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Research Article

Concept for the Development of Urban Planning Structures in Small Towns of Armenia

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Abstract

This article examines the problems of urban planning in Armenia's small towns. Interest in the urban planning challenges of small towns grew significantly during the 1960s and 1970s, primarily driven by the rapid increase in the number of large cities. This was also the period when the specific features and criteria of small towns were defined, allowing experts to distinguish them from towns of other categories, as well as identify the unique problems of small towns and develop recommendations for improving their planning structures. A very common typology of towns is based on their economic function: industrial, transport-industrial, industrial-agricultural, resort and health-related, and others. The national-economic specialization of the town lays the material foundation for its formation and development. It is worth supporting the proponents of the concept that any typology should be based on a set of interconnected criteria and diverse indicators that reflect the various aspects of the development of a town as a socio-economic system. This approach makes it possible to encompass all aspects of urban life and is more effective, since it allows the assessment of the town, regardless of its specific economic functions. More specifically, it enables one to evaluate the diversity in labor activities performed in the town, assess how well the town supports a varied range of social roles, whether it provides favorable opportunities for the development of diverse forms of employment, their content and conditions, and evaluate the quality and availability of cultural and public amenities. Within the scope of this article, we are particularly interested in the specific features of the formation of urban planning structures in the small towns of Armenia. The distinctive features of a town's planning structure are revealed through its role and significance within the settlement system, as well as through natural and climatic factors and the peculiarities of the local terrain. It is proposed to use the commonly accepted classification of these structures into compact, linear, and linear-branching types. Moreover, the detailed analysis of the master plans of selected towns has shown that the compact planning structures differ in their development level, which allowed us to classify the master plans of the towns with discrete development into a separate category. The analysis produced a set of recommendations to enhance the planning structures of the under consideration towns.

Keywords

Planning Structure, Complex Terrain, Development, Transport Structure, Small Town, Natural Constraints

1. Introduction

**In the 60-70s of the last century, there was an increased interest of urban planners in the problems of small towns, in the context of urbanization, which was due to the rapid growth of large cities, that is, it was during this period that*

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*specific features of small towns were identified, which make it possible to distinguish them from cities of other categories, the problems of small towns were considered and ways to solve them were proposed**. The ecological situation in small towns is generally different - the air is fresher, the water is cleaner, and nature is closer at hand. [1]

**In addition to traditional forms of employment, freelancing is experiencing active growth thanks to the emergence of fiber-optic internet networks, which make it possible to receive job offers, complete tasks, and get paid without ever leaving home. This innovation has positively impacted the quality of life for many people, especially those working in creative fields. Talents from remote areas have gained the opportunity to realize their creative and financial potential without the need to relocate to big cities*.

*Alongside painters, musicians, and accountants, representatives of various other professions are constantly joining the ranks of remote workers. Soon, this trend will only continue to grow, especially if technological advances make it possible to integrate communication tools directly into the human body, potentially creating an entirely new network of interaction and work - BrainNet. Considering the global expansion of internet markets (giants like Amazon and Alibaba are willing to deliver their products to virtually any point in the world), transnational corporations are now enabled to hire specialists from small and medium-sized towns worldwide, and the professionals have the opportunity to work remotely**. [2]

Up to this day, urban literature doesn't clearly establish the quantitative criteria for defining a small town. In the works of F.M. Listengurt, E.M. Smolyar, and V.G. Davidovich, dating back to the 1960s, settlements with populations over 20,000 were considered small towns [3]. Later, B.S. Khorev extended the numerical threshold to 50,000 people while also emphasizing the specific developmental characteristics of towns with populations under 20,000 people [4]. This approach aligned with the commonly accepted population size-based classification of towns established at the time by the USSR State Committee for Construction.

There are many studies in which the mentioned upper limit is significantly exceeded. From our point of view, the definitions mentioned above should be considered conditional, since the range of issues faced by small towns is by no means strictly determined by the given requirements towards the number of population in each of them. Furthermore, these problems are constantly evolving in response to the growing urban needs within the scope of human activity.

An approach to determining the minimum number of residents required for settlements to receive city status in the CIS has not been developed. This imposes difficulties in aligning the international and regional standards of the development norms for this category of towns. For example, in Russia, a settlement is required to have a population of at least 12,000 people to be classified as a town. In Ukraine, Uzbekistan, Moldova, Kyrgyzstan, and Tajikistan, the limit is set to 10,000, while in Kazakhstan, Latvia, Turkmenistan, and Estonia, it is 8,000; in Belarus, 6,000; in Georgia and Azerbaijan, 5,000; and in Lithuania, no numerical threshold is defined.

However, in most sovereign republics, there are towns with populations below the limits set by their respective legal frameworks. For instance, in Kazakhstan, Fort-Shevchenko (Mangystau Region) has 6,300 residents, and Temir (Aktobe Region) has just 2,300. In Armenia, Jermuk has 4,300 residents, Agarak has 4,429 residents, and Dastakert has only 257 [5].

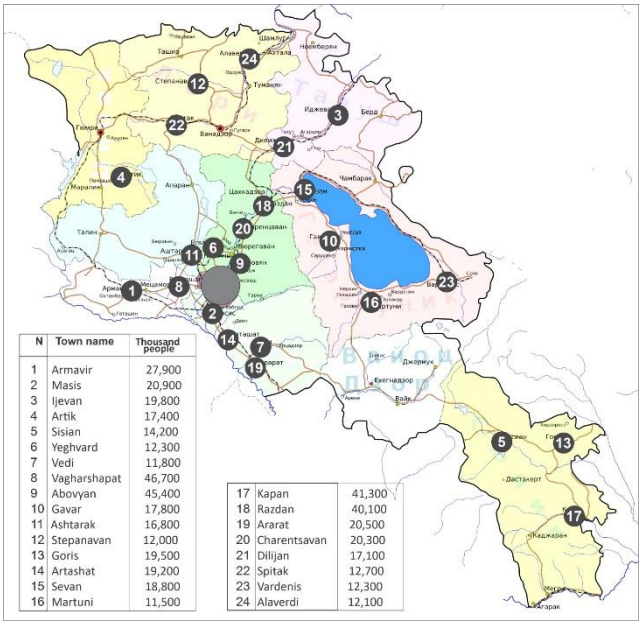
*We have already addressed this issue in a dedicated article published in the Scientific Works of NUACA in 2023 [6], where we propose to set the lower population threshold for small towns in Armenia at 8,000 to 9,000 inhabitants. *Despite such a small number of inhabitants, small towns represent an important element of the functional and spatial activity of any country.*[7]*

**Small towns relieve the burden placed on larger centres and can therefore be seen as structural nodes in a network of settlements*. [8]*

The goal of this article is to analyze the planning structures of small towns in Armenia, identify patterns in their formation, and develop recommendations for their future development.

2. Materials and Methods

As of 2024, in total, there are 49 cities in Armenia, out of which 24 can be classified as small towns, with a population between 10,000 to 50,000 people (see Figure 1). These towns have a combined population of 508,400 people, which represents 17% of the country's total population and 25.8% of the urban population. [9]



N	Town name	Thousand people
1	Armavir	27,900
2	Masis	20,900
3	Ijevan	19,800
4	Artik	17,400
5	Sisian	14,200
6	Yeghvard	12,300
7	Vedi	11,800
8	Vagharshapat	46,700
9	Abovyan	45,400
10	Gavar	17,800
11	Ashtarak	16,800
12	Stepanavan	12,000
13	Goris	19,500
14	Artashat	19,200
15	Sevan	18,800
16	Martuni	11,500
17	Kapan	41,300
18	Razdan	40,100
19	Ararat	20,500
20	Charentsavan	20,300
21	Dilijan	17,100
22	Spitak	12,700
23	Vardenis	12,300
24	Alaverdi	12,100

Figure 1. *Small towns, with a population between 10,000 to 50,000 people.*

The planning structure of a town is most clearly expressed in the placement of its key functional units and the configurations of the transport links between the town's functional zones. The transportation structure not only fixes the planning structure but also largely determines its future development, since the elements of the transportation infrastructure—urban highways, overpasses, and public transit lines—are the most stable elements of the urban plan. Moreover, the areas adjacent to the main nodes and axes of the transportation network are the most advantageous and comfortable in terms of accessibility. This makes them the preferred locations for the most important urban construction objects - places of employment and specialized service institutions.

Thus, the configuration of transport infrastructure is anchored in the town's layout by the highest intensity spatial development urban areas gravitating towards it. Together, these elements form a relatively stable long-term planning structure for the town. The analysis of the planning structures of the examined towns allowed us to identify three primary types: compact, linear, and linear-branching. A similar classification for cities built on relief is adopted by Krogius [10]. At a certain point, the territorial expansion of the town towards the perimeter of the new development zones requires reorganization of the transport network and introduction of linear and grid-based elements into the urban fabric [11]. The changes in the main road structure allow for better urban connectivity and promote territorial growth. However, due to natural constraints such as complex terrain and water space, these changes often result in the formation of compact planning structures characterized by fragmented linear or linear-branching development patterns (see Table 1).

Table 1. *Towns with a linear planning structure.*

Towns with a linear planning structure **Thousand people**			
13	Goris 19,500 	15	Sevan 18,800 
14	Artashat 19,200 	16	Martuni 11,500 

Table 2. *Towns with a linearly branched planning structure.*

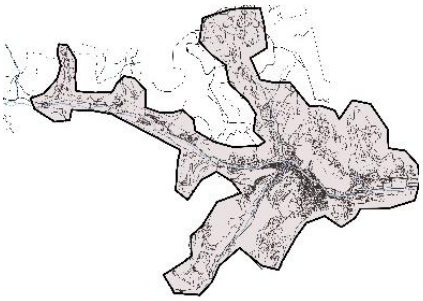
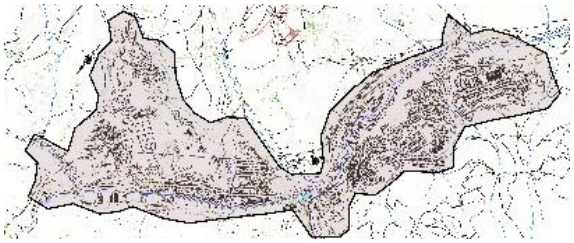
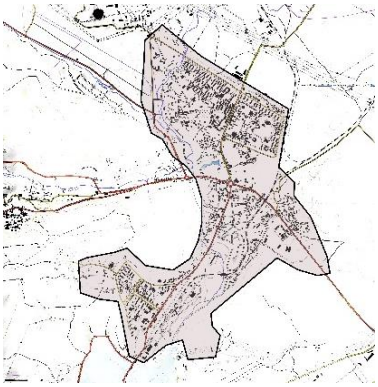
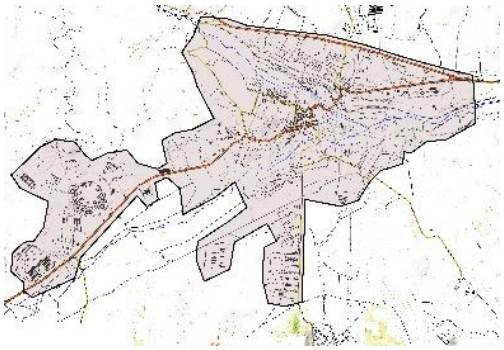
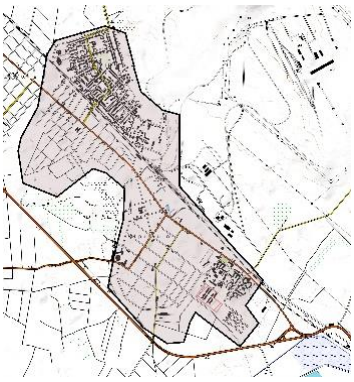
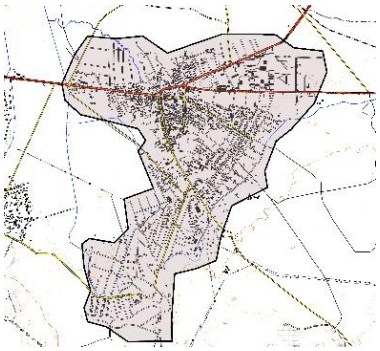
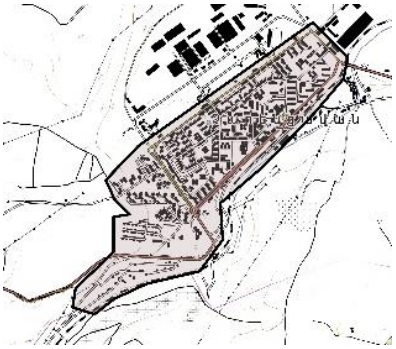
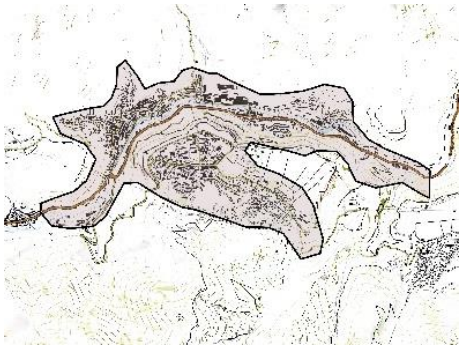
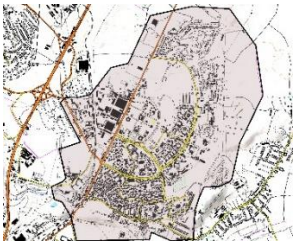
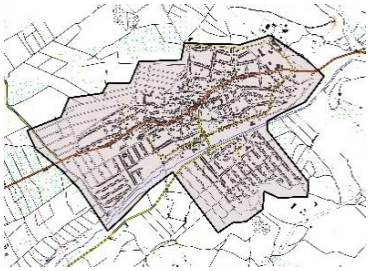
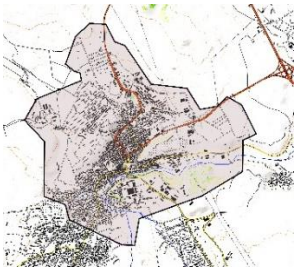
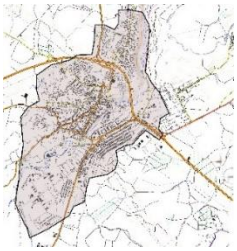
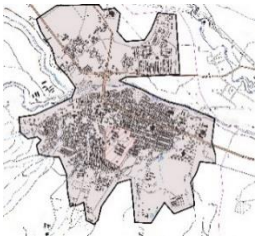
Towns with a linearly branched planning structure **Thousand people**			
17	Kapan 41,300 	21	Dilijan 17,100 
18	Razdan 40,100 	22	Spitak 12,700 
19	Ararat 20,500 	23	Vardenis 12,300 
20	Charentsavan 20,300 	24	Alaverdi 12,100 

Table 3. *Towns with a compact planning structure.*

Towns with a compact planning structure					
	Towns with compact development **Thousand people**			**Towns with discrete development** **Thousand people**	
1	Armavir 27,900 	5	Sisian 14,200 	8	Vagharshapat 46,700 
2	Masis 20,900 	6	Yeghvard 12,300 	9	Abovyan 45,400 
3	Ijevan 19,800 	7	Vedi 11,800 	10	Gavar 17,800 
4	Artik 17,400 			11	Ashtarak 16,800 
				12	Stepanavan 12,000 

When used rationally, construction on complex terrain can offer significant aesthetic advantages over development on flat surfaces. Nonetheless, it is important to consider the downsides of the placement of buildings on steep slopes. This includes increased costs of the construction due to the need for specialized building types and extensive earthworks; technological challenges during construction; higher operational and maintenance costs for transportation system maintenance (e.g., reduced traffic speed, longer travel distances due to winding roads, expenses related to vertical transport); forced decentralization of the service institutions because of the reduced pedestrian accessibility caused by steep inclines; and difficulties associated with the installation of underground utilities [12].

Complex terrain contributes to the artificial fragmentation of natural landscapes and the disruption of key ecological connections. It also results in uneven accessibility to central urban functional zones, creating long transportation distances between residential, work, and recreational areas. This ultimately leads to:

1) densification of urban development and more intensive land use;
2) expansion of the town towards the transport communications;
3) decentralization of service institutions;
4) the "budding" of new, independent suburban zones from the main city;
5) the emergence of new building types using integrated vertical communications.

3. Results and Discussion

The analysis of the planning structures of small towns in Armenia allowed us to apply the commonly accepted classification in urban planning science, dividing them into three main types:

Towns with compact planning structures - such as Gavar - typically originated either in ancient times or in proximity to palaces and monasteries. In the case of Gavar, the town emerged within its current boundaries, though somewhat removed from the modern center. In the center of modern Gavar, there has long been a village known as Gavar or Kavar. The earliest reliable reference to the town's name is found on a khachkar located in the old cemetery near the chapel of St. Stepanos.

The inscription on the stone says: "*Year 291… I, Amir Vasak, son of Prince Vasil, built a church and dug the Gavaray canal through mountains and gorges."* [13].

Examples include Artik, Armavir, Vagharshapat, Gavar, Yeghvard, Sevan, and Masis.

The detailed analysis of these towns' master plans has revealed that the compact planning structures implemented in each of them differ in the development density level, which, in turn, allowed us to classify the following towns into discrete development categories: Ashtarak, Stepanavan, Abovyan, and Gavar.

3.1. Towns with Linear Planning Structures

Many areas of the republic have complex terrain, which has led to the formation of settlements along roads laid through gorges and along riverbanks or lake shores. Examples include Artashat, Vedi, Goris, Martuni, and Sisian.

We classify planning structures as linear when the ratio of length to width exceeds two to one.

3.2. Towns with Linear-Branching (Segmented) Structures

The limited availability of land for urban development, on the one hand, and the desire to organize the planning structure of the town more effectively, on the other, resulted in the usage of territories that were previously considered unsuitable or only marginally suitable for construction due to the high cost estimates associated with the preparation of such sites for development. This, in turn, resulted in the segmentation of urban planning structures. Subsequently, the settlements expanded into river terraces and the major access roads leading to the town. The spatial configuration plan of such towns was generally determined by the convenience of building placement and proximity of sites to transport communications. Avoiding development in less convenient areas disrupted the compactness of the town, resulting in its segmentation into separate, distant zones.

Examples include Alaverdi, Ararat, Vardenis, Dilijan, Ijevan, Kapan, Spitak, and Hrazdan.

The following towns are located within a 30-minute transport radius from the capital city Yerevan, along major outbound highways: Yeghvard, Ashtarak, Abovyan, Masis, and Vagharshapat.

Currently, intense construction activity is underway between the capital city and these towns, since the transportation routes between them represent the growth corridors for future development. The natural expansion of these towns along the direction of these transport lines is expected to lead, over time, to the formation of linear or linear-branching structures.

It is essential to develop a strategy for the development of these corridors now to guide future growth effectively.

4. Conclusion

Work on the master plan schemes of several towns with complex terrain and linear-branching planning structures (Dilijan, Alaverdi, Meghri) allowed us to develop recommendations for improvements in the planning structures of these towns [14]:

1) development of constructions in areas between natural drainage channels that serve as paths for landslides,

rockfalls, and mudflows

2) laying of secondary (duplicate) roads along the upper contour of development zones

3) creation of vertical communication systems

4) Phasing out of the stepped system of public service

In towns with a compact planning structure but discrete development, the following measures are necessary:

1) construction of additional bridges (Ashtarak, Stepanavan)

2) development of underused inner-city territories (Abovyan, Sevan, Gavar, Sisian)

In towns with linear planning structures, it is necessary to develop territories parallel to existing urban areas. This would help move these towns closer to a more compact planning structure.

In towns with linear-branching plans located in areas with complex terrain, a maintenance system shall be established for the steep slopes using cable cars and funicular systems (Alaverdi, Dilijan, Kapan). For towns located on relatively flat terrain, such as Ararat, Hrazdan, and Vardenis, the efforts should be focused on the development of internal urban areas.

For a detailed analysis of the master plans of small towns, it is essential to study the geomorphological structure of the territory, the relief, the typology of existing development, as well as the configuration and density of the transportation network. However, this is a subject for a separate study.

Urban planners are facing the challenges of modern lifestyles. In this regard, design tasks must be re-evaluated so that the development concepts become achievable realities rather than distant utopias [15].

Abbreviations

NUACA National University of Architecture and Construction

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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