain biomass in tons per hectare per year and then converted into MWh. Real data from agricultural activity around Kombinat were also integrated, including crop residues, livestock manure, and organic waste volumes from municipal reports. These values allowed the modeling of biogas production potential, considering both energy output and environmental benefits such as waste reduction and circular economy practices.

The hydroelectric potential estimation considered two parameters: slope and drainage area (flow accumulation), both derived from MERIT-Hydro and SRTM. The normalized combination of these two indices generated a continuous raster, indicating higher suitability zones. The purpose of this analysis was not to propose large dams but to assess the feasibility of micro-hydropower systems in drainage channels and hillside streams. While Kombinat has hills rather than mountains, the modest slopes still provide opportunities for localized hydropower interventions.

Residual thermal energy was addressed using data from the literature, considering urban consumption profiles and maps of industrial or densely built-up zones, as no specific publicly available raster was found.

For this, energy intensity values from European industrial case studies were applied to Kombinat's industrial building stock, providing an approximate baseline of waste heat recovery potential.

After running the scripts, it became clear that the Kombinat area has significant renewable energy production potential. Observing the scale of the study, it was noted that the mountainous areas have high energy production capacity, mainly due to their potential for wind and hydroelectric generation. However, considering the need to preserve the natural landscape and local biodiversity, intensive exploration of these areas is not recommended. Still, foothill areas offer a strategic opportunity for the development of distributed energy generation systems focused on local supply. Small-scale energy production integrated into the urban or peri-urban grid could directly meet the demand of nearby neighborhoods, promoting the re-signification of land use and encouraging decentralized and sustainable consumption models.

The land use data was analyzed in its original form, made available openly, ensuring a solid foundation for spatially evaluating the territorial dynamics of the studied region. Based on georeferenced information, it was possible to identify that areas around the Kombinat urban zone have significant agricultural production, which directly contributes to maintaining the quality of life for the local population by ensuring access to fresh food and strengthening the rural economy. This scenario highlights a productive territory with great potential for an energy transition based on renewable sources, particularly biomass. The utilization of agricultural and urban organic waste, such as crop residues, animal manure, and food waste, could be optimized through the installation of biogas production systems, contributing to thermal and electrical energy generation from local sources. Decentralizing this type of energy production would allow nearby agricultural communities to become not only self-sufficient but also energy providers for the local grid, promoting synergies between the agricultural and energy sectors. Furthermore, the detailed land cover analysis allowed for identifying areas that must be strictly preserved in future interventions such as native vegetation zones, urban green spaces, ecological corridors, and water recharge areas essential for ensuring the continuity of ecosystem services, biodiversity, and local climate balance. These areas also act as natural barriers against unchecked urban sprawl and should be considered strategic elements in sustainable territorial planning. On the other hand, the analysis also revealed land parcels with low occupancy, underutilized use, or in the process of abandonment, which could be strategically used for the implementation of renewable energy generation technologies.

Thus, the spatial analysis of land use not only reveals the current state of the territory but also illuminates a wide range of possibilities for sustainable energy development, integrated with local dynamics and

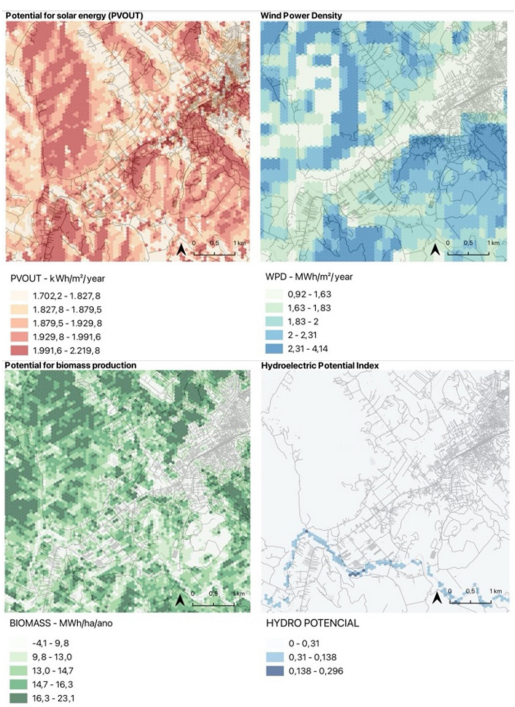


*Fig 2/ : Energy production capacity source/ author (2025*

adapted to the environmental and social reality of Kombinat. By linking productive land use with conservation practices and technological innovation, it is possible to create an energy model that is efficient, inclusive, and environmentally balanced.

For analyzing the energy infrastructure, open georeferenced data were also used, enabling a more accurate understanding of the spatial functioning of the existing infrastructure and its relation to the energy transition potentials in the territory. From these data, it was possible to evaluate different informational layers that make up the urban fabric of Kombinat, with particular attention to connectivity conditions, distribution of urban facilities, and structures supporting energy generation and distribution. First, a classification of building use was performed based on satellite images and cadastral data, allowing for the identification of the predominant function of each building type—whether residential, commercial, institutional, or industrial. This identification was crucial for pinpointing potential public infrastructure for energy distribution, for example.

Additionally, existing high-voltage power lines were mapped using open data from institutional platforms and collaborative networks, aiming to identify the main energy transmission axes within the territory. Proximity to these lines reduces infrastructure costs and increases the economic attractiveness of local generation projects.

The analysis of urban mobility infrastructure also played a key role in the territorial diagnosis. The strategic location of bus stops and high-traffic corridors can be leveraged for the installation of electric vehicle charging stations powered by renewable sources, promoting the decarbonization of urban mobility.

The cross-referencing of all these geospatial layers allowed for the development of an integrated approach that synergistically links the energy, urban, and social dimensions.

The comparative analysis between population data for 2020, 2025, and 2030 revealed trends in urban expansion and population density, especially at the urban fringe.

This dynamic, when correlated with local energy production data, highlighted imbalances between supply and demand and, above all, pointed out areas that, in the future, may face greater pressure on existing energy systems.

The energy demand mapping also served as a basis for spatially comparing the overlap between areas with higher consumption and areas with greater renewable generation potential, allowing for the identification of opportunities for implementing microgrids, renewable energy communities, and energy self-sufficiency systems. This approach strengthens the idea of decentralizing energy production, enhancing system resilience, and promoting energy justice, as it enables access to clean energy for communities that often face energy vulnerability.

Furthermore, the integration of population density data and land use revealed areas of conflict and synergy between energy production and urban, agricultural, or ecological activities. For example, regions with intensive agricultural activity and low population density were identified as ideal for biomass projects, while urban sectors with high density and good solar exposure were prioritized for residential or collective photovoltaic installations. Sloping areas with significant water flow but low occupation appeared as potential sites for small hydropower systems, provided that environmental and landscape criteria are respected.

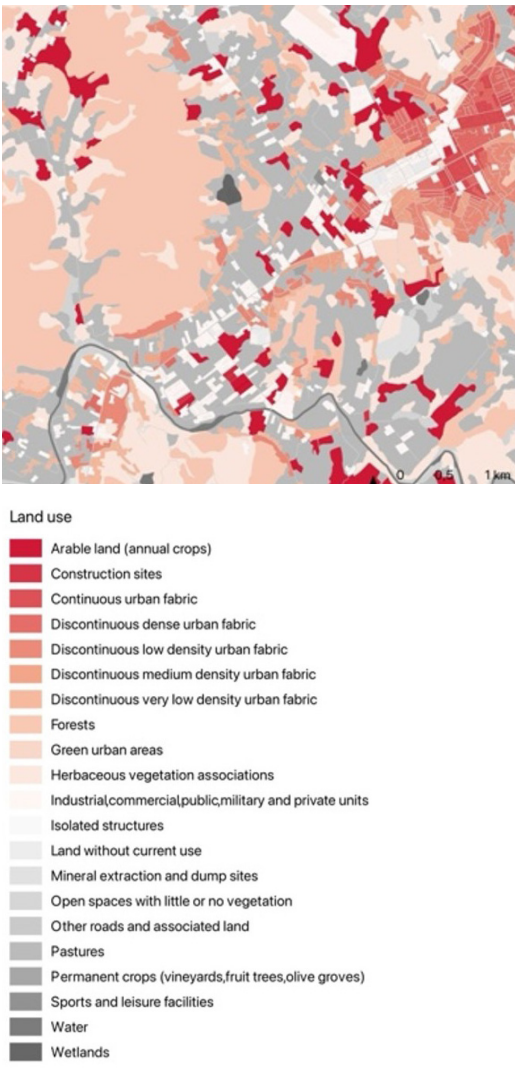


*Fig 3/ : Land Use*
*source/ author (2025*

## Conclusions

Given the set of analyses conducted in this study, the relevance of integrating territorial and energy approaches to understand the possible paths toward energy self-sufficiency in urban neighborhoods, such as the case of Kombinat in the outskirts of Tirana, Albania, became evident. By utilizing a methodology based on geospatial data, remote sensing, and open information, it was possible to build a solid foundation to identify potential sites for renewable energy production and consumption, associating them with land use characteristics, infrastructure, and population dynamics.

The process began with the definition of the study area and the establishment of a work structure composed of six main steps: defining data and categories, data search, review and download, script research, and implementation in Google Earth Engine (GEE). This structure allowed for the systematization of the analyses and ensured the traceability of the decisions made throughout the research.

To estimate the solar potential, data on average horizontal radiation and the PVOUT index were used, which indicates the performance of photovoltaic generation per unit of installed capacity. The result revealed a broad feasibility for the use of solar panels, especially in built-up areas, rooftops, and shadow-free surfaces. Despite the limits imposed by urban density, the peripheral and elevated areas of the neighborhood show potential for exploitation, especially if aimed at self-consumption or small-scale installations. These findings are consistent

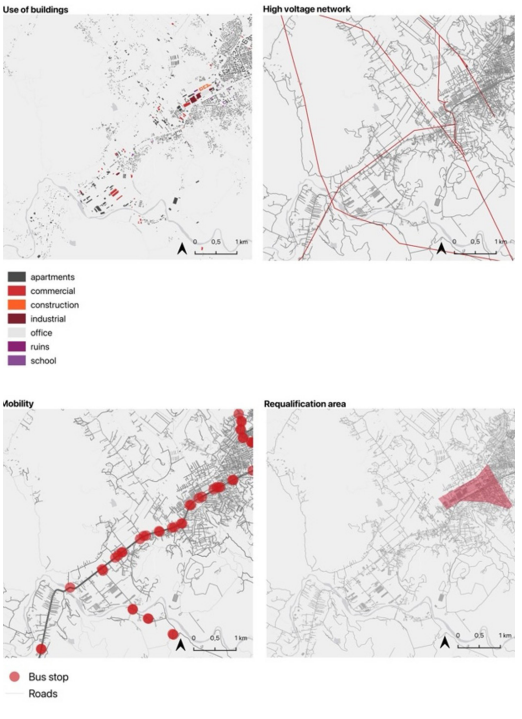


*Fig 4/ : UUrban Infrascature*
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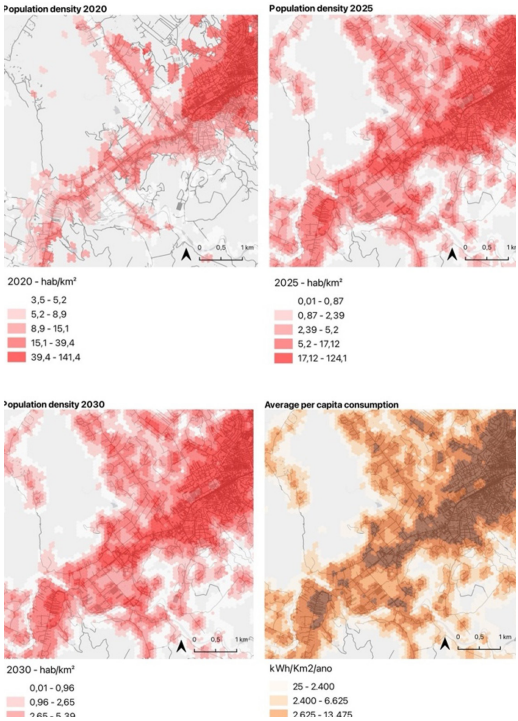


*Fig 5/ : Population density*
*source/ author (2025*



with European case studies that highlight the role of urban photovoltaics as the most effective renewable technology in compact urban fabrics.

The biomass potential estimation was based on Sentinel-2 images, derived from the calculation of the annual average NDVI. In this study, the biomass index was strengthened by considering soil composition, which allowed for a more realistic estimation of productivity. The results indicated significant areas with relevant production, particularly in agricultural zones and green spaces near the urban perimeter, which could contribute to local energy supply through agricultural residues or community-based biodigestion projects.

Hydropower was estimated based on two main factors: terrain slope and drainage area, obtained through MERIT Hydro data. Although urban scale limits this type of exploitation, the edges of the urban area and zones with existing hydrological infrastructure may benefit from small-scale systems. While modest in scale, micro-hydropower could contribute to diversification, echoing studies that recognize its role in hybrid energy systems in peri-urban areas (EEA, 2019).

Land use and land cover analysis played a central role in identifying the restrictions and opportunities for energy development. The reading of original land use, based on open data, highlighted the presence of agricultural zones around the urban fabric, which, in addition to their food function, reveal potential for biomass generation and solar panel installation. These areas should be considered strategic both for ensuring quality of life and for creating synergies with distributed energy systems. Furthermore, preservation areas and zones with dense vegetation were identified as sensitive regions, where any intervention should consider environmental and social impacts in order to preserve biodiversity and the local landscape.

Another important axis of the research was the analysis of existing energy and urban infrastructure. Georeferenced data were used to map high-voltage networks, transport infrastructure, buildings, and spaces in the process of degradation or with potential for revitalization. This critical reading allowed the identification of viable connection points, priority areas for intervention, and the possibility of incorporating energy solutions into future urban projects. The combination of low-density built-up areas and existing infrastructure creates unique opportunities to test local energy community models adapted to the specificities of the territory. The consideration of infrastructure also provides insights into potential synergies with urban mobility, such as the installation of EV charging stations powered by renewable energy, which is increasingly emphasized in sustainable city planning (EEA, 2019).

To understand energy demand, a population raster with a 1 km resolution was used, calibrated with official data from INSTAT (Albanian Institute of Statistics). This calibration helped to improve the accuracy of estimates and provided a continuous reading of population density by pixel. Subsequently, energy demand was estimated based on average per capita annual household consumption, multiplied by population density. The result was a continuous raster representing the estimated energy demand by area, in kWh/year, which allowed direct cross-referencing with the previously mapped generation potentials.

Thus, it was possible to establish areas with greater imbalance between supply and demand, as well as identify areas with technical and environmental feasibility to meet their needs locally. This analytical model creates the conditions for decentralized energy planning, based on the proximity between production and consumption, reducing losses and increasing the resilience of the urban system.

One of the main findings of the research refers to the complementarity between renewable energy sources. While solar can serve dense and consolidated areas, biomass and wind energy find space in peripheral zones and transition areas. Hydropower, in turn, can be activated complementarily at strategic points. The combination of these sources allows the creation of hybrid systems adapted to local needs and capable of operating at different scales.

As a continuation of this research, a study is

proposed to overlay the georeferenced layers analyzed, with the aim of identifying specific portions of the Kombinat neighborhood that meet the ideal conditions for the implementation of sustainable energy infrastructure, integrated with urban revitalization projects. This step will allow for a deeper planning of concrete actions in the territory, promoting solutions that simultaneously consider technical, environmental, and social aspects. The goal is to transform these areas into pilot hubs for local energy production and management, reinforcing local autonomy and promoting the energy transition as an integrated strategy for urban development.

In summary, this research reinforces the role of the territory as a central element in the construction of just, resilient, and sustainable energy solutions. The articulation between open data, geospatial tools, and urban planning offers a promising path for the transformation of cities, based on their singularities and potentialities. The case of Kombinat shows that even in peripheral and challenging contexts, it is possible to build viable, sustainable, and replicable alternatives when technical knowledge is combined with a commitment to collective well-being. Nevertheless, the study has some limitations, including the lack of detailed official datasets from Albania, reliance on open global datasets, and the absence of cost–benefit or policy impact analysis. Future research should address these limitations by integrating local measurements, socio-economic data, and governance frameworks. If replicated, the methodology could support not only Kombinat but also other post-industrial districts in the Balkans, positioning them as laboratories for the development of Renewable Energy Communities (RECs) and participatory energy governance.



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## 6.1

## Integrating Heritage Conservation and Sustainable Urban Redevelopment Balancing Preservation and Modernization in the Historical and Urban Context of Kombinat – Tirana

*Riccardo ALTOBELLO*

# 6

# Proposals for landscapes and heritage

# Integrating Heritage Conservation and Sustainable Urban Redevelopment

## Balancing Preservation and Modernization in the Historical and Urban Context of Kombinat - Tirana

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**Abstract -** *The aim of the abstract, which is going to be more deeply analyzed in the article, is the sustainable transformation of urban spaces while preserving historical and cultural heritage which is the genetic of the neighborhoods of Tirana. In fact the main goal is to combine traditional and modern elements to achieve multifunctionality, resilience, and sustainability without losing the identity of the city. The preventive indexing methods, which is the starting point of my PhD research, could serve as a foundational framework for systematically documenting and assessing heritage structures like the Kombinat factory, aiding its redevelopment into a "city within a city." Similarly, the adaptive reuse and decentralized urban planning strategies in the Kombinat project, which has been investigate during the Workshop (December 10-20, 2024), align with the conservation goals of maintaining architectural authenticity while fostering urban growth. Together, these studies offer complementary insights into managing the complexities of heritage conservation and urban transformation in evolving social and environmental contexts. By aligning preventive conservation methods with adaptive reuse and decentralized planning, these approaches provide a blueprint for balancing preservation and modernization, addressing the challenges of natural disaster (flood, earthquake, etc.) response, urban growth, and connectivity in diverse contexts. This study collectively want demonstrate that a thoughtful integration of heritage conservation and sustainable urban redevelopment can foster resilient, functional, and culturally enriched urban environments.*

*Keywords - Heritage conservation, Sustainable urban redevelopement, Resilience and connectivity*

## Introduction

The Kombinat neighborhood, located in the western section of Tirana, presents a complex and multifaceted challenge for contemporary architectural discourse: the intricate task of harmonizing urban regeneration with the preservation of cultural heritage in a post-socialist context. Established in the 1950s as a potent symbol of communist industrialization, Kombinat now faces significant hurdles, including physical degradation, social fragmentation, and functional obsolescence. This research, undertaken as part of a doctoral program in architecture, seeks to explore and develop viable strategies for transforming this neighborhood into a model of sustainability. Within this framework, the adaptive reuse of industrial heritage, combined with active community participation, emerges as an indispensable tool for constructing a resilient urban identity. This study aspires to demonstrate how revitalizing abandoned industrial spaces, when integrated with comprehensive planning, can yield substantial social, economic, and environmental benefits while simultaneously safeguarding the historical memory of the area.

Regeneration, as a broad concept, encompasses a diverse array of processes aimed at revitalizing urban areas that have experienced decline or neglect. In the unique context of Kombinat, the emphasis on regeneration extends well beyond mere physical renewal; it encompasses the promotion of community engagement, the enhancement of local economies, and the creation of a vibrant urban fabric that authentically reflects the identities and aspirations of its inhabitants. The challenge lies in balancing these multifaceted objectives while ensuring that the unique historical character of Kombinat is not only preserved but also celebrated and valorized.

## Literature review

The origins of Kombinat can be traced back to the 1950s when it was conceived as a satellite city for Tirana, centered around the "Stalin" Textile Factory, completed in 1952. This industrial complex, characterized by monumental volumes and expansive glazing, exemplified the aesthetics of socialism, while the compact block-style residential buildings were designed to foster a sense of communal living. The architectural typology employed in Kombinat effectively combined productive functionality with political symbolism, generating a distinctive urban landscape within the broader Balkan context. The factory served as the beating heart of the neighborhood, functioning not only as a workplace but also as a crucial space for social interaction, integrating theaters, kindergartens, and clinics into its productive fabric.

However, the collapse of the communist regime in 1991 marked a critical turning point that led to a rapid decline for Kombinat. The closure of the factory left behind significant urban voids, and the chaotic expansion of Tirana transformed the neighborhood into an area marked by congestion and marginalization. Currently, approximately 70% of the industrial buildings are in a state of neglect, and the historic public spaces have lost their vibrancy and functionality. The transition to a market-driven economy has resulted in spontaneous construction interventions that frequently clash with the original fabric, thereby disrupting the delicate relationship between solid structures and voids. Despite these challenges, the architectural heritage of Kombinat retains untapped potential; its modular structure and spacious interiors offer exciting opportunities for innovative reconversions, provided that such efforts are guided by a scientific approach that incorporates active community engagement.

The literature on urban regeneration emphasizes the importance of thoroughly understanding the historical context of a neighborhood. The architectural heritage of Kombinat is not merely a backdrop; it is an integral part of the community's identity and collective memory. Research indicates that successful regeneration projects often incorporate elements of historical significance to foster a sense of belonging and continuity among residents. The preservation of cultural landmarks, even in the face of modernization, can enhance the social fabric of the community by providing points of reference that evoke shared memories and collective experiences.

Moreover, regeneration efforts must take into account the intricate social dynamics at play within Kombinat. The neighborhood is not a monolithic entity; it comprises diverse populations with varying needs, aspirations, and cultural backgrounds. Engaging local residents in the planning and decision-making processes not only empowers them but also ensures that regeneration efforts are aligned with their desires and expectations. This participatory approach can lead to more effective outcomes, as it fosters a sense of ownership and responsibility among community members. Recent studies have shown that neighborhoods that successfully integrate community input into their regeneration strategies tend to experience greater social cohesion and economic revitalization.

Furthermore, the concept of adaptive reuse has gained significant traction in recent years as an effective strategy for revitalizing industrial heritage. Unlike conservative restoration, which aims to maintain the original appearance of a structure without functional modifications, adaptive reuse allows for the reinterpretation of historical buildings through the introduction of new activities that respect the material and cultural identity of the site. This methodology not only preserves the architectural essence of the neighborhood but also fosters innovation by providing flexible spaces that can adapt to the evolving needs of the community. The successful implementation of adaptive reuse can create a harmonious blend of the old and the new, allowing for the continuation of the site's historical narrative while accommodating contemporary uses.

## Tools and methodology

The regeneration of Kombinat is intricately linked to an ongoing international discourse that revolves around three theoretical pillars: the utilization of post-industrial heritage as a resource for ecological transition, the adaptation of urban spaces to withstand economic and climatic shocks, and the active engagement of local communities in the planning process. According to the guidelines established by ICOMOS (2011), abandoned industrial sites are not merely historical remnants; they also present unique opportunities to experiment with models of circular economy. Concurrently, the concept of urban resilience, as outlined by UN-Habitat (2023), necessitates interventions designed to enhance the capacity of urban spaces to absorb and reorganize in the aftermath of socio-economic crises.

In this framework, typological reuse emerges as a pivotal strategy. Unlike conservative restoration efforts, which typically aim to maintain the original appearance of a structure without functional modifications, adaptive reuse allows for the reinterpretation of historical buildings through the introduction of new activities, as long as these developments respect the material and cultural identity of the site. This approach has been successfully applied in various contexts, such as the Fabbrica del Vapore in Milan, and necessitates a collaborative synergy among advanced technologies, multidisciplinary expertise, and meaningful dialogue with local residents.

The methodological framework of this study employs a blend of advanced surveying techniques, digital modeling, and community engagement strategies to develop a replicable model that can be applied in similar contexts. The process commences with a detailed metric-instrumental survey that integrates 3D laser scanning and UAV photogrammetry. These cutting-edge technologies capture high-resolution point clouds, facilitating the documentation of complex geometries, such as the vaults of the "Stalin" factory, along with surface deterioration issues, including cracks and detachments. The digital datasets are complemented by manual surveys to capture decorative details, such as stucco moldings and wrought iron elements, which are often overlooked by automated systems.

Concurrently, a stratigraphic analysis of the building elevations identifies various construction phases through a meticulous examination of joints, materials, and techniques. This analysis distinguishes, for example, original solid brick masonry from subsequent post-communist concrete additions. Non-destructive diagnostic methods further enrich the investigation: infrared thermography identifies thermal bridges and moisture problems that are critical for the preservation of historical plaster, while Ground Penetrating Radar (GPR) maps underground structures, such as foundations and cisterns. Additionally, X-Ray Fluorescence (XRF) analysis characterizes the chemical composition of mortars and pigments, thereby guiding the selection of compatible materials for restoration efforts.

The integration of Building Information Modeling (BIM) into the methodology serves as a crucial tool for visualizing and planning interventions. The BIM model acts as a dynamic repository of information, allowing for the simulation of various scenarios related to space utilization, structural integrity, and environmental performance. This digital framework enables architects and planners to explore multiple design alternatives while assessing their potential impacts on the existing urban fabric.

Community engagement plays a vital role in the methodological approach. The active participation of local residents is facilitated through workshops and perceptual mapping tools. The Lynch method, which focuses on identifying urban "markers" (landmarks, pathways, boundaries), reveals the identity elements most valued by residents, such as the iconic clock tower of the factory. Collaborative design tables engage residents, artisans, and institutions in defining usage priorities, balancing conflicting needs such as cultural hubs versus business incubators.

## Conclusions and recommendations

In summary, the pilot project centered around the "Stalin" Factory has yielded tangible and measurable outcomes. The adaptive reuse of 90% of the existing buildings has successfully averted

the cementification of 5 hectares of agricultural land, while simultaneously generating 120 direct jobs within the cultural and artisanal sectors, with an estimated annual economic impact of 2 million euros. A survey conducted in 2024 indicates that 78% of residents now recognize the symbolic importance of the converted factory, a significant increase from just 35% in 2020. Kombinat serves as a living laboratory for testing urban regeneration models in post-industrial contexts.

This research underscores the notion that the preservation of heritage is not an impediment to modernity but rather a valuable ally in the quest to create inclusive and sustainable urban environments. Through an integrated approach that harmonizes technology, community participation, and respect for historical context, the neighborhood has the potential to transition from being a relic of the past to a hub of innovation.

This case provides invaluable insights for other Balkan cities undergoing similar transitions. The forthcoming challenge lies in scaling this model to a metropolitan level, thereby creating a network of cultural and productive nodes that reconnect Tirana with its rural hinterland. Ultimately, the experience gained from Kombinat can serve as a blueprint for other urban areas facing the dual challenge of regeneration and heritage conservation, demonstrating that thoughtful integration of past and present can yield vibrant, resilient communities. The lessons learned here can inspire future projects aimed at revitalizing urban spaces across the globe, particularly in regions where industrial heritage is at risk of being lost to neglect and modernization.

In conclusion, the regeneration of Kombinat encompasses not merely the restoration of physical structures but also the revitalization of the very essence of community life. The careful balancing of heritage conservation and contemporary development can create a vibrant urban environment that honors its past while looking forward to a sustainable future. As cities around the world grapple with similar challenges, the insights and methodologies developed through the Kombinat project offer a valuable framework for navigating the complexities of urban regeneration in a rapidly changing world.

Therefore, the transformative journey of Kombinat stands as a testament to the potential of adaptive reuse and community-driven initiatives in fostering sustainable urban environments. By emphasizing the significance of historical preservation and active participation, this project not only revitalizes a neighborhood but also reinforces the idea that cities can thrive by respecting their history while embracing innovation.

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# 7

# Proposals for settlements, public spaces and dwelling

# Towards new heights:
## The Impact of High-Rise Developments on Tirana's Urban Transformation

DOI:

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**Abstract -** *The construction of tall buildings has recently become a defining feature of Tirana's urban development, marking a clear departure from its traditionally low-rise character. Once characterized by compact neighborhoods and modest housing blocks, the Albanian capital has, in the last five years, experienced an unprecedented wave of high-rise projects. This rapid vertical expansion reflects not only the city's response to growing demographic pressures and urban density, but also ambition to position itself within the broader network of European capitals.*

*Unlike cities such as London, Paris, or Frankfurt, where vertical growth has been gradual and log established, Tirana's transformation is occurring within a short timeframe, making its impact on the urban fabric particularly pronounced. This trend is enabled by the adoption of advanced construction technologies and innovative materials. High-strength concrete, prefabricated structural elements, modular systems, and energy-efficient façades have significantly accelerated the pace of construction while ensuring higher safety standards and sustainability. The integration of digital tools such as BIM further enhances project efficiency, coordination, and performance monitoring. Collectively, these innovations allow Tirana to realize taller, more complex structures than previously possible, while aligning with global shifts toward environmentally conscious architecture.*

*Rapid vertical growth also raises critical questions about urban density, environmental impact, and the preservation of Tirana's historical character. Balancing innovation with cultural heritage remains a pressing challenge for planners and policymakers. This paper examines the implications of high-rise developments in Tirana, focusing on their cultural, economic, and educational transformations. It explores how these towers are reshaping the cityscape and urban experience, while critically analyzing the balance between progress and preservation in the Albanian capital.*

*Keywords - High-rise developments, Vertical urbanization, Sustainable design, Skyline evolution, Urban growth*

## Introduction

The Council on Tall Buildings and Urban Habitat (CTBUH) has extensively documented the evolution of tall buildings worldwide, highlighting a significant shift towards sustainable vertical urbanism. While Europe may not lead globally in the sheer height of its skyscrapers, it has seen a remarkable increase in the number of tall buildings, particularly those over 100 meters. As of August 2024, CTBUH has cataloged over 15000 buildings worldwide exceeding 100 meters in height, with Europe contributing a substantial portion to this figure. Notably, over half of Europe's 1217 buildings (100 m+) have been completed since 2010, indicating a rapid acceleration in vertical construction. This surge aligns with Europe's efforts to address urban challenges such as housing shortages, land scarcity, and the need for sustainable city planning.

Among the European capital cities, Tirana is taking the stage and grabbing the attention of the world, with its recent tall buildings and distinctive architecture. Already, CTBUH has cataloged a list of 7 tall buildings in Tirana, with height more than 50m, with Downtown One (140 m) considered to be the tallest building.

Tirana's current urban development trajectory, especially its emerging skyline and high-rise construction, aligns more closely with the polycentric cluster model seen in Rotterdam and Milan, rather than the centralized skyscraper hubs of Paris La Défense or Frankfurt. To support this statement, Tirana has a dispersed high-rise development, it doesn't have a single centralized high-rise district like La Défense or Frankfurt's Bankenviertel. In fact, the new tall buildings in Tirana, are emerging in multiple nodes across the city, such as Downtown One, Tirana InterContinental, Eyes of Tirana, Alban

tower (4-Ever Green), Vertical Forest Tirana, Lake View Residences and several other towers under construction or planned to be implemented in various strategic locations.

Similar to Milan, Tirana's towers are integrated within the existing urban fabric, not standalone financial or business zones. The objects are often mixed-use, blending residential, office and commercial spaces, which is typical of polycentric clusters focused on human-scale livability and green integration. Both Tirana and Milan place a strong emphasis on green building strategies (vertical forests, LEED-certified towers, urban parks etc.), that reflect a planning ideology that prioritizes environmental sustainability, landscape integration and diversified growth centers. According to Tirana's 2030 General Local Plan (TR030), decentralized urban density will be achieved through "poly-nodes" and "urban corridors" rather than a vertical core.

Meanwhile, La Défense and Frankfurt are clear examples of centralized skyscraper zones, which are often isolated from residential and cultural zones, primarily driven by financial institutions; in Tirana, there is no such enclave, which is dominated by businesses. Its vertical growth is weaved into the urban tissue, not segregated. Frankfurt and La Défense are fueled by global finance and corporate headquarters. Tirana's towers are more about mixed-use development, real estate investment, and urban renewal – a different typology and motivation.

The list of European cities building to new heights continues to grow exponentially, embracing vertical urbanism as a means to achieve carbon neutrality and sustainable growth (ctbhub.org, April 2025). The CTBUH's 2025 Europe Conference, themed "Different Densities: The Quest for Carbon-Neutral Cities in Europe", underscored this commitment. The conference highlighted how European cities are adopting various models of vertical development, from skyscraper clusters in Paris La Défense and Frankfurt to polycentric clusters in Rotterdam and Milan. These developments prioritize low-carbon materials, energy efficiency, and integration with existing urban fabrics.

## Literature Review

The recent emergence of high-rise developments in Tirana signifies a pivotal shift in the city's urban morphology. Scholars examining vertical growth in European cities such as Frankfurt, Rotterdam, Paris La Défense and Milan provide valuable comparative frameworks for understanding Tirana's trajectory. This literature review discusses how researchers evaluate such urban interventions, while also proposing a methodology tailored to Tirana's context.

Urban scholars argue that tall buildings in Europe are less about sheer height and more about sustainable vertical density, as outlined by CTBUH. In cities like Frankfurt, high-rise clusters concentrate around financial centers, while polycentric models like in Rotterdam or Milan demonstrate a more distributed impact on surrounding neighborhoods. Tirana's case straddles both logics: it lacks a singular central business district, yet its towers influence distinct urban zones.

Methodologically, evaluating the impact of such developments often involves spatial analysis, social surveys, economic impact assessment and cultural mapping. Scholars like Gehl (2010) emphasize the need to assess how new architecture fosters public life, accessibility and human-scaled interventions. In Tirana, this methodology can be adapted through a multi-scalar framework that incorporates:

-spatial buffers (ex. 250-1000m radius around each tower),

-sectoral impact zones (economic, cultural, social and educational),

-temporal analysis (before vs after development),

-visual mapping techniques (influence diagrams, heat maps etc.).

Recent research in post-socialist cities (Stanilov, 2007; Tsenkova, 2012) emphasizes how towers are often symbols of new capital flows, signaling globalization, yet may lead to uneven development

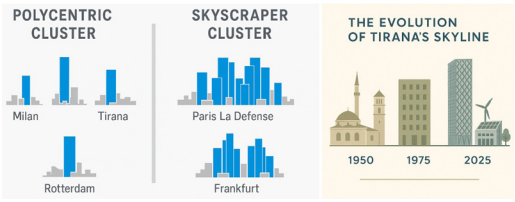



*Fig 1/ : Tirana's polycentric cluster (left) and the evolution of Tirana's skyline (right).*
*source/ author (2025*

and displacement. The 4-ever green tower, for example, promotes ecological branding, aligning with green architecture discourse (Beatley, 2011), while Downtown One presents itself as a mixed-use landmark contributing to both residential density and business prestige. Such towers function not only as buildings but also as urban actors, reshaping investment patterns and cultural narratives.

However, Tirana-specific literature remains limited, which underlines the relevance of this study. While some planning documents and local architecture reviews acknowledge the aesthetic and economic ambitions of these towers, systematic evaluations of their social, educational and cultural influence are lacking. By applying a zone-of-influence methodology, which considers not only proximity but qualitative impact, this research aims to bridge that gap.

In sum, the literature supports a multi-dimensional approach to evaluating high-rise impacts. Tirana's towers, though young, offer a fertile ground for urban analysis – blending aspirations of global identity with local socio-cultural transformations. A robust methodological framework will allow a more nuanced understanding of their true contribution to the city's evolution.

## Tirana's Towers

In 2003, the city of Tirana, headed by then-mayor Edi Rama (currently prime minister), had commissioned a masterplan for the redevelopment of the city center. Drafted by Architecture-Studio, the plan



| FACTS | |
|---|---|
| Population | 3,195,000 |
| Area | 28,748 km² - 11,100 mi² |
| Density | 111.1 people per km²<br>287.8 people per mi² |
| Tallest Building | Downtown One (140 m) |
| Tallest City | Tirana |

| BUILDINGS | | | |
|---|---|---|---|
| Rank | Name | Status | Height |
| 1 | Downtown One | C Completed | 140 m / 459 ft |
| 2 | Arena Center Tower | C Completed | 112 m / 367 ft |
| 3 | Ekspozita Building | ST Structurally Topped Out | 93 m / 305 ft |
| 4 | 4-ever Green | AT Architecturally Topped Out | 85 m / 279 ft |
| 5 | TID Tower | C Completed | 85 m / 279 ft |
| 6 | ABA Business Center | C Completed | 81 m / 266 ft |
| 7 | Tirana Vertical Forest | AT Architecturally Topped Out | 75 m / 246 ft |

*Fig 2/ : List of highest buildings in Tirana according to CTBUH.* *source/ re-concepted from scyscrapercenter.com by the author, (2025*

| SUPERTALLS (H>300m) | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Name | Location | Height | Floors | Architect | Developer | Year |
| 1 | Tirana Society Towers | Tirana 41.32894°N 19.82104°E | 300 m (980 ft) | --- | Alejandro Aravena | Delta sh. p.k / Techno Alb sh. p.k | ongoing |
| **SKYSCRAPERS (H=200-300m)** | | | | | | | |
| No. | Name | Location | Height | Floors | Architect | Developer | Year |
| 1 | Grand Park Skyline Tower 1 | Tirana 41.32894°N 19.82104°E | 266 m (873 ft) | 71 | Valerio Olgiati | X One sh. p. k. | approved |
| 2 | Mixed-use Tower | Tirana 41.34426°N 19.81453°E | --- | 65 | Herzog & de Meuron | Klar sh. p.k. | approved |
| 3 | Mount Tirana | Tirana 41.32975°N 19.82054°E | 206.4 m (677 ft) | 58 | CEBRA | Nova Construction sh. p. k. | u/c |
| 4 | Papuli Tower | Tirana 41.32779°N 19.80768°E | 205 m (673 ft) | 58 | Bofill Arquitectura | Classic S&J sh. p. k. | approved |
| 5 | ABA Tower | Tirana | --- | 58 | --- | Gener 2 | ongoing |
| 6 | Lana Riverside Residences | Tirana 41.32210°N 19.80248°E | 204.45 m (670.8 ft) | 56 | Marco Casamonti & Partners / X-Plan Studio | Forever Construction sh. p. k. | u/c |
| 7 | Barcelona Tower | Tirana 41.32689°N 19.81628°E | 202 m (663 ft) | 53 | Bofill Arquitectura / UDV Architects | Bami Holding Sh. p. k. | approved |
| 8 | Bond Tower | Tirana 41.33539°N 19.79661°E | 199.5 m (655 ft) | 55, 44 | OODA | Nova Construction sh. p. k. | approved |

*Fig 3/ : List of Supertalls and Skyscrapers in Tirana.* *source/ re-concepted from wikipedia.org by the author, 2025.*

envisioned the construction of ten towers, arranged in parallel order around Skanderbeg Square, with an intended maximum height of 85 meters set for each tower, so to maintain a cohesive skyline.
However, this is not the case! Every tower that has already been built, or will be implemented exceeds the height limit of 85m. Some may say there is a hidden competition between investors to have the tallest tower in Albania, but often overtly visible.
According to recent data (scyscrapercenter.com, 2025), the tallest building in Tirana nowadays is Downtown One (140m - 37 floors), followed by Arena Center Tower (112m - 25 floors), Ekspozita Building (93m - 25 floors), 4-Ever Green (Alban Tower, 85m – 25 floors) and others.
Another list of tallest buildings in Albania is also provided, with almost 103 structures, some of which are shown in figure 3. These buildings have different statuses as: constructed, under construction, ongoing or approved to be implemented.
In order to entitle a building "tall" the Council on Tall Buildings and Urban Habitat has developed the international standards for measuring and defining them, and is recognized as the arbiter for bestowing designations such as "World's Tallest Building". Although, according to CTBUH the number of floors is a poor indicator of defining a tall building due to the changing floor-to-floor height between different buildings and functions (e.g., office versus residential use), a building of 14 or more stories, or more than 50 meters (165 feet) in height, could typically be used as a threshold for a "tall" building. In the case of Albania, based upon the height and relativeness to each other, "tall buildings" can be categorized as below:
1. Supertalls (H > 300m)
2. Skyscrapers (H = 200-300m)
3. Highrise (H = 100-199m)
4. General Urban Developments (H = 45-99m)

| No. | Category of Towers | Height (m) | Quantity |
|---|---|---|---|
| 1 | Supertalls | >300 | 1 |
| 2 | Skyscrapers | 200-300 | 8 |
| 3 | Highrises | 100-199 | 48 |
| 4 | General urban development | 45-99 | 46 |

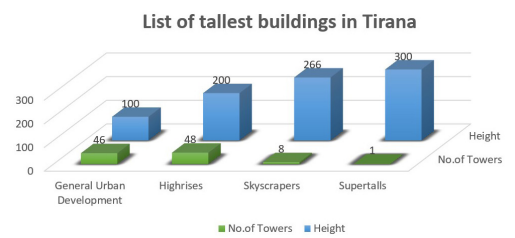



*Fig 4/ : List of highest buildings in Tirana according to CTBUH. source/ re-concepted from scyscrapercenter.com by the author, (2025*

As it seems, from the data provided, Tirana's towers aim for the sky, or better say "sky is the limit"! If one would like to have a better perception of how many towers correspond to each category, the answer is given in the following table.

## Methodology and New Lands

In order to evaluate the influence of these towers on Tirana's economic, cultural, social and educational spheres, the following approach is proposed.
Economic Impact. It could be assessed the economic impact through examining the capital invested in each project and subsequent economic activities generated. Another metric could be assessing job creation during construction time and also after, during operational phase of the building. Monitoring the emergence of new businesses and services in the vicinity could be also another important indicator.
Cultural Influence. Every new tower that is being added to Tirana has an architectural significance. Every architect that has designed such a tower has evaluated the contribution of their concepts to Tirana's architectural identity, which can be highlighted. Moreover, in the operational phase, it can be evaluated the community's engagement through different events that promote cultural activities. Analysing the integration of public art, plazas and cultural venues would also be a great input.
Social Dynamics. An important indicator would be the demographic shifts by studying changes in population density and diversity in surrounding areas. The quality of life also can be indicated through surveying residents on perceived changes in living standards and amenities. Meanwhile evidencing the social cohesion by investigating the impact of the tower on community interactions and inclusivity would be important.
Educational Contributions. This could be performed by identifying any educational institution or programs housed within or supported by the towers. Evaluating training programs or workshops initiated during or after construction. Exploring partnerships with universities or research centres for the technology used during construction and in operational phase could lead to interesting results.
This methodology approach aims to provide a comprehensive understanding how the implementation of these skyscrapers has reshaped Tirana's urban dynamics across multiple dimensions.

## Analysis and main findings

In order to test the methodology proposed, four towers have been selected. Respectively:


*Fig 5/ : List of Supertalls and Skyscrapers in Tirana.* *source/ re-concepted from wikipedia.org by the author, 2025.*




*Fig 6/ : Photos of four analyzed towers (left to right as described). source/ Websites of each tower, 2025.*

Downtown One, Tirana InterContinental Hotel, Eyes of Tirana and 4-Ever Green (Alban tower) (fig.6 left to right respectively). The reasons why these towers are taken into consideration, are as below:
- firstly, they are the highest built towers in Tirana up to now,
- secondly, they are located around the city center, with some of them very near to each-other, which gives insight into Tirana's rapid vertical urbanization, each of these towers have significant architectural difference, but, even that they are mixed-use and offer same services, their amenities are different and attract the curious eye of residents and tourists, which make them worth to have a deeper look.

Their varying heights, locations and developers reflect diverse urban strategies, architectural styles and socio-economic impacts. Analyzing them together helps understand how vertical development shapes the urban space, the social behavior and city branding in Tirana.

Figure 8 depicts the Economic Impact and Cultural Influence maps derived from information gathered about the towers. According to the Economic Impact map, the main indicator for assessment was the total cost (capital invested) of the building. It also shows the employment rate created during construction, as well as more capital flowing into the economy. Other indicators of Economic Impact include the long-term revenue generated by the building, such as rental income and business profits. Additionally, the increase in property values in the surrounding area and the tourism attracted by the iconic structure contribute significantly to the local economy. These factors, combined with the initial construction costs, provide a comprehensive view of the building's economic influence.

On the Cultural Influence map, the architectural attractiveness of the towers has been taken into account, showcasing the towers' architectural identity. Moreover, it has been taken into consideration the integration of the building with its surrounding plazas and cultural monuments.



| | Downtown One | Tirana InterContinental | Eyes of Tirana | 4-ever Green (Alban tower) |
|---|---|---|---|---|
| Height (m) Floors (above/ underground) | 150m (40 / -5) | 133.5m (33) | 135m (31) | 107m (27 / -6) |
| Type | Mixed-use, Residential, Office, Conference, Commercial | Hotel | Mixed-use, Residential, Office | Mixed-use, Hotel, Residential, Office |
| Address | Bajram Curri Boulevard | Skanderbeg Square | Kavaja Street | Ibrahim Rugova Street |
| Coordinates | 41.32412°N 19.82386°E | 41.33009°N 19.81832°E | 41.32851°N 19.81559°E | 41.32610°N 19.81652°E |
| Construction Start / End | 2019 – 2024 | 2021 – 2023 | 2017-2025 | 2008-2022 |
| Structural system | Reinforced concrete | Reinforced concrete + Steel | Reinforced concrete | Reinforced concrete + Steel |
| Floor Area (m2) | 78'800 | 36'500 | 63'500 | 15'600 |
| Architect(s) | MVRDV | Peter Wilson + Atelier 4 | Henning Larsen + X-Plan studio | Archea Associati |
| Structural engineer | Arup & LEAL | AEI Progetti | - | AEI Progetti |
| Investor | Kastrati Group | GECI Group | Ideal Construction | AI&Gi |
| Total Cost (Euro) | 80 M | 60 M | 70M | 32 M |

*Tab. 1. : Essential data of the evaluated towers* *source/ author (2025)*

Cultural events held around the towers further enhance map's significance by highlighting the vibrancy and diversity of the area, creating a dynamic atmosphere that reflects the community's cultural richness.

The maps of Social Dynamics and Educational Contribution are illustrated in figure 9. Social Dynamics map was drafted using indicators of perceived changes in living standards and different amenities provided by the towers. Meanwhile, displaying the vibrancy of the social fabric around the towers. Living standards are measured by evaluating various factors such as income levels, access to education and healthcare, availability of clean water and sanitation, and quality of housing. Other indicators include employment opportunities, social security, and the overall cost of living in the area. These metrics collectively provide a comprehensive view of how well individuals and communities are able to meet their basic needs and achieve a good quality of life.

On the Educational Contributions map, the indicator of educational institutions or programs housed within or supported by the towers has been used. Educational contribution plays a crucial role in shaping the social dynamics of the community by providing individuals with the skills and knowledge necessary for personal and professional growth. Access to quality education can lead to better job opportunities, higher income levels, and improved living standards, which in turn foster economic development in the area. Furthermore, education promotes social cohesion and empowers communities to address challenges collaboratively, enhancing overall well-being and resilience.

## Conclusions and Recommendations

Efforts in Europe to develop tall buildings reflect their understanding of urban challenges and commitment to sustainable solutions. By focusing on vertical density, adaptive reuse, and environmentally conscious design, European cities are redefining their skylines while addressing critical issues such as climate change, housing shortages, and urban livability. Through its research and conferences, the CTBUH continues to shed light on these developments and foster a global dialogue on the future of urban habitats.

In the case of Tirana city, the emergence of Downtown One, Tirana InterContinental Hotel, Eyes of Tirana and 4-Ever Green Tower marks a transformative moment in Tirana's urban development, symbolizing the city's shift toward vertical expansion and international urban aesthetics. While these towers introduce modern design and economic investment, their impact extends beyond form, reshaping cultural identity, social interaction and educational infrastructure within their zones of influence.

This study has evidenced that a multi-scalar, sector-based methodology, using spatial buffers and thematic influence mapping, can effectively capture the complexity of their urban role, as shown in figure 10.



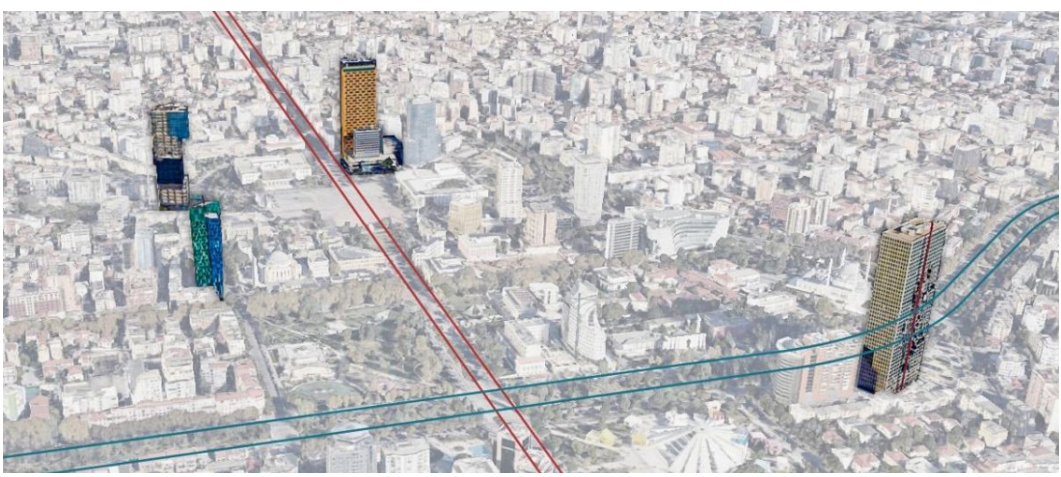
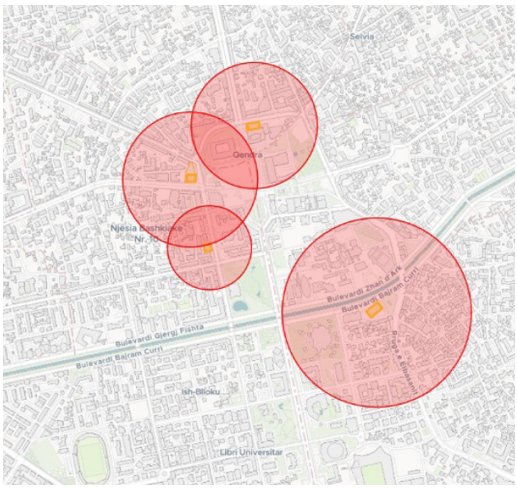


*Fig 7/ : 3D view of the four assessed towers* *source/ author, 2025.*


*Fig 8/ : Map of location and footprint of four towers (in red)* *source/ author, 2025.*



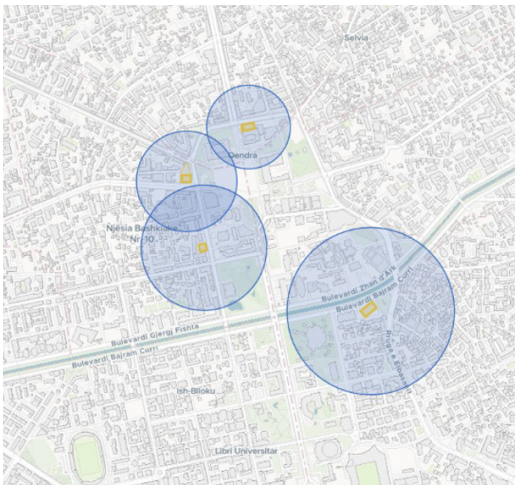
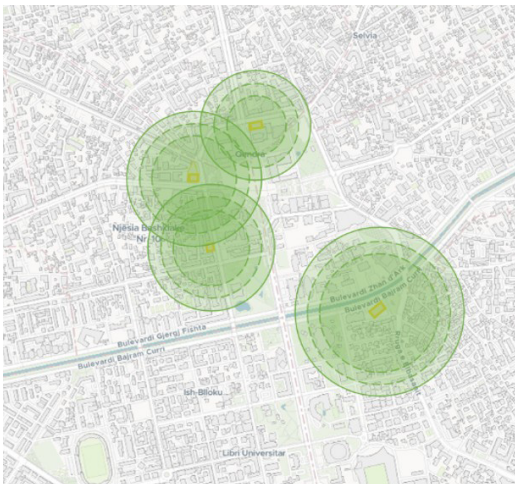




*Fig 9/ : Map of Economic Impact (left) and Cultural Influence (right).* *source/ author, 2025.*





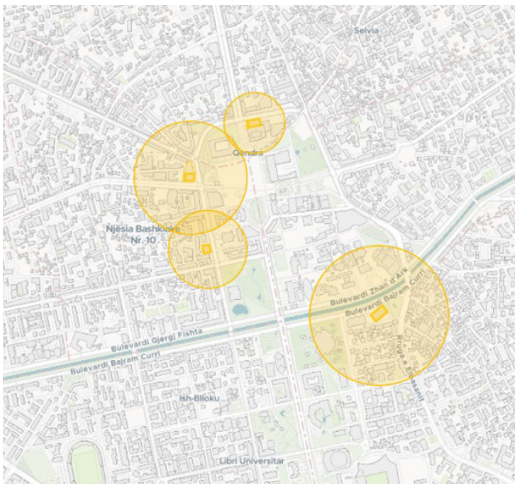




*Fig 10/ : Map of Social Dynamics (left) and Educational Contribution (right).* *source/ author, 2025.*

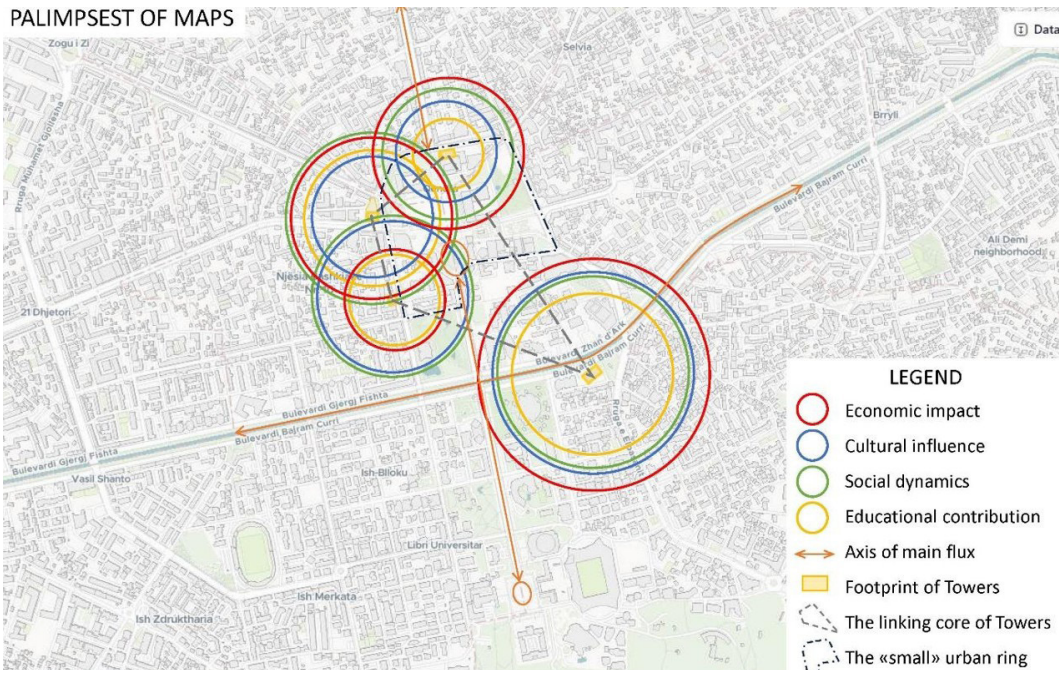



*Fig 11/ : Palimpsest of maps showing the influence of the 4 selected towers in Tirana's urban fabric.* *source/ author, 2025.*

To ensure these high-rise developments contribute holistically to Tirana's growth, future planning should emphasize inclusive design, public accessibility and integration with local communities. Stronger interdisciplinary collaboration between architects, urban planners and sociologists is needed to assess long-term effects on neighborhood fabric and urban equity. Policymakers should implement tools like impact assessment frameworks and community engagement protocols to manage future vertical developments responsibly. Lastly, continued research – bot quantitative and qualitative – should monitor how these towers evolve over time, ensuring they remain assets, not isolated icons, within Tirana's urban narrative.

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# The Role of Urban Mobility in Shaping City's Image and Boosting Tourism
## The Case of Tirana

DOI:

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**Abstract -** *Urban Mobility has a crucial role in shaping the image of the city and affecting its attraction as a tourism destination. To make a vibrant, sustainable and habitable city an effective urban transportation is needed. The performance of economy, environmental sustainability, tourism, and the general standard of life are all significantly impacted. Adequate congestion and transportation management is crucial in rapidly growing cities like Tirana, both to improve everyday urban living and to increase the city's attractiveness to tourists. This paper deals with the connection between Tirana's urban mobility, tourism growth, and the city's image. It evaluates the negative consequences that reduced mobility systems, traffic congestion and insufficient infrastructure might have on tourists' experiences and the city's perception. As a result, it explores how strategic changes to urban mobility—like the development of a favourable city image, draw more tourists, and support sustained economic growth. A major problem that needs to be addressed in the case of Tirana is the establishment of an appropriate road network that links the city's main tourist attractions with adequate urban transport. By addressing these issues, Tirana can improve its image internationally, increase accessibility, and make the city a more sustainable and pleasant place for both locals and tourists. This study highlights the benefit of an integrated approach to urban planning that takes into consideration city branding, tourism management, and infrastructure as interconnected components that work together to establish the city's future. It takes a comprehensive approach to address present issues and build the city for long-term success.*

*Keywords - City Branding, City Image, Urban Mobility, Tourism*

## Introduction

### Urban Development of Tirana

To understand how the traffic and infrastructure problem arose in the city of Tirana, we need to go back in time, from the first planning projects to the present day. This is because by analysing the work during the implementation of its regulatory projects, we will try to identify the cause of the real problems already reflected. At the time of its declaration as the capital, Tirana had a spontaneous, organic structure with medieval characteristics. It had no modern enterprises and was dominated by separated crafts such as textiles and metallurgy, which employed one to three apprentices. (Dhamo & Thomai, 2016) The economic crisis was resolved and the rate of industrial and economic growth was accelerated with the coronation of Ahmet Zog as king of Albania's constitutional monarchy. Following 1939, Tirana was overrun by Italian fascist and later German forces, ushering in a new era of local projects and implementations. The first plan for the new capital's center was designed in 1925 by renowned Italian architect Armando Brasini. In his early versions of the boulevard, the Royal Palace was planned to be built on the dominating hill in the southern half of the axis, with the lands along the axis were given to high-ranking government officials. For this reason, this area became a manifestation of Tirana's new architecture, expressed in different languages: from the most traditional ones or those influenced by Italian architecture from the fascist period, to those representing the newest movement of European modernity. Meanwhile, during the communist period, along this same axis, the government established its own hierarchical structure. The offices of the Central Committee of the PPSH were built along the so-called "bllok", where the highest-ranking figures of the party hierarchy resided. Although the Boulevard is an abstract geometric scheme, it best visualizes and reflects the local features of the Tirana valley. A more thorough design for Tirana was created in 1926;

it was essentially an extension of the 1923 plan. A further thorough plan for Tirana was developed in 1926. Kohler and Frashëri later created a more comprehensive plan for Tirana in 1928, which required the city to expand south-westward in the area of New Tirana. It was more of a modification of the idea from 1923. We find a re-establishment of Tirana's transition from an organic city to an organized city in the years 1939–1943 in the city's regulatory plan. Continuing in 1957–1958, the city witnessed a period of transition during which the historic center was demolished and an artificial lake park was constructed. Over these years, Tirana had developed an industrial zone and started to lose its small-crafts identity. It was suggested that the road network scheme operate in a "circular" manner, with outer and inner rings, radius that reached the city center, and two bypasses that ran parallel to the city's central axis and traversed the city in north-south directions. This would ensure that traffic was distributed evenly throughout the various parts of the city at the time. The establishment of several types of small routes that would enhance the network's overall performance also fulfilled this aim. With a length of roughly 8 km, the radials—which included Durres Road, Kavaja Road, Dibra Road, and Elbasan Road—were connected to both the inner and outer rings, intersecting with the latter in the regions that were then suburbs in its broadest sense, this road conception heavily referenced the proposal set forth in the 1943-approved regulation plan, particularly for the section inside the outer ring road. The implementation of this road system established the foundations for the more structured operation of Tirana's road network, as well as the framework for the city's structural expansion and the modification of construction typologies to conform to this new framework. Unfortunately, parts of the outer ring road's projected segments were never built, which has caused circulation and connection issues across a significant part of the city. The Bërryli district up to Elbasan Road, which is currently heavily inhabited and suffers from the absence of a major transportation route, is typical of this phenomenon. It would be quite expensive to open nowadays. Time demonstrated that some of the inner ring's elements would never be constructed. Since the 1937 cartography surveys had not been updated and were not included in a separate plan, it was challenging to get a clear picture of the collapses that would result from the construction of new roads and green areas. (Fig. 1)
Traffic congestion is still a big issue because of the way the present infrastructure is set up, which was encouraged by the 1957–1958 (Fig. 2) and 1985–1989 plans as well as the proposed unfinished traffic scheme of the "Greater Tirana" Strategic Plan (2001).

## Transportation in Tirana

Road infrastructure in Tirana was one of the issues we discussed earlier, but public transportation is another crucial component that has a negative effect on this phenomenon. From 1944-1990, Albania was under the rule of a communist regime that prohibited the ownership of a private vehicle. In addition, a substandard public bus system, bicycles, a few motorcycles, and a few taxies for special occasions provided passenger transport. A small fleet of horse-drawn carriages was in use for goods transport. The poor quality of public transport in Tirana during communism stood in sharp contrast with other communist capitals, which often had very good bus and rail systems. Since the fall of communism, Tirana has experienced a population explosion from 300,000 to well over 800,000, owing to rural-urban migration (Fig 3). (Pojani, 2010)
A dual city has developed as a result of this process. New high-rise apartment complexes, usually ten to twelve stories, were constructed in the inner city at great densities, squeezed into the available space between existing buildings. Unable to afford conventional accommodation, new migrants occupied private or public agricultural property and constructed large, unpermitted dwellings on the outer edges of cities. The occupied land had limited

access to official public transportation routes and frequently lacked roads and other infrastructure. Big box stores and light industrial sprawl along the major interstate routes came after this trend. Compared to other communist capitals in East Europe, Tirana's public transportation system, which only included buses, was of deplorable quality during the communist era. (Fig. 4).

A modest fleet of 114 buses, covering 12 routes with an average distance of 12 km each, was left to Tirana from the Soviet era. The bus stock was in poor condition. Only roughly half of the buses were in operation on any given day. Typically, the buses were packed and lacked a set timetable Station wait times were frequently longer than thirty minutes. A conductor collected fares on board and issued tickets using a manual ticketing system (monthly passes were also utilized). Following the fall of communism, the land uses and density structure of the city changed, making many routes and stations inconvenient.

The hygienic, maintenance, and service standards of buses were inadequate. The air inside the buses was unbearable during the sweltering summer months in Tirana. Overcrowding was really bad on rainy days and around rush hour. In addition, busses were rather slow. Frequently, buses remained in the stations until they had enough passengers on board, instead of leaving and departing on a scheduled basis. There was no shelter at bus stops. Throughout the 1990s, the public transportation industry remained highly centralized in terms of management. (Fig. 5).

A single public enterprise offered both urban and suburban public transportation services in the city, despite the fact that there was no legal monopoly on the sector. This company, which belonged to the Ministry of Transportation, had no working capital and no debt. By the mid-1990s, bus ridership had fallen by half compared to communist times. Public transportation's modal share of trips had decreased to 16 percent by the late 1990s, with over half of those trips being to and from work. The users' transition to cars was accelerated by the subpar bus services. In a vicious circle, reduced revenue led to further deterioration. During the mid to late 1990s, the dilapidated bus fleet that had been in use throughout communism had been replaced with a colorful, mismatched fleet of used vehicles that had previously been employed in other European cities with the entrance of foreign help. Not much was done to modify their look for Tirana use. Buses frequently featured "out of service" signs in foreign languages along with the logos of the foreign businesses that had donated or sold them for low costs. Additionally, all instructions were given in foreign languages. Despite being in far better shape than the fleet they replaced, these buses did little to enhance public transportation's reputation.

Around 1999, a significant number of unofficial minivans, sometimes known as "furgons," entered the market as a result of the formal public transportation system's crisis. In fact, this type of unofficial transportation is common in underdeveloped nations all over the world. In addition to competing with the public enterprise on all public bus routes, inner-city furgons (10-seat minivans) also provided service to locations that buses did not reach. Furgons were thought to be the



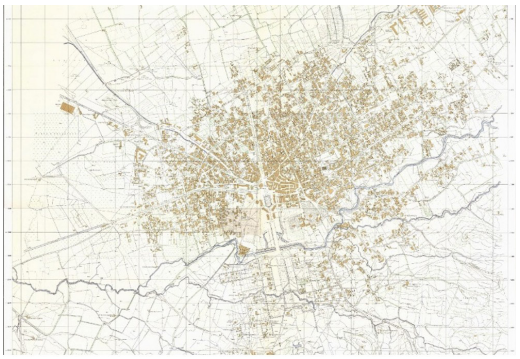

*Fig 1/ Map of Tirana 1937.*
*source/ Endritzeneli, Wordpress (2012)*

*Fig 2/ Map of Tirana 1958*
*source/ Flickr (2013)*

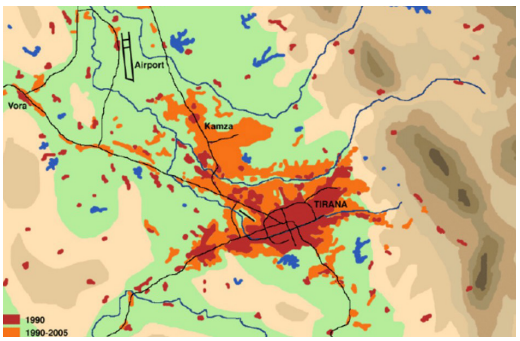


*Fig 3/ Urban expansion in the post-1990 period. (Most squatter settlements are around Kamza).*
*source/ Tirana Expansion, Wikipedia (2007)*

*Fig 4/ Public bus in the 1980s.*
*source/ Shqiperia në Vitet e Socializmit*

*Fig 5/ Transportation in Tirana in 1991.*
*source/ Christian Jungeblodt (1991)*


*Fig 1/ Map of Tirana 1937.*
*source/ Endritzeneli, Wordpress (2012)*

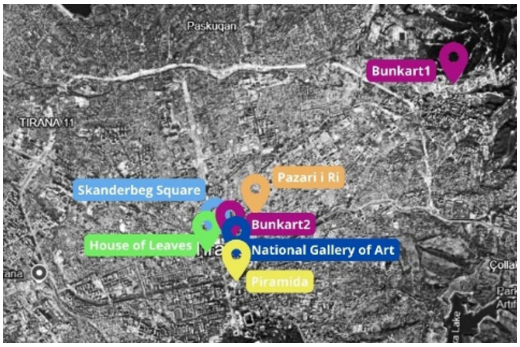


*Fig 2/ Map of Tirana 1958*
*source/ Flickr (2013)*

*Fig 3/ Urban expansion in the post-1990 period. (Most squatter settlements are around Kamza).*
*source/ Tirana Expansion, Wikipedia (2007)*

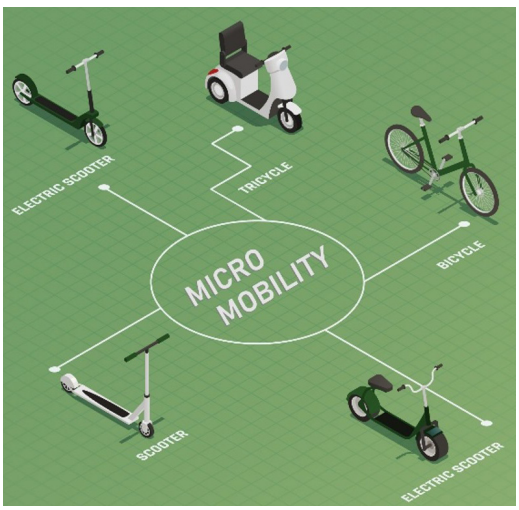


*Fig 4/ Public bus in the 1980s.*
*source/ Shqiperia në Vitet e Socializmit*

city's quickest form of transportation. In actuality, furgons' tiny size made them easier to manoeuvre in the traffic. Along the way, furgons also made "elastic" trips, picking up and dropping off individuals as needed; if police were visible at junctions, furgons changed where they stopped to evade police restrictions. The City of Tirana made the decision to privatize the public transportation system in 2001, following the example set by other East European towns. By 2006, four private businesses ran nine of the ten urban lines, which had been effectively privatized. (Pojani, 2010) These days, the City of Tirana primarily serves as a watchdog over private businesses rather than as a transportation provider. The city determines policies about how public transportation is distributed around the city, how many lines are added, where bus stops and terminals are located, how much money is given to businesses that are still in the public sector, and the conditions of agreements with private businesses. Bus users in the suburbs complained more about high fares, frequent stops, frequent changes in bus stop locations, the fact that passengers are permitted to transport trading goods on buses, and the suburban lines' lack of access to the city center than urban bus users did about overcrowding, slow speed, and low frequency. The primary factors compromising the quality of bus services are the negligence of public transportation employees, the high volume of traffic, the small number of buses, and the absence of government oversight. (Fig. 6).
Given the city's high population, moderate size, and level topography, Tirana's transportation issues and negative transport externalities might be significantly reduced without the need for extraordinary public investments. Because of this, a lot of urban travel can be done on foot, by bicycle, or by taking quick bus trips. One of the people' main concerns is the calibre of public transportation services. By conducting this analysis over the years regarding infrastructure and transportation services, this directly affects the tourism sector and the image of the city that may be created.

## Aspects of Tourism in Tirana

The tourist industry has recovered well from the pandemic, as seen by the ongoing growth in both numbers of tourists and profits. Tirana has profited from this trend by drawing more visitors to its historical and cultural sites. In 2023, there was a notable surge in cultural tourism, surpassing even the 2019 numbers. The Ministry of Culture reports that 391,608 domestic and foreign visitors visited national museums, 342,824 visited archeological parks, and 271,383 visited fortresses and other historical sites. Given the growing number of tourists, the city's mobility and infrastructural issues need to be fixed.
According to Tripadvisor and Visit Tirana, some of the top tourist attractions are:
- Skanderbeg Square
- Bunk'Art 1 & 2
- National Gallery of Arts
- Pazari i Ri (New Bazaar)
- Pyramid of Tirana (Piramida)
- House of Leaves – Museum of Surveillance

With the National History Museum, Et'hem Bey Mosque, and the Clock Tower all nearby, Skanderbeg Square is a prominent landmark in

Tirana, according to TripAdvisor. Located in a huge subterranean bunker, Bunk'Art 1 is a historical and artistic facility that provides information about Albania's communist era. The history of the Albanian Ministry of Internal Affairs from 1912 to 1991 is the main topic of Bunk'Art 2. The primary venue for showcasing and preserving Albania's visual arts legacy, the National Gallery of Arts is home to more than 4,600 pieces of art, according to Visit Tirana. According to Tripadvisor, Pazari i Ri is a newly renovated market with a range of sellers offering locally made goods, souvenirs, and fresh vegetables, all of which add to the lively atmosphere. The House of Leaves, a museum devoted to Albania's surveillance history, resides in a structure that was formerly the National Intelligence Service headquarters. The Pyramid of Tirana, which was first constructed as a mausoleum for Enver Hoxha, is now a popular tourist destination and a representation of Albania's controversial past, according to Visit Tirana. In the following map (Fig. 7) is shown the location of these attractions.

### Micromobility as a solution

To attempt to cope with problematic urban issues driven by an increase in the usage of private transportation, many tourist locations are focusing more on "micromobilities. (Fig. 8) The term “Micromobilities” is still up for debate, but it generally encompasses the non-motorised modes of walking and cycling in addition to several fast-growing new forms of mobilities. (Davies Nick, 2020) . For Tirana and tourists visiting these alluring locations, this might be a fantastic option. The last few years have witnessed significant improvements to Tirana's urban planning, especially in the area of encouraging sustainable travel. Dedicated bike lanes, scooter-sharing services like GoGreen Albania and Tirana Ecobike, as well as expanded pedestrian zones, have all been implemented by the municipality. Because of such developments, micromobility in Tirana's city core is particularly accessible. (Fig. 9) The heart of Tirana is Skanderbeg Square, which is conveniently accessible by bicycle, scooter, or foot. It is perfect for walking excursions because it is a pedestrian-only area. There are parking spaces for bikes and scooters on the nearby streets. The National Gallery of Arts is about a 5- to 7-minute walk northeast of Skanderbeg Square. On Bulevardi “Dëshmorët e Kombit”, a designated bike lane provides a secure path for scooter and bicycle users. Skanderbeg Square is only a short stroll west of the House of Leaves (Museum of Surveillance). Walking is the most convenient choice because it's situated in a small, historic street. Bunk'Art 2, located in the pedestrian zone behind the Et'hem Bey Mosque next to Skanderbeg Square, is only accessible by foot. It takes 8 to 10 minutes to walk east from Skanderbeg Square to the New Bazaar. Bicycles and scooters are permitted in this area, which is reachable by “Rruga Hoxha Tahsim” or “Rruga e Barrikadave”. Parking spaces are accessible at the entrance. The Pyramid of Tirana is most straightforward accessed by foot or micromobility via Bulevardi Dëshmorët e Kombit, and it is roughly ten to twelve minutes from Skanderbeg Square. This mode of transport is made convenient by bike lanes and scooter lanes. Bunk'Art 1 is situated close to Mount Dajti on the outskirts of Tirana, in contrast to the other attractions. Taking a city bus to the Dajti Ekspres Cable Car station is the most convenient way to get there. After taking a cable car to the location, visitors can take a quick stroll.

## Conclusions and Recommendations

The city we perceive, not just the city that is. (Lynch, 1960) The story of a city is often told through its monuments and museums, but it is lived and felt in the spaces between them—on its streets, sidewalks, and public squares. (Cullen, 1961) In Albania's vibrant capital, Tirana, a quiet revolution in urban movement is reshaping how both residents and visitors connect with its layered narrative. The city, with its favourable topography and a growing commitment to rebalancing its public spaces, is emerging as a compelling laboratory for sustainable tourism. By threading its key historical sites together with a network of bike lanes and pedestrian zones, Tirana invites us to experience its past and present not through the insulated window of a car, but from the intimate vantage point of a bicycle seat or a leisurely stroll. This shift towards micromobility does more than just lower carbon emissions; it fosters a slower, more sensory engagement with the urban environment, allowing the rhythm of the city to become part of the visitor's experience. To truly grasp this synergy, one can imagine a journey beginning at the city's reinvented heart: Skanderbeg Square. This vast, car-free civic space is far more than a crossroads; it is a statement of intent. Here, the cacophony of traffic has been replaced by the hum of human interaction, creating a democratic plaza where the city's architectural soul—a palpable mix of Ottoman, Italian, and Soviet influences—can be contemplated at a human pace. The equestrian statue of national hero Skanderbeg gazes out over a city consciously redefining itself. From this central axis, the recent history of the Albanian nation unfolds within a short, walkable radius. A cluster of sites offers a profound, if at times unsettling, immersion into the 20th century. At Bunk'Art 2, housed in a former anti-nuclear bunker, the chilling narrative of the communist regime's surveillance state is made visceral. Just steps away, the delicate beauty of the Et'hem Bey Mosque, with its rare frescoes of trees and waterfalls, provides a poignant counterpoint, speaking to an older, spiritual heritage. This dialogue between the oppressive and the sublime continues at the National History Museum, where a grand mosaic, The Albanians, attempts to visually consolidate the nation's long and complex story. The journey then pushes further, tracing the paths of memory etched into the city's fabric. A brief ride on a bicycle or e-scooter leads to the House of Leaves. This unassuming building, once the central listening post of the Sigurimi, the secret police, has been transformed into a museum of espionage. Its quiet corridors compel visitors to reflect on the architecture of fear and the fragile nature of privacy, making the newfound freedom of movement outside feel all the more significant. This theme of transformation finds its most potent architectural symbol a short distance away: the Pyramid of Tirana. Originally a mausoleum for the dictator Enver Hoxha, this concrete form is now being repurposed, its slopes a canvas for the city's youthful energy, slated to become a hub for technology and education. It stands not as a static

relic, but as a living testament to a society actively repurposing its most difficult monuments. After such intense historical engagement, the senses find respite at the Pazari i Ri (New Bazaar). This revitalized market is a feast of colours, smells, and sounds—a place to taste local specialities, hear the cadence of daily conversation, and witness the seamless blend of tradition and modernity that defines contemporary Tirana. It is a destination that feels naturally discovered, rather than simply visited, when approached via the city's human-scale transport. For those whose curiosity extends beyond the city centre, an optional excursion to Bunk'Art 1 offers a deeper, more remote dive. Accessed by a public bus ride and a breathtaking ascent on the Dajti Express cable car, this massive bunker tunneled into a mountainside is a stark reminder of the nation's isolation. The journey there, offering panoramic views of the city below, physically and metaphorically frames Tirana's past within its wider geographical and historical context. In conclusion, Tirana's ongoing investment in pedestrian and green infrastructure is more than a practical urban policy; it is a form of storytelling. By prioritizing the mobility of people over vehicles, the city is not only enhancing its tourist appeal but also actively crafting a new identity—one of accessibility, sustainability, and resilience. As visitors and residents alike weave through its streets on two wheels or on foot, they become active participants in this narrative, co-authoring a future where the journey between the past and the present is as enlightening as the destinations themselves.

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# #1

## WORKSHOP DAY


## TEAM

# BRAINSTORM


HIDRANT
ZJARRI
Evolution of the organic patterns


Lorisa Mano, Sara Shehu, Arzhen Brari, Lediano Hasano

# #2

## SITE VISIT

# CONTEXT

## Observation

# FINAL PRESENTATION

# Stakeholders

# Tirana Traffic

## The Mitigation of Traffic in Tirana through the Formal Reconceptualization of the City



**Issue 2**

A project developed in the framework of the
International Doctorate in Architecture and Urban Planning IDAUP
POLIS University, Albania / University of Ferrara, Italy

# Tirana
# Traffic

# contents

# 1
# Interdisciplinary exchanges

# From Abandonment to Interpretation:
## The Industrial Heritage Tour as a Tool for Safeguarding Albania's Industrial Past

DOI:

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**Abstract -** *This article proposes Tirana as a pioneering case for integrating industrial heritage into emerging museum networks in the Balkans and wider Europe. Although countries across Eastern Europe have, for several decades, developed systematic approaches to preserving and valorizing their industrial past, Albania despite possessing a rich portfolio of industrial-era infrastructures has not yet institutionalized such efforts. Tirana, with its emblematic sites such as the former "Kombinat and Porcelan" sites or Stalin Textile Combine and associated industrial-residential complexes, represents a unique urban laboratory where the material, social, and ideological dimensions of industrialization intersect. These sites witness not only technological and architectural histories but also the lived experiences of workers, the socio-economic transformations of the socialist period. Drawing from contemporary scholarship on industrial heritage, memory studies, and adaptive reuse, the article argues that Tirana's industrial remains hold significant potential to be reinterpreted as cultural assets within a transnational framework. Developing an industrial heritage tour connected to European and Balkan networks would allow the city to reposition itself as part of a broader narrative of modernity, labour, and collective memory. Such an initiative would also fill a notable institutional gap in Albania, where engagement with industrial heritage has thus far been fragmented, sporadic, and primarily driven by academics or the media rather than public institutions. The proposed model emphasizes three pillars: (1) systematic identification and documentation of Tirana's industrial sites; (2) reinterpretation of these sites through contemporary museological and participatory approaches; and (3) integration into existing European cultural routes, thereby enhancing visibility, educational value, and sustainable urban development. By situating Tirana within a regional and European heritage ecosystem, the article demonstrates how industrial heritage can shift from being overlooked or derelict to becoming an engine for cultural tourism, memory work, and community regeneration. Finally, the paper presents Tirana not merely as a repository of industrial remains but as a potential leader in shaping a new cultural geography of industrial heritage in the Balkans one that aligns preservation with innovation, and local narratives with transnational networks.*

*Keywords - Industrial Heritage, Albanian Industry, Balkan Tour, Museum Network.*

## Being part of the Network

### Discussion of the importance of the Industrial Heritage and touring

Industrial heritage has shifted from the conservation debates discourse to a central field where technology, labour, memory and urban regeneration intersect. The European consolidation of this field is evident in the European Route of Industrial Heritage (ERIH), which frames more than 2,500 sites as a shared memory landscape and translates dispersed infrastructures into coherent cultural itineraries and event platforms (e.g., ExtraSchicht in the Ruhr; Industriada in Silesia). ERIH demonstrates that networking is not merely promotional but epistemic: it stitches together heterogeneous remains into a legible narrative for publics, policy and markets. Kenneth Hudson's early texts "Industrial Archaeology: An Introduction and World Industrial Archaeology" shifted industrial remains from antiquarian curiosity to public-facing practice. He argued that documentation, access and didactic presentation are integral to preservation, positioning industrial archaeology as "fieldwork for industrial history" and, implicitly, as a museological endeavor. Such framing underwrites the later insistence that sites must be interpretable at scale precisely what networks enable. (Gregorio, S., Vita, M., Berardinis, P. ,2020) At the level of heritage theory, David Lowenthal's (1998) pioneering thesis that heritage is a present-centered construction warns against treating industrial residues as neutral evidences. The value and meaning ascribed to factories, machinery and

workers' districts are negotiated in the here-and-now; hence interpretive frameworks must remain reflexive and plural. This insight frames museum networking as a governance practice concerned not only with logistics but equally with the interpretation of heritage: multi-site collaborations temper monologic narratives and open space for contestation and learning. Castilo, J.J., (2011) Patrick Wright's critique of nostalgia emphasizes the argument. For Wright, heritage risks becoming a shelter for consoling myths unless it is curated as a dialogic rather than celebratory practice. Industrial heritage, loaded with memories of discipline, gendered labour, environmental damage, and unforseen deindustrialisation, is particularly tended towards simplification. Networked museum practices, by distributing the story across places, voices and media, are structurally better suited to multi-vocality and critical reflection than isolated site-museums. (Wright, P., & Davies, J. 2010). This attention to memory is extended and operationalised by Hilary Orange and collaborators in Reanimating Industrial Spaces (2020), which demonstrates "memory-work" as a curatorial method (oral histories, ethnography, digital archives) capable of re-activating post-industrial landscapes. The book's comparative cases show that when communities co-produce interpretation, industrial heritage becomes social infrastructure rather than static relic an ethos that meshes naturally with network models where knowledge production is shared across nodes. From the planning and design side, contemporary scholars on adaptive reuse have equipped industrial heritage with tools for sustainable urbanism. Coscia, Lazzari and Rubino (2024) argue that decisions about industrial sites should surface multiple values including intangible ones and integrate community preferences (e.g., willingness-to-pay) early in the process to reduce conflict and align redevelopment with identity and memory. Networked museums, in turn, provide the institutional backbone that can carry such negotiated values into stable cultural products and routes. Complementing this, De Gregorio, De Vita and colleagues propose methodological matrices for context-sensitive, circular-economy-oriented reuse, linking building-level diagnostics with territorial readings. Their approach is particularly apt for industrial ensembles that exceed single-parcel logics; a museum network can map and stage these relations, transforming scattered fragments into a legible urban "system" with educational and touristic traction. (Gregorio, S., Vita, M., Berardinis, P. 2020). If these works define how industrial heritage should be read and reused, spatial analytics explain why networking is structurally necessary. Mi Yan, Qingmiao Li and Jiazhen Zhang (2023) show that industrial heritage in the EU is unevenly clustered "dual cores, dual centres, a belt, three zones and multiple scattered points" and shaped by natural and social factors. In such a geography, single-site interventions cannot achieve narrative or territorial coherence; only networked approaches can connect peripheries and densify meaning across distances. Orange, H., (2021) Within Europe's practice, the Wieliczka Salt Mine exemplifies how industrial operations can be transformed into high-impact public heritage through sophisticated interpretation, multi-layered visitor experiences and integration into broader routes. Wieliczka's success underscores the scalability of industrial narratives and the feasibility of sustained audience development when heritage is articulated beyond its immediate locality. (www.wieliczka-saltmine.com) Tirana is a city abundant in industrial sites yet vulnerable to loss through demolition piece by piece and opportunistic redevelopment. Studies highlight the prevalence of unused or abandoned buildings built during the 1950s-1990s and call for integrated regeneration strategies that reconnect remaining structures with their historical and social contexts, precisely the kind of connecting narrative that museum networking can provide.This state of the art defends the thesis that without networks, industrial heritage risks remaining a distributed archive; with networks, it is transformed into a living educational, economic and identity ecosystem.

## Methodology

This article undertakes a qualitative methodology, integrates historical analysis, spatial reading of industrial landscapes, and comparative heritage studies to assess Tirana's potential role within emerging industrial-heritage museum networks

in the Balkans and Europe. The research design unfolds across four complementary steps. First, the study undertakes a systematic documentary analysis of Tirana's industrial infrastructures and will provide a list of sites in Tirana. Second, the article uses a heritage-theory lens informed by scholars on industrial heritage, memory studies, and adaptive reuse to evaluate how these remnants can be reinterpreted within contemporary cultural-tourism frameworks. Third, a comparative regional analysis positions Tirana within wider European and Balkan practices of industrial-heritage revaluation. By facing Albanian conditions with established models elsewhere, the methodology reveals both the gaps in Albania's institutional engagement and the opportunities for alignment with transnational cultural routes. Finally, the article develops an applied interpretive model of the Former Industrial Tour integrated into European heritage networks.

### Limitation

This study is subject to several methodological limitations that shape its analytical scope. First, the research relies predominantly on secondary sources, including scholarly literature, archival accounts, and existing documentation of Tirana's industrial sites. Given the absence of comprehensive institutional inventories in Albania, the article will not analyze a fully list of surviving industrial infrastructures, but it will bring a pioneer case study how we can promote nationally and internationally some of these sites. This article will propose a model for integrating Tirana into transnational heritage networks Second, the comparative perspective is limited by unequal data availability across Balkan and European contexts. While some countries maintain extensive industrial-heritage datasets, Albania and several neighbours do not, creating asymmetries that may affect the balance between conceptual arguments and empirical grounding.



## A short discussion among scholars

If we summarize the different point of view to the above state of art it will be: Hudson's programme insists in an establishment of a baseline, a rigorous documentation and public-oriented interpretation ensuring that material and technical histories are legible among the experts. More, Lowenthal and Wright, concluded that networked museums are more effective than an isolated museum in a specific or isolated location, they spread history widely, raise the voice and are among the better infrastructures. In continually, Coscia Lazzari–Rubino and De Gregorio, did write that planning should measure processes, analyses and design reuses that connect building diagnostics or better said "health check-up" with neighbourhood and city systems. Finally, as identified by Yan, Li and Zhang, the spatial dispersion, the whole must be assembled as a network, digital archives and temporary programs, should be aligned with pan-European routes (ERIH) to ensure visibility, standards and market access. In this light, Tirana's industrial heritage is neither a set of isolated ruins nor a single-site museum in waiting. It is not part of any network or any institutional initiative, its importance depends on curatorial strategies, community participation, and trans-local action. The European precedent shows what is It is achievable when all decision-making and participating parties work in coherence and harmony with each other; Wieliczka Salt Mine in Poland (one of the most famous mines in the world) is part of the European Historic-Industrial Site, the visitor economy potential of technically rich narratives. Another example is the former Eastern Bloc cities such as Ostrava (Czech Republic), Katowice (Poland) and regions of Slovakia have old mining and metallurgy industries integrated into tourism.

The Albanian researcher, Pashako, F. and Salihaj, O () researches on former Stalin Textile Combine in Tirana identifies community memory, spatial deterioration, and strategic location as key factors justifying its regeneration, proposing adaptive reuse approaches that reconnect the site to contemporary urban life. Blerim Nika, whose international doctorate explores the adaptive reuse of Albanian industrial structures through energy-efficient and passive architectural systems. His research frames abandoned industrial buildings as strategic assets for sustainable development rather than burdens. Therefore, the conclusion of academics and researchers is that industrial heritage is not only important as a document of preservation of technology and work, and as a testimony of social and economic life, but also that networking of museums is the most promising methodology to protect, interpret and activate it in ways that are intellectually honest, socially inclusive and economically sustainable. In this point of discussion Tirana is well positioned to lead this change in the Balkans. While Europe and parts of Eastern Europe have long operationalized industrial heritage through networks and events, Albania's engagement has been sporadic, almost non-existent, and mainly personal initiatives, outside of institutional commitments. More broadly, Albanian scholars argue that industrial heritage in and around Tirana is a potential driver of sustainable urban development if addressed through adaptive reuse and networked planning rather than isolated preservation.

## A Narrative Analysist: To be or not to be an Industrial-Heritage Tourism

Tirana is a city with a rich historical heritage, rich urban morphology and has always been in the focus of the economic strategy that has been even more developed in recent years, an even greater boost came when it was named the European Youth Capital. This lends support to the hypothesis of this article to include Tirana as a broader model of industrial heritage and post-industrial tourism. Referring to the archive and field visits as well as evidenced by contemporary research, Tirana possesses a vast infrastructure built during the industrial era, although today almost all of it is inactive. They are a treasure trove for research, reflecting the technological, social and ideological layers of Albania's socialist industrialization. Academic studies on the urban regeneration of Tirana's industrial heritage emphasize that the city still contains numerous former factories, production buildings, and industrial districts whose abandonment has resulted from post-1990 deindustrialization, yet whose potential for adaptive reuse remains significant. This body of evidence demonstrates that Tirana's industrial traces are not marginal anomalies but embedded elements of its urban fabric, creating a legitimate foundation for industrial-heritage tourism. (Curraj, E. Hasanaliaj I., 2025)

### Tirana as a Post-Industrial Urban Destination

An additional point of view of the Tirana potential role is the emerging profile as a post-industrial urban tourism magnet. A study assessing Tirana as an "attractive modern urban area for tourism" reveals that the city's appeal no longer depends on antiquity but on its modern landscape, urban vibrancy, new commercial centers, and post-communist transformation, all of which have

contributed to significant increases in tourist numbers. This aligns directly with the global trends towards post-industrial tourism, where visitors are drawn to cities that exhibit the urban, spatial and social transitions of industrial production to contemporary urban life. Tirana's rapidly evolving cosmopolitan identity places it firmly within the emerging typology of cities where industrial inheritance coexist with contemporary development history.

## Existing Cultural-Heritage Initiatives as Institutional Foundations

Although Albania has yet to institutionalize industrial-heritage tourism, there are signs of emerging frameworks capable of supporting it. The Tirana Heritage Roots initiative, new initiative by DMO Albania, funded by Boost Balkans. launched in 2025, focuses on digitally documenting the city's heritage, developing thematic itineraries, and engaging communities in storytelling and heritage interpretation. While its core mission is cultural rather than industrial heritage, it establishes regional and methodological foundations digital archiving, thematic routing, community participation that are highly transferrable to industrial-heritage contexts. This demonstrates that the city already possesses the institutional scaffolding needed to integrate industrial sites into broader heritage tourism offerings. (Veleshnja, J.,2024) .

## Tirana in the European Post-Industrial Context

Other post-socialist capitals like Warsaw, Poznań, Bratislava, Bucharest etc where industrial heritage forms a central component of post-East tourism itineraries, shows us that Tirana is walking in the same path. Tourists increasingly seek to understand the socio-economic transitions of such cities, exploring themes of deindustrialization, socialist production systems, and the reclaiming of industrial spaces in contemporary urban life. Although this argument is discussed at the conference of UPT on 2025 Curraj, E. Hasanaliaj I., 2025) still it is more a concept, an analogous perspective built from models documented in the broader literature and is consistent with the situation described for Tirana in academic works.

## Industrial Sites as Narrative Anchors

Crucially, Tirana contains industrial sites with strong narrative and spatial potential, most notably like the Stalin Textile Combine (Kombinati), one of Albania's most significant industrial complexes. Document its scale, socio-economic impact, and transformation from an industrial hub to a fragmented post-industrial district. According to Word Bank 2025, such sites are ideal candidates for industrial-heritage walking tours, post-industrial regeneration tours, and memory-based storytelling routes, aligning with contemporary European practices of linking industrial spaces to labour histories, gendered experiences of production, everyday socialist life, and post-transition urban changes.

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# Industrial Sites in Tirana

In 2019, the Central Technical Construction Archive undertook an important initiative with the Polytechnic University of Tirana, digitalizing the former industrial sites in Tirana. This remains the first and only project in which a government institution has partnered with academia to document and preserve Albania's Industrial Heritage. The Archive provided to the team, students and professors of this university, the original plans, photos and historical material which then were digitized.

The publication by Bushati, E., Mezezi, I., and Thomai, G., "Documenting the Industrial Building of 1945-1990" (2019), represents an essential contribution to this field. However, the documented materials cover only a portion of the existing industrial sites in Tirana. Many others remain to a limit excited explored, lacking detailed historical, technical, and architectural analysis. Therefore, I warmly encourage other researchers, scholars, and practitioners to engage further with the study of these industrial sites. Their histories, typologies, social impact, and architectural evolution present a significant and yet largely unexploited field of research, one that is important for understanding and urgent for preserving Albania's industrial heritage as a whole. This list is not exhaustive; rather, it represents an initial foundation for continued research and documentation. Many industrial sites remain insufficiently studied, and their historical, architectural, and technological narratives are still to be uncovered. Among the sites in Tirana requiring further investigation are the: "Partizan" Factory, Electromedical Factory, Wooden Board Factory, Beer Factory, Bread Factory, Oil Painting Factory, Transformer Plant, Ceramic Factory, Silicate Brick Factory, Construction Enterprise "21 Dhjetori", Educative Equipment Enterprise

# Tirana: A Pioneer in Industrial Heritage Tourism (Scenario)

This session will design an action plan introduces the Tirana Industrial Heritage Circuit, a cultural route that connects multiple sites to narrate the intertwined histories of technology, labour, everyday socialist urbanism, and post-1990 transition. Designed in accordance with European Route of Industrial Heritage (ERIH) criteria, the initiative aims to position Tirana as a future reference point and thematic route node within the broader European network. Interpretation across the circuit will combine themes such as technology, gendered labour, ideology, ecological transformation, and post-socialist transition, reflecting scholarly analyses of Tirana's degraded post-industrial zones and the urgent need for responsible, community-

| Year | Name of the Industrial Buildings |
|---|---|
| 1947 | "Stalin" Textile Plant;<br>"Enver" Plant;<br>"Misto Mame" Plant |
| 1952 | "Mihal Duri" Plant;<br>TEC;<br>Passenger Automobile Park |
| 1957 | State Construction Enterprise (NSHN) "Rruga Ura"; "Josif Pashko" Combine |
| 1960 | "Ali Kelmendi" Food Complex;<br>"Dinamo" Plant |
| 1967 | Pipe Factory |
| 1970 | Polygraphic Plant;<br>Antibiotic Plant;<br>Glass Factory |
| 1974 | Antibiotic Plant |
| 1978 | "Enver Hoxha" Tractor Plant;<br>"Dajti" Plant;<br>Agricultural Equipment Plant |
| 1980 | OAN Construction Vehicle Plant |
| 1981 | Electromedical Plant |
| 1982 | Officine Geological Park |

*Tab. 1. Industrial buildings.*
*Source/ Authors*

oriented reuse. This interpretive strategy follows ERIH's multilayered approach to public education and cultural valorisatio, keeping the narrative both rigorous and easy to engage with. Advancing from this starting point, a complementary module on Communist/Red Heritage will further situate Tirana within the wider post-socialist tourism networks of Bucharest and Central/Eastern Europe. This module will operate under strict ethical guidelines,embracing multiple perspectives, avoiding nostalgia-driven propaganda, and centering lived contradictory memories that characterize the socialist past. Through this approach, the framework maintains a clear distinction between European practices of interpreting communist heritage and the state-driven "Red Tourism" model seen in China.

The circuit will be operationalized through three scalable visitor experiences:

- Industrial Tirana – Core Loop (5–6 hours): Kombinat , Uzina Autotraktori, Porcelain/Bread
- Factory, supported by layers, archival media, and pop-up micro-exhibitions.
- From Factory to City (Full Day): Core loop plus satellite visits (e.g., former glass/tile plants) and a hands-on adaptive-reuse workshop.
- Memory Night Walk (Evening): Archival projections (Porcelain 1980; Kombinat 1950-80) and community storytelling.



## Structuring the Circuit: Three Thematic Corridors

The first phase consists of defining and curating three interpretive corridors, each capturing a different industrial typology and historical narrative.

### *Corridors Corridor 1: Textiles & Energy – Kombinat.*

Centred on the Stalin Textile Combine, an integrated industrial-residential complex built between 1949 1951 with its own thermal power plant (TECI), this corridor interprets production processes, workers' housing, social services, and the lived experience of labour in a "factory-city" that once employed thousands. Urban reading tools entry panels, interpretive stops, and oral histories enable visitors to reconstruct the rhythms of socialist industrial life. Ongoing initiatives to transform former industrial zones into eco-industrial parks provide a contemporary frame for discussing sustainability and future reuse.

### *Corridor 2: Mechanics & Mobility – Uzina Autotraktori*

The 1976–1978 Tractor Plant, once the largest mechanical enterprise in Albania, represents the apex of socialist engineering and the symbolism of producing the first Albanian tractor. Surviving structures enable thematic stops on machining, prototyping, and industrial organisation across three work shifts.

### *Corridor 3: Food, Porcelain & Industrial Craft – Central/Peripheral Tirana.*

This corridor connects former food-processing infrastructures, such as the publicly recorded case of the state bread factory and the post-privatisation evolution of Miell Tirana, illustrating shifts from socialist distribution chains to market-economy diversification. It further includes the Tirana Porcelain Factory, documented in the 1980 film "Our Porcelain," offering material for an exhibition

*Fig. 1. Kombinat Site View 1963*

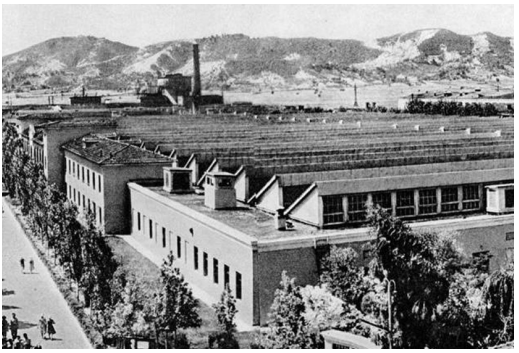

*Fig. 2. Textile Plant Site View 1963*

*Fig. 3. "Traktore" Plant, Air View 1965*

*Fig. 4. "Traktore" Plant, Drone View 2021*

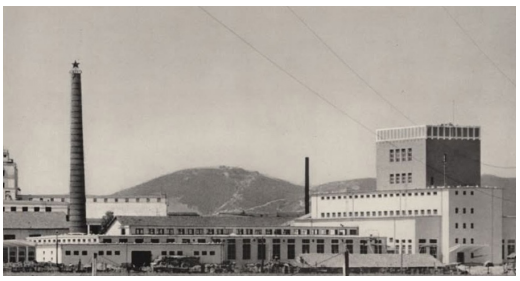

*Fig. 5. Food Processing Plant "Ali Kelmendi"*

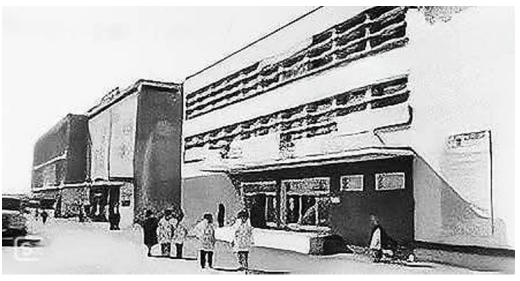

*Fig. 6. Meat and Milk Processing Plant 1976*

on industrial design and decorative production. The Migjeni Artistic Enterprise complements the narrative through its hybrid "industrial-artisan" output. The successful implementation of this initiative depends on coordination of collaboration among key actors, including the Municipality and its Destination Management Organization, academic institutions, local communities, and private/ tour operators. Universities and academics play a particularly important role through the collection of oral histories, spatial mapping, and research that grounds the route in lived experience. Community involvement ensures that local knowledge and memory guide the interpretive direction, while private operators help operationalize the circuit within the city's tourism ecosystem. A central step in formalizing the initiative is submitting an ERIH membership application, which would position Tirana within established European industrial heritage networks and enhance its international visibility. To monitor progress, the action plan proposes a clear set of Key Performance Indicators, such as route adoption, visitor volume, increased dwell time, the number of recorded oral histories, operator participation, and engagement from educational institutions. These KPIs align with broader regional trends in heritage education and experiential cultural tourism.

## Conclusion

The combination of Tirana's material heritage, its evolving urban landscape, and its emerged institutional initiatives together make a strong case for its inclusion in industrial heritage tourism networks. The city brings together the visible remains, rich narratives, and initial institutional efforts that make the creation of industrial heritage routes not only possible but promising. With strategic interpretation and integration into European cultural networks, Tirana can evolve from a city whose industrial relics have long been neglected into a meaningful reference within the broader geography of post-industrial tourism in the Balkans and Europe. As highlighted by Coscia, Lazzari and Rubino (2024), the long-term success of industrial heritage preservation depends fundamentally on the meaningful involvement of local communities. Their study shows that industrial sites carry multiple layers of value, social, cultural, historical, and emotional, that cannot be fully understood through technical assessments alone. By integrating community perspectives into decision-making, adaptive reuse projects become more legitimate, more context-sensitive, and ultimately more sustainable. Community engagement not only enriches the evaluation of what should be preserved, but also strengthens public ownership, ensures continued use, and promotes redevelopment that responds to local priorities. In this light, industrial heritage preservation is most effective when it becomes a collaborative process, co-produced with the people who live with, remember, and give meaning to these places through lived experience. In this context, the creation of a museum network for industrial heritage becomes deeply aligned with these principles, offering a platform where community values, memories, and interpretations can be actively integrated into preservation and interpretation efforts. Although many European and Eastern European countries have long established their industrial heritage through organized networks and recurring initiatives, Albania's engagement with industrial heritage has been irregular and largely driven by individuals, rather than institutional support. Albanian researchers note that the industrial sites in and around Tirana present a valuable opportunity for sustainable urban growth. They addressed it through adaptive reuse and coordinated planning, rather than isolated conservation actions, these sites could contribute meaningfully to sustainable urban development. Moving from isolated efforts to coordinated strategies is therefore essential for realizing this potential. The challenge now is to shift from sporadic engagement to coordinated, long-term strategies capable of unlocking this potential.

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# Strengthening Tirana's Infrastructures to Reduce Traffic Congestion

## Possible solutions, best practices and success stories

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**Abstract -** *Traffic congestion in Tirana has become a critical urban challenge shaped by multiple interrelated factors, including inadequate public transport, fragmented urban development, insufficient road infrastructure, weak traffic management, poor parking regulation, limited pedestrian accessibility, and inconsistent enforcement of the Highway Code. This article examines these structural deficiencies and proposes an integrated roadmap for reducing congestion through coordinated spatial, institutional, and transport interventions. The study is developed within the theoretical framework of the UPT – Urban Planners' Toolset project, which aims to support urban planning processes through software-based analytical tools. Methodologically, the article is based on an extensive literature review of both Tirana-specific studies and international best practices, focusing on infrastructure and governance-related dimensions of congestion rather than motorisation growth itself. The analysis identifies several priority measures: implementation of the planned electric Bus Rapid Transit (eBRT) corridors; redesign of the public transport network through a hierarchical model and performance-based contracts; deployment of adaptive traffic signal systems; establishment of a metropolitan mobility governance authority; transition from a monocentric to a polycentric urban structure; formalisation and infrastructural upgrading of informal settlements; stronger parking management; and improvements in pedestrian safety and road rule enforcement. The findings suggest that congestion in Tirana is not merely a transport issue, but a manifestation of broader urban and institutional fragmentation. Therefore, effective mitigation requires a multidimensional and phased strategy combining quick wins, medium-term reforms, and long-term structural transformation. Despite data limitations and the absence of scenario modelling, the article contributes to defining planning requirements for UPT and provides a policy-oriented framework for addressing traffic congestion in Tirana.*

*Keywords - Tirana; traffic congestion; public transport; urban fragmentation; metropolitan governance*

## Introduction and Diagnosis of the Current Situation

The main causes of traffic problems in Tirana can be summarised as: the rapid growth in vehicle ownership has outpaced the development of infrastructure and road network capacity (already discussed in another article); the inadequate public transport on all fronts, i.e. quantity, quality and reliability; the insufficient road infrastructure and the inefficient use of existing capacity; parking shortages and dysfunctional parking management; a weak and inconsistent traffic policing services; an unplanned urban development and severe multidimensional fragmentation; deficiencies in pedestrian infrastructure and significant road safety issues; road construction and maintenance works that further worsen the situation. In light of this summary, this article proposes several solutions. The main ones are listed below. The first is the development of three main electric transport corridors for e-BRT rapid buses, already planned, which will serve as high-frequency, high-speed backbones to connect secondary lines in a hierarchical model. Another one is the use of performance-based contracts for public transport rather than per-kilometre contracts. Then, the use of adaptive traffic light signalling systems for optimal traffic control at critical junctions. Also, the reorganisation of the metropolitan traffic governance authority for Tirana and surrounding cities, in particular Kamëz, Vorë, and Durrës, is creating a single entity with management and coordination tasks. Mandatory is also a comprehensive improvement that formalises informal settlements by creating roads, services, and utilities. At the urban form level, the transition from a monocentric Tirana to a polycentric structure, with 5-7 secondary centres, follows a transit-oriented development (TOD) approach. Finally, much stronger, more efficient and effective

management of parking and, in general, compliance with the Highway Code, including through automatic enforcement tools, and the implementation of road safety programmes for pedestrians and cyclists.

## Objectives and Methodology

This article is part of a theoretical framework of a larger project named UPT-Urban Planners' Toolset. The UPT project aims to develop a set of software tools to support urban planners in their work. It will be grounded in solid theoretical foundations in both urban planning and computer science. A main analysis of the reasons for traffic in Tirana is conducted to support the definition of requirements for some modules of the UPT project (mobility and traffic measurement, crowd measurement, public participation and citizen engagement, etc.). This article also proposes best practices and potential solutions to reduce traffic congestion in Tirana. The rapid growth in motorisation is not considered in this document, as it has already been discussed in another article that also analysed congestion charging. This document focuses on the infrastructure that must be strengthened to reduce traffic congestion. The methodology followed has been a deep literature review to identify both prior studies on issues and on solutions. This literature review has focused on research on infrastructure deficiencies in Tirana and potential solutions, while also considering the lack of available data at the outset of the research. The literature has been selected to focus on the main causes discussed in section 1.1, excluding rapid motorisation growth. For each item, an analysis of the context in Tirana has been conducted, considering both past and planned projects, success case studies, and best practices. After the literature review, the gathered information has been organised and summarised in the results section. Then a discussion of these results was held, and conclusions were drawn.

## Analysis

### Inadequacy of public transport

A factor significantly affecting traffic congestion in Tirana is the urban public transport system, which is almost entirely based on buses and is characterised by limited capacity, coverage, comfort, and reliability (Transformative Mobility Foundation, 2024; GIZ, 2025). According to analyses conducted by the Transformative Mobility Foundation, in 2024, the urban service operated approximately 314 buses in a metropolitan area of over one million inhabitants, corresponding to one bus for every 2,800-3,000 residents (Transformative Mobility Foundation, 2024). The average operating speed was approximately 11 km/h, with speeds dropping to 5-7 km/h during peak hours and on certain sections of the network (Transformative Mobility Foundation, 2024). Waiting times on many lines typically range from 10 to 30 minutes, with significant service irregularities, a lack of real-time information, and frequent overcrowding, which often makes it impossible for some passengers to board at the busiest stops (Transformative Mobility Foundation, 2024). A significant part of the fleet consists of second-hand diesel buses, which are generally old and are characterised by high pollutant emissions and recurring technical reliability problems (Transformative Mobility Foundation, 2024).Passenger information systems and network maps are incomplete and not fully integrated. User satisfaction surveys indicate that approximately 80% of users rate public transport services as poor or very poor, while only 6% are satisfied (Transformative Mobility Foundation, 2024). These critical issues encourage the use of private cars among potential users who can afford them, thereby exacerbating urban traffic congestion or, at best, preventing any reduction in it.

### Electric Bus Rapid Transit - eBRT

One element that could significantly reduce urban traffic congestion in Tirana is the electric Bus Rapid Transit (eBRT) project, known as Green Transport Tirana. The initiative is supported by the European Union, the German development bank KfW and the Western Balkans Investment Framework, in collaboration with local institutions (Western Balkans Investment Framework, 2024; Albanian Daily News, 2024). The project involves constructing three main corridors by 2029 (Western Balkans Investment Framework, 2024; Balkan Green Energy News, 2023).The eBRT infrastructure will feature physically separated lanes in corridors with the highest demand and the introduction of intelligent transport systems

*Fig. 1. Public transport service in Tirana*



(ITS) to ensure traffic light priority at intersections (Western Balkans Investment Framework, 2024; Albanian Daily News, 2024). The service will be provided by modern, high-capacity electric buses equipped with level platforms and rapid, integrated ticketing systems. Stops will also be equipped with real-time information systems and high standards of accessibility and comfort (Western Balkans Investment Framework, 2024; Transformative Mobility Foundation, 2024). According to the project specifications, the intervention, which will begin in 2023–2024 and is expected to be completed by 2029, should enable an increase in average operating speed to around 20 km/h, the transport of approximately 60,000–80,000 passengers per day along the three corridors, and a substantial improvement in the reliability and comfort of the service, thereby encouraging a modal shift from private cars and private s to public transport (Western Balkans Investment Framework, 2024; Transformative Mobility Foundation, 2024).

## Redesign of the urban public transport network

A second element of intervention is the redesign of the network. This redesign of the network must account for the introduction of eBRT lines, which will form its high-speed, high-capacity backbone, within a hierarchical network model (ITDP, 2017).
Starting from the main corridors served by eBRT, feeder lines will be created to connect neighbourhoods and secondary centres to eBRT stations (ITDP, 2017). At the same time, the structure of the lines will need to be rationalised to reduce overlaps and serve the main demand hubs: schools, universities, hospitals, business and commercial districts (Crozet, 2020). This approach is essential for effectively reducing congestion (Crozet, 2020). In this context, the bus fleet should be expanded and modernised to reach 450-500 buses, with a clear transition path towards European and electric vehicles (European Commission, 2020; Transformative Mobility Foundation, 2024). As already mentioned, it is essential to move from contract models based mainly on a cost per kilometre to performance-based gross cost contracts, in which operators are paid per kilometre but receive incentives through bonus and penalty mechanisms linked to the quality, reliability and punctuality of the service (Crozet, 2020). To maximise the efficiency of such contract forms, it is essential to draw on similar experiences, for example, in London, Hordaland County, Norway, New Zealand, and the Copenhagen metropolitan area. In London, the introduction of Quality Incentive Contracts in the urban bus transport system has shifted from cost-based to gross-cost contracts with incentives for service quality. Following their introduction, there was a reduction in excess waiting time from 2.1 to 1.1 minutes and an increase in demand from 1.3 to 1.8 billion journeys per year, as well as an improvement in the economic performance of operators, with a shift from penalties to positive bonuses (Transport for London, 2008; Greater London Authority, 2006). Costs per kilometre also remained virtually unchanged, despite increases in wage and energy costs (Greater London Authority, 2006). In Hordaland County, Norway, the quality contracts system is strongly performance-oriented, setting compensation based on kilometres, hours of service, and passengers carried, while leaving operators considerable autonomy in setting timetables, fares and route configuration (Bekken et al., 2006; Aarhaug & Fearnley, 2016). In New Zealand, another success story, public transport has been reformed under the so-called Patronage Funding Scheme, which comprises three elements: a base rate, initial contributions, and demand-related incentives. This approach made it possible to quantify the social benefit in terms of internalisation of benefits: 8–13 pence per passenger-kilometre during normal hours and 40–50 pence during peak hours. This result was achieved through the link between operator incentives and the number of passengers carried. This policy has encouraged operators to attract customers by improving their service, thereby persuading people to reduce their car use (New Zealand Transport Agency, 2014).
In the Copenhagen metropolitan area, contracts are awarded through a highly competitive process based on service quality. The tender specifications include multidimensional evaluation criteria based on variables such as cleanliness, punctuality, safety, and customer service quality. The systematic, combined use of bonuses and penalties has enabled the maintenance of high service standards over time and led to continuous improvement in operational performance (Nielsen et al., 2005). These experiences, like others not reported in this document, demonstrate how performance-based gross cost contracts improve the efficiency and effectiveness of public transport, triggering a virtuous cycle in which improved service leads to increased use, reducing urban congestion. In Tirana,

*Fig. 2. Tirana as a monocentric city*
*Source/ Anil Baki Durmus*

a combination of elements from these models could be envisaged rather than a single model. In addition, a gradual rollout would be appropriate, accompanied by data collection that, over time, would allow the initial scheme to be refined to reflect Tirana's specific characteristics. The main risks associated with the reorganisation of the network and the introduction of performance-based contracts can be summarised as operator resistance to change, the quality of the data collected, limited institutional capacity and the technological challenges of location, monitoring and interoperability systems (Crozet, 2020; World Bank Group Independent Evaluation Group [IEG], 2017). These risks can be mitigated through the early and organised involvement of operators, the adoption of independent monitoring and data auditing systems, the use of international technical assistance, the definition of competition- and quality-oriented tendering procedures, the strengthening of transparency mechanisms, and the allocation of part of the revenue from congestion charges and paid parking to the financing of public transport (Crozet, 2020). Furthermore, in order to fully leverage investments in eBRT, it is necessary to develop a unified Mobility as a Service (MAAS) platform that integrates buses, eBRT, future rail lines, bike sharing and possibly car sharing, complementing them, as will be seen later, with large car parks in strategic areas (entry points to the city) (OECD/ITF, 2021; European Commission, 2020). An integrated ticketing mechanism with smart cards and mobile apps will also need to be introduced, including daily and monthly fare capping, real-time multimodal journey-planning services, and service-disruption alerts (European Commission, 2020; Transport for London, 2020).

## Urban Fragmentation

Tirana has inherited a post-socialist transition morphology that significantly impacts traffic. Starting from a structure based on centralised planning, the post-communist period has, to a large extent, seen rapid development driven mainly by the free market, with a high degree of informality and deregulation (Pojani, 2010; Aliaj et al., 2003). Also, as a result of this transition, the city of Tirana shows clear signs of fragmentation across multiple levels. The first level is administrative fragmentation, combined with governance of the metropolitan area that still has weaknesses that limit its capacity for coordination and territorial planning, as well as for infrastructure and mobility (Aliaj, 2014; IEG, 2017). There is also spatial and morphological fragmentation, characterised by the spread of numerous informal settlements, with high central densification and unplanned polycentric development in the suburbs (Pojani, 2010; UN-Habitat, 2017). Tirana also experiences socio-economic fragmentation: the northern suburbs have a higher concentration of low-income households, while the southern and south-eastern areas are predominantly home to more affluent groups (Aliaj et al., 2003; Pojani & Stead, 2015). Finally, there is infrastructural fragmentation due to the uneven distribution of the road network, public services and urban facilities. Infrastructure development has largely been reactive rather than coordinated with demographic and territorial evolution. All these factors compromise the effectiveness of the urban system and exacerbate congestion problems (IEG, 2017; UN-Habitat, 2017). A further element of fragmentation is spatial and morphological. In Tirana, there is simultaneous central densification, with infill development and vertical extensions, the conversion of courtyards and green spaces, and uncontrolled suburbanisation, characterised by low-density development along access roads (Aliaj et al., 2003; Pojani, 2011; UN-Habitat, 2017). This results in the coexistence of planned socialist-era superblocks and spontaneously evolving informal areas, along with large commercial complexes and gated communities. All these elements are often loosely connected (Hirt, 2012; Stanilov, 2007).

In practice, Tirana presents itself as a monocentric but unplanned city, overwhelmed by traffic that, as already mentioned when discussing the increase in private vehicles, makes it practically ungovernable, especially during peak hours (World Bank Group Independent Evaluation Group [IEG], 2017; Pojani & Stead, 2015). Poorly connected networks result in limited route choices, creating bottlenecks and making it difficult to design efficient public transport routes, as well as challenging the design of safe routes for pedestrians and cyclists (IEG, 2017; OECD/ITF, 2021). Due to this multidimensional fragmentation, the problem of urban congestion presents numerous and complex variables to manage. From a strategic perspective, fragmentation should be addressed by establishing a single metropolitan authority with jurisdiction over strategic transport planning and territorial and infrastructure development for Tirana and adjacent areas, including the Tirana-Durrës functional area. This authority would be able to define policies for high-speed, high-capacity public transport corridors and to coordinate investment in roads and, more generally, network connections, linking these to urban and territorial development. In this way, public transport would be coordinated with the development of the urban network. To facilitate this process, the metropolitan authority should comprise representatives of the various municipalities, the central government, and other stakeholders, primarily citizens (European Commission, 2020; OECD/ITF, 2021). A second vitally important element is the development of a polycentric urban structure. It is therefore necessary to plan and develop secondary centres, such as Khamez, Kashar, Kombinat and Lapraka, creating a local micro-economy, services and infrastructure,

with high-quality public transport hubs, public spaces and adequate civic facilities. This type of organisation, by virtue of the local micro-economy, also involves decentralising the flow of people and, as a result, facilitates reducing flows to and from the central core. The load removed from the original central hub would consist of much shorter routes that cross the suburbs and are therefore more practicable. Consequently, creating multiple centres would reduce congestion, relieve the centres, and shorten routes. A further strategic element is the formalisation of informal situations and the fight against uncontrolled urbanisation, while also strengthening informal settlements. It is necessary to activate legalisation processes alongside infrastructure retrofits, thereby regularising property rights; building or upgrading local road networks according to geometric standards that respect the optimal morphology for the local spatial context; and deploying infrastructure for water,

| Dimension | SCOOT | SCATS |
|---|---|---|
| Control philosophy | Fully traffic responsive, optimises splits, offsets, and cycle time continuously using on-street detectors. | Adaptive, plan-based; selects and tunes timing plans from a library based on real-time volume/occupancy data. |
| Typical delay reduction vs fixed/coordinated plans | About 10–20% average delay reduction; some case studies report 17–38% reduction in vehicle delay on specific corridors. | Around 15–20% average delay reduction; case studies report consistent reductions in stopped delay at major intersections. |
| Travel time improvements | 5–20% reduction in journey times on corridors; up to ~8% in Toronto trials and >20% during incidents. | Measurable travel time reductions on major routes in field deployments (e.g., Park City, Mashhad), with best gains in peak periods. |
| Stops and queues | Strong performance under non-recurring congestion; adapts to incidents and can cut delay 6–25%+ during lane closures. | More robust under detector or pattern changes, but incident responsiveness depends on configuration and plan set; generally, improves recovery vs fixed timing. |
| Detector requirements | Typically, dense detector deployment (loops or equivalent) on approaches; higher data dependency. | Can work with more limited detection (key approaches), somewhat less detector-intensive in many deployments. |
| Tuning and maintenance effort | Requires careful calibration but then self-optimises; more engineering effort up front, less need for periodic retiming. | Emphasises central rule-based logic and automatic calibration; marketed as reducing the need for recurring field surveys and retiming visits. |
| Typical strengths | Very good along busy corridors, where continuous optimisation yields strong delay and travel time savings; strong bus priority integration. | Very good network-wide robustness, especially where patterns shift over time; often praised for operational stability and reduced retiming effort. |
| Typical limitations | Benefits diminish once the network is fully saturated; requires reliable detectors and communications. | Performance varies by site and time of day; improvements at major intersections can be mixed and depend on configuration. |

*Tab. 1. Quick SCOOT vs SCATS comparison table*
*Source/ Authors*



sewerage, electricity, and public lighting services. At the same time, it is necessary to introduce public transport routes with appropriate manoeuvring and stopping spaces, and to allocate space for schools, clinics, hospitals, parks and other community centres. The decentralisation strategy requires close coordination, making the metropolitan authority even more vital. In practice, Tirana should aim to become a polycentric city which, while maintaining strong inter-centre communication links, would significantly reallocate traffic at the local level and relieve the other centres.

## Road infrastructure and traffic management

Tirana's road network was largely designed for a much smaller, monocentric city and has not kept pace with population growth, suburbanisation and private motorisation, as already analysed above (Aliaj et al., 2003; Pojani & Stead, 2015; World Bank Group Independent Evaluation Group [IEG], 2017). The main features are a radial structure centred on the city centre and a low degree of completion of road rings or ring roads. Ongoing upgrades to the Tirana-Durres motorway are not yet complete, making the separation between local and through traffic inadequate (IEG, 2017). Bottlenecks are frequently encountered at large roundabouts, at-grade crossings and intersections of arterial roads. Finally, the lack of grade-separated junctions at critical points and, in some cases, poor intersection design increase congestion. This structural deficit is exacerbated by inefficient traffic light management and illegal parking (IEG, 2017; Pojani & Stead, 2015). To address road infrastructure and traffic management problems, it is necessary to complete and rationalise ring roads and bypasses, creating a functional system such as Milan's, with radial and ring roads and the completion of large ring

road segments. This process of infrastructure upgrading should be coordinated with the polycentric evolution described in the previous section (OECD, 2012; European Commission, 2020). To provide alternatives that do not cross the city, the development of slip roads would allow long-distance traffic, including freight, to be diverted from the centre (Nugmanova, 2019).

Another element of relief is to design intersections that minimise conflict between traffic flows, ensuring safe and efficient entry and exit routes (ECMT, 2007). Another highly effective measure would be to adapt intersections to the use of adaptive traffic light control technologies. Better management of traffic flows and traffic light timing would reduce a major factor of congestion: conflict between traffic flows at intersections (Papageorgiou et al., 2003; European Commission, 2020). Traffic light coordination along corridors is weak or nonexistent, causing queues to build upstream and blocking earlier intersections in a domino effect.

Regarding advanced traffic light systems, two solutions of proven maturity can be proposed. The first is SCOOT (Split Cycle Offset Optimisation Technique), developed in the United Kingdom and based on real-time adaptive models. SCOOT is based on data measured by field sensors, allowing traffic light cycles to be adapted at high frequencies (Department of Transport, 1999). The second is SCATS (Sydney Coordinated Adaptive Traffic System), developed in Australia, based on a library of pre-calculated schedules, selected according to conditions observed in real time (Roads and Maritime Services, 2010). At Tirana's urban, congested, and dynamic intersections, SCOOT is potentially the most suitable, especially along corridors with high-frequency bus lines (Stevanovic et al., 2009). Of course, whatever technology is chosen will have to integrate with the ITS planned for eBRT lines.

## Poor enforcement of the Highway Code

Another very critical issue is the poor enforcement of the Highway Code. Although there is a significant regulatory framework for penalties, the enforcement of the Highway Code rules is often inconsistent and heterogeneous across the territory (World Health Organisation [WHO], 2023).

The most common violations are speeding, particularly on arterial roads; failure to give way to pedestrians; running red lights; illegal parking; and distracted driving, for example, due to mobile phone use (WHO, 2023; European Commission, 2020).

Accident data in Albania indicate that road accidents are among the leading causes of serious injury or death, with a high incidence among young male drivers, high speed and alcohol use (WHO, 2023).

A strategic approach to enforcing compliance with the Highway Code should be based on a city-wide network of automatic enforcement systems, such as fixed and mobile speed cameras, cameras to monitor red light running at high-risk intersections, cameras to monitor bus lanes and illegal parking, integrated with ANPR automatic number plate recognition systems, and a modern traffic control centre for centralised data processing and automatic notification of penalties (World Bank, 2020; NCSL, 2022; City of Ottawa Auditor General, 2024; Unity5, 2024). At the same time, it is also necessary to professionalise and supervise the traffic police, for example by introducing body cameras and GPS tracking for patrols, providing advanced training on road safety, professional ethics and how to interact with vulnerable road users, as well as performance evaluation based on safety results rather than quantitative targets for fines, also to avoid excessive penalties, which are not only often ineffective but could also undermine the relationship of trust with drivers.

Obviously, this enforcement should be accompanied by road safety education programmes in schools, national and local campaigns on key behaviours, such as the use of seat belts and right of way at crossings, and the creation of partnerships with non-governmental organisations to promote road safety education at all levels (WHO, 2018; European Commission, 2020).

## Pedestrian infrastructure and accessibility

Another critical issue is the lack of pedestrian infrastructure in Tirana. The pedestrian environment in Tirana is often unsafe, uncomfortable and incomplete, with a continuous presence of architectural barriers and poor accessibility (World Health Organisation [WHO], 2018). Many roads have no pavements, forcing pedestrians to walk on the carriageway. Existing pavements are often occupied by parked cars, vendors or physical barriers (UN-Habitat, 2013; WHO, 2018).

Crossing opportunities are often insufficient, and when present and signposted, compliance is low: fewer than half of drivers give way to pedestrians at crossings (WHO, 2023; European Commission, 2020). Traffic speeds and road design often favour vehicles over people, even in densely populated areas and near schools. This dramatically reduces walking, increases the risk of injury and discourages the use of public transport and walking (WHO, 2018). One strategy to address this problem would be to build continuous pavements with a minimum width of 2 m, and wider in commercial areas, along all urban roads. In addition, accessibility ramps on pavements, tactile paving and adequate lighting should be provided (APTA, 2010; WHO, 2018).

Surfaces should be kept in good condition, free of potholes, obstacles, or sudden changes in level, as is often the case. The network of safe crossings with traffic calming measures should also be greatly expanded, with pedestrian crossings or, where appropriate, pedestrian traffic lights, raised crossings and pavement extensions at corners to slow down turning vehicles and reduce crossing distances (APTA, 2010; European Commission, 2020).

## Roadworks management

Another critical issue is frequent delays in Albania's road construction and maintenance (International Monetary Fund, 2018; World Bank, 2018). These delays are due to design changes, disputes over land expropriation, and problems with contractor tendering (Centre for the Study of Democracy and Governance, 2020; Ministry of Infrastructure and Energy, 2020; Western Balkans Investment Framework, 2019). Cost overruns and prolonged disruptions are common (International Monetary Fund, 2018; World Bank, 2018; Western Balkans Investment Framework, 2019). Finally, temporary traffic management during construction is often inadequate (Strnad, 2019). It is therefore advisable to strengthen project management and procurement procedures by improving preliminary studies, including geotechnical surveys and mapping of underground utilities, introducing more stringent pre-qualification requirements for contractors, using performance-based contracts with penalties for unjustified delays and payments based on work progress, with independent monitoring of quality and timeliness (Western Balkans Investment Framework, 2019; Ministry of Infrastructure and Energy, 2020; World Bank, 2023). They should also define accelerated approval procedures for strategic

infrastructure, thereby streamlining administrative processes for approving projects, such as those designated as of national or metropolitan importance, while maintaining environmental and social safeguards (International Monetary Fund, 2018; World Bank, 2018; World Bank, 2023). This streamlining can also be achieved by reducing duplication of expertise and documentation through a mechanism for public communication and coordinated traffic management during the construction phase (Strnad, 2019; Western Balkans Investment Framework, 2019).
Consequently, comprehensive traffic management plans should be developed and implemented during construction periods, clearly communicating schedules, diversions, and phases of work through a variety of channels, minimising total closures, including by dividing the work into phases that do not necessarily require closures (Strnad, 2019).

### Parking Management

Another problem plaguing Tirana is the chronic discrepancy between parking demand and regulated supply. This is due to several factors, in particular, the limited number of parking spaces relative to the number of vehicles on the road (OECD, 2012). As a result, there is a widespread habit of illegal parking on pavements, at intersections and even on traffic lanes, reducing effective capacity and severely hindering traffic flow, which becomes turbulent (Shoup, 1997; ECMT, 2007).
Garages and underground or multi-storey car parks are underused due to costs, access problems or unattractive management models (Shoup, 1997).
To address this problem, intelligent parking management should be implemented and strictly enforced. On-street parking zones should be clearly defined, with dynamic, demand-based pricing: higher costs in the centre and lower costs in the suburbs, and multiple payment methods, including parking meters, mobile apps, and SMS (Shoup, 1997; OECD, 2012).
Strict no-parking zones should also be established near intersections, bus stops, and narrow streets, and control mechanisms should use automatic number plate recognition to remove obstructing vehicles. All this can reduce traffic caused by parking searches and generate revenue to be reinvested in public transport and adaptive traffic signal timing (ECMT, 2007).
A second way to address chronic parking shortages is to build multi-storey underground car parks at strategic locations. Parking facilities should be upgraded at major public transport hubs, such as BRT stations, city entry points, near central business districts and new secondary centres, if the focus is on polycentric development (European Commission, 2020). Differentiated parking rates should be established, with higher costs in the central area and lower costs in peripheral park-and-ride areas; good pedestrian connections and clear signage should also be provided.
Finally, demand should be reduced through the policies outlined above (OECD, 2012; European Commission, 2020).

## Discussion

As the analysis shows, Tirana's public transport is inadequate, and it is essential to implement the planned eBRT to improve it, along with performance-based contracts to drive better service.
Urban fragmentation increases traffic congestion, converges traffic in a single centre, and leads to uncoordinated development.
The existing road network is inadequate, too, in both capacity and quality. It is also weakened by numerous road construction sites and illegal parking, which further reduce available capacity and seriously impact traffic flow. The absence of coordination among signalling systems (semaphores) also leads to inefficient traffic flow management, with fixed policies and the need for human intervention (policemen) to avoid traffic jams.
Pedestrians and cyclists are at risk in an unsafe urban environment with a serious lack of protected lanes. Low respect for the Highway Code and weak law enforcement, along with other factors, further degrade safety and traffic.
These results confirm that rapid motorisation growth has only been a trigger for evidence of a systemic issue that must be addressed through a multidimensional, coordinated approach.
As a roadmap to reduce traffic congestion, congestion charging cannot be used alone; it must be paired with the other actions described below.

### Local Public Transport and eBRT

It is mandatory to develop the eBRT as a high-speed, high-capacity backbone for the LPT and integrate it with the normal bus transport mode. In addition, reducing informality in taxi services can lead to further coordination and improvement. The LPT service must be designed considering attractive nodes for passengers (schools, hospitals, ...). A good LPT service will encourage its use, reducing circulating vehicles.
Performance-based contract schemes must be designed and implemented to support service improvement and shift users from vehicles to LPT.
This approach will increase the average commercial speed of LPT vehicles, improve LPT service reliability, and reduce car use.

### Polycentric Urban Form and Metropolitan Governance

Identifying different centres and creating local economies, also decentralising public services (like hospitals, public offices, schools) will lead to long-distance traffic reduction by creating shorter paths to travel locally, subtracting traffic from the centre and reducing overall congestion, with significant benefits for the population in terms of fuel saving, pollution reduction, shorter travel times and more.
Creating a central metropolitan entity to coordinate urban development and reduce informality will result in greater efficiency, effectiveness, and the recovery of degraded urban areas. With this central entity, future development will be harmonious and will be able to support the transition from monocentric to polycentric.
This approach will reduce average path length, reduce radial traffic, and increase network resilience.

### Road network, ITS and Construction

Intelligent Traffic Systems must be implemented at least on arterial corridors to speed up eBRT. The road network must be planned in coordination with neighbouring municipalities, and its realisation must be managed to minimise impacts on existing traffic flows by reducing closure times, providing sufficient advance notice, and providing well-signalled alternative paths. The ITS should rely on the SCOOT system for semaphores, as it is better suited to Tirana's environment. Improving in these directions will reduce bottlenecks and improve traffic flow. However, if not adequately planned and monitored, it can even induce further congestion (a domino effect at intersections due to incorrect semaphore policies, for example).

## Pedestrian, safety and parking

Improving sidewalk quality and implementing protected lanes for pedestrians and cyclists can reduce car use for short-distance travel, thereby amplifying the effect of polycentric reshaping.
Enforcing the Highway Code will reduce incidents, traffic jams, and bottlenecks. At the same time, increasing parking capacity, especially at the city's gateways, will encourage multimodal mobility (car + bus, car + bicycle, …), further reducing traffic congestion.

## A possible roadmap

A possible sequence of implementation could be quick wins, followed by medium-term interventions, and then long-term projects.
Quick wins with low cost and high visibility include automated enforcement (speed cameras, automatic detection of illegal parking, …), reorganisation of semaphore policies on main corridors, continuous, high-quality sidewalks in critical areas, and parking restrictions near intersections.
Medium-term structural interventions could include eBRT, LPT network reorganisation, pilot performance-based contracts, and interchange parking at the city's gateways.
Long-term reforms could include the Metropolitan Authority for Mobility, the full formalisation of urban tissue, rings, and connectors.
ITS and congestion charging can be considered related from a technological perspective and can benefit from each other. They can be thought of as a mid-term milestone for pilot projects and, in the long term, as a final realisation.

## Enabling conditions and risks

Institutional capability to design and manage is one of the most important elements. The empowerment process, which began with GIZ support, must continue and be extended to other areas, including law enforcement, planning, construction site management, and more. Institutional coordination is compulsory and should be realised first as a committee that will work as a pilot for the final Metropolitan Authority for Mobility. Political resilience, i.e. the ability to survive political changes at both the municipal and government levels, is also vital.
Effective financing schemes, efficient business models and social acceptance are also essential. Tensions that could emerge between political consensus and tariffs, congestion charges and paid parking must be anticipated and managed with complete and adequate information.
Technical and technological limits must be considered and managed.
One risk to consider is being locked into suboptimal solutions, such as road network empowerment, without strengthening LPT or creating territorial inequity.

## UPT Implications

The results suggest that UPT's requirements should be focused on providing data to support both eBRT and bus network planning and monitoring.
An important component could be law enforcement to enforce the Highway Code and support measures for unsafe conditions, such as pedestrian flows in critical areas or accident detection.

# Conclusions

Reducing Tirana's traffic congestion requires a multidimensional and coordinated approach. Despite the absence of secondary data, the severe scarcity of primary data, the lack of quantitative modelling of possible scenarios, and a single-case-study focus, this article supports the definition of UPT requirements. It identifies possible solutions and proposes a feasible roadmap.
Further research is needed to overcome these limitations.

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# 2
# Workshop Reports

# The continuity of Tirana boulevard through Paskuqan Lake

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**Abstract -** *This report is prepared as part of the Joint International PhD Program IDAUP by POLIS University (Tirana, Albania) and Ferrara University (Italy), focusing on urban planning and architectural solutions for sustainable urban development. The workshop addresses traffic congestion in Tirana, Albania, caused by rapid urbanization, inadequate infrastructure, and centralization of activities. By reconfiguring urban form, we aim to mitigate congestion without solely relying on expanding road networks or improving public transport but create new centres in different areas of Tirana. The output of our group of this workshop includes the development of alternative urban centres to decentralize traffic flows, enhancing liveability and sustainability, more specifically the area at the end of New Boulevard and Paskuqan. Inspired by the concept of the linear city, our vision for the proposed area focuses on extending the New Boulevard to terminate at Paskuqan Lake. This extension is envisioned as a reflection of the current Tirana city center, with the assumption that the new area will develop similar functional dynamics. By doing so, we aim to address Tirana's critical need for a mobility transformation that aligns with the urban challenges of the 21st century.*

*Keywords - Urban Form, Traffic Mitigation, Tirana*

## Introduction

Traffic congestion is a persistent challenge in many rapidly urbanizing cities, and Tirana, the capital of Albania, is no exception. Even though the total population in Albania has been decreased during the year Tirana's population continues to grow from 594,706 in 2001 to 925,268 to 2023 with growth rate of percentage of 54.1% (Tab.1 population) and urban activities become increasingly centralized. ( Fig.1 map of the actual situation) , the existing infrastructure struggles to accommodate the rising demand for mobility (Fig.2 map of the actual mobility) and the result is unsustainable levels of congestion, long travel times, and increased pollution, which together diminish the quality of life. While different solutions, such as expanding road networks, new rings and public transportation, are in place, they fail to address the deeper, systemic issues of urban form and spatial organization. Tirana was developed as a monocentric city from the urban plan of the Italian architect A.Brasini in 1926. The proposed road network was a combination between the orthogonal network and the series of concentric rings. The general structure of the city was presented by the Italian master plan and is still present in Tirana today as it has formed the way of its current development. The strong centralization and concentration of the main functions of the city has produced traffic in the road circulation of the central streets and at the same time the gap of services ( Fig.3 traffic analysis ) in the peripheral neighborhoods by concentrating all in the center. This work explores an alternative approach to traffic mitigation in Tirana by focusing on the reconfiguration of its urban form. By decentralizing economic and social activities and enhancing peripheral urban centers, this strategy aims to reduce the dependence on the city's historic routes. A key aspect of this strategy involves developing the Paskuqan area as a new urban pole, positioned to alleviate pressure on the city's historic centre. By extending the boulevard to the end of the Paskuqan Lake, this initiative aims to create a new peripheral centre, offering new economic, social, and recreational opportunities.

The New Boulevard recently constructed is linked to the New Ring is a key strategic north-south within Tiranabut still the extension of it till the River of Tirana creates a physical border for the city. Tirana is a city of two rivers and two lakes in its ends and surrounding by mountain our aim is to extend the city further this new boulevard to the end of the Paskuqan Lake with the idea of mirroring the actual centre due to its similarities (Fig.4 first draw of the boulevard). This transformation also includes the redesign of the actual roads also adding a new ring which relates to the actual ring and with direction to the airport.

## Vision

Our vision is to strengthen the urban identity of the city by reinforcing its primary spatial axis through the development of a new multifunctional district that both complements and reinterprets the existing urban fabric. This approach is grounded in the idea of continuity and extension, where the new development is not conceived as an isolated intervention, but as an integral part of Tirana's evolving metropolitan structure.

The proposed district is designed to seamlessly integrate with the current city layout, adopting an organic urban form that responds to the natural morphology and cultural context of the Paskuqan area. Particular emphasis is placed on resilience, ensuring that the spatial and infrastructural solutions are capable of addressing both natural hazards and human-induced risks. In this regard, the extension of the city's main boulevard towards Paskuqani Lake acts as a structuring element, creating a cohesive urban flow and reinforcing the perception of a continuous and legible urban system.

Three main strategic components underpin this vision:

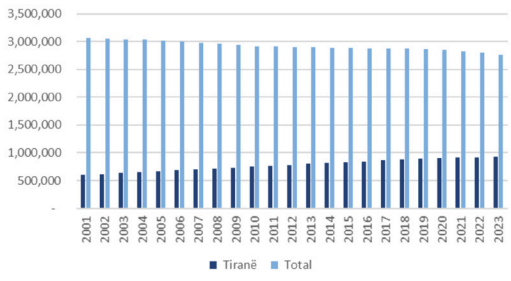
1. Establishment of a green-blue ecological belt

A continuous green corridor is proposed along the river and the lake, functioning as both an environmental and spatial backbone for the new district. This green belt enhances ecological sustainability by supporting biodiversity, improving air quality, and regulating microclimates. At the same time, it serves as a natural buffer against flooding, mitigating the impacts of climate change and extreme weather events. By preserving and revitalizing natural landscapes, the project strengthens the relationship between urban life and nature, while embedding disaster risk reduction strategies within the spatial structure of the city.

2. Provision of integrated public services and community infrastructure

The new district is envisioned as a hub for essential public services, including educational institutions, ecological museums, cultural facilities, and recreational spaces. These functions are carefully embedded within the landscape, creating a strong dialogue between built and natural environments. Beyond improving quality of life, these facilities support social cohesion, environmental awareness, and inclusive urban development. The planning approach prioritizes resilience by incorporating

*Tab.1 Population growth*




*Tab. 1. Population growth*
*Source/ Instat (2023)*

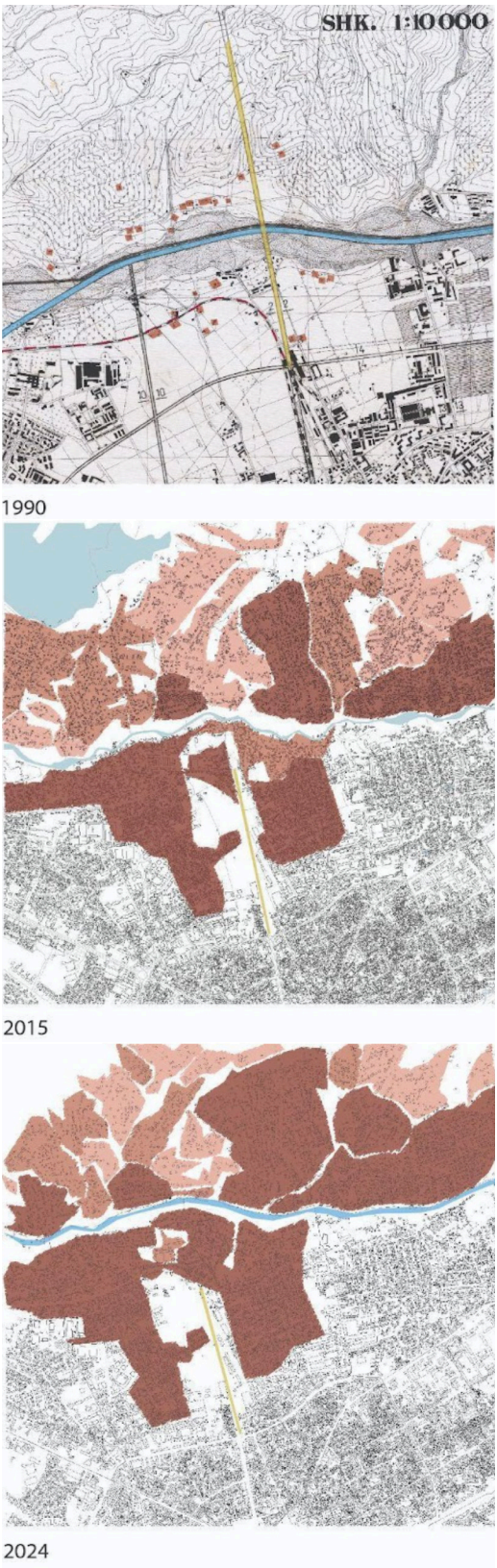



*Fig 1. map of the actual situation*
*Source/ authors (2025)*

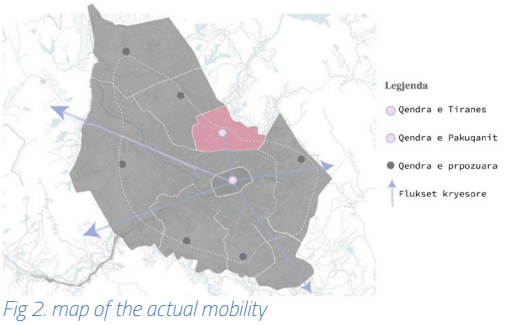



*Fig 2. map of the actual mobility*
*Source/ authors (2025)*

adaptive design principles, such as flexible public spaces and infrastructure capable of responding to future uncertainties.

3. Resilient infrastructure and mobility-oriented development

A key aspect of the vision is the integration of robust infrastructural systems designed to withstand natural hazards such as floods and earthquakes. Advanced urban planning strategies are employed to enhance adaptability and long-term sustainability, including risk-sensitive land use planning and resilient building typologies. The proposal also includes a new road connection linking the ring road to Kamza and the airport, which will redistribute vehicular traffic and reduce congestion along existing routes.

In parallel, the spatial organization promotes transit-oriented development, with higher-density residential and commercial areas strategically located near the tram line and train station. This encourages the use of public transport and reduces dependency on private vehicles. Mixed-use neighbourhoods, combining housing, retail, and office functions, are designed to minimize travel distances, enhance walkability, and support vibrant street life.

The tram line is envisioned as a key element of the mobility system, seamlessly integrated with existing transportation infrastructure to create a unified, efficient, and sustainable network. Together, these interventions contribute to a more balanced and accessible urban structure.

Overall, this vision aims to create a vibrant, inclusive, and environmentally responsive urban environment that not only addresses present-day needs but also ensures long-term resilience. By integrating ecological systems, public services, and sustainable mobility within a coherent spatial framework, the project positions the city towards a future that is both adaptable and regenerative, safeguarding its communities against emerging environmental and urban challenges.

## Methodology

The methodology process involves site visits, diverse representational techniques such as sketching, parametrics, and collage. During our work and desk review of demographics were conducted . Deliverables include physical models, planimetric and altimetric representations, and perspectives of proposed solutions. This initiative contributes to a broader discourse on urban rehabilitation and sustainable city planning as the new center of Tirana.

## Results

The proposed idea aims to decentralize urban activities by creating a new urban hub in the Paskuqan area, thereby alleviating pressure on Tirana's historic core and its already congested primary corridors. In response to the rapid urban growth and increasing mobility demands, the project envisions a polycentric development model, where new centers of activity redistribute

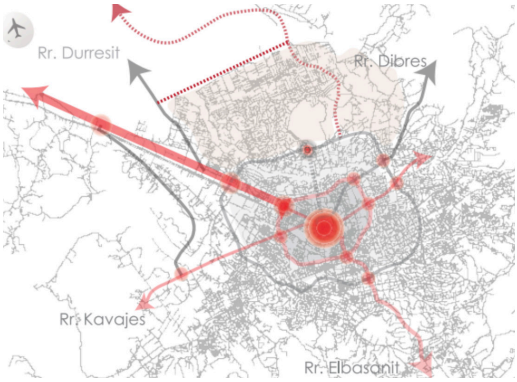



*Fig 3. traffic analysis. Source/ authors (2025)*


*Fig 4. first draw of the boulevard. Source/ authors (2025)*


*Fig 5. proposed roads and connection of the tram. Source/ authors (2025)*

*Fig 6. proposed plan Source/ authors (2025)*

economic, social, and cultural functions across the metropolitan area.

A key spatial intervention is the extension of the main boulevard towards Paskuqani Lake, transforming this axis into a strategic connector between the existing urban fabric and the emerging district. This extension not only enhances physical accessibility but also establishes a new focal point for economic development, public life, and recreational activities. The lakefront becomes a central element of the project, integrating landscape design with urban functions and creating a strong identity for the area.

In parallel, the proposal includes the development of a new ring road connected to Tirana International Airport, which is expected to significantly improve regional connectivity and divert transit traffic away from the inner city. This infrastructure intervention will contribute to a more efficient distribution of traffic flows, reducing congestion and travel times across the metropolitan network.

To further support sustainable mobility, the integration of a tram line linking the new district to the train station and other key urban nodes is proposed. This public transport system is designed to provide a reliable, low-emission alternative to private car use, encouraging modal shift and supporting a more environmentally sustainable urban mobility system.

From the perspective of urban development and public service provision, the project emphasizes the introduction of key social infrastructure, including educational institutions, ecological museums, cultural spaces, and recreational facilities. These functions aim to enhance community well-being, promote environmental awareness, and foster social interaction, contributing to a higher quality of life for residents.

The new district is conceived as an extension of Tirana's urban identity, reflecting its spatial patterns, vibrancy, and mixed-use character, while carefully responding to the natural landscape and cultural context of Paskuqan. Particular attention is given to the integration of green and blue infrastructure, ensuring ecological continuity and resilience to environmental challenges.

Overall, the proposed development provides a comprehensive framework for sustainable urban growth, addressing critical issues such as traffic congestion, spatial imbalance, and lack of public amenities. By promoting decentralization, enhancing connectivity, and prioritizing sustainable mobility and public services, the project contributes to building a more resilient, inclusive, and livable metropolitan Tirana.

## Conclusions

Key outcomes of the proposed plan include a significant reduction in traffic congestion and a more balanced distribution of mobility flows across the metropolitan area. By shifting from a mono-centric to a more polycentric urban structure, the plan alleviates pressure on Tirana's central corridors and introduces alternative routes and destinations that redistribute daily movements more efficiently.

A major contribution of the proposal lies in the improvement of mobility through the integration of multimodal transport systems. The combination of road infrastructure, public transport (including the proposed tram line), and pedestrian and cycling networks creates a more cohesive and accessible mobility framework. This integrated approach not only enhances connectivity between key urban nodes but also promotes a shift towards more sustainable modes of transport, reducing dependency on private vehicles and lowering environmental impacts.

In parallel, the establishment of a new vibrant district introduces a diverse mix of public services, cultural institutions, and recreational spaces. This mixed-use development supports everyday urban life by bringing essential functions closer to residents, encouraging social interaction, and strengthening local economic activity. The presence of educational, cultural, and leisure facilities contributes to the creation of a dynamic and inclusive urban environment that responds to the needs of different user groups.

The extension of the main boulevard towards Paskuqani Lake represents both a spatial and symbolic transformation, redefining the relationship between the built environment and natural landscapes. Together with the creation of a continuous green belt, this intervention enhances the ecological performance of the area by improving air quality, supporting urban biodiversity, and providing climate-responsive spaces. At the same time, it elevates the aesthetic and experiential quality of the city, offering accessible green and blue spaces that promote well-being and recreation.

Overall, these outcomes contribute to fostering a more resilient and adaptable urban system, where mobility, environment, and urban life are integrated into a cohesive framework. The plan supports a harmonious coexistence between urban development and natural systems, positioning Tirana towards a more sustainable, livable, and future-oriented urban model.

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*[5] Dhamo.S Tirana Qyteti Munguar*

# West Node Kombinat
## A Metaphor for Connectivity

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**Abstract -** *Albania's capital and largest city, Tirana, has registered 2,761,785 inhabitants, according to the latest census published by INSTAT in January 2023. About 33.5% of these inhabitants live in Tirana. Due to the rapid increase in population and urbanized areas in the last decade, Tirana is experiencing a congestion that is mainly reflected in the mobility of people and vehicles. The traffic jams in Tirana have become more and more repetitive causing a negative impact on the city's environment and on the quality of everyday life. Furthermore, it has also increased the number of accidents and delays, frequently causing extreme congestion in the urban area. Moreover, the lack of a multimodal public transport system of any kind increases the gravity of the problem to an even larger extent.*
*Tirana today requires a comprehensive reflection on its territorial and regional context. The city should be approached as a metropolitan hub that interacts with neighboring cities through various networks and transportation systems. This perspective provides a clearer understanding of its urban form and whether it can or should be reconfigured. By reconceptualizing new urban nodes around Tirana's center, the city can move toward decentralization. This shift would alleviate pressure on the city center, distributing urban flows more evenly and reducing congestion.*
*The Kombinati area holds significant potential to evolve into a vibrant urban center. Historically, this area is anchored by the former textile factory, a landmark project constructed during the communist regime. As the first major urban development of its kind in the region, the factory was designed as the centerpiece of a satellite town located west of Tirana. This planned community embodied the regime's vision for industrialization and urban expansion, setting a precedent for the design and organization of similar industrial towns during the 1950s and 1960s. The Kombinati area's historical significance and strategic location make it a prime candidate for urban redevelopment and transformation.*

*Keywords - Polycentric city, mobility networks, urban nodes and functions, sustainable infrastructure, settlements connectivity*

## Introduction

In the case of Kombinat, former Stalin Textile Factory in Tirana, the urban center was designed recalling the shapes of a medieval city, featuring gates, towers, and arched loggias. This historicized approach to urban design was intended to create immediate cohesion between the emerging working class and the urban environment. It served as a stylistic code to evoke the "city effect," animating material forms while unifying the built environment. Here, the challenge was not in seeking originality or architectural innovation, as is often the case in modern architecture, but rather in blending historical elements and addressing the compatibility—or inconsistencies—between architectural forms and their intended programs. The combination was envisioned as a cradle of communist tradition and a symbol of the "new man", making it an experimental model for testing urban policies and social dynamics that could later be implemented on a broader scale.

### Research Objectives

As part of the research objectives outlined in this study, the redistribution of the traffic intensity joints in Tirana's central city will be used in order to reduce traffic congestion. In order to accomplish this, the urban form needs to be reconfigured, but

the strategy for doing this is to determine how the urban form can be interpreted from a variety of perspectives. A formal conceptualization of a city would refer to the process of defining, analyzing, and articulating the structure, functions, and characteristics of an urban area in a systematic and theoretical manner. This approach aims to establish a coherent framework for understanding the city as a complex, dynamic system influenced by historical, social, economic, and environmental factors.


*Fig 1. The key components of formal conceptualization of a city. Source/ authors (2025)*

## Literature review

The mitigation of traffic and its principles have been the subject of discussion by many authors. There are some very interesting ideas in Christopher Alexander's book A City is not a Tree, Kevin Lynch's book The Image of the City, and Le Corbusier's book The City of Tomorrow and its Planning, in which each author analyzes the structure of a city, the spatial organization, and human behavior.

Alexander critiques the hierarchical, "tree-like" urban structures that isolate different parts of the city, arguing instead for "semi-lattice" structures that allow overlapping and dynamic relationships. This kind of urban structures were identified in fact in the neighbourhoods of Kombinat, and villages like Prush or Peze-Helmes. In fact, all these settlements are linked through the main road Tiranë-Durrës, that resembles a tree-like, passing from Kombinat and where is created a lot of traffic recently. So, by promoting decentralization and fostering permeability as Lynch strongly advise, pedestrians, cyclists and vehicles would navigate more flexibly. This is considered into our proposal by finding some hillfoot paths alongside the main road that connects the clusters identified. Our attention was drawn to Le Corbusier's principle of having wide avenues and hierarchical street systems with designated arterial roads for fast travel, which led us to look at the Kombinat city and enliven existing functions by improving the main boulevard and adding parallel routes. This kind of proposed system would better connect the natural areas surrounding Kombinat, the agricultural areas, but also the residential zones, and the old industrial zones that can be reactivated. All this, accompanied with Lynch concept on humans perceiving urban environments with clarity and ease of navigation.

## Vision

The vision of this report and workshop is to enhance the urban context of the Kombinat as an ingrowing settlement next to Tirana, with a lot of existing functions such as economic, administrative and local governance, social and cultural, educational and research, transportation and infrastructure, residential and mixed-use, recreational and leisure, social and cultural etc. Despite the currently existing functions, mostly represented by residential buildings and abandoned productive facilities, through the revitalization of the historical manufacturing activities and the addition of a plethora of new functions, Kombinat can achieve the role of a “city in a city”.

A sample of the functions needing consideration could be the following:

- Reactivation of the old and abandoned industry of textile and glass production, intended on a more artisanal scale rather than the former heavy industrial development;

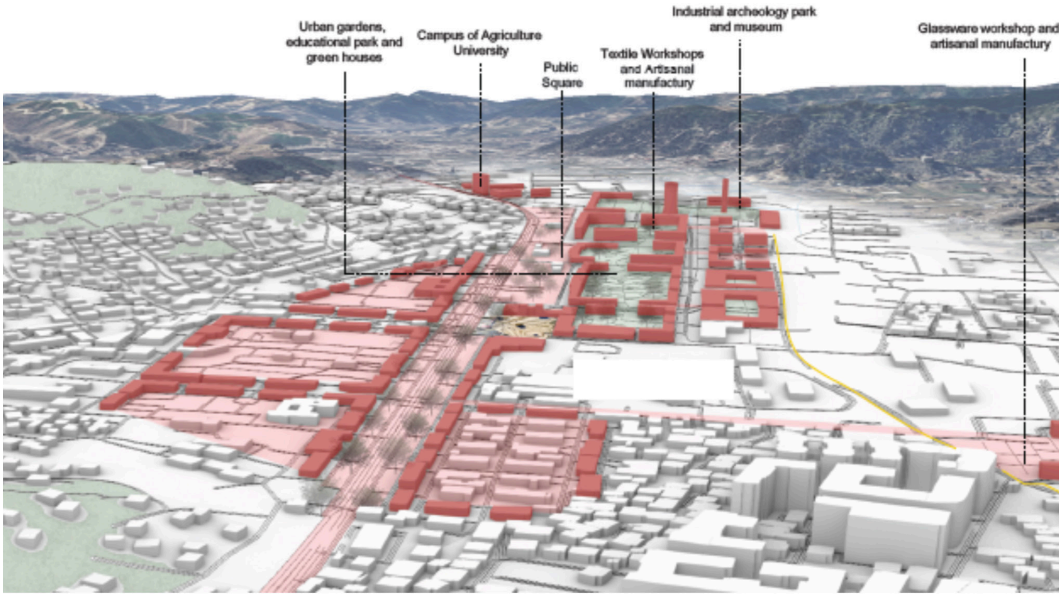


*Fig 2. Proposed perspective on existing and new functions. Source/ authors (2025)*



- Creation of a business hub alongside the main boulevard of Kombinat, in order to attract the business industry into the area;
- Expansion and improving of the existing road network, mainly through micromobility infrastructure such as cycle lanes, pedestrian paths and public transit;
- Increasing the green areas between the buildings, also creating a natural park for the zone by activating paths and pedestrian routes alongside Sharra lake and connecting it with the main boulevard;
- Increasing the connectivity of the functions in the city, by creating a multifunctional hub where the different businesses, industries and the local community can create virtuous cooperation processes;
- Realisation of new connections with the other rural settlements towards Durrës, like Vaqarr, Pezë and Ndroq, through the reactivation of hillfoot paths, by directing and extending the people's flow towards them.

The general vision of this report is considering Kombinat as the main western node of the city of Tirana, with the aim of mitigating the traffic flow into the ring road coming Northwest from the Tirana-Durrës highway and South from the Tirana-Elbasan highway. Being in the middle of the two said flows, Kombinat with its existing and planned functions would increase its attractiveness as a "city in the city" itself. Apart to Kombinat, the other settlements like Peza with its monuments, history and cultural, Ndroq with its agriculture and viticulture tradition, complement Kombinat. Also, nowadays these villages are quite frequented during the weekends for leisure.

## .Methodology / process of understanding

The starting point for the research was to investigate the system of the urban clusters found along the road from Tirana to Kavajë, from the junction between the ring and Kombinat up to the first major historical center in the valley in Ndroq.

The urbanized environment, predominant in the areas closer to the city and gradually decreasing when moving far from the center, is mostly structured around the axis of the main road running at the center of the valley. It is on this path that spontaneous settlements - both old and new - such as Pezë-Helmes, Pezë e Madhe and Ndroq are developed, with a structure of secondary streets developing directly from the main valley path. In the same way, the planned city of Kombinat revolves around the main boulevard with squares and productive buildings facing right on this axis.

On the other hand, some of the settlements develop on the foothill in an intermediate position on the slope of the surrounding reliefs, usually with a much more linear layout organized along one main street following the contour lines. Examples of this are the towns of Vaqarr, Lalm, Prush, Fortuzaj.

Based on the extension of the urbanized areas in contrast to the agricultural and forest land, the clusters have been identified and classified according to their urban morphology. In particular, the research investigated the shape of the urban fabric, consisting in the layout of streets and buildings related to the topography, land use, agricultural and water systems, highlighting a series of patterns that can be found multiple times in different settlements. The synthesis of this classification generated an abacus of urban morphologies that characterizes the entire linear system of the valley from Kombinat to Ndroq, highlighting a diverse and morphologically differentiated territory, that already accommodates in essence the multicentric potential of a new centrality in the southwestern suburbs of Tirana.

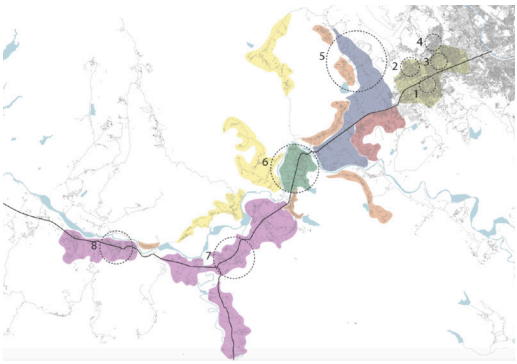


*Fig 3. Identified clusters*
*Source/ authors (2025)*

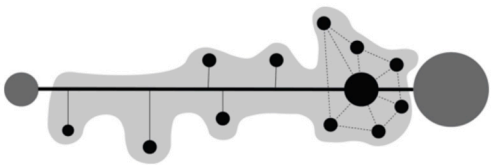

*Fig 4. The urban neuron of Kombinat*
*Source/ authors (2025)*

## Results

The strategy, in order to highlight and empower the differences of the different urban areas, is centered on building new connections between the said centers, refunctionalizing them and adding infrastructure in order to create new relations. The concept, mainly focused in the case study of the Kombinat district, proposes a reuse and reinterpretation of the typical open, wide courtyards located on both sides of the main boulevard. Their rigid geometrical structure, that defines the urban space with its rhythmicity, often encloses a more organic and spontaneous fabric of informal or semi-formal settlements, acting as a container for new urban structures.

The current abandoned productive site and the other nodes in the Kombinat district could be restructured with the reproduction of the open courtyard layout that encases the organic, spontaneous morphologies found in the countryside directly along the valley running to Ndroq.

This double layer of morphologies can welcome a variety of functions, recovering both the former industrial and productive soul of the district and at the same time giving space to new uses such as urban gardens, greenhouses and activities related to the nearby countryside, well represented and hosted by the informal structures enclosed inside the new courtyards. These structures will be linked to each other with the existing roads and with new infrastructure, developing both inside the urbanized area (e.g. along the dismissed railway tracks), and in the countryside by reactivating the already existing foothill paths running through the landscape and the rural settlements, thus giving an alternative infrastructure to the already congested valley roads. This relationship between the peripheral valley urban structures and the "brain" of the system in Kombinat, achieved by connecting the settlements between them, conceptually results in a neuron-like shape, with its "soma" concentrated in Kombinat and its "axon" spread along the valley with the villages of Vaqar, Prush, Pezë and Ndroq.

## Conclusions and recommendations

It is believed that the enhancement of the already existing different centralities and the introduction of new functions inside the Kombinat area and its valley, symbolized and characterized by the respective urban morphologies, can help to turn the southwestern districts of Tirana into a polycentric and attractive system itself, thus relieving the traffic towards and from the current city centre. The shape of the urban fabric in this case study is used to accommodate the new mix of functions. A further development of this experiment could involve the rural settlements in the valley of the river Erzeni, by individuating potential development nodes with the relative urban morphology, introducing functions related to the protection of the natural environment and its valorization.

The strengthening of the whole urban-rural system can also start a new era of better integration between city and countryside, where the relationship between the two can be of mutual benefit instead of subordination, laying the foundation for a potential return of the population to the countryside settlements..

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# 3

# Proposals for Proposals for Infrastructure and facilities.

# Decentralizing Traffic Congestion in Tirana's Urban Centre

## Re-interpreting spontaneous commuting as a tool for sustainable growth in Kashar

DOI:

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**Abstract -** *The socio-political and historical evolution of Tirana, Albania has left a complex interweaving of overlapping patterns, functions and narratives upon the urban landscape, resulting in a rapidly urbanizing and growing city that is responding to concurrent phases of top-down, bottom-up, planned and organic urban development. These dynamic and conflicting development narratives are a broader reflection of post-socialist urbanization phenomena in the Balkans, where rapid growth often outpaces or occurs outside of infrastructural and governance capacities. These contradictory planning processes rely upon a transport infrastructure that inadequately meets commuter needs, resulting in intense traffic congestion at major entry or exit points. This research hypothesizes that the challenges of traffic congestion, concentrated financial investment in the city centre, and preference towards privately-owned vehicles can be addressed through an alternative methodological approach focused on examining the effects of small-scale commuting decisions on road infrastructure and its relationship to urban services. The methodology is explored through a project-based approach in the peripheral neighbourhood of Kashar, a strategic area along the Tirana - Durrës corridor that connects to the airport and major highway and railway infrastructure projects. Application of this methodology in Kashar uncovers a network of secondary and tertiary roads functioning as alternative primary roads for commuters to bypass traffic, in addition to isolated urban areas that are void of necessary services. The resulting analysis and findings enable an interpretation of a closed-system geometric framework that addresses the realities of commuting choices, urban functions and integration of major development. This sustainable framework for urban growth mitigates traffic congestion by decentralizing existing hotspots and identifying sites for new urban centres that pierce the landscape to weave together present and future connections. By leveraging commuters' spontaneous use of infrastructure, this approach addresses Tirana's organic development logic while providing solutions for its future growth.*

*Keywords - Traffic congestion, Multi-modal transportation, Spontaneous growth, Infrastructure, Urban centres*

## Introduction

### Research Hypothesis and Objectives

In Tirana, the concentration of economic functions and administrative service within the city centre further exacerbates already strained mobility systems taken up primarily by private means of transportation, creating uneven patterns of accessibility and reinforcing socio-spatial polarization of services. This research hypothesizes that the challenges of traffic congestion, concentrated financial investment in the city centre, and preference towards privately-owned vehicles can be addressed through an alternative methodological approach that reads Tirana's urban form via the effect of small-scale commuting decisions on the role of road infrastructure and its relationship to urban services. More specifically, the research considers the overlap of existing underused tertiary roads together with spatial analysis of ten-minute service areas, to reveal latent infrastructural hierarchies and informal patterns of connectivity inscribed on Tirana's urban landscape that are not given space in contemporary formal planning approaches.

The guiding research question asks how everyday commuting choices can reveal and reshape the infrastructural and spatial logics that guide Tirana's urban growth? This methodological approach repositions citizens simultaneously as the subject,

reader, and active interpreter of urban processes and transformations, following a participatory form of knowledge generation and challenging traditional or top-down views of planning processes. The data analysis includes observational analysis of private vehicular traffic patterns, spatial mapping, census data where available, and field-based validation of commuting flows. This approach references existing empirical and theoretical literature in urban studies and planning that call for bottom-up data creation and interpretation, co-production of knowledge and everyday urbanism (Chase et al., 1999; Friedmann, 1987, 1989; Healey, 1997; Schon, 2017).

Altogether, the intentional choice to reframe citizen commuting decisions and activity as the primary mechanism for reading and interpreting Tirana's urban landscape contributes to a sustainable framework for urban growth that decentralizes existing hotspots of traffic congestion and urban development and envisions an alternative system of future urban centres. This approach contributes to the rich urban and transport planning discourse surrounding Tirana and its surrounding regions, by reconciling the spontaneity of citizen activity with strategic infrastructural planning, offering a reconceptualization of how cities can effectively address mobility and growth challenges.

The study objectives are to (1) identify and map the informal commuting routes using private vehicles that shape Tirana's mobility structure; (2) evaluate the relationship between these commuting routes and existing service accessibility; and (3) develop a framework to inform sustainable future urban growth that both decentralizes and redefines new multimodal systems.

## Literature Review

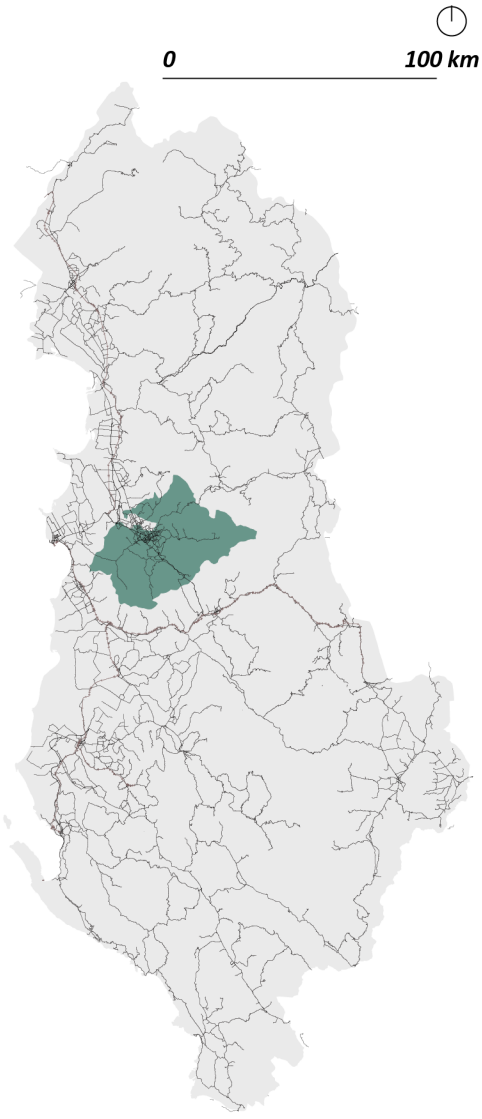
### Overview of Tirana's Historic Urban Development

Tirana's historical urban development has seen diverging phases of planning approaches and methodologies in line with the corresponding socio-political context at the time. Drawing from Rossi's conceptualization of analyzing the city and its architecture, this research considers the analysis of Tirana as not only the visible urban elements, but also the dynamic processes of constructing and demolishing elements that continually redefine the city over time (Rossi, 1982). The following overview of Tirana's historical urban development outlines the phases of organic building activities, planned construction interventions, destruction and demolition of historic symbolic artefacts, expropriation of land for private use, and rapid land use changes that characterize Tirana's urban dynamics (Rossi, 1982).

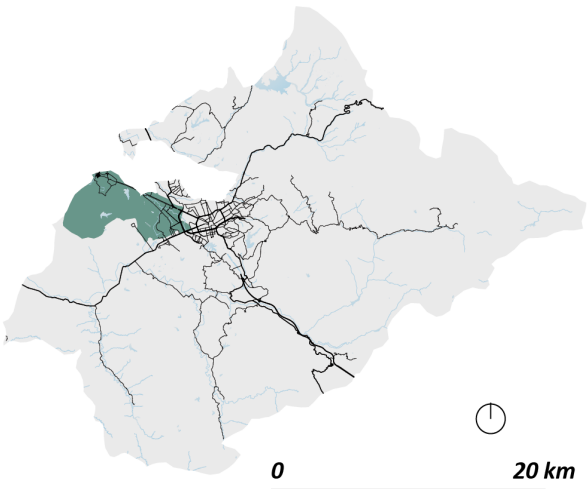
Transportation is positioned at the centre of Tirana's urban origins, as early settlements began to take form in the beginning of the 17th century influenced by the presence of Ottoman Empire trade routes (Dhamo, 2021a). At this time, Tirana's urban development was primarily organic, structured around social and cultural norms, including familial ties and the concept of külliye, where certain building functions are organized around mosques (Dhamo, 2021a). In 1920, Tirana's role changed definitively when it was named as the capital, a moment that would significantly shape its future urban evolution. With this change, Tirana was now available for top-down planned interventions to organize and formalize the urban landscape. During this time, Armando Brasini's masterplan for expanding Tirana included the centralization of government functions in the city centre around Skanderbeg Square and defined the north-south boulevard. The latter would dominate subsequent planning interventions, by symbolically and spatially overwriting the east-west organic development logic that had developed out of Tirana's transportation connection to Durrës and imposing a new direction of movement through the city. During the Fascist period, Brasini's plan was expanded upon by Gherardo Bosio, whose interventions underscored the importance of the north-south Grand Boulevard and continued constructing buildings in the style of Italian Fascism. After World War II and with the introduction of the Communist government, historic buildings were demolished and replaced with four to five-storey block style apartment buildings. Importantly, private car ownership was not permitted, and citizens took to moving around Tirana via bus or bicycle. This period echoed top-down planning mentalities, in an effort to contain and shape social behaviours and urban mobility. After the fall

of the Communist government, citizens reacted to the newfound freedom of urban mobility and development through spontaneous urban infill and informal, unregulated construction that occurred irrespective of urban morphologies outlined by previous historical development periods. "A private sector emerged" and "free movement of people seeking employment and better living conditions is now considered a fundamental human right" (Potsiou, 2010, p. 10). This reactionary organic development phase is reflected in the urban sprawl of the city, as the city grew outwards and increased in population density. The responses from the Albanian government to the questions of informal development has primarily occurred in four ways: demolition of illegal structures, ignoring or refusal to address the situation, comprehensive spatial planning, or legalization (Potsiou, 2010). Currently, Tirana's road infrastructure suffers from poor management of urban traffic, poor conditions of rural and urban roads, lack of opportunity for mixed-modal transportation journeys, and extremely high levels of environmental pollution related to transportation congestion (Josifi, 2021). The limited expansion of public transport networks contrasts sharply with citizen dependency on private vehicle use. We can consider the top-down, formal attempts to organize and plan Tirana's urban landscape as adhering to Alexander's discussion of the systems composing a city in terms of an artificial tree, wherein "no piece of any unit is ever connected to other units, except through the medium of that unit as a whole" (Alexander, 2013, p. 9). Similarly, "informal practices are rhizomic in contrast to the tree-like strictures of urban regulation and planning" that has been outlined by Tirana's governance systems over time, responding with informal network connectivity to oppose hierarchical control of urban space (Dovey, 2012, p. 354). In this sense, Tirana's neighbourhoods and peripheral areas are only understood in relation to their connectivity as facilitated by the primary and secondary ring roads. The road infrastructure is therefore the ultimate structure that inherently defines how neighbourhoods (and by virtue, residents within the neighbourhoods) can interact and connect with each other. However, the road infrastructure does not align with the actual usage by residents. "The main outer orbital link which should distribute the flows across the city, is not yet completed," and "the structure of the Tirana road network is currently implicitly forcing the private traffic to use the inner

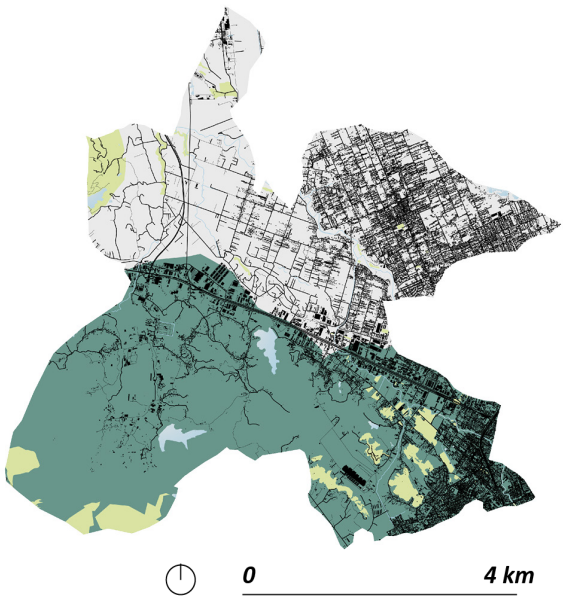





Tirana within Albania




Kashar within Tirana




Kashar near neighbouring

*Fig. 1. Context Map of Kashar within Tirana, Albania*
*Source/ Author (2025)*

city primary and secondary network" for small and large-range travel, resulting in extremely heavy traffic conditions towards the centre (Bosetti et al., 2020, p. 29). This misalignment between planned and practiced mobility underlines the research hypothesis: the spontaneous mobility decisions of citizens and commuters constitute an implicit urban logic that is overlooked by contemporary formal planning approaches in Tirana.

Altogether, these major phases of planning development in Tirana occurred without commensurate investments in transportation infrastructure that accurately reflected the mobility needs and mobility patterns of citizens. Simultaneously, major shifts in transportation occurred as citizens were able to move around with private vehicles, drastically changing the possibilities and limits of urban mobility. In fact, from 2018 to 2022, the number of road vehicles per 1,000 inhabitants in Albania increased by 44% (Rembeci, 2024). The oscillation from large-scale top-down urban development to reactionary informal urban infill, along with the insufficient road system infrastructure has resulted in contradictory urban development processes that do not adequately meet the existing and future mobility needs of Tirana's citizens. To this end, it is possible to consider Tirana's contemporary growth as a kind of hybrid between formal planning intentions and informal adaptations, where transport systems are both the structure and symptom of transformation.

## Spontaneous Mobility Choices & Spatial Justice

To contextualize this research, it is necessary to understand how spontaneous commuting decisions shape urban landscapes and how new mobility patterns emerge to accommodate alternate travel routes. Drawing from Le Corbusier's articulation of the street as an atelier en longueuer, this research reads the urban landscape by considering Tirana's road network as an active workshop to observe and analyze data information that more accurately represents spontaneous commuter decisions to better inform urban planning and transportation planning decisions (Le Corbusier, 1987). Research on the role of commuter decisions and mobility use in shaping urban landscapes has primarily focused on the causes of such decisions, the chosen transportation mode, and the resulting urban informality through unplanned growth or development (Kenyon & Lyons, 2003). Research on the factors influencing transportation decisions often focuses on optimal economic opportunities related to employment, housing, or services, the accessibility to particular land use activities or opportunities for interaction, the presence, choice, and frequency of public transportation, and the density or pedestrian-oriented design of streetscapes (Cervero et al., 2013; Dobbs, 2005; Geurs & van Wee, 2004; Lanken et al., 1994; Lucas, 2012; Lyons, 2004; Verplanken et al., 1997). To this end, individual travel choices can be considered as the result between weighing the costs and benefits of transportation modes or routes. These individual travel choices may also be influenced by the mismatch between where services are located and the transport options available to residents in order to reach these services. For example, Hilberseimer describes potential transportation challenges caused by the disconnect between urban development and technological advancements (Hilberseimer, 1955). This is especially relevant in Tirana, where the development of municipal services, urban functions and transportation infrastructure has not kept pace with unplanned, informal urban sprawl or infill. Over time, these processes have resulted in consolidation of government services, retail, healthcare and services in the city centre and increased fragmentation between service-rich central zones and service-poor peripheral zones. This unequal distribution of and access to essential services has resulted in significant spatial and social inequalities for residents in underserved peripheral neighbourhoods (Pereira et al., 2017, 2019). As a result, residents in peripheral areas who wish to use centrally-located services are forced to use heavily-trafficked primary and secondary roads that unnecessarily lengthen travel times. In this context, Fainstein's discussion of spatial justice provides a useful framework to understand how Tirana's spatial arrangements are a primary determinant of social inequalities for marginalized neighbourhoods (Fainstein, 2017). Spatial accessibility analyses such as service area mapping and gravity models provide an analytical foundation for quantifying this unevenness in Tirana's spatial arrangements.

From the overview of Tirana's historic masterplans, it is evident that attempts to "produce a city organized along rational lines [i.e. the north-south Boulevard]" have attempted to impose particular visions of land use and mobility (Fainstein, 2017, p. 132). Furthermore, the municipality of Tirana's contemporary urban development and solutions to high traffic congestion (and in Albania as a whole) continues to adhere to a general strategy of creating more and wider highways. In reality, this approach does not address the underlying issues causing traffic congestion in Tirana, whether due to limited road capacities or road incidents, and "increased provision of interstate highways and major urban roads" highly unlikely to resolve the existing challenges (Downs, 2005; Duranton & Turner, 2011, p. 2616). However, the reality is that these masterplans are wholly discordant with the transportation modes and choices used by residents in Tirana, and these approaches to organizing urban space "disregard local knowledge and fail to develop understanding among the public" (Fainstein, 2017, p. 134). These transportation choices can reveal patterns of spatial inequality and infrastructural need, that can inform opportunities for service redistribution and effectively address spatial justice for peripheral areas. The amalgamation of these seemingly small-scale, instinctual driving decisions over time has resulted in a spatial reorganization of Tirana's road infrastructure, wherein tertiary and local roads take precedence over the primary and secondary roads. Recalling Lynch's discussion of how citizens experience their urban surroundings through identifying landmarks, pathways and districts, the spontaneous use of Tirana's primary, secondary and tertiary road networks reflect how citizens experience and navigate the urban landscape, in comparison to the prescribed use as designated by formal road hierarchy. The commuter choices to bypass traffic congestion redefine informal routes and through consistent rewritings of the urban landscape, the city and its infrastructures become "product[s] of many builders who are constantly modifying the structure for reasons of their own" (Lynch, 1960, p. 2). In this way, Tirana's urban environment is composed of people who are creating a means of ordering the city through mobility patterns, to create an alternative reading of Tirana that betters align with their own use, meanings and memories (Rossi, 1982). Recalling Alexander's criticism of urban systems (trees) whose physical layouts fail to correspond to social realities or real living systems, this research proposes a methodological turn to draw out and highlight the organic use of

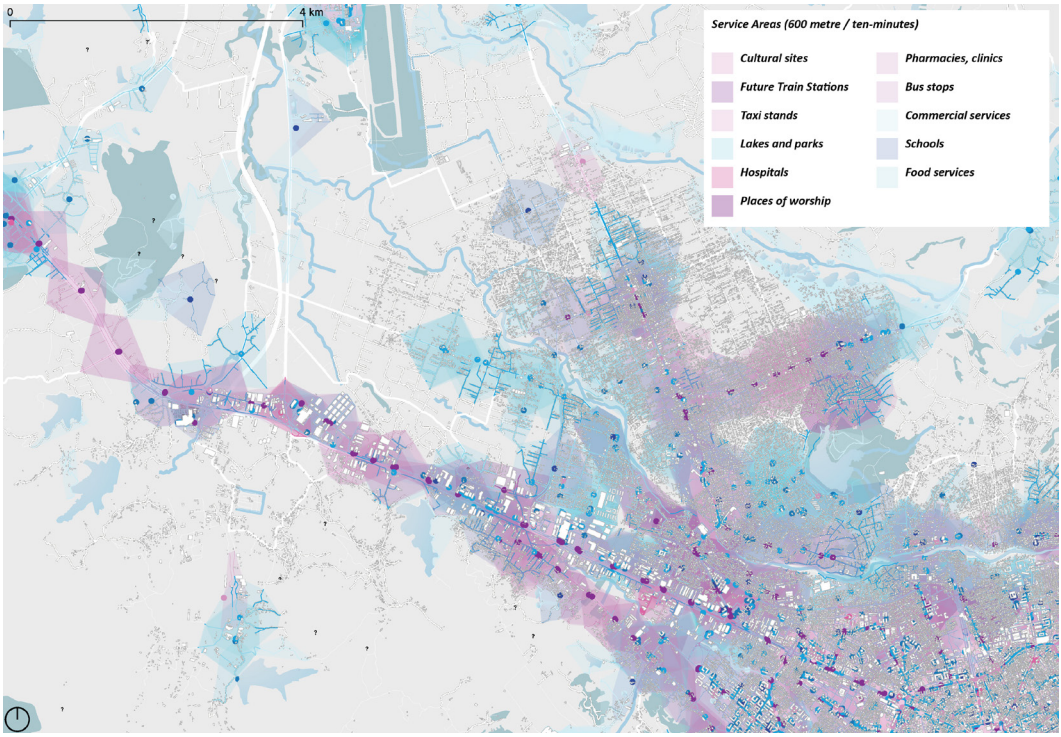



*Fig. 2. Network Analysis of Services in Kashar, Tirana*
*Source/ Author (2025)*



road infrastructure as opposed to the prescribed use (Alexander, 2013). Drawing from Hilberseimer's discussion of urban change and urban systems, this research proposes moving away from the archaic conceptualizations of Tirana's urban form as defined by the north-south boulevard, and towards a "new city element, a new settlement unit" that would "permit a general solution of all the different parts of the city and their relation to each other," and "provide a framework for healthy community life" (Hilberseimer, 1955, p. 193). Borrowing from Dovey's reference to Shatkin's discussion of Manila's informal settlements, "the informal is often rendered invisible to the gaze of the formal city" and "the streets of informal settlements do not appear on maps" (Dovey, 2012, p. 351). In this context, "the morphologies and spatialities of informality" can be defined as "the ways in which informal urbanism flourishes in the spatial interstices of the city and produces urban phenomena with a potent impact on the streetscape and urban image" (Dovey, 2012, p. 352). As such, the methodological choice to leverage citizen behaviour and the subsequent informal networks, reframes the negative aspects generally associated with informality and instead validates or legitimizes spontaneous actions as a planning mechanism (Dhamo, 2021a, 2021b).

## Tools and Methodology

The methodological approach employed to develop an alternative planning perspective towards transportation planning in Tirana utilizes academic references on action-based research, emergent urbanism and radical planning as theoretical frameworks, grey literature describing the historical development of Tirana, and explores these themes through a project-based study of the neighbourhood of Kashar, Tirana. The research utilizes primary and secondary data to describe Tirana's existing urban context in terms of geomorphology, road infrastructure, and major urban projects, as well as traffic conditions and the presence of and access to services. Primary data were collected during fieldwork observations in December 2024 during peak traffic hours from 6AM – 9AM and from 5PM to 8PM. Secondary data included spatial data files from OpenStreetMap and Tirana Municipality's Open Data Portal, urban plans and strategies from Tirana Municipality including Tirana's Sustainable Urban Mobility Plan (SUMP), demographic data from the Institute of Statistics (INSTAT) and traffic data from Google Maps (Drejtoria e Përgjithshme e Qeverisjes Elektronike dhe Inovacionit, 2024; Google Maps, 2024; Institute of Statistics, 2024; OpenStreetMap, 2024; Republika e Shqipërisë Instituti i Statistikave, 2024; Simone Bosetti et al.,

| Service Type | Total Service Area in Kashar (sq km) | Share of Kashar's Land Area (%) |
|---|---|---|
| Cultural Sites | 1.09 | 2.77 |
| Future Train Stations | 1.03 | 2.62 |
| Taxi stands | 1.12 | 2.85 |
| Lakes & parks | 2.68 | 6.83 |
| Hospitals | 0.88 | 2.24 |
| Places of worship | 0.00 | 0.00 |
| Pharmacies and clinics | 6.02 | 15.34 |
| Bus stops | 10.1 | 25.75 |
| Commercial Services | 10.2 | 26.00 |
| Schools | 32.6 | 83.12 |
| Food services | 8.28 | 21.11 |
| ALL SERVICES | 13.5 | 34.3 |

*Tab. 1. Service Areas by Type in Kashar*
*Source/ Author (2025)*

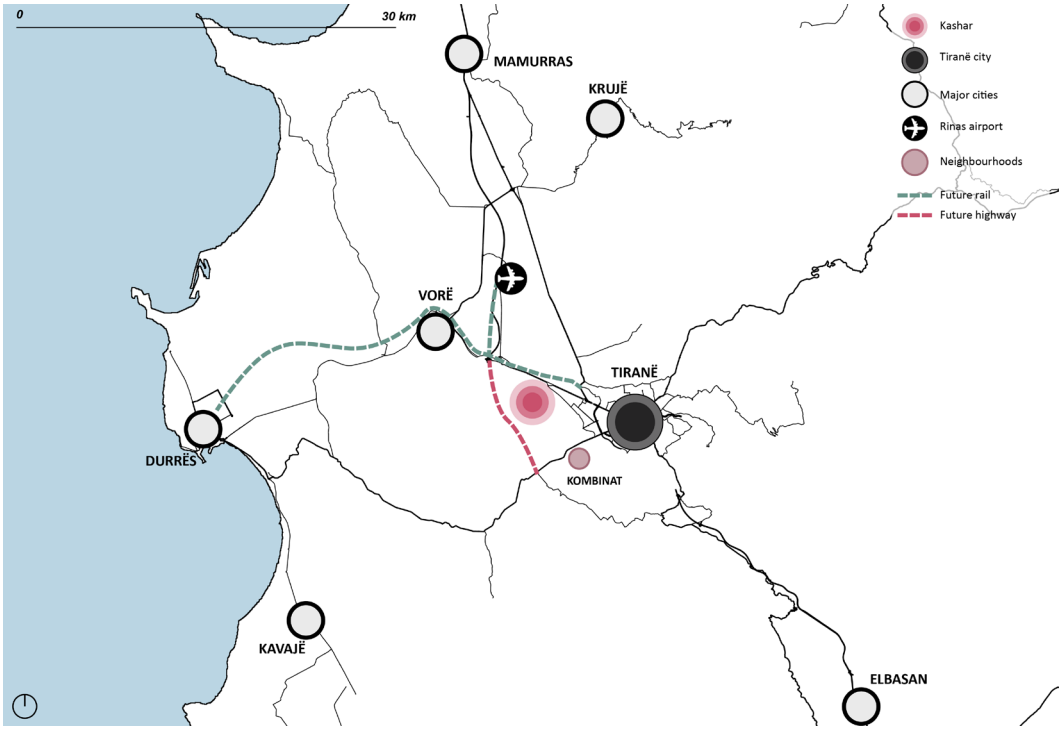



*Fig. 3. Strategic location of Kashar within Tirana- Durrës corridor*
*Source/ Author (2025)*



2020). All geographic information systems (GIS) files were projected in EPSG 6870 (ETRS89 / Albania TM 2010) with neighbourhood-level analysis at 1:79,439 resolution.

The analysis began with by mapping Tirana's road infrastructure, according to the official road hierarchy and connections to key areas. The latter includes transportation nodes, such as Rinas airport, major urban zones including Tirana's city centre, Durrës, and Vorë. The road infrastructure was further analyzed using ethnographic observations of the traffic conditions, usage and traffic commuters. The research team observed vehicular traffic in terms of directions on primary, secondary and tertiary roads during weekday peak periods.

In addition to this work, we considered the locations of major infrastructural projects including upgrading the highway connecting Kashar to another major peripheral neighbourhood (Kombinat), and the construction of the Tirana-Rinas-Durrës railway, with three train stations planned in Kashar (Western Balkans Investment Framework (WBIF), 2025). The overlay of the existing and future context of Kashar enables a closer understanding of how the neighbourhood is expected to evolve and where new hubs may emerge. We then identified road connections with considerably high traffic congestion, to locate areas with existing missing road connections or future high-traffic zones. We then mapped where existing urban services are located, including healthcare facilities, places of worship, commercial services, cultural centres, food and grocery stores, bus stops, schools, and major retail centres. From this mapping work, we analyzed network walking distance from the services based the actual pedestrian infrastructure, to identify areas with a high number of services and islands that are lacking services. Service access areas were calculated using network-based walking distances of ten minutes, assuming an average walking speed of approximately 3.6 kilometres per hour, resulting in 600 metre service areas. Finally, these analyses were considered altogether, to fully describe where services are located in relation to the existing road hierarchy and future urban projects, and the existing accessibility to these services for peripheral areas.

## Case Study

The contrast between planned and actual use of urban space is particularly notable in the peripheral neighbourhood of Kashar (as seen in Figure 1). Kashar is located to the west of Tirana, along the Tirana - Durrës corridor that connects to the airport and major highway and railway infrastructure projects. Kashar is a primarily industrial zone that was one of the most recent additions to Tirana's municipal expansion in 2015. The neighbourhood is relatively young, with a little over 12% of the population aged 65 years and older, compared to the city average of 16% (Rembeci, 2024). Kashar is densely populated and is in fact the second most populous community in Tirana. Despite this, Kashar experiences a lack of resources and connectivity to the larger urban scale. Kacani describes how Kashar is "missing a larger scale of management," thereby impacting the ability to benefit from an integrated system of services and infrastructure with the rest of Tirana (Kacani, 2023, p. 31). Kashar's strategic location along the highway and between the service-rich city centre and a primarily residential neighbourhood also provides a useful site to visualize how commuters attempt to avoid the congested highway and primary roads and turn to tertiary and local roads to move through trafficked areas faster, despite potentially driving longer distances. For these reasons, Kashar was selected as the case study site to implement the project-based methodological approach of emergent and spontaneous urbanism as a framework for formal urban planning design. From the analysis of Kashar's road infrastructure, we found that the primary and secondary motorways were heavily trafficked for most of the day and therefore avoided by commuters in favour of tertiary or residential roads. As a result, although commuters travelled further geographic distance with possibly negligible time-saving efforts, commuters chose to exercise the ability to select different routes and continue driving as opposed to remaining still in dead-lock traffic. This was a key observation in that the

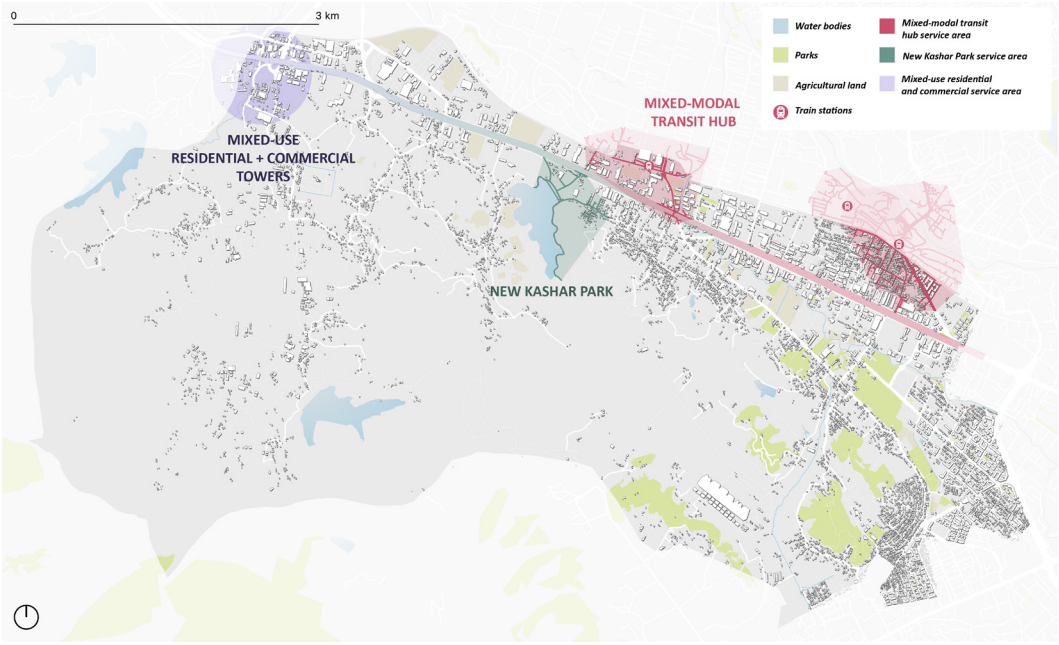



*Fig. 4. Masterplan of interventions in Kashar*
*Source/ Author (2025)*



choices of commuters were gradually changing the functionality of roads and pushing urban activity in new directions or patterns from those prescribed by formal municipal and regional planning.

From the network analysis of services in Kashar (shown in Figure 2), we found that the vast majority of services and activities are concentrated along the primary highway connecting Durrës to Tirana, with a few located north on the highway towards Kamëz. In fact, about two-thirds of Kashar's land area is void of services within a 600 metre or ten-minute walking area, with only 34% (13.5 sq km) of Kashar within a ten-minute walking service area (see Table 1). Only a quarter of Kashar's land area is within a ten-minute service area of bus stops, and a little over a quarter is within a ten-minute service area of commercial services. Furthermore, less than 3% Kashar's land area is within a ten-minute service area of existing and future train stations, highlighting the significant need to identify opportunities for locating new multi-modal transport hubs that relieve pressure from already high-trafficked roads and the constrained areas of train stations in existing development plans.

Altogether, the scattered distribution of services in Kashar and the concentration of services towards the city centre of Tirana gives credence to the existing directional flow of people and traffic moving to reach functions located laterally along the highway and primary roads. In contrast, the existing service deserts significantly impact the daily lives of residents both within and around Kashar, as there is little reason stay within Kashar apart from utilizing the neighbourhood to circumvent traffic.

With this in mind, the location of major future infrastructure projects (shown in Figure 3) will create more incentive for commuters to reach Kashar and stay, while at the same time offering potential to alleviate existing traffic congestion from main roads. These major projects include the development of the railway connecting Tirana to Durrës that will see three train stations located in or near Kashar, the extension of the Blue Corridor highway linking Kashar to the neighbourhood of Kombinat in the south, and the recently completed Univers City residential complex. Altogether, the commuter choices away from primary roads, the development of new urban functions and infrastructural connections, and the reclassification of tertiary and residential roads can be integrated to reconfigure new urban centres and consolidate the sporadic distribution of inhabitants in Kashar.

From the case study findings, it is possible to propose a series of interventions at different scales and functions, that punctuate the urban landscape and consolidate the existing disparate context (as shown in Figure 4). Firstly, the introduction of a new multi-modal station near the Tirana – Durrës highway, between the communities of Laknas and Katundi I Ri, will give identity to the current liminal area and act as a starting point for alternative modes of circulation. The multi-modal station will redirect traffic flow and orient new mobility strategies, linked to the future Rinas-Tirana-Durrës railway and Univers City residential complex currently under development. Secondly, the existing Kashar lake will be made newly accessible via an overpass for light mobility (pedestrian, cyclists) connecting to the new multi-modal station. This intervention will overcome the pedestrian boundary created by the existing road and become a link for new connections. Furthermore, the promotion of the existing natural amenity will gradually change the industrial character of the neighbourhood and become the focal point for a local sub-system of mobility. The third punctuation comes in the form of a mixed-use residential and commercial tower located along the highway connecting Kashar to Kombinat and the airport. This new tower will serve as a pole of attraction for people to live and stay in Kashar long-term. Finally, the overlapping analyses that informed the siting of new punctuations are interwoven to consolidate new neighbourhoods that stitch together the currently disconnected or unspecified land parcels in an organic manner that encourages linkages between different land use and mobility patterns.

Interestingly, it is possible to draw parallels between the theoretical rationality underpinning the case study of Kashar and Tirana as a whole, with that of Cerdá's Plan for Barcelona. While Cerdá's Plan was undoubtedly very much a top-down effort that sought to open the city through introduction of structured geometric urban forms, there are echoes

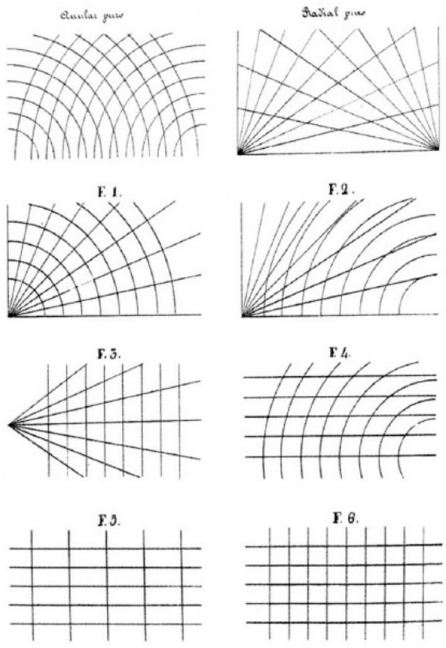



*Fig. 5. Composite diagrams of various configurations of networks of ways by Cerdá*
*Source/ Author (2025)*

of the same logic in both case studies. Cerdá's Plan for Barcelona attempted to "create a new form of existence based on an organized system of human cohabitation and circulation," exploring this through different forms of networks as seen in Figure 5 (Adams, 2020, p. 4). In Tirana, Brasini's plan for the north-south Boulevard cutting the city from Skanderbeg Square to Mother Theresa Square (later realized by Bosio) was used as an ideology tool to impose political ideals. Similarly, Cerdá knew that the 'city' was too tied to political meanings, and there was a need for new theories and language that would recall the humanity within cities: the 'urban'.

With this, Cerdá redirected the focus of spatial organization towards the people and their activities, very much like how this research project's methodological approach for Kashar is centred on citizen behaviour and movement. Furthermore, this project problematizes Tirana's existing urban context that privileges the concentration of economic functions and activities in the city centre, by finding new urban poles and centres of activity in Kashar. In the same vein, Cerdá's plan for Barcelona found that plazas in their strictest functional definition had no "logical reason to exist" and therefore, the function of the plaza should be distributed throughout the city via the design of street systems (Adams, 2020, p. 11). In the same manner, the implementation of this research methodology found potential new urban poles in Kashar via the introduction of multi-modal transportation hubs that would ease existing congestion, reconfigure new centres, and change the direction of traffic flows in Tirana.

As such, the functional urban plaza role of Tirana's historic city centre is taken up and disseminated across the peripheral neighbourhoods, so that multi-modal stations become both the nodal centre and transport balance for the area. The processes of outlining the overlaps between routes of spontaneous mobility, service deserts, and future infrastructure projects, gradually reveals the contours of potential neighbourhoods centred around multi-modal stations that themselves are now agents of change. In short, the overlaps have become the multi-modal station to anchor the neighbourhood.

## Conclusion and Recommendations

The project-based exploration of the research methodology confirms that Tirana's traffic congestion, concentrated activities in the city centre, and reliance on private vehicles can be mitigated through implementing a planning framework that elevates citizen-driven mobility choices as primary planning data. These processes can be characterized as a form of emerging urbanity, that offers the opportunity to leverage the informal networks defined and redefined by citizens over time. This form emerges from daily citizen activities occurring "within the framework of pre-existing physical determinants, or other prior geometries and social arrangements" (Dhamo, 2021a, p. 87). The methodological approach exercised in this research characterize Tirana's future development as truly self-organized in the sense that residents are themselves the users, readers and planners of urban space and form. This approach addresses the dichotomous view of urban informality as problematic, and leverages this spontaneous, unplanned activity into the framework from which Tirana's existing and future urban development can be reevaluated (Dhamo, 2021b). By interrogating how residents redefine their urban environments through everyday decisions, Tirana's urban composition is constantly renegotiated through bottom-up, inductive activities that completely contradict the top-down planning regulations that historically attempted to organize and control urban form. The investigation of Kashar's urban form and transportation trends thereby unveils a hidden, evolving infrastructure with the capacity to consolidate liminal urban forms, give specificity to peripheral zones, and decentralize existing axes or poles of traffic congestion. Drawing from Friedmann's discussion of radical planning that promotes "self-empowerment of households, local communities and regions" and "thinking without frontiers," and Alexander's discussion of overlapping urban systems, the case study in Kashar showed how citizen behaviour can be mobilized as the pivotal tool to fully understand what elements can constitute Tirana's urban form (Alexander, 2013; Friedmann, 1987, p. 14, 1989). Just as Rossi describes how "a city may change its face even in the course of one man's life, its original references ceasing to exist," the urban elements and references composing Tirana's road infrastructure are erased and written over countless times by the government and users (Rossi, 1982, p. 61). The findings thereby confirm that Tirana's existing transportation and urban planning context can and should be addressed through a methodological approach that maximizes the complexities of self-organized citizen behaviour, as a strength in and of itself. The tendency to fall back on bifurcated or opposing perspectives of unplanned urban activity as being inherently informal, irregular or chaotic will always result in a methodology that considers spontaneous urban form as a challenge to be overcome. Instead, Tirana's history of reactionary and imaginative citizen activities that push back against top-down planning decisions is precisely the theoretical logic that can redefine how existing and future urban growth unfold.

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# Paskuqan Lake's Regeneration as a Pathway for Decentralizing Traffic and Revitalizing Tirana's Urban Fabric

## Integrating Heritage, Ecology, and Mobility in Albania's Capital

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**Abstract -** *Tirana, the capital of Albania, faces severe traffic congestion due to its monocentric structure and rapid population growth (reaching 925,000 by 2023), with critical arteries handling over 20,000 vehicles daily and an average commute time of 45 minutes, exacerbating environmental degradation and declining quality of life. Focusing on the Paskuqan Lake area as a key case study, this research explores innovative urban restructuring strategies to alleviate congestion. Historically, Paskuqan Lake served as an agricultural irrigation hub and later evolved into a workers' settlement during industrialization, offering underutilized low-density housing and vacant factories for functional revitalization. However, current population density disparities—800 inhabitants/km² in the hollowed core versus 1,500/km² in peripheral informal settlements—and reliance on cross-city commutes (75% of workers) intensify congestion on Rruga e Elbasanit. To address this, the study proposes a tripartite strategy: extending a new boulevard to the lake to form a north-south axis (diverting 20% of traffic), creating a green corridor along the lakeshore (8m² of green space per capita) with adaptive reuse of industrial heritage for eco-housing and cultural hubs, and integrating tramlines, buses, and shared mobility to reduce commutes to 25 minutes while boosting local employment by 40%. Projections indicate a population density increase to 2,500/km² within a decade, attracting young families and remote workers, synergizing with Shkoza's riverside development and Kombinat's industrial revival to establish Tirana's polycentric network. The findings demonstrate that the Paskuqan Lake initiative—combining heritage revitalization, ecological resilience, and mobility innovation—provides a replicable paradigm for high-density cities to overcome monocentric challenges while balancing cultural identity and sustainable growth.*

*Keywords - Traffic mitigation; Polycentric development; Paskuqan Lake; Industrial heritage; Mobility integration*

## Introduction

Urban transportation is a critical infrastructure supporting socioeconomic development and residents' quality of life. However, rapid global urbanization, marked by concentrated populations and economic activities, has made traffic congestion a central challenge to sustainable development (Handy, 1999, p. 108.; Mcmanus, 1999, p. 35). Tirana, the capital of Albania, epitomizes this struggle in the Balkans. Since the 1990s, its population has surged from under 300,000 to 925,000 by 2023 (INSTAT, 2023), with annual private vehicle growth rates of 12%, while infrastructure and planning lag severely. Critical arteries endure daily traffic exceeding 20,000 vehicles, average commute times of 45 minutes, and worsening air pollution, reflecting a systemic crisis rooted in monocentric urban structures. Historical planning legacies—such as Armando Brasini's 1926 radial road network—have entrenched a "core-periphery" divide (Pojani, 2010, P.483), exacerbated by inadequate public transit and green infrastructure, forcing overreliance on private vehicles (Pantoleon, 2017, p.81).

Globally, cities are adopting innovative strategies to decentralize functions. Polycentric models disperse urban nodes to reduce cross-city commutes (Hoornweg et al., 2011 P.207; Li, 2019, p.100), while smart mobility systems optimize efficiency, and sustainable transit policies—such as bus prioritization and walkable networks—curb emissions (Lee, 2024, p.7924).

Theoretically, Kevin Lynch's "urban imageability" emphasizes legible paths and nodes, Christopher

Alexander's "semi-lattice" advocates functional overlap, and Jan Gehl's "human-centered design" prioritizes walkability (Lynch, 1960; Alexander, 1965; Gehl, 2006). Yet, existing studies often focus on singular dimensions, neglecting the integration of historical revitalization, ecological restoration, and mobility synergy.

This study addresses this gap through the Paskuqan Lake area, Tirana's western gateway. First, it traces the area's evolution from an agricultural hub (pre-20th century) to an industrial enclave (1950s), highlighting underutilized factories and low-density housing as spatial assets. Second, GIS heatmaps quantify current population stratification (800 inhabitants/km² in the hollowed core vs. 1,500/km² in peripheral informal settlements) and commuting patterns (75% cross-city employment), revealing their impact on Rruga e Elbasanit's congestion (20,000 vehicles/day).

Finally, a tripartite strategy is proposed: extending a new boulevard to form a north-south axis (diverting 20% of traffic), creating a lakeside green corridor (8m² green space per capita) with adaptive reuse of industrial heritage for cultural hubs and eco-housing, and integrating tramlines with a MaaS (Mobility as a Service) platform to reduce commutes to 25 minutes.

Employment growth was estimated by applying a land-use elasticity approach: of the 43 ha of industrial wasteland, 70% is adaptable, with adaptive reuse for cultural and creative industries projected to generate 30–40 new jobs per hectare, consistent with Kombinat's cultural park performance. This yields a potential 40% increase in local employment relative to the current 2,500 jobs (Baumgardner, 2019, p.136).

This research not only charts a path for Tirana to reconcile historical identity with ecological resilience but also advances a polycentric framework for high-density cities. Future work must address climate adaptability (e.g., flood risks) and social equity (e.g., affordable housing quotas), while exploring rural-urban linkages (e.g., integrating Ndroq's agricultural markets) to enhance systemic resilience. Through cross-scale collaboration and dynamic monitoring, the Paskuqan initiative may emerge as a model for Global North cities navigating monocentric legacies.

## Historical Dimension: From Agricultural Settlement to Industrial Enclave

The history of the Paskuqan Lake area dates back to the Ottoman Empire, when its low-lying terrain and abundant water resources established it as a vital agricultural irrigation hub west of Tirana. Late 19th-century cadastral maps reveal scattered family-based villages (e.g., Vaqarr, Paskuqani) around the lake, sustained by wheat cultivation, olive groves, and livestock. This self-sufficient economy fostered a low-density, decentralized spatial structure, with a population density below 200 inhabitants/km². (see Figure 1: Master plan 1939/1943). The mid-20th century marked a transformative era under Albania's socialist industrialization drive. Leveraging its proximity to Tirana, Paskuqan was designated a light industrial base. In 1952, the Stalin Textile Factory (Kombinati Stalin) was constructed, accompanied by worker dormitories, schools, and community centers, forming a self-contained "factory-village complex". The architecture, characterized by functionalist principles, featured prefabricated concrete frameworks and sawtooth-roofed factories, while residential zones adopted rigid grid layouts, embodying the utopian ideals of collective socialist living (see Figure 2: project in 1950s Albania: the birth of the textile complex). By 1975, the population density surged to 2,000 inhabitants/km², solidifying Paskuqan's role as a key industrial satellite city, though its mono-functional economy fostered heavy reliance on cross-city commuting.

## Current Challenges: Post-Industrial Decline and Monocentric Dependency

Following the 1990s regime collapse, state-owned factories shuttered, plunging Paskuqan into structural decline. Vacant factories became ruins, while informal economies emerged: workshops occupied abandoned buildings, and residents expanded homes haphazardly, creating a fragmented urban fabric. This grassroots adaptability revealed community resilience but also underscored the consequences of planning neglect, setting the stage for future regeneration challenges. By 2023, the lake's core area had a density of 800 inhabitants/km², while peripheral informal

settlements (e.g., near Sharra Lake) reached 1,500/km², reflecting a paradoxical "hollowed core and swollen periphery" dynamic (see Figure 3: 2023 Paskuqan Population Density Heatmap). Vacant factories occupy 70% of industrial land, with only 30% repurposed as small workshops or storage facilities, while 60% of residential units are dilapidated dormitories and 30% are unregulated self-built extensions (Nepravishta, 2015, p.1237).

Transportation epitomizes Tirana's monocentric crisis: 75% of Paskuqan's workforce commutes daily to the city center via Rruga e Elbasanit, a corridor handling over 20,000 vehicles daily with a peak congestion index of 2.4 (1.0 being free-flow conditions) (Transport Ministry Report, 2023). Centralized public services—hospitals and schools—force residents to cross districts, compounding traffic pressures. Although the renovation project of Paskuqan Lake Park in 2024 added 10,000 trees and 8 kilometers of walking trails in attempt to enhance the region's attractiveness through ecological restoration, its potential as a public space has not yet been fully realized. Although land transactions around the lake are active (average price 42 euros per square meter), the lack of unified planning has led to fragmented development, and the coexistence of high-end residential projects and low-income communities continues to deepen (Latreille et al., 2024, p.102407).



This dual tension between space and socio-economics actually reveals the unique potential of Paskuqan in the contemporary urbanization process. Grimshaw's master plan pointed out that of the 43 hectares of industrial wasteland in the area, 70% of the factory structures are still adaptable to transformation, and the restoration of the lake ecosystem can connect the Tirana River Green Corridor to build a "blue-green infrastructure network" at the urban scale. At the same time, grassroots innovations in informal settlements - such as small workshops or community farms opened in abandoned factories - suggest the possibility of bottom-up regeneration (Aritenang, 2025, p.10585). However, unclear property rights, lack of funds and lack of governance are still the key bottlenecks restricting its transformation, and it is urgent to break through through policy intervention and community participation.

## Future Prospects: Synergizing Ecology, Heritage, and Mobility

1. Industrial heritage revitalization and cultural economic empowerment

The core of Paskuqan's regeneration lies in transforming the industrial heritage of the socialist period into a cultural and economic driving force. Vacant factories such as the Stalin Textile Factory are not only material remains, but also carriers of collective memory. Drawing on the transformation experience of the Bovisa Industrial Zone in Milan (Moro, 2022, p.36) and the Zollverein Mine in the Ruhr area of Germany, a cultural production hub can be created by retaining the building shell and implanting art workshops and digital archives. This strategy has already achieved initial results in the Kombinat district, where the occupancy rate of its cultural and creative park has increased to 65% within three years (Baumgardner, 2019, p.136), providing a practical model for Paskuqan. At the same time, combining with the local Albanian artist and artisan community to develop handicraft markets and industrial heritage tourism routes can activate the regional economy and attract young creative talents to return.

Ecological Restoration and Green Infrastructure


*Fig. 1. Master plan 1939/1943*
*Source/ Gherardo Bosio-Archivio Tecnico delle Costruzioni di Tirana (2011)*

*Fig. 2. "1951"—the birth of the textile complex*
*Source/ Gherardo Bosio-Archivio Tecnico delle Costruzioni di Tirana (2011)*

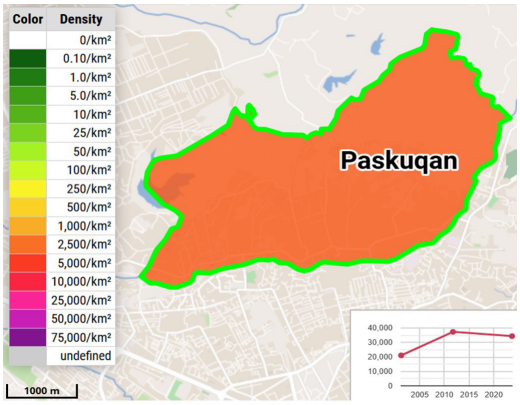


*Fig. 3. "2023 Paskuqan Population Density Heatmap.*
*Source/ Municipal Unit in Albania (2023)*

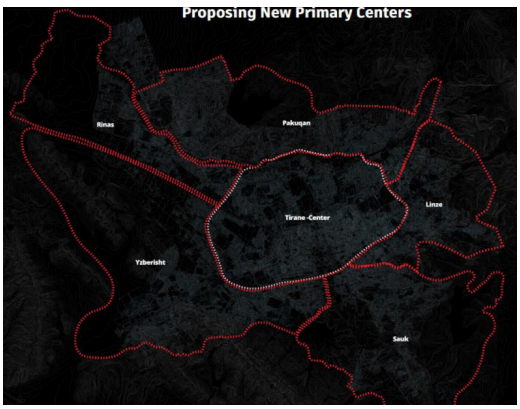


*Fig. 4. Tirana's western polycentric network*
*Source/ : Albania, Tirana, Polis University, student Ledia Sulaj, Juri Hibraj,Liselda Haruni,Ana Kratelli,Sindi Sopaj (2024)*

Networks
2. The ecological rehabilitation of Paskuqan Lake is foundational to the area's transformation. The 2024 lakeside park marks an initial shift from industrial decay to green public space. Future efforts should expand an 8-meter-wide green corridor around the lake, integrating constructed wetlands, native vegetation zones, and pedestrian pathways to raise per capita green space to 8m² (WHO standards). Inspired by the Emscher Landscape Park in Germany's Ruhr Valley (Nepravishta, 2015, p.1237), abandoned drainage channels could be repurposed into ecological corridors, forming a "blue-green respiratory system." Additionally, vertical gardens, rooftop farms, and community gardens in low-density residential areas could enhance climate resilience, mitigating floods and urban heat islands.
Mobility Restructuring and Mixed-Use Community Development
3. Optimizing transportation is critical to dismantling Paskuqan's marginalization. Extending a new boulevard to the lake would divert 20% of traffic from Rruga e Elbasanit (Latreille et al., 2024, p.102407), while integrating tramlines with a Mobility-as-a-Service (MaaS) platform—using real-time data to optimize public transit and shared mobility—could reduce average commutes to 25 minutes. Residential development must prioritize mixed-use communities: lakeside passive-design energy-efficient housing with community farms and co-working spaces could attract remote workers, while retaining "gray spaces" in former dormitories for resident-led modifications, as seen in Berlin's Tempelhofer Feld, would foster social cohesion through participatory workshops and temporary installations.

## Challenges and Pathways: From Experiment to Paradigm

Paskuqan's revival faces fragmented land ownership, funding gaps, and limited community engagement. A phased "pilot-to-scale" approach is proposed: initiate lakeside parks and small cultural hubs (2025–2030) to attract public-private partnerships; expand to heritage retrofits and mobility hubs (2030–2040); and ultimately integrate with Kombinat and Shkoza to form Tirana's western polycentric network(See Figure 4 for details) (2040–2050). This trajectory positions Paskuqan as a Global South exemplar of "historical-ecological-mobility synergy," offering lessons for cities navigating post-industrial transitions.

## Analysis

### Opportunities

al South exemplar of "historical-ecological-mobility
Strategic location and urbanisation trend. Paskuqan's proximity to Tirana's core and Albania's rising urbanisation rate (65.4% in 2024) provide strong growth potential (World Bank, 2024).
Existing pilot projects. Interventions such as the Paskuqan Lake Park demonstrate institutional capacity to deliver improvements (RTSH, 2022).
International alignment. EU integration and donor frameworks create access to funding and technical expertise (OECD, 2024).
Socio-economic dividends. Regeneration offers opportunities for job creation, improved air quality, and enhanced quality of life (Housing Europe/ UNECE, 2024) .

### Governance obstacles

Administrative fragmentation and jurisdictional ambiguity. Paskuqan is an administrative unit within Kamëz municipality (Government of Albania, 2015). This limits its autonomy in urban planning and requires coordination with Kamëz and Tirana metropolitan authorities.

Government of Albania. (2015). Administrative and territorial reform law. Official Gazette of Albania.
- Regulatory and planning discontinuities. The Tirana 2030 plan (TR030) articulates a vision for metropolitan polycentric growth, green corridors, and controlled densification, but achieving coherence across zoning and informal settlements requires stronger regulatory enforcement (Stefano Boeri Architetti, 2016).
- Lack of participatory governance and local capacity. Recent projects such as the Paskuqan Lake Park illustrate the state's ability to deliver amenities, yet citizen engagement and municipal technical capacity remain limited (RTSH, 2022).

Economic
Land-tenure insecurity and informal constructions. Many parcels remain unregistered or developed without formal title, complicating land assembly and redevelopment (World Bank, 2019; UNECE, 2024).
Funding constraints and budget fragmentation. Local governments have limited fiscal capacity, and large-scale infrastructure depends on multi-source funding including EU support (OECD, 2024).
Market risk and displacement pressures. Redevelopment risks raising property values and displacing vulnerable groups if safeguards are absent (ID Publications, 2017).
Economic obstacles primarily manifest in funding gaps and investment risks. According to the Albanian Development Fund, the comprehensive renovation of Paskuqan requires approximately €280 million, of which 40% is for industrial heritage restoration, 35% for transportation infrastructure, and 25% for ecological restoration. Currently, public funding covers only 30%, leaving the remainder dependent on private investment. However, investors are deterred by unclear property rights—70% of industrial land is state-owned, but 30% is privately owned by hundreds of heirs of former factory workers (INSTAT, 2023). To address this issue, the "land trust fund" model used in the renovation of the Lozno Textile Mill in Poland could be used as a model (Lódź City Council, 2022): the government acquires land ownership, private enterprises participate in development through a 40-year concession, and 20% of the profits are used to fund the construction of affordable housing. Furthermore, it is recommended that the EU's Western Balkans Investment Framework (WBIF) establish a dedicated Resilient Cities Fund to provide low-interest loans and risk guarantees.

### Implementation

Phasing and political cycles. Long-term visions such as TR030 face risks from short electoral cycles and shifting municipal leadership (Boeri Architetti, 2016).
Infrastructure deficits. Peripheral areas like Paskuqan lack adequate transport, drainage, and utilities (JICA, 2019).
Environmental constraints. Legacy pollution from old industrial facilities and degraded riverfronts require costly remediation (ACQJ, 2023).

## Conclusions and recommendations

Paskuqan's regeneration offers a transformative pathway for Tirana to transition from monocentric congestion to a polycentric, resilient urban model. By leveraging its industrial heritage—such as repurposing the Stalin Textile Plant into cultural

hubs—and restoring ecological assets like the lakefront green corridor, the area can bridge historical identity with sustainable development. A GIS-based traffic assignment model using 2023 Transport Ministry data (20,000 vehicles/day) indicates that the proposed north-south boulevard could divert approximately 4,000 vehicles daily, corresponding to a 20% reduction on Rruga e Elbasanit under peak conditions.

However, fragmented governance and gentrification risks demand a phased, equity-focused approach. Priority actions include: launching pilot projects like a lakeside cultural incubator and floating wetland park to demonstrate viability; establishing a Regional Regeneration Task Force to coordinate stakeholders and streamline permits; mandating a certain amount of affordable housing in new developments to prevent displacement; and deploying smart monitoring tools (GIS, IoT) to track ecological and social impacts. Crucially, Paskuqan's revival must align with broader regional strategies, such as integrating lake restoration into Tirana's stormwater management network and partnering with villages like Ndroq for agro-tourism. By balancing heritage preservation, climate resilience, and inclusive governance, Paskuqan can catalyze Tirana's shift toward equitable, post-carbon urbanism—a model relevant to Global South cities navigating similar historical and ecological tensions.



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## 4.1

## Beyond Kombinat
## A Morphological Approach for a Sustainable Development of the Erzen River Valley

*Luca FORMIGARI*

# 4

# Proposals for the protection and conservation of biodiversity and the Environment

# Beyond Kombinat
## A Morphological Approach for a Sustainable Development of the Erzen River Valley

DOI:

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**Abstract -** *The Erzen River Valley runs southwest of Tirana, from the former manufacturing district of Kombinat to the Adriatic coast, following the old road to Durrës and Kavajë. Dotted with historical settlements, ruins of fortifications and rural settlements, it is an area rich in historical, cultural and landscape values. In the valley bottom, the river flows alongside the road that has been connecting the capital to the coastal towns to the west from ancient times until the construction of the current motorway, and on which the main settlements are built. The surrounding countryside still maintains its agricultural and productive nature, a resource to be preserved in order to protect the local environment and, especially in the stretch between Kombinat and the village of Ndroq, to contain Tirana's productive and functional centralising thrusts, in an attempt to alleviate the pressure on the historic centre.*
*By analysing the structure of the territory in the section between Tirana and Ndroq, especially considering the morphology of the settlements, the positioning and hierarchy of the territorial routes in relation to the orography and the other elements of the landscape, an attempt is made to develop strategies for the completion and reconnection of the rural settlements by taking up the morphological peculiarities of their urban fabrics. The analysis of the context of the valley both on an urban scale, characterising the layout of built lots and routes in the towns, and on a broader territorial scale, investigating the structuring of routes in relation to polarities (settlements) and antipolarities (river, mountain ridges), is taken as the starting point for a proposal of expansion of the current urban and territorial structures, reinterpreting the morphological characteristics of the context.*

*Keywords - Cultural Heritage, Historical Settlements, Territorial Analysis, Urban Morphology, Landscape Preservation*

## Introduction

The valley of the Erzen River, which flows southwest of Tirana starting from the former industrial district of Kombinat, represents an area of significant landscape and historical interest. It is characterized by a stratification of settlements and is rich in archaeological findings that attest to the long history of the area dating back to the pre-Roman period (Forsén et al., 2015). The valley floor hosts State Road SH56, which connects Tirana to Durrës and which, prior to the construction of the current highway located further north, served as a major communication route between the two cities. The landscape of the valley is distinguished by its varied composition, where actively cultivated agricultural areas, historic settlement cores, and small-scale local production activities coexist. As one approaches the outskirts of Tirana—particularly in the valley floor—the early signs of diffuse urbanization become apparent. This form of development, partially disconnected from the pre-existing villages, is emblematic of urban sprawl. In contrast, the hillsides and areas further away from the capital have preserved the original separation between the built environment and the landscape. This balance between natural and anthropized elements grants the area a notable historical, scenic, and ecological value, which is now at risk due to the urban expansion dynamics that have characterized the recent growth of the Albanian capital (Sula, 2023).

The continued presence of a substantial amount of agricultural land—central to both the local economy and culture—alongside small productive activities, offers the opportunity to envision a sustainable development model grounded in the enhancement of existing resources. Such a model would avoid the kind of urban sprawl that has adversely affected many peri-urban areas in the Balkans (Živanović, Tošić, Mirić, & Vračević, 2022). From this perspective, the Erzen Valley can be interpreted as a complex

settlement system, in which historical routes, the relationships between inhabited centers, and the morphology of the landscape serve as guiding elements for conscious spatial planning.

Adopting a morphological approach—which centers the analysis on the form and evolution of anthropic structures and the configuration of territorial pathways—this study aims to identify strategies for enhancing the urban-rural system of the Erzen Valley. These strategies seek to improve the urban quality of the settlements without resorting to significant new expansions. Possible actions may include targeted interventions to mend fragmented urban fabrics, completion of road and pedestrian networks, valorisation of historical and natural pathways, and reclaim of residual open spaces. In this way, the Erzen Valley becomes a territorial laboratory to test strategies that integrate both landscape quality and environmental sustainability with the development needs of peri-urban areas.

## Literature Review

The undeniable historical and archaeological significance of the area is confirmed by the existence of numerous studies dating back to the early stages of Illyrian studies (Koçollari, 2021), as evidenced by the investigations of J. G. Von Hahn (1854) on archaeological sites and settlements in the area surrounding Tirana, and by the work of prominent figures in Albanian archaeology such as H. Ceka, who, among other sites, examined the settlement of Dorëz, located along the ridgelines surrounding the Erzen Valley (Ceka, 1951).

From the perspective of landscape and land use, the large number of agricultural enterprises in the area reflects the continuing importance of the primary sector in the country (INSTAT, 2024). Moreover, the widespread presence of agritourism facilities, combined with the proximity to the city, offers promising opportunities for the area to establish itself within the domains of rural tourism and ecotourism, in line with the objectives set forth in the Albanian National Tourism Strategy 2024–2030.

The importance and effectiveness of targeted interventions in the regeneration of historic settlements and rural contexts have been investigated in other settings, with various examples demonstrating how selective built heritage restoration interventions (Donatelli, 2024) and the completion of extra-urban territorial pathways (Boccia et al., 2005), when grounded in a thorough analysis of local characteristics (Pascolo & Piccinno, 2006), can serve as a catalyst for the revitalization of rural areas.

## Tools and Methods

It is important to preface that the territorial analysis conducted for the present research focused on a limited area—specifically, the stretch between the Kombinat neighborhood and the village of Ndroq—with the aim of identifying a small number of case studies for which to propose recovery strategies. The goal is to outline an exemplary, though by no means exhaustive, framework of potential interventions.

The approach adopted in the analysis of existing anthropic structures draws on the theories developed by Saverio Muratori (Caniggia & Maffei, 1979), which are based on a careful observation of the territory and its stratifications in order to understand the formative and transformative logics at play. The first step, therefore, consists of an analysis of the system of urban settlements located along the valley between Tirana and Ndroq. The urbanized environment—denser in areas closer to the city and progressively sparser moving away from the capital—develops primarily along the valley floor, in proximity to the Erzen River. It is along this axis that more recently established valley-floor settlements such as Pezë-Helmës, Pezë e Madhe, and Ndroq are located. These urban centers are characterized by a network of secondary routes, referred to as foundation routes, which branch off directly from the main valley route and follow patterns that conform to the morphological and orographic features of the terrain: more linear in the flat, meandering sections of the river, and more irregular in the hilly areas corresponding to natural constrictions of the valley (Figure 1). Other settlements have developed along the hillslopes, occupying intermediate positions on the surrounding elevations, generally following a linear layout organized along a single main road

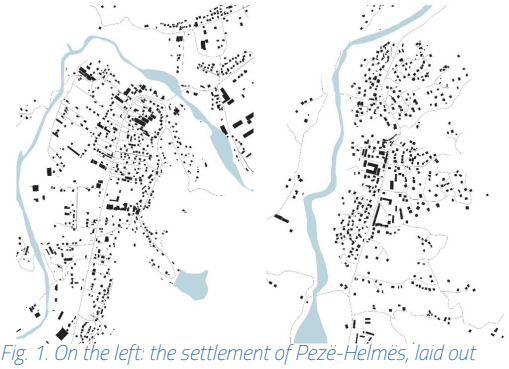

*Fig. 1. On the left: the settlement of Pezë-Helmës, laid out along the valley-floor route, featuring linear and regular foundation routes. On the right, the older village of Ndroq reveals a more curvilinear and irregular layout, shaped by the hilly orography of the terrain. Source/ author*

*Fig. 2. On the left, the settlement of Lalm exhibits a linear development along the counter-valley route. On the right, the village of Prush, although articulated across multiple elevation levels, still features foundation routes oriented along the contour lines.*
*Source/ author.*



*Fig. 3. In red, the valley-floor route; in yellow, the counter-valley routes. It can be observed that the territorial system is centered around the road running alongside the river, relegating the other routes to a secondary role.*
*Source/ author.*

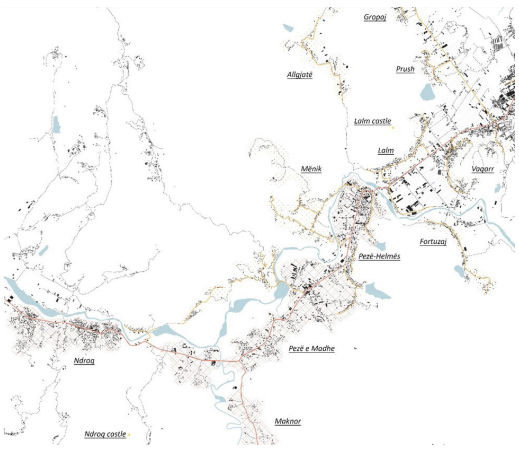


*Fig. 4. General overview of the Erzen Valley: in red, the valley-floor route; in orange, the counter-valley routes. The clusters of settlements are differentiated based on their hierarchy: in red (checked pattern), the valley-floor settlements; in orange (cross-hatched pattern), the low promontory settlements. The yellow circles indicate the castles, former high promontory settlements, while the blue areas (striped pattern) highlight regions characterized by urban sprawl.*

that traces the contour lines of the terrain (Figure 2). These settlements, known as low promontory settlements, are structured along counter-valley routes: pathways that run parallel to the valley floor but at a higher elevation, typically located at the boundary between the cultivated plain and the forested areas occupying the upper slopes.

Low promontory settlements thus form a belt of inhabited centers surrounding the valley floor, interconnected by counter-valley routes and linked to the main valley road through a network of transversal connections, which converge at strategic points such as river crossings or primary urban hubs. Among these settlements are the centers of Vaqarr, Lalm, Prush, and Fortuzaj.

With the progressive strengthening of valley infrastructure and the intensification of urbanization, counter-valley routes have gradually lost their territorial relevance, retaining only the role of generative paths for the settlements that have historically developed along them. As a result, in the case under examination, this counter-valley belt often appears discontinuous and fragmented (Figure 3), lacking coherence and poorly suited to medium-range mobility, which instead tends to concentrate along the main valley-floor axis. This redirection of traffic onto the primary valley route leads to its overloading, increasing infrastructural pressure and reducing the overall efficiency of the system.

Finally, at a higher elevation and still dominating the surrounding valleys, high promontory settlements can be identified. These represent the first stage of territorial urbanization, dating back to the Middle Ages, when, during the fortification process, local populations sought refuge at higher altitudes due to the instability and dangers of the valley floors. They built fortifications and castles in elevated areas, traces of which can still be found today. In the case under examination, none of the high promontory settlements have survived the subsequent gradual shift of human activity to lower areas, which, during periods of greater stability, offered better access to resources, easier mobility, and a more advantageous position for controlling trade routes (Caniggia & Maffei, 1979). Today, only the ruins of these settlements remain, identifiable with the castles of Ndroq, Bixhi (also known as Lalm), and Dorëz (Koçollari, 2021).

The overall picture that emerges (Figure 4) is that of a linear territorial system, centered on the single main valley-floor axis, along which the major urban centers of the area are concentrated. At this elevation, a diffuse urbanization can be observed, which, while still leaving ample space for cultivated fields and agricultural activities, marks the first step towards sprawl and scattered development. A buffer zone along the riverbanks, however, remains free. From the main route, secondary paths branch off in both directions, leading to the low promontory settlements located on the mid-slopes. These settlements are positioned between the cultivated areas of the valley and the higher slopes, often covered by forests. Only in a few cases are these villages connected to each other through counter-valley routes, further confirming the secondary role these connections play within the local road network.

This configuration strengthens the centrality of the valley-floor road, which becomes the primary transportation axis of the entire territorial system. Consequently, this infrastructure bears a particularly high traffic load, exacerbating the issues related to congestion, a phenomenon that also characterizes the other radial routes emanating from the urban center of Tirana (Seitllari & Luga, 2016), contributing to increasing pressure on local mobility.At the same

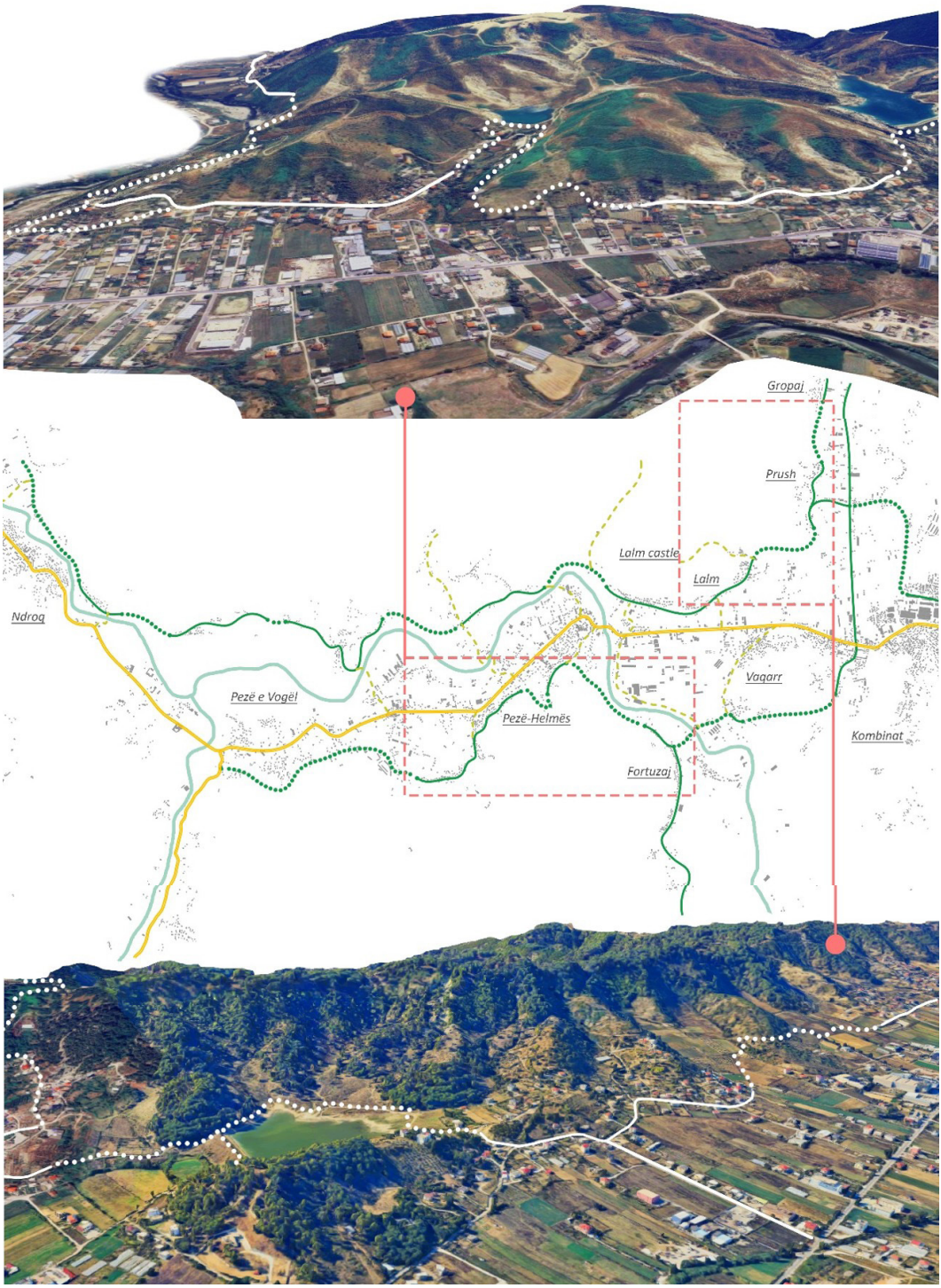


*Fig. 5. Proposal for the recovery and enhancement of territorial path systems. In the center: general plan of the intervention. The continuous yellow line represents the main valley-floor road, the continuous green lines represent the active counter-valley routes, and the dotted green lines represent those to be recovered. The dashed green lines indicate the current connection routes between the low promontory settlements and the valley-floor route. At the top and bottom: zoomed-in views of two areas involved in the recovery of the counter-valley routes.*
*Source: author.*

time, the extensive cultivated lands of this territory offer excellent potential for expanding rural tourism and agritourism in an area easily accessible from the city center. The presence of the river and forested hillsides can be enhanced by creating a network of tourist paths that connect natural points of interest and the archaeological sites of the castles along the ridges. Finally, a sustainable development plan for the territory can be envisioned by revisiting the formative logic of the territorial system, acting both on the settlements and on the routes. On one hand, the strengthening of existing urban cores can be planned with small expansions within the built fabric or in proximity to it, to introduce new functions that support local communities and visitors. On the other hand, the currently interrupted counter-valley routes can be stitched together and reconnected to form an alternative network of paths to the valley-floor route, linking secondary centers and opening them up to new opportunities.

## Case Studies

In relation to what was premised in the previous chapter, several case studies have been identified in the area of interest: two focused on the settlements and one concerning the routes. For each case study, recovery interventions for the urban fabric and reconfiguration of the access routes to the various

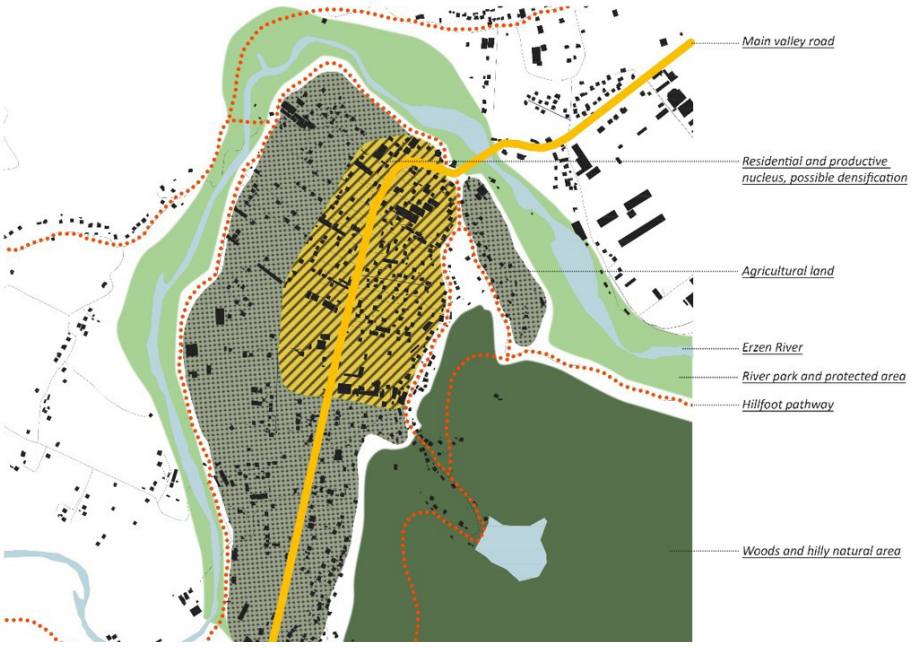


*Fig. 6. Proposal for the recovery of Pezë-Helmës. The central core, to be strengthened, is indicated by the dashed yellow area. The light green dotted area represents the agricultural zone to be protected from further development. The dotted peripheral route runs along the Erzen riverbank on one side and, on the other, at the base of the hills located to the southeast. Source/ author*



settlements have been proposed.

## Paths system

As part of a reconfiguration of the territorial routes in the area, the recovery of the counter-valley routes is proposed, with an expanded role in alleviating the traffic on the main valley-floor road (Figure 5). The remaining sections of this route, still in use, located at the boundary between the cultivated plain and the beginning of the forested slopes, could be reconnected to form a network of paths parallel to the valley-floor route, linking all the low promontory settlements and serving a dual purpose: both as an alternative route to the main road and as a tourist trail immersed in nature. The recovery of the route could thus be implemented in certain areas as an accessible road for private vehicles, especially in zones where it is necessary to restore connections between villages, while in more nature-oriented areas, the creation of a strictly pedestrian and cycling path with resting areas and observation points for the landscape could be envisaged.

Similarly, some of the ridge routes leading to the ancient high promontory settlements, now in the form of ruined fortifications, such as the castle of Lalm, could be reactivated and enhanced. Regarding the proposal for the recovery and enhancement of the settlements, the village of Pezë-Helmës represents an exemplary case of a valley-floor settlement. It is situated in a bend formed by the Erzen River, likely composed of river debris, in an area bordered by the river on three sides and by a hill on the fourth. The settlement is located along the main valley-floor route, which also serves as the matrix route of the settlement. A denser central core can be identified between the bridge over the Erzen and the beginning of the narrow pass formed by the southern hills, where most of the houses and productive activities are concentrated. Moving away from this central area, cultivated fields occupy the majority of the space up to the riverbank. At the edge of the settlement, on both sides, a well-defined antipolar route marks the end of the settlement and the beginning of, on one side, the river and, on the other, the hills (Figure 6). The proposal aims to consolidate this type of morphological layout of the settlement, which is the result of the same dynamics of formation and growth that have governed the birth and transformation of historic settlements. To achieve this, it is proposed to concentrate development within the identified central core, potentially densifying it with functions that support productive activities, such as an agricultural market, while reserving the peripheral area for the productive function of cultivated fields. The peripheral route can become an important part of the tourist route for the counter-valley paths, also reaching the small artificial lake to the southeast, integrating with a potential riverine naturalistic path along the Erzen riverbanks, which is proposed to be transformed into a protected area.

A good example of a low promontory settlement is Lalm. In this case, the settlement is entirely developed along the counter-valley route, following a linear pattern where most of the buildings face south, with direct access to the mid-slope path (Figure 7). Some roads connect this route perpendicularly to the valley-floor path, cutting across the cultivated plain. Above the settlement, which lacks a true central core, the forested slope begins abruptly. On the ridge, the ruins of the Lalm castle are still visible, marking the ancient high-promontory settlement from which, over the centuries, human activity has gradually descended, occupying the valleys and settlements still in use today. The proposal here primarily aims to preserve the original land-use pattern, attempting to restore the flat area between the settlement and the valley-floor path to an agricultural function, halting the already widespread sprawl phenomenon. Any potential urban expansion, albeit modest in scale, should align with the existing layout of the Lalm settlement, continuing its linear development along the counter-valley route. The recovery of this route is important not only for defining the built-up areas but also for creating a naturalistic path that continues towards the lake and the village of Prush located further north.

# Conclusions and Recommendations

The analysis conducted on the Erzen River Valley has highlighted how this territory constitutes a complex settlement system, characterized by deep historical stratification and a strong relationship between the natural landscape and the built environment.

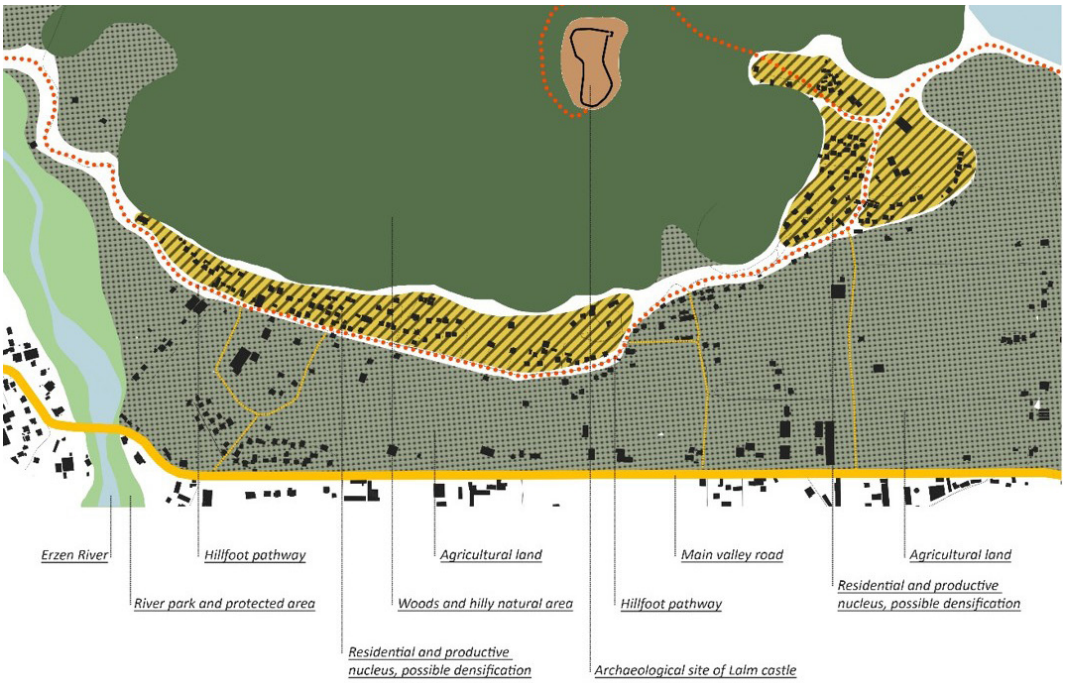


*Fig. 7. Proposed recovery of the village of Lalm. In dashed yellow the inhabited area and possible expansion areas. In dotted green the areas where agricultural functions are to be preserved and recovered. The counter-valley path, dotted red, marks the boundary between the cultivated plain and the built-up area, running parallel to the valley floor infrastructures. Source/ author*



The morphological reading has allowed for the identification of spatial logics that guided the formation of inhabited centers and networks of territorial paths, thus providing an interpretative key useful for guiding future development strategies.

In a peri-urban context marked by increasing urban pressures, the Erzen Valley stands as a particularly sensitive area, where it is still possible to prevent phenomena such as uncontrolled land consumption and landscape fragmentation, typical of urban sprawl. The enhancement of agricultural, historical-archaeological, and natural components, combined with targeted interventions aimed at stitching together and redeveloping existing settlement fabrics, represents a feasible path towards sustainable and integrated development.

Through the analyzed case studies, the aim is to propose solutions that, even through small-scale interventions, can promote territorial regeneration capable of strengthening local communities, improving internal accessibility, and encouraging forms of rural and nature-based tourism compatible with the context. In particular, the recovery of counter-valley paths and the enhancement of settlements offer the opportunity to build a light and resilient infrastructural network that supports development without altering environmental and social balances. In summary, the Erzen Valley can become an experimental laboratory for territorial policies that are attentive to the context, capable of balancing the need for growth with the conservation of local resources.

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## 5.1

## Industrial areas and historic villages: two sides of the same coin? Proposals for enhancement and regeneration through urban strategies

*Nicola Pio DI TOMMASO*

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# 5

# Proposals for landscapes and heritage

# **Industrial areas and historic villages: two sides of the same coin?** Proposals for enhancement and regeneration through urban strategies

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**Abstract -** *The contemporary urban landscape is increasingly characterized by a territorial structure divided into core and non-core areas, which face common critical challenges such as depopulation, infrastructural decay, and difficulties in adapting to contemporary needs. This study aims to outline effective urban regeneration strategies for marginal areas, identifying their criticalities, root causes, and potential opportunities for reconnection and revitalization. The main objective is to explore the transferability of successful models and practices from the Italian context to diverse settings, specifically within the metropolitan area of Tirana, focusing on the Uzina area in Shkoza. The methodology adopts a qualitative approach based on a comparative analysis of two case studies: the village of Campolo in Italy, which exemplifies the process of the urban regeneration in the Italian context, and the Uzina area in Shkoza, Tirana, a former industrial zone characterized by a unique blend of residential, industrial, and rural functions. The comparative approach is not based on a direct parallelism between settlement typologies, but on the application of a proven theoretical framework derived from the Italian experience to a new and distinct context, aiming to extract guiding principles such as the valorization of cultural and landscape heritage, rural sustainability, and participatory design. The results highlight how the Italian experience offers a solid methodological framework for reconnecting and valorizing Uzina's intrinsic territorial capital (the Tirana River, agricultural areas, the former industry, and the community), transforming it into a potential new urban hub. This systemic approach contributes to rebalancing Tirana's fragmented urban fabric, promoting resilient and inclusive development that transcends historical and geographical differences.*

*Keywords - Urban Regeneration, Industrial Areas, Historic Villages, Participatory Design, Rural Development*

## Introduction

The contemporary urban landscape, both in Europe and globally, is increasingly shaped by a territorial structure divided into core and marginal areas. This diversified hierarchical system appears unbalanced due to the process of urbanization, which has accentuated the urban-centric nature of the territory (Lanzani, 2003) and has relegated marginal areas to the role of passive beneficiaries of urban development (Modica et al., 2021). Harrison and Heley (2015, p. 1130) also criticize this logic, arguing that non-core areas are often perceived "simply as an appendage hanging on to the coattails of the great modern metropolis." The distinction between core and non-core areas is not merely geographical but reflects profound socio-economic, infrastructural, and cultural disparities, contributing to phenomena of decline and depopulation. In fact, core areas are generally understood as urban zones acting as "growth engines for regions and/or countries" (Modica et al., 2021, p. 237). They benefit from concentrated investments in essential infrastructure and services, such as education, healthcare, and transportation, which enhance their functional attractiveness and economic competitiveness (Basile & Cavallo, 2020). By contrast, the non-core areas are not only physically peripheral but also structurally disadvantaged in economic and social terms. They are frequently characterized by processes of depopulation, infrastructural decay, and the abandonment of cultural and landscape heritage, which reduce their attractiveness for residents and businesses (Oppido et al., 2019). It is difficult to identify the precise historical moments and causes that led

to the fragmentation of territories. Undoubtedly, processes such as urbanization, mechanization, globalization, the rise of the knowledge economy, and the economic crises following the Second World War have profoundly shaped the dichotomy between non-core and core areas (Lanzani, 2003; Modica et al., 2021). However, as Modica et al. (2021, p. 240) note, "from the United States to Europe, every country has its own historical peripheral areas produced by long-term processes, as well as more recent ones formed by contemporary phenomena." In recent decades, there has been growing interest in this issue, particularly regarding depopulation, among academics and international organizations such as the OECD, the United Nations, and the European Commission (Loras-Gimeno et al., 2025), given the importance of maintaining a balance between urban, peri-urban, and rural areas for the long-term stability of countries. Accordingly, international policies promote urban and territorial regeneration projects (Speciale et al., 2022) and advocate moving beyond the binary distinction between "leading" and "lagging" territories (Oppido et al., 2019, p. 2). This contribution aims to support the overcoming of the distinction between leading and lagging territories, therefore the main objective of this work is to investigate urban regeneration practices with the aim of fostering balanced development between urban centers and peripheral areas, enhancing local resources and mitigating territorial inequalities, and to better support the background of international policies that today appear weak, disconnetted and lacking generalizability (Loras-Gimeno et al., 2025). More specifically, the study seeks to identify, through the Italian experience with historic villages, a set of tools and practices applicable to the Albanian context. It focuses on two international case studies, selected for their comparability in terms of fragility and marginality:

- Campolo (Emilia-Romagna, Italy), a historic village included in the so-called Minor Italy, composed of 5,683 small municipalities with ≤ 5,000 inhabitants (17% of the Italian population), most of which are affected by depopulation and decline, and have already been subject to various initiatives and regeneration programs, such as those of mountain communities, the National Strategy for Inner Areas (SNAI), and the National Recovery and Resilience Plan (PNRR) (Flora & Crucianelli, 2013, p. 28). Campolo represents a significant example of the implementation of the National Villages Plan (Piano Borghi), within a region that has long been a socio-economic laboratory for processes of modernization, agrarian landscape transformation, and urbanization (Montanari et al., 2004). Its marginal location in relation to the metropolitan city of Bologna reflects the condition of much of the Apennines.
- Uzina in Shkoza (Tirana, Albania), a former socialist peri-urban industrial area, located between the densely urbanized city center and the rural periphery. Its regeneration responds to the urgent need to mend Tirana's fragmented urban fabric, alleviating pressure on the center and promoting new development poles. In particular, its position along the Tirana River makes it strategic for reconnecting the city along an east–west axis.

The two cases share common vulnerabilities, such as decline, depopulation and marginality, despite their historical and territorial differences, and represent voids, respectively territorial and urban, to be regenerated. The comparison adopts a qualitative, multi-scalar, and interdisciplinary approach, applying a theoretical framework tested in Italy to a distinct Albanian context, and promoting regeneration as a holistic process at the territorial scale. The international relevance of this work lies in the proposal of transferable models and tools for sustainable development and territorial cohesion. The comparison between Italy and Albania contributes to the global debate on depopulation policies, which are often fragmented and scarcely generalizable, providing insights for assessing transferable regeneration strategies and planning scenarios for the Uzina area and also for the other international contexts.

The paper is structured as follows. Section 2 outlines the methodology, based on a qualitative, multi-scalar, and interdisciplinary comparative analysis. Section 3 examines the Italian context, with a focus on the historic village of Campolo and its regeneration process, while Section 4 analyzes the Albanian case of Uzina in Shkoza, Tirana. Section

5 discusses the results of the comparative analysis, identifying common challenges and transferable strategies, and Section 6 concludes by highlighting the main findings, limitations, and potential future directions.

## Methodology

This contribution adopts a qualitative approach within a multiscalar and interdisciplinary framework, based on two international case studies: Italy and Albania. The use of a comparative analysis serves to explore the transferability of urban regeneration strategies between diversified contexts. The methodology was structured in three key steps.

The first involved a literature review (Emiliani et al., 2006; Barbera et al., 2022; Lanzani, 2003; Oppido et al., 2019; Modica et al., 2021; Basile & Cavallo, 2020; Islami & Veizaj, 2024) to define the context of marginal areas, with a particular focus on a type of Italian settlement: historic villages, which are currently the subject of research in regeneration practices. From this analysis, four important guiding elements emerged in the regeneration process, which assume the landscape as a development factor.

The second phase involved a contextual analysis of the Italian experience of the PNRR's Piano Borghi (Villages Plan). For this purpose, the village of Campolo, a rural and mountainous settlement in the northern Apennines of the Metropolitan City of Bologna in Emilia Romagna region, was selected. The case of Campolo is not intended as a case study for a direct and parallel comparison, but rather as a set of principles derived from the regeneration process in which it is currently involved. It illustrates how landscape and local identity can become generative elements in a requalification process, providing a valuable lens through which to analyze the context of Tirana. The regeneration process, especially when based on the principles of landscape and local identity, requires participatory planning where community involvement plays a central role. By way of example, the European experiences of the LEADER model Liaison Entre Actions de Développement de l'Économie Rurale) and the CASPER project (Citizen Actions for Smart Public Enhancement of Resilience) represent valuable reference tools for the territorial context of Tirana and, in particular, Uzina. The LEADER model provides the framework for "bottom-up" local development, fostering cooperation between public and private actors and the enhancement of territorial resources (European Commission, 2023). The CASPER project offers a methodological approach centered on the direct involvement of citizens to address the challenges of demographic decline and improve services (Interreg Europe, 2023). Together, these models provide guidance for implementing strategies aimed at sustainable and inclusive urban regeneration. The final phase, based on the guiding principles extrapolated from the Italian context, saw the study conduct a detailed analysis of the Uzina in the Shkoza area, Tirana. The objective is to evaluate the area's potential and identify a series of plausible tools and strategies for its regeneration. The comparative approach, therefore, does not lie in a direct parallelism, but in the application of a proven theoretical framework, derived from the Italian experience, to a new and distinct context. This is possible by assuming that places in a state of degradation and depopulation require practices based on integrated, participatory, and shared approaches, regardless of the origin and nature of a given settlement, to highlight the importance of a new interconnected territorial system



## The Italian Case

Italy has distinguished itself for its prompt adoption of European initiatives, becoming a model of reference at both national and international levels. One of the most significant aspects of its territorial structure is the urban phenomenon, an ongoing process that has led to a complex division between core and no-core areas. This process is generally traced back to the 1950s, with the emergence of suburban areas that reshaped the traditional relationship between the compact city and the countryside. In fact, alongside the traditional configuration of the compact city, increasing urbanization in certain centers and the experimentation with new settlement models have given rise to the so-called diffuse city, reorganizing territorial structures based on economic and administrative criteria. The causes of this transformation are manifold and vary depending on the context. In general, they can be attributed to technological factors, such as mechanization and the spread of motorization; socio-economic factors, including industrialization, the growth of the tertiary sector, and internal migrations; and finally, a new political approach to territorial management. However, this is not merely a cause-and-effect phenomenon but rather a complex process in which various elements have influenced each other (Lanzani, 2003). Nevertheless, the Italian territory stands out for its polycentric nature, where each settlement has historically functioned as an autonomous and self-sufficient center, with its own unique characteristics and deeply rooted history. Analyzing the literature from a historical perspective reveals deeper underlying causes that have undoubtedly shaped the fate of these areas, contributing to their isolation (Lanzani, 2003; Bagioli & Anfosso, 1977; Bagioli & D'Innella, 1978; Emiliani et al., 2006). The urban phenomenon in Italy has produced a variety of settlements, the result of redefining the historic center as cultural heritage and of the spread of new settlement logics such as suburbanization and the urbanization of the countryside linked to industrialization. This expansion of the city into the territory has generated fragmentation and socio-economic inequalities, often accompanied by a marked lack of public spaces and indifference toward the territory and the environment. Italy is now addressing these disparities through concrete urban regeneration policies and a form of "urban stitching" initiated in the 1990s, overcoming conservative immobilism and recognizing the landscape as a resource to be activated and as a new inhabitable territory. This Italian context is strongly comparable, albeit under different conditions and historical moments, to what Albani, and Tirana in particular, is experiencing, with its uncontrolled expansion and the evident disparities with peripheral areas. The comparison between these contexts, even among settlement types that may appear very different (such as historic villages and peri-urban industrial areas), falls within the perspective of integrated territorial development. The goal is holistic growth that enhances intrinsic territorial capital and fosters cohesion, recognizing the landscape as a dynamic and interconnected element, an expression of a society made of multiplicities (Lanzani, 2003).

### The Italian experience of the Historical Village of Campolo

The Italian polycentric landscape is composed of a vast range of settlement types, from metropolitan hubs to small historic villages, bringing into focus the ongoing debate around the classification, role, and regeneration of non-core areas (Barbera et al., 2022; Emiliani et al., 2003; Lanzani, 2003). Within

*Fig. 1. The Historical Village of Campolo, Emilia-Romagna, Italy.*
*Source/ author (2025)*

*Fig. 2. Imbalance between rural and urban: an overview of Tirana*
*Source/ author (2024)*

*Fig. 3. (Il)legal building*
*Source/ author (2024)*

this framework, in recent decades, the theme of regeneration of historic villages has gained particular relevance, especially after the Covid-19 pandemic.

The historic village, the Italian term "borgo storico," is a typical settlement linked to the period of "incastellamento" (castle-building) that began in Italy from the 11th century (Bagioli G. & D'Innella M., 1978). Over the centuries, it has undergone profound changes due to urbanization processes, and precisely because of this continuous evolution, it is difficult to define it unequivocally. Indeed, it embodies the complexity and stratification of the Italian territory, representing a historical, cultural, and landscape heritage that would be reductive to associate exclusively with tourism or a vision of well-being (Barbera et al., 2022).

The definition of a historic village adopted in this work derives from the synthesis of recurring aspects present in the literature (Associazione I Borghi più Belli d'Italia, 2024; Ministero della Cultura, 2022; DM 02/12/2016, n. 555; Touring Club Torino, 2023). It is a settlement comprising a palimpsest of historical stratifications that define its identity, chronologically placeable between the 11th and 18th centuries, with the Renaissance as the last reference era, as the subsequent modern age is characterized by different settlement criteria. The village is characterized by a strong connection with nature and the territory, which guide its urban conformation: an organic and irregular fabric, adapted to the natural morphology and located away from major urban centers. Its relevance also lies in aspects of social, economic, and environmental sustainability. Demographically, the debate is broad but oriented towards settlements with fewer than 5000 inhabitants, corresponding to small municipalities in severe conditions of depopulation, degradation, and social marginality. In administrative terms, they constitute approximately 60% of the Italian territory (Catone, 2020) considering also hamlets, the total would exceed 20,000 units. From this emerges the national necessity to activate regeneration processes. The most recent expression of this attention is the National Villages Plan (Piano Nazionale Borghi), launched in 2021 with a series of interventions on two fronts. In particular, Line A has selected 21 pilot projects, one per region, intended to guide the regeneration processes of historic villages (Ministero della Cultura, 2022).

Among these, the experience of the village of Campolo represents a significant case (Figure 1).

Located at 600 m above sea level in the Bolognese Apennines, within the metropolitan territory of Bologna, Campolo is historically known as the "village of stonemasons" due to its tradition linked to local stone processing, evidenced by the now disused quarries and the inhabited area. The village preserves buildings dating back to the 15th century and traces of an older agricultural vocation, recalled by the Latin name campulus ("small field"). Immersed in nature, it is flanked by one of the area's most evocative landscape attractions: the Stonemasons's Falesia with the Montovolo mountain. The closure of the quarries, due to the scarcity of material and reduction of the workforce, led to a progressive state of abandonment and depopulation, reaching fewer than 50 inhabitants. Today, Campolo is involved in a regeneration process promoted by the municipality and centered on the project "Da Campolo l'arte fa scola" ("From Campolo, art becomes a school"). The initiative aims to transform the village into a new cultural and tourist hub through the relaunch of entrepreneurial activities and the reconstruction of a solid community. In this process, the landscape becomes a generative

element: the recovery of cultivable surfaces, the contemporary relaunch of stonemason activities for the sustainable production of building materials, and the valorization of environmental resources as well as tangible and intangible heritage all constitute development drivers rooted in local identity. A central role is assigned to the community, which has contributed to rebuilding the village's identity through participatory, integrated, and shared approaches, a necessity arising from the complexity of revitalization processes. To this end, a community cooperative was founded, designed to operate with shared value and act as an intermediary between inhabitants and local administration, while also engaging stakeholders in development strategies. Identity is therefore not only historical and cultural but unfolds into plural and interconnected trajectories: productive, social, agricultural, and exchange-based (Druidi, 2022; Vivicampolo 2023). The program combines the safeguarding and recovery of the village's cultural, architectural, and artistic heritage with the need for social and economic revitalization and the creation of new employment opportunities. The project envisions Campolo as a "cooperative village," with affordable rental housing, temporary accommodation units for young families, researchers, artists, slow travelers, pilgrims, and digital nomads, as well as the regeneration of shared facilities such as a medical center, telehealth services, a civic hall, and sports spaces. Cultural buildings are being restored, and public areas are requalified with a strong integration into the surrounding landscape. Beyond these material interventions, the initiative also places great emphasis on the intangible heritage of the village, in particular the artisanal tradition of stonemasonry. This legacy is being leveraged to establish an Advanced Training School in construction and restoration, alongside the creation of a Casa delle Arti (House of the Arts) and the promotion of cultural events such as music and literary festivals, thereby weaving together tradition, education, and innovation (Lipparini & Antonucci, 2024).

A less developed but relevant aspect concerns infrastructures, especially in terms of physical connectivity: Campolo suffers from limited public transport services and accessibility conditions, which would require enhancement, also in relation to its proximity to the Via Porrettana and its important railway network (Manella, 2017). Simultaneously, the theme of digital connectivity has been initiated, which appears more easily achievable and strategic for the village's future. To date, the projects realized involve the requalification of some buildings and significant areas, but the question of next steps and future scenarios remains open, especially in view of the conclusion of the Piano Borghi funding, expected by June 2026.

The discussion of this experience, regardless of its level of implementation, aims to extrapolate relevant aspects of regeneration useful for application in other contexts, including international ones.

## Deconstructing the Regeneration Process: Key Components and Strategic Guidelines

The experience of Campolo, shared by numerous Italian contexts, together with insights from the literature, including the valuable Glossary from the book Urban Regeneration by Lupatelli and De Rossi (Lupatelli & De Rossi, 2022), has made it possible to highlight the main recurring elements in regeneration practices.

An effective model must be grounded in the analysis of the specific challenges of each area and

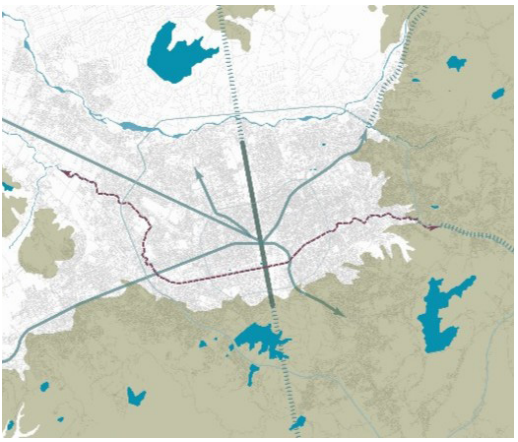

*Fig. 4. The key elements of the pattern of the city of Tirana Source/ the author et al. (2024)*

in the enhancement of local economic, social, and landscape resources. These are key elements for defining new models of sustainable development and growth (Stephenson, 2008). Such resources enable the tackling of issues like the protection of cultural heritage, innovation in traditional products, land access, sustainable agriculture, renewable energy, environmental risk management, and the involvement of local communities in evaluating adopted strategies (Basile & Cavallo, 2020).

Territorial and Infrastructure Dimension. Analyzing the territorial context, its critical issues, and available resources constitutes the first step in outlining the operational boundaries of a regeneration model, while also defining long-term objectives (Oppido et al., 2019; Modica et al., 2021; Basile & Cavallo, 2020). In this regard, the landscape plays a strategic role due to its multidimensional values, capable of triggering new development dynamics and shaping local identity. The landscape should be considered an essential asset to safeguard (Oppido et al., 2019), especially in light of its vulnerability to natural risks, thus promoting mitigation and adaptation strategies (Modica et al., 2021; Basile & Cavallo, 2020).

Cultural Identity and Heritage Valorization. Landscape and cultural heritage are essential to local development, acting as strategic resources to strengthen identity and foster socio-economic progress (Oppido et al., 2019). Heritage encompasses both tangible and intangible elements, which are fundamental in nurturing the bond between community and territory (Basile & Cavallo, 2020; Cervellò et al., 2012). Authenticity, defined as the compatibility between use, time, and place of origin, is a guiding principle in heritage enhancement (Basile & Cavallo, 2020). Place-based and history-based approaches place cultural identity at the heart of development strategies.

Rurality and Sustainability. Rural identity is a key element in the conservation and sustainable enhancement of territory. There is a close relationship between rural identity, sustainability, and authenticity: a solid territorial identity results from accumulated social capital, which becomes an intangible resource for local development, reinforcing the sense of belonging and engagement of local actors (Basile & Cavallo, 2020). In this context, sustainability is pursued through the responsible and non-dispersive use of environmental resources, such as water, soil, forests, and energy (Basile & Cavallo, 2020). An example of this effective model of rural development is represented by the LEADER approach (Liaison entre actions de développement de l'économie rurale), promoted by the European

*Fig. 5. Location of the Uzina area in relation to the center of Tirana*
*Source/ the author/ image reprocessing from Google Earth (2025)*

Union. It is based on local development strategies elaborated and implemented by Local Action Groups (LAGs), which are public-private partnerships representing local socio-economic interests. The approach is characterized by seven key elements defined in EU Regulation No. 1303/2013: place-based strategies in well-defined rural areas, bottom-up design and implementation, public-private partnerships, integrated and multisectoral actions, innovation, cooperation projects, and networking (European Commission, 2023).
Participatory Design and Stakeholder Engagement. A key element in triggering sustainable development processes is the interaction with local communities and the dialogue with stakeholders. Participatory design is an essential tool to ensure the effectiveness of regeneration strategies by actively involving residents, local businesses, and institutions (Oppido et al., 2019; Modica et al., 2021; Basile & Cavallo, 2020; Cervellò et al., 2012; Barbera et al., 2022). A significant example in this field is the CASPER project (Citizen Actions for Smart Public Enhancement of Resilience). Co-financed by the European Regional Development Fund through the INTERREG EUROPE programme, this project's primary goal is to improve territorial policies by directly involving citizens in finding solutions to the challenges of demographic decline, unemployment, and service deficiencies in rural areas across Europe. The project achieves this by facilitating the exchange of best practices among its partner regions, thereby strengthening the sense of belonging and enhancing the quality of territorial policies to ensure more effective and shared solutions (Interreg Europe, 2023).

## The Albanian Case

To emphasize the presence of historical peripheries across different territorial contexts, the Albanian case is examined to identify both divergences and convergences with the broader European scenario.
The analysis focuses on a specific case study within the city of Tirana: the Uzina area in Shkoza. Although located within the urban fabric, this area displays many of the characteristics typically associated with inner or marginal areas. Before delving into the specifics of this case, it is essential to clarify the nuanced distinction, within the Albanian context, between rural areas and marginal areas. This distinction arises from unique historical trajectories, markedly different from those in Western Europe. In Albania, the concept of non-central areas retains a strong rural connotation, rooted in the traditional relationship between settlements and the landscape, and historically linked to an agrarian economy. Today, many of these areas face economic disadvantage, significant demographic decline, and diminished prospects for local development (Aliaj et al., 2003; Islami & Veizaj, 2024). The current territorial configuration of Albania is largely the result of profound socio-economic transformations following World War II, shaped by two pivotal events. First, the rise of the communist regime, which implemented ambitious development programs and restricted migratory flows, leading to substantial population growth. Second, the regime's collapse, which triggered the breakdown of the territorial system and marked the beginning of intense depopulation, particularly in rural areas. These territories experienced severe socio-economic and political consequences, including a dramatic decline in agricultural output (Aliaj et al., 2003; Islami & Veizaj, 2024).
Although decades have passed, the consequences of these transformations remain visible. In recent years, a first attempt at rural regeneration has emerged through the governmental "100 Villages" program, which adopts a methodology similar to territorial acupuncture (Islami & Veizaj, 2024), a widely used approach in Europe where landscape and nature are central to planning strategies. This initiative is supported by a classification of rural areas introduced by the Institute of Studies and Design in 1987, which categorizes villages into four types: small (up to 500 residents), medium (500–1,000), large (1,000–2,000), and very large (over 2,000 residents) (Islami & Veizaj, 2024). These historical dynamics did not only affect rural regions but also had a profound impact on urban areas, particularly Tirana. During the post-socialist transition, the city experienced widespread urban growth, driven by market liberalization and internal migration from the countryside (Figure 2). Alongside international emigration, Tirana attracted a significant internal population flow in search of employment, resulting in uncontrolled urban expansion, the proliferation of informal housing, and serious infrastructure deficits (Figure 3).
This chaotic growth led to what some scholars describe as the emergence of five Tiranas (Sotir, 2015), portraying the capital as a "multifaceted city" (Sotir, 2015, p. 144) with exceptional features that differentiate it from other urban contexts. The disordered expansion has made it imperative to rethink urban classifications and urgently adopt planning tools to address issues such as traffic congestion, service shortages, and environmental degradation, particularly in peripheral areas.
In this context, the city of Tirana today shows a clear social, economic, and cultural distinction between

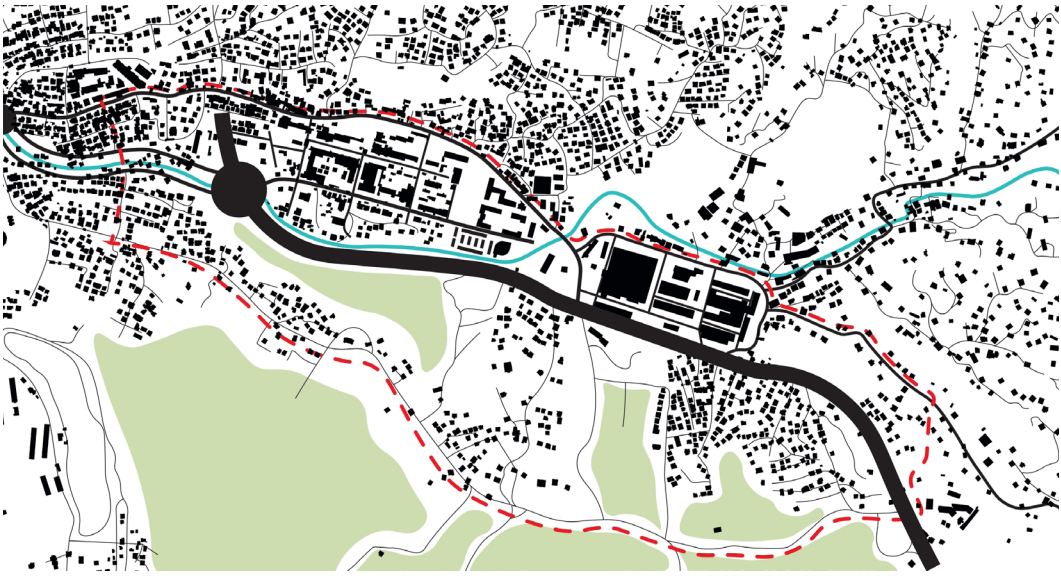

*Fig. 6. Double layer of urban fabric in Uzina: organic pattern and rigid pattern*
*Source/ the author et al. (2024)*



the city center and the surrounding areas. The study of historical maps has been crucial in tracing the city's evolution from its original core around Skanderbeg Square (Aliaj et al., 2003), revealing fundamental elements of the urban structure, such as the five main axes and the two rivers, Lana and Tirana (Figure 4).

Within this framework, the eastern sector of the city, and particularly the Uzina in Shkoza area, emerges as a focal point of interest (Figure 5).

Located in the eastern part of Tirana, Uzina represents a former industrial urban hub, historically marked by the activity of an important footwear factory, centrally situated within the settlement. The area is traversed by the Tirana River and the Unaza highway, which are the main connections to the city center, and serves as a connection node between two neighborhoods: to the northwest, Shkoza, characterized by the landscape at the foot of Mount Dajti, and to the south, the Farkë e Madhe neighborhood, with its Park and artificial lake. The Uzina area is primarily residential, with the presence of some services, including schools concentrated in the northeastern part. The southern part of the area, however, is less urbanized: to the west, rural spaces and uncultivated green areas prevail, while to the east, some lands are designated for agricultural use (Figure 6). The residential layout also presents a strong fragmentation: on one side, buildings arranged according to a regular hierarchy, and on the other, dwellings scattered across the territory in a more disorganized manner. This fragmentation reflects a condition of degradation and abandonment, especially on a social level, likely initiated with the cessation of the footwear factory's industrial activity. Based on this analysis, it is possible to summarize some key characteristics of the area through three main emerging aspects:

Accessibility: the area has a direct connection to the city center via the Unaza highway and the main roads along the Tirana River. However, these constitute the only privileged connections, generating congestion on the main arteries and in the historic center. Moreover, Uzina's location coincides with a break in part of the Ring, making access to surrounding areas and neighborhoods difficult, with the highway serving as the main connection node.

Services: services are mainly concentrated in the north-western part, including schools, commercial activities, and primary services. This concentration, however, creates a heterogeneous distribution across the rest of the area, where residential uses prevail and other portions remain poorly served.

Informality and urban fragmentation: high, with disorganized buildings and discontinuous residential spaces, reflecting post-industrial decay and a lack of coordinated planning. The presence of the river and the highway further accentuates internal separation, dividing the area into two parts. Despite the abandoned state of the former industrial site, there are occasional socio-cultural activities, demonstrating the community's desire to recover local identity, of which the former footwear factory remains a key symbol.

## Discussions

The neighborhood of Uzina in Shkoza, Tirana, represents a fundamental piece for rebalancing the chaotic and fragmented urban context of the Albanian capital. Its importance is not limited to reconnecting the surrounding territory with the city, but also lies in its potential to serve as a model for a new type of development.

The comparison with the Italian case of Campolo, although the historical and territorial contexts are different, reveals common factors such as degradation, depopulation, and marginality. These critical issues make the Italian experience, and particularly the approach to regenerating historic villages, a valuable source of inspiration for Uzina. The common objective is to initiate pathways aimed at economic, social, and environmental sustainability (Proietti et al., 2024), by exploiting the intrinsic potential of the territory, also with a view to a circular economy.

The analysis of the Campolo case has allowed for the extraction of key principles applicable to Uzina. Firstly, the valorization of cultural heritage as a starting point. In Uzina, the former footwear industry and its history constitute a material and immaterial heritage of considerable value, which can strengthen local identity and trigger new socio-economic development. Similarly to Campolo, where

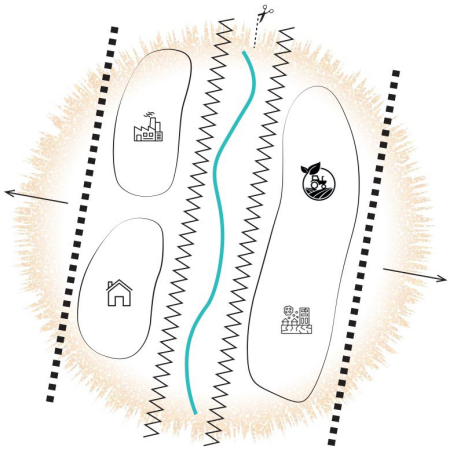

*Fig. 7. Analysis of the current state of the functional areas of Uzina. The concept represents the poor dialogue between the four areas that characterize Uzina, where the river, along with the Uzana highway, acts as a separating element. Furthermore, there is a strong sense of alienation from the surrounding context.*

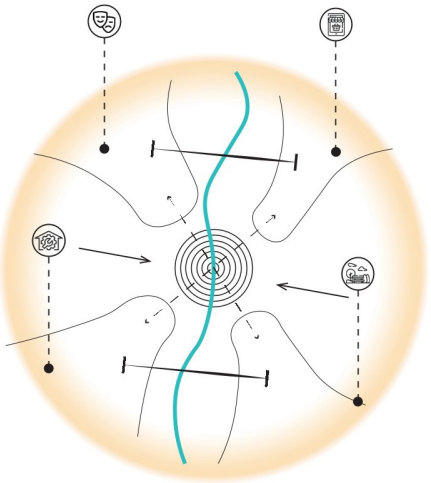

*Fig. 8. Potential functional and administrative strategy for Uzina. The concept shows how the Tirana River can become a unifying and generative element, creating a central community space that connects the four areas: residential, socio-cultural, agricultural, and the urban park. The highway could be elevated to free up the space beneath for the community*



production linked to stone extraction and agriculture guided development, in Uzina, the industrial legacy can become the pivot of new trajectories.
Secondly, landscape emerges as a key element for regeneration. While Campolo focused on its close connection with the mountain environment and hiking trails, the analysis of Uzina reveals intrinsic potentials in its landscape to guide change. The presence of four different territorial typologies (rural areas, spontaneous settlements, residential neighborhoods, and industrial zones) constitutes a unique asset. The presence of the Tirana River, from being an element of separation, can be transformed into a generative element, creating a collective central core and giving rise to new trajectories: a cultural center in the former industrial area, a residential area, one dedicated to sustainable agriculture, and an urban park, while respecting pristine lands (Figures 7 e 8).
Furthermore, by transferring the altimetric data of the area into a conceptual environmental section, the landscape shows a natural orographic tendency to converge towards the river, drawing attention to the river, around which the new hub would develop, in which the landscape seems to transform into a container (Figure 9).
To fully leverage the landscape's potential for reconnection, it is essential to reconsider the strategy for crossing the Uzana highway, which currently marks a clear separation between the different portions of the area. Possible solutions could involve elevating the section that passes through Uzana, thereby creating a central hub capable of reducing fragmentation and informality in both the physical and social fabric, while also improving environmental quality. Alternatively, an elevated space, such as a plaza, could be constructed above the highway, overcoming the barrier and reconnecting the portions of the area.
The success of the regeneration process critically depends on the strong involvement of the local community, which is essential in a densely populated area like Uzina. Drawing inspiration from Campolo, where a community cooperative played a central role in the dialogue between inhabitants and the administration, a similar model can also be established in Uzina to promote shared values and re-educate inhabitants to active participation. In this regard, the LEADER model can serve as a useful reference for Uzina. The first step is to verify the existence of locally active public-private partnership groups capable of undertaking territorial development practices. If such groups do not exist, it becomes essential to engage in dialogue with regional and national authorities to identify appropriate instruments for establishing a multidisciplinary action group guided by common socio-economic interests, tasked with collecting and outlining all possible development trajectories for Uzina. This action group should then seek to involve and integrate the participation of all other residents and the wider community, through planning workshops, community-led cultural initiatives, and the co-management of public spaces, adapting interventions to the fragmented urban fabric of Uzina, as exemplified in the CASPER project. Finally, the territorial and infrastructural dimension of Uzina is a relevant factor. Although its position is marginal compared to the center of Tirana due to some critical issues, the regeneration of the area as a new urban core would allow for rebalancing the socio-economic structure and decongesting central

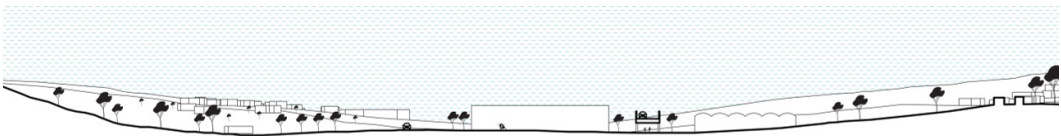

*Fig. 9. Environmental section of Uzina: the landscape as the backdrop for the new social and cultural hub in the former Uzina factory*
*Source/ the author et al. (2024)*

areas. The revision of the infrastructural layout, for example through the creation of a transverse green corridor along the Tirana River and the valorization of the nearby Unaza highway, could improve traffic flow and reconnect the city in an east-west direction, linking the peripheral neighborhoods of Farkë and Kinostudio (Figure 10).

## Conclusion

This study aimed to explore the challenges and potential of marginal urban areas through a comparative analysis of two international cases: Italian historic villages and a peri-urban former industrial area, with the goal of identifying methodological insights applicable to the Uzina area in Tirana. The comparison highlighted common fragilities, such as degradation, depopulation, and socio-spatial marginality, emphasizing the importance of an integrated territorial perspective capable of valuing local peculiarities. The historical reading of villages and peri-urban areas is not used merely as a memory of the past, but as a tool to design contemporary interventions. From this perspective, the different territorial realities form a network of connections and collaborations, useful for addressing local challenges and supporting more coherent urban strategies at the international level, where policies often remain fragmented and selective.

From the analysis, several possible scenarios for Uzina emerge. These include the promotion of social and community regeneration, with participatory spaces, cultural initiatives, and micro-entrepreneurial projects capable of strengthening social cohesion; the enhancement of the environment and landscape, through targeted interventions on the Tirana River, green areas, and connections with peri-urban agriculture; and a selective mixed-use redevelopment, in which the former industrial area becomes a hub for cultural, artisanal, and start-up activities, without altering the historical and territorial identity of the neighborhood. The implementation of these scenarios requires an integrated and multidisciplinary approach, based on ongoing dialogue between administration, community, and private stakeholders. Models such as LEADER and CASPER can guide the creation of local action groups and the participatory management of spaces. It is also essential to include tools for impact monitoring and evaluation, as well as the direct involvement of residents through interviews, participatory mapping, and workshops, so that actions are truly inclusive and sustainable over time. In this sense,



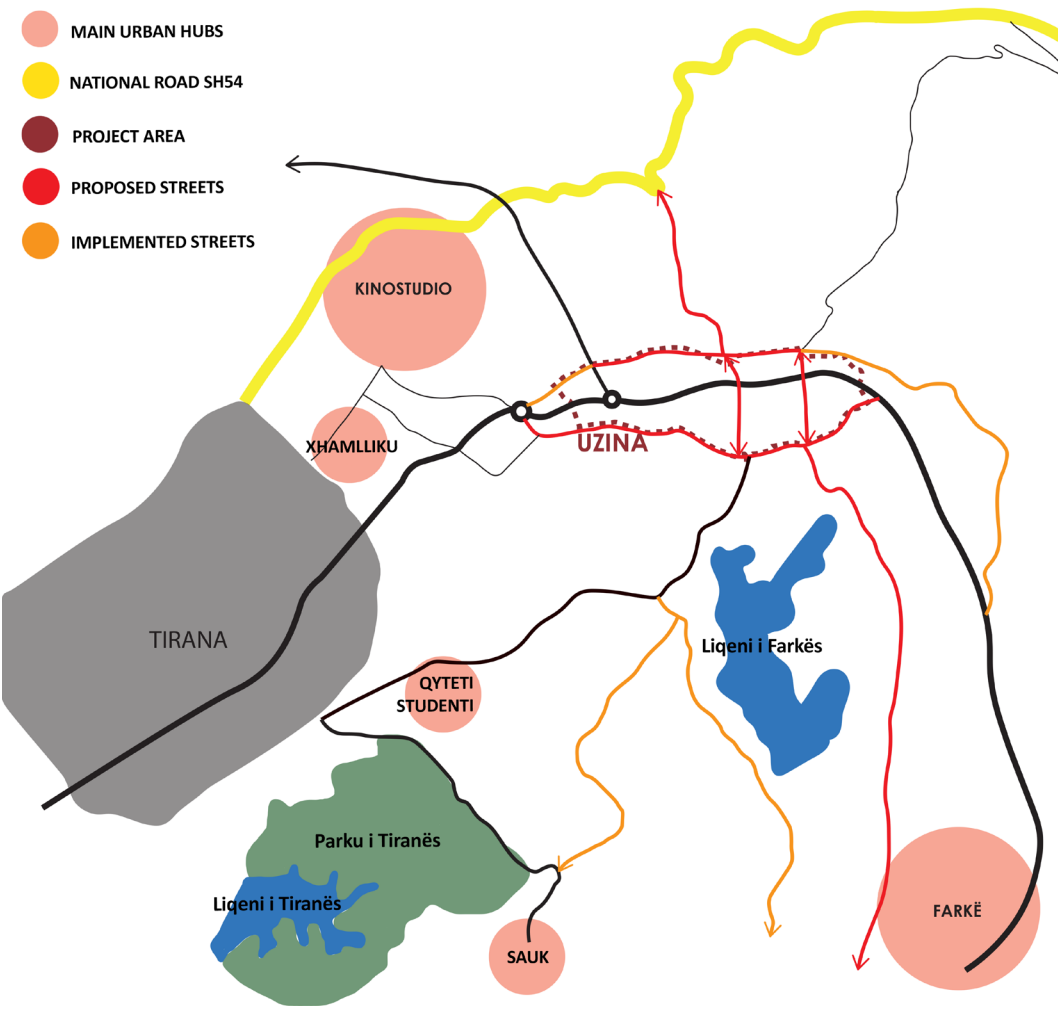


*Fig. 10. Connection strategy of the Uzina area with the surrounding contexts and the center of Tirana*
*Source/ the author et al. (2024)*

the contribution goes beyond the local analysis, showing how an experience like Uzina's can provide useful insights for international urban policies, in line with the objectives of sustainable urban development, social inclusion, and the regeneration of marginal or post-industrial areas. The intrinsic resources of the area such as environmental, social, cultural, and historical, can thus be transformed into instruments of resilience and inclusion, offering a vision of urban regeneration that combines innovation, participation, and the valorization of existing territorial capital.

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## 6.1

## Temporal Morphologies: Bridging Historical and Contemporary Patterns in Shkoza's Urban Design

*Arjola SAVA, Dejvi DAUTI*

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# 6

# Proposals for settlements, public spaces and dwelling

# **Temporal Morphologies:**
# Bridging Historical and Contemporary Patterns in Shkoza's Urban Design

DOI:

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**Abstract -** *Urban design flourishes at the intersection of historical context and contemporary requirements, with temporal morphologies playing a significant role in creating resilient and sustainable urban environments. This paper investigates the evolution of Shkoza, a peripheral region in Tirana, by analyzing historical patterns alongside modern urban dynamics. The study synthesizes data collected from various maps of Tirana with contemporary morphological research to explore the impact of historical codes on modern design interventions.*
*The main goal of the proposed intervention is to establish a network of plazas that will transform Shkoza into a dynamic urban center. This initiative serves as a structural and functional foundation by connecting different urban areas, decentralizing processes, and alleviating traffic in Tirana' s city center. The project highlights the significance of roadways, plazas, and natural features in creating an urban fabric that balances functionality with aesthetic coherence, drawing inspiration from Camillo Sitte and Kevin Lynch.*
*The methodology includes an analysis to assess the terrain' s development potential, including natural flood control measures and the creation of green buffers. This approach ensures the integration of topography with urban design, enhancing land use while promoting sustainability. The analysis also proposes strategies to improve Shkoza' s connectivity and functionality within the metropolitan network by utilizing undeveloped areas to accommodate social and commercial activities.*
*This study underscores progressive development, stakeholder engagement, and adaptive measures for long- term urban resilience, positioning Shkoza as a model for the co- evolution of historical and modern patterns. To address the challenges of urban fragmentation and sprawl, the article advocates for a comprehensive approach to urban design that embraces temporal morphologies and merges historical continuity with contemporary innovation. The findings offer a replicable paradigm for similar contexts, aiming to balance sustainability, mobility, and heritage in urban planning.*

*Keywords - Decentralization, Mobility, Morphology, Patterns, Sustainability*

## Introduction

As part of the international workshop organized by Polis University and the University of Ferrara in December 2024, the Shkoza area was the focus of the workshop. The aim was to create a new center node for the city of Tirana while trying to mitigate traffic through the formal reconceptualization of the City.
Shkoza, an area in the east of the city, serves as an excellent case study that combines the fragmented urban patterns resulting from different historical changes with urban development. In recent years, uneven growth has led to fragmented patterns, as the area serves as a transit hub between the rural periphery of Shkoza and the central urban nucleus. This part of the city serves as an open laboratory for understanding the coexistence of ancestral patterns and modern ones, manifesting in a complex morphology generated by spontaneous constructions from the 1990s until late urban interventions.
Despite the fact that this appears problematic, we will attempt to use it to conceptualize a morphological lens that converts these lacks of coherence into empathy for place and time. This paper aims to examine temporal morphologies to understand the city's historical stratifications and

connect them to the current demands of urban planning. Employing a temporal filter to explore the urban morphology of this area highlights the importance of using historical layers as a guide for accurate and informed architectural and urban interventions. Using morphological theories in conjunction with a critical approach to planning, a new interpretation of Shkoza is presented as an intermediary area where urban planning serves as a link between the past and the future.

Meanwhile, this study aims to investigate Shkoza's transformation while analyzing the connection between historical structures and contemporary urban developments. To make it clearer the orientation of this research, this article tends to give answers to questions: How did Shkoza evolve in relation to urban historical models and existing morphological structures? In what way could these findings orient further interventions on a metropolitan scale? By answering these questions, the purpose is not only to describe the development, but also to identify lessons that can serve as a basis for planning in similar areas in other cities.

The unplanned development of Shkoza, like that of other post-socialist city outskirts, has resulted in an unequal urban landscape with various building typologies, ranging from spontaneous residential buildings to remnants of an industrial past that has already been abandoned; they coexist. With its origins in various social, economic, and political changes, this diversity creates a fertile ground for investigations that aim to both analyze and redefine urban form.

## Literature review

In architecture and urban planning, how form is treated has changed from a functionalist standpoint to a more sophisticated one that considers history, time, and the' complexity of cities. This theoretical transition has drawn attention to urban morphology as a dynamic process rather than merely a built structure. It emphasizes how important it is to understand the city through its layers of history, impromptu changes, and socioeconomically driven fragmentations. Understanding interrupted places like Shkoza, where spontaneous structures, former agricultural portions, topographical divisions, and contemporary interventions create a landscape that defies comprehension by a single design logic, requires these components. Aldo Rossi, a prominent architect who has had a significant influence on this approach, claims in his 1966 book "The Architecture of the City" that the city must be viewed as a structure of collective memory in which typologies and artifacts not only serve as functional components but also express identity, history, and a way of living in space. According to Rossi, the city is a palimpsest created over time, where the past is ever-present and crucial for all future interventions, rather than a structure that emerges according to the logic of modernist design. Similar to Rossi (1982), Camillo Sitte (1889) highlights the significance of public form and aesthetic sensibility in the construction of historic cities. This reading, based on Rossi and Sitte, is essential to Shkoza's context: agricultural parcel trails are not "urban chaos," or fragments from independently, but rather indicators of a morphological continuity that must be recognized and understood. The 1994 orthographic map (fig. 1 left) clearly shows these parcel traces, while the 2024 orthographic map (fig. 1 right) shows the filling of parcels with spontaneous structures. As stated by Rossi, it is clear that the historical urban structure appears as a man-made object in modern times, which gradually takes on new meanings. As a result, agricultural land becomes more and more recognized as a part of living structures.

In their 1978 book "Collage City," Colin Rowe and Fred Koetter reaffirmed this view by criticizing the concept of the city as a singular endeavor. They argue that contemporary planning tends to obliterate informality and history in favor of imposing a new, largely context-indifferent order. Instead, the authors suggest that the city is constructed as a collage in which elements of origin, time, and various functions are skillfully blended together without losing its unique identity. They acknowledge that fragmentation is an inherent feature of modern cities and propose that coherence through plurality, rather than artificial uniformity, should be the goal of architecture and urban planning. This strategy is particularly effective in Shkoza because it aids in conceptualizing a new design that transforms existing fragments into components of

a new integrated urban system without destroying them. As Rowe and Koetter point out, this new, contemporary area of Tirana has always been—and always will continue to be—a collage—a blend of the formal and the informal, the utopian and the pragmatic—highlighting the fact that Shkoza is not created as tabula rasa. They also highlight that the city must be encouraged in (Sitte, 1889) (Lynch, 1960) its disjointed state, and we might provide design frameworks that integrate these pieces with memory. In the same logic of the collage of Rowe and Koetter (1978), Kevin Lynch (1960) points out the legibility of the city through the structures as roads, nodes, and referential points, which help in constructing the spatial understanding. As seen in Figure 2, the most important buildings from history (the fabrics) are preserved as strong elements that have remained unaffected by the passage of time.

Additionally, Vitor Oliveira's theories in "Urban forms: the death and life of urban block" (2016) provide a morphological analysis model based on three processes: sustainability, transformation, and substitution. This idea of the city as a complex structure has found practical application over time. According to Oliveira, a thorough and accurate examination of urban blocks, parcels, and infrastructure allows us to piece together the history of how this area of the city came to be. It also helps us determine which structures have remained in use, which have been modified to serve new purposes, and which have been replaced or are no longer in use. This helps in determining the possibility of effective solutions that do not take away from the area's current nature. This method gives tools to read the ground as a dynamic system in transition in Shkoza, where functional fragmentation and topological interruptions coexist, as we can see in the figure 3.



Jeremy Whitehand, who represents the Conzenian approach to morphology, emphasizes the significance of interpreting the city by its physical elements, such as the road network, site shapes, and building typologies, in a similar manner to how urban facts are analyzed. In "Conzenian Urban Morphology," he makes the case that the form of a city is built upon a series of successive transformations that may be traced via the analysis of urban planning. By interpreting the grammar of urban form in this way, it is possible to see the periphery areas—which are based on disorganized manners—as crucial components of a larger historical process. In Shkoza, where the lines separating rural areas, informality, and other novel interventions are blurred but not invisible in the alphabet of plans, this is particularly crucial.

However, Alexander R. Cuthbert goes beyond the formal analysis in his 2003 book "Analyzing Cities," placing these readings in a broader, more critical context and contending that the city's shape also reflects ideology, capital, and power. According to him, economic actors' interests are frequently prioritized over the requirements of the populace in urban development, and these asymmetries must be taken into account in critical planning. In this sense, fragmentation is caused by politics that marginalizes one area of the city while favoring another, in addition to the form. This idea is particularly relevant to Tirana, where neighborhoods like Shkoza have the potential for inclusive and sustainable urban redevelopment despite frequently being overlooked in development.

Like others, Maria Cecilia Marengo's study of Cordoba, Argentina (Urban Growth by Fragments, 2023) examines in detail how public housing politics have produced isolated, mostly fragmented districts that are not connected to other parts of the city. Marengo notes that this low-cost land-based intervention in outlying areas creates new types of spatial segregation and is driven more by commercial interests than by community needs. This reasoning is the same as that seen in Shkoza, where the functional and physical divisions come from both informality and the lack of a coordinated urban development goal, even though the settings may differ.

From another perspective, considering Sotir Dhamos' analysis of the three urban models in Tirana, or "Patterns at a Glance" as the author called it, the integration of space quality, social areas, and land use patterns results in the development of new models. These models are frequently associated with the inhabitants, social relations, and informal dynamics. This way, we can study Tirana as a model for Shkoza and also as a caution for future scenarios.

Finally, this concept approach aligns with the findings of Reyes-Schade et al. (2024) in their research of Barcelona, Spain's Trambesos neighborhood, where public spaces and public transportation are integrated as part of the city's framework. In order to overcome urban fragmentation and create a new integrated, functional structure, they propose interventions at various urban scales, ranging from nodes to articulation axes. The most pertinent aspect of this work is the use of transportation as a vertebral structure of the city, which reduces motion and establishes new spatial and social relationships. This reasoning could lead to interventions in Shkoza, where the lack of functional connections and public infrastructure has left the area divided; however, there is also a significant opportunity for urban reconciliation through a modern and sensitive morphological approach.

## Tools and Methodology

This paper's methodology combines critical reflection on the potential for architectonic intervention, historical spatial layering interpretation, and urban morphological study. The Shkoza area in eastern Tirana was selected as the case study because it is a representative area of a transitioning morphology, which is marked by spontaneous urban forms, agricultural development patterns, construction associated with new infrastructure, and prospects for additional integration into the metropolitan structure.

Working directly with the selected area during the 10th International Workshop, "The Mitigation of Traffic in Tirana through the Formal Reconceptualization of the City," which was conducted at Polis University in December 2024, has been a crucial component. In order to establish techniques for graphic interpretation, visual analysis, and the idea of Shkoza as a new urban node of Tirana, an experimental terrain was created during this workshop. Graphical methods such as density analysis, access networks, vacant space identification, and the possibility of overlapped functions (mixed-use strategies) were used within this frame. By using the current morphology as a foundational model for future forecasts, these methods are used to construct possible possibilities for progress without discounting it.

This study's primary methodology is morphological analysis, which is grounded in the Conzenian tradition. This analysis focuses on three elements: building type, agricultural parcels, and the road network. To enhance the credibility of the results, it employs triangulation by comparing historical maps, field observations, and institutional data

*Fig. 1. Shkoza's changes from 1994 (left) to 2024 (right) are illustrated with orthophotos from Asig Geoportal. The aerial images reveal the expansion of the built-up area and landscape transformation, highlighting the gradual urban sprawl over 30 years. the images clearly depict the densification and fragmentation of the space, providing a direct illustration of the broad urban transformation.*
*Source/ ASig Geoportal (2024)*

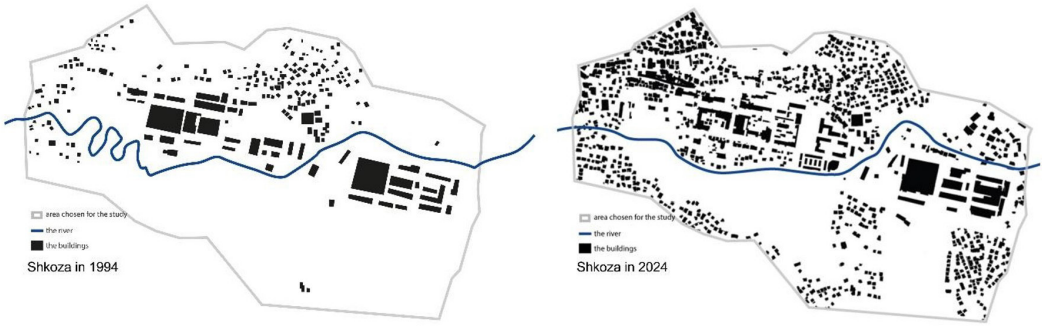




*Fig. 2. Shkoza's existing buildings from 1994 (left) to 2024 (right). The visual comparison emphasizes the swift urbanization of the cityscape, where spontaneous interventions and historical layers evolve alongside new developments.*
*Source/ Elaborated by the author, 2025*

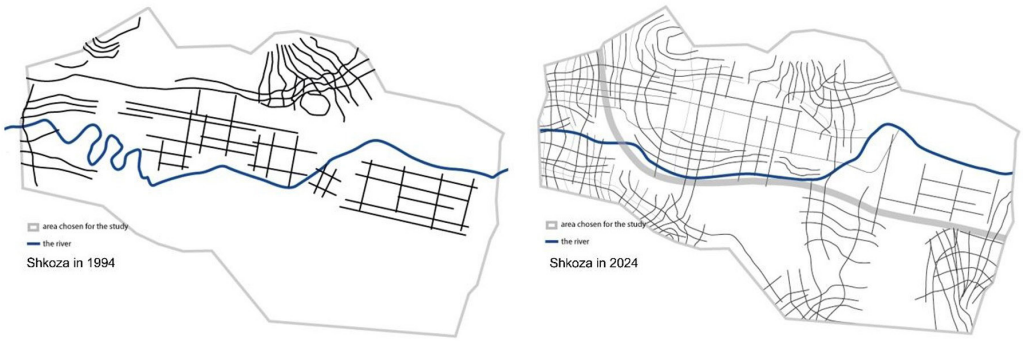


*Fig. 2. SMorphological analysis of the existing structure in Shkoza in 1994 (left) and 2024 (right). This comparison illustrates the shift from a dispersed urban layout to a more dense morphological structure, where new buildings have filled empty spaces and altered the existing typology.*
*Source/ Elaborated by the author, 2025*

on urban development. This approach helps mitigate limitations that could arise from relying on a single data source. Although the study does not directly incorporate the voices of institutional bodies or local communities, their perspectives are vital for a comprehensive understanding of urban changes. Therefore, including insights from residents and decision-makers is recommended as a next step to add the social and political context to the morphological analysis. This is achieved by contrasting the real advancements depicted in digital platforms (such as Geoportal Asig, Google Earth, and OpenStreetMap) with the urban changes in the region (as shown by orthographic imagery). In order to detect changes over the past few decades and determine if the physical structure of the land is coherent or not, the surveillance is finished with terrain recording using digital photographs, sketching, etc.

Along with formal analysis, the study additionally employs a diachronic method, which seeks to discover historical layers of interventions and their effects on actual form in order to comprehend how the region has changed over time. Archival materials, urban documentation, and the interpretation of past spatial, encompassing parcel traces morphology are all used to accomplish this. This reading is also full of theoretical references that help to structure the analysis: Cuthbert for the relationship between the form and social and political forces, Whitehand for the continuity of the structure, Oliveira for the transformation logic of

the urban block, Rowe and Koetter for collage as a building method over the existing, and Rossi for the city's memory.
A flexible and interdisciplinary approach that tends to maintain tension between three elements—history, spatially analysis, and planning—defines the methodology used. By employing temporal morphology as a means of interpretation and a foundation for time-sensitive architectural interventions, this project aims to not only comprehend Shkoza but also to advance a larger conversation about design in fragmented contexts.

## Conclusion

The developed analysis in this paper, supported by the experience gained in the international workshop on Shkoza and the theoretical literature readings on urban morphology, highlights the importance of understanding the city as a complex and multitemporal system. Shkoza, as an area positioned between the consolidated city and the untreated periphery, represents a tense area between unconsidered history and rapid, primarily informal development. This spatial fragmentation should not be viewed solely as an urban problem but as an opportunity to understand new dynamics of cohabitation between the form and usage of urban space. The findings of this study reveal that a thorough examination of morphological layers—such as block configurations, transportation networks, land parcel sizes, and building interactions—offers a robust framework for comprehending a region's history and its future development potential. The notion of "temporal morphologies" promotes a non-linear interpretation of the city, allowing historic sites, spontaneous adaptations, and modern requirements to harmoniously coexist in an open and collaborative framework.
In this regard, it is suggested that urban planning processes and projects adopt a strategy that respects and involves the historical context of places like Shkoza. This approach does not imply merely nostalgically preserving the past, but instead promotes a thoughtful and innovative understanding of how historical layers contribute to new urban perspectives. Techniques such as "urban collage, "Conzenian morphological analysis, and visual storytelling can serve as valuable tools in this effort.
Furthermore, engaging the local community in exploring and reshaping the space is essential. The workshop revealed that small-scale interventions, whether symbolic or functional, could foster gradual transformations that are sustainable and resonate with residents. This approach ensures that urban fragments are integrated into a growth framework, where the relationship between the old and new develops organically rather than being forcibly applied.
Ultimately, this reflection and action model should be applied to other areas with similar characteristics, whether domestically in Albania or internationally, by recognizing challenges and opportunities for innovative design and urban planning solutions. Beyond analyzing the concrete case of Shkoza, this study aims to contribute to a broader understanding of urban transformations in the peripheral areas of Albanian cities and beyond. By examining how historical layers coexist with new interventions, it offers valuable insights for urban policies and practices that need to preserve local identity while addressing modern development needs. This approach could serve as a model for similar analyses in peripheral areas, expanding the impact of these findings beyond the case study boundaries.

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## 7.1
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# 7

# Conclusions

# Conclusion – Proposals for Traffic Mitigation

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This new volume of the Scientific Journal of the Observatory of the Mediterranean Basin brings a broad overview of the challenges and opportunities of urban development in Tirana and the surrounding regions. The selected articles are not simply academic studies, but new visions for the future of the city, where history, technology and citizen participation come together to create sustainable development models.

Decentralization of the city and consequently of traffic and urban mobility includes works that directly address the challenge of congestion in the center of Tirana. Morika Kakinuma Deangelis, in the article "Decentralizing Traffic Congestion in Tirana's Urban Centre: Re-interpreting Spontaneous Commuting as a Tool for Sustainable Growth in Kashar", proposes a methodological framework that reads urban form through the small daily decisions of commuters, aiming at the decentralization of congestion points and the creation of new peripheral poles. In the same vein, Andia Vllamasi, with "Exploring the Feasibility of Using GANs for Traffic Mitigation", analyzes how generative adversarial networks (GANs) can generate new alternatives for the urban structure in Shkozë, reducing traffic and supporting the creation of a second urban center. Alma Gjonaj, in "Access to Historic Buildings and Traffic Flow in Tirana", examines the connection between historical monuments and the formation of congestion, proposing measures for public transport, pedestrian infrastructure and parking management. Vjola Ziu, with "The Role of Urban Mobility in Shaping City's Image and Boosting Tourism", connects mobility with the city's image and tourism, suggesting the use of micromobility to increase access to main attractions.

The topic of Digital Technology and Sustainable Planning is addressed in articles that examine the role of new technological tools in urban planning. Chiara Marcantonio, in "Integrated and Multilevel Knowledge", shows how GIS, laser scanning, photogrammetry and H BIM can support heritage conservation and sustainable planning, turning cultural heritage into a strategic resource for revitalization. Giulia Albini, with "Navigating Urban Complexity: The Role of City Information Modeling", explores the role of CIM in integrating spatial, infrastructural and social data, for more responsive and participatory policies. Erjon Çobani, in "Towards New Heights", analyzes the impact of new towers on the urban transformation of Tirana, proposing methods for assessing their role in the city's identity and urban density. In "Impact of rapid private motorisation growth on Tirana's traffic", Luca Lezzerini and Andia Vllamasi argue that the motorization is not the cause but a "trigger" that has revealed system wide criticalities that range from digital infrastructure and communication to physical urban infrastructures. These articles place Tirana in a global context, where digital technologies and contemporary architecture are an inseparable part of planning.

The traffic topic in relation to Cultural Heritage and urban regeneration is addressed in articles that combine the preservation of the past with the needs of the future. Luca Formigari, in "Beyond Kombinat", uses morphological analysis of the Erzen valley to propose interventions that preserve agriculture and limit uncontrolled expansion. Nicola Pio Di Tommaso, with "Inner Area and Historic Villages: Two Sides of the Same Coin?", analyzes the relationship between inner areas and historic villages, proposing regeneration models based on rural identity and co-planning. Riccardo Altobello, in "Integrating Heritage Conservation and Sustainable Urban Redevelopment", explores the transformation of a former textile factory into a "city within a city", balancing preservation with modernization. Zhuo Chang, in "Paskuqan Lake's Regeneration", proposes the regeneration of the lake area through green corridors and the integration of public transport, creating a new residential and recreational pole. In "From Abandonment to Interpretation", Erida Curraj makes the case that the restoration and rehabilitation of the existing abandoned industrial heritage can be transformed into an urban and territorial infrastructure that enables both sustainable tourism and integrated local urbanisms. These articles show that heritage is not an obstacle to development, but a basis for new urban visions.
Energy, ecology and theoretical visions of

decentralization include works that link ecological transition to urban planning. Karla Cavallari, in "Integrated Energy Methodologies for Urban Ecological Transition", suggests the creation of Renewable Energy Communities in Kombinat, linking urban regeneration with local energy production. Tommaso Paolo Emiliano Randazzo presents a theoretical approach to the decentralization of functions and the creation of peripheral centers to reduce traffic congestion in the article "A Vision for Tirana's Traffic Mitigation". Arjola Sava and Dejvi Dauti treat the Shkoza area as a territory with historical layers and informal development, proposing a morphological approach that transforms it into a functional peripheral center in the article "Temporal Morphologies". These contributions see ecology and the theory of decentralization as part of an integrated vision for the city.

And finally, this volume of SJOMB contains two additional contributions that deal with the morphological structure of the city. While, at first sight, these articles do not deal directkly with teh problem of traffic, they do however cast light of the urban structure of Tirana and its historical evolution, and how such structure forms the context of Tirana's contemporary developments. In "The Structure of Tirana from 1614 to 1943", Genti Avdija argues the structure of Tirana is the result of continuities and discontinuities, of its inherited radial shape and several interventions by teh Italian architects of the 30-s and 40s. In "Fragmented Densification and Urban Form in Contemporary Tirana", Jonila Prifti offers a critique of the quantitative and formulaic mentalities and practices of planning, while arguing the importance of a morphological and phenomenological approach to the city, which would enable and sustain urban unity, continuity, and coherence.

This volume of SJOMB positions Tirana as a living laboratory where traffic challenges, cultural heritage, digital technologies and ecological transition intertwine to create new development models. The articles grouped under these four main themes offer not only detailed analyses, but also bold visions for the city's future. The journal aims to foster interdisciplinary dialogue and offer new ideas for today's urban challenges, placing Tirana at the center of a broader debate on cities in transition and their sustainable future. This is a volume that invites the reader to look beyond the boundaries of traditional planning and imagine a city where mobility, heritage, technology and ecology coexist in harmony.

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