

An abstract architectural illustration featuring a building facade on the left with various levels, balconies, and windows, rendered in shades of orange, red, and dark brown. The background consists of layered, wavy horizontal bands of color, transitioning from a light yellow at the top to deep reds and dark browns at the bottom, suggesting a landscape or sky. The overall style is modern and graphic.

Revitalization of the Ye'elim Quarter and the Patio housing units

Master's Degree Thesis
Politecnico Di Torino
Tzili Lussato



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Revitalization of the Ye'elim Quarter and the Patio housing units

Master's Degree Thesis

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Abstract

This thesis is focused on the regeneration of the 'Patio' Housing Units and Ye'elim Quarter, both built during the years 1961–1964, in the city of Arad, Israel.

Since it is an existing built area, the research starts from conducting a deep dive into various local aspects, from geographical and demographic analysis of the country, the city of Arad and the Ye'elim Quarter, to economical and growth aspects and moreover.

These parameters are all taken into consideration, in order to come up with a design proposal for an intervention in the area, that would satisfy the wide range of needs of the stakeholders involved.

From governmental decisions as a guideline to the project, through municipal orders to the needs of the neighborhood residents.

The main outcome of the elaborate is an architectural design project for the area, that is practicable according to the span of needs and requirements of the actors involved in such processes.

A secondary outcome of this research is to gather and create an accessible ordered database about the city, the quarter and the Patio housing units in the English language.

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1.1. Presentation

Ye'elim Quarter and the Patio housing units, the subject of interest of this thesis, are located in the city of Arad, in the southern part of Israel.

Arad city finds itself nowadays in constant growth of population, as the entire country, (average of 2.90 births per woman)¹, and therefore the demand for new housing and its related infrastructures, increases in accordance.

The rise in interest in residential units is also expressed by the recent agreement between the Municipality of Arad and the related Ministries, planning to build 5000 new houses gradually in the next years. By giving a major attention for planning of the regeneration and densification of its core neighborhoods, while at the same time, developing new neighborhoods of low-density detached houses.²

1.2. Motivation

The decision to choose such a specific place to conduct this elaborate is not casual, as you can probably imagine...

The Ye'elim Quarter is the first permanent neighborhood in Arad, which is my also hometown.

The city's uniqueness relays on the fact that the team of more than 25 architects and urban planners, moved to the area in 1960, to realize and understand in firsthand how to plan a city in desert, experiencing it by living in a front camp while planning and building in the first few years.³

During my years as a student of two degrees in the Politecnico di Torino, I return time and time again to the city where I grew up, walking around and looking each time through the binoculars wide range of tools that I acquire during my studies, and for lifetime.

Perpetually fascinated by the city's distinctive 'Tabula Rasa'⁴ planning project of Arad, integrating the varied cultural backgrounds of its habitants, contemplating it with architectural richness, heavily influenced by the 50's movements philosophy, emphasizing the human scale in its planning.⁵

While I walk around the city's neighborhoods and afterwards, I continue to run in my thoughts how to apply the extensive toolbox that I received during my study years here. Seeking to understand the cities current position and needs, in comparison to the original planning design and demographic forecast, which the city of Arad is yet to arrive.

1. The World Data Bank. (2022). *Fertility rate, total (births per woman) - Israel*. Published by: The World Bank Group.

Available at: <https://data.worldbank.org/indicator/SP.DYN.TFRT.IN?locations=IL-IT>

2. Hatzvi staff. (2022). *Mayor of the city; Arad opens a new page*. Aradnik - news website. Available at: <https://www.laderech.com/nahal-kidod/>

3. Shadar, H. (2022). *Arad - an Experimental Town*. Published by The Council for Conservation of Heritage Sites in Israel.

4. Tabula Rasa: in Latin, proverb that is often translated as 'clean slate'. Available at: <https://www.builddcb.com/tabula-rasa>

5. Shadar, H., Oz, O. (2012). *Brutalist Architecture in Israel: Arad*. Available at: <https://www.brutalist-architecture.org/untitled-cpdb>

1.3. Question and aims

Main inquiry of the research is to shed light on what kind of project can contribute and be feasible to implement under the re-generation of Arad's nucleus quarters, next to the growing need for new residential units?

The elaborate aim to provide two main outcomes:

At first, as a soon to be planner, I strive to purpose an architectural and urban project for rehabilitation and re-evaluation of its existing first core neighborhood, Ye'elim. as a part of the solution to the increasing housing demand and in accordance with the cities densification plan.

The practicability of the project is strongly guiding this research and therefore, enhances exanimating information going directly to the specific case of the city of Arad.

This choice is accompanied alongside focusing on the Urbanization process in Israel and specifically in the city of Arad across the years, in geographical, economic and demographic terms, in relation to national and municipal policies.

Secondly, due to hardly any research works, books or articles about the city of Arad nowadays in the English language, I consider it of great importance to connect the various anecdotal information clouds and put them into a cohesive writing essay, that enhances a better detailed view on the peculiarity of the case study of Arad and its timeline. Doing so together with collecting and creating a documented archive of a considerable amount of the documents written about the city, thereby giving access to information in an additional way of orderly list at the end of this work.

1.4. Methodology

In this thesis, the approach carried out is documentary and content research, which would be conducted by studying a varied set of recorded documents and putting them together into a larger narrative.⁶

To develop a design project that is feasible, a great attention would be dedicated to the studying the documentation of the urban framework, from national planning laws, through the local municipality plans, and to specific tools that are associated with the area of the project.

Enabling afterwards to come up with a design solution that takes in consideration multiple factors such as local laws and plans, population and demographic trends, local economy, local heritage and construction technics and so on.

The essay is laid out with the logic of from a macro to a micro. Starting by research about the country and its urbanization process, then on a city scale level of Arad, zooming into its first neighborhood, the Ye'elim quarter, and finally focusing on The Patio unit complex.

In its next part, the elaborate presents an initial design proposal for the Patio units and the Ye'elim quarter, concluding afterwards with the outcome of the work, conclusions and reflections.

6. Iowa State University Library. (2022). *Research Methodologies Guide*. Available at: <https://instr.iastate.libguides.com/researchmethods>

2.1. Inquadration of Israel

2.1.1. General Geographical & Demografical data

Ye'elim Quarter is the first permanent neighborhood⁷ in the Arad, which is located in southern part of Israel.

Israel is situated on the eastern shores of the Mediterranean Sea. It confines with Lebanon to the north, Syria to its northeast, Jordan to its east and southeast, and Egypt to the southwest.⁸

It is a relatively small area, of 470 km north to south and 135 km east to west at the widest spot, for total land area of 22,145 km².⁹

The country is connected by train rails, a national roads system including one highway, Highway 6, crossing from Somekh Interchange in its northern point, and Tzomet Shoket at south, between Be'er Sheva and Arad (connected recently in 2016).¹⁰



Fig 1. Israel General Map. Source: elaborated by the author.

Divided into 7 Regions from North to South:¹¹

1. Northern District with Nof Hagalil city as its capital.

2. Haifa District with Haifa city as capital, a port city.

3. Tel Aviv District with first city Tel-Aviv Jaffa, the economical metropolitan hub of area.

4. Central Region with Ramla city as its main city.

5. Jerusalem District with Jerusalem city as the capital city and governmental seat.

6. South Region with Be'er Sheva as its focal city, and Arad city to its east.

7. Judea and Samaria Area with no official main city, but with Modi'in Ilit city as the largest one.

Total estimated residents in all districts is 9,339,833.

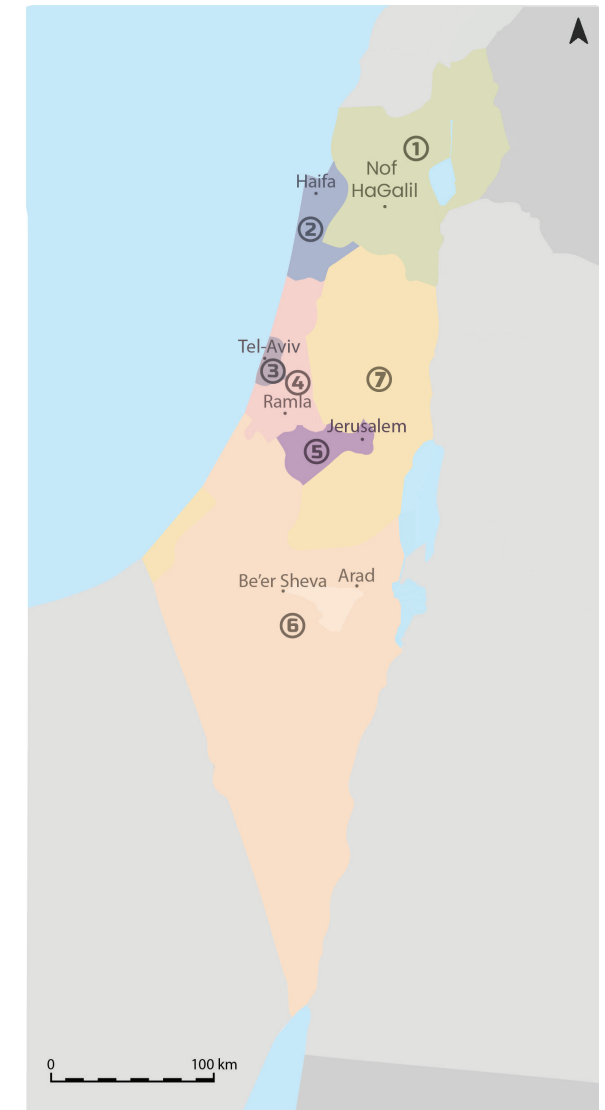


Fig 2. Israel Districts Map. Source: elaborated by the author.

7. Shadar, H., Oz, O. (2012). *Brutalist Architecture in Israel: Arad*. Available at: <https://www.brutalist-architecture.org/untitled-cpdb>

8. Ochsenwald, W. L., Sicherman, H., Elath, E., Russell A. (2022). *Israel*. *Encyclopedia Britannica*. Available at: <https://www.britannica.com/place/Israel>

9. Ibid.

10. Globes services. (2016). *Highway 6 Extension: New free section opens this week*. Globes. Available at: <https://www.globes.co.il/news/article.aspx?did=1001164172>

11. Central Bureau Statistics - CBS. (2021). *Maps: districts, sub-districts and natural areas*. Available at: https://www.cbs.gov.il/he/publications/Maps/01_01.pdf

n	District	Number of residents	Capital City	Number of residents
①	Northern District	1,513,300	Nof HaGalil	43,556
②	Haifa District	1,098,200	Haifa	285,611
③	Tel Aviv District	1,480,400	Tel Aviv Jaffa	420,780
④	Central Region	2,233,500	Ramla	78,170
⑤	Jerusalem District	1,208,800	Jerusalem	973,501
⑥	South Region	1,330,600	Be'er Sheva	212,532
⑦	Judea & Samaria	476,033	Modi'in Ilit	82,293

Table 1. Israel Districts division, capitals and population. Source: Central Bureau Statistics- CBS.

Arad is located in the South Region, 47 km east to Be'er Sheva, or 35 minutes drive on Route 31.

Positioned in subregion of Arad Valley, with a form similar to a triangle, delimited between Arad urban area, Be'er Sheva and Dimona.

Since Arad is the closest city to the lowest habitable area on earth¹², the Dead Sea, a natural phenomenon attraction, giving also a role of a tourist point, in addition to job opportunities in the various sectors to the city's residents.

The train railway arrives to Be'er Sheva in its most southern point. with the new extension of Highway 6, 21 kilometers northeast to Arad, the ride from Tel Aviv TLV (141 km) was shorten to one hour and thirty minutes, from originally more than two hours and twenty minutes ride.



Fig 3. Driving distance comparison from TLV to Arad, before and after the new road. Source: elaborated by the author.

It is a big opportunity to reconnect Arad and establish its positioning, Arad could regain its function as a gate city to the western Negev, collocated under these relationships as the connection hub between Be'er Sheva, and the Dead Sea.

The Arad Development Region: (marked in)¹³

Geographical Location: Judean Desert plateau

Altitude: 620m ASML

Total area: ~126 Square km (=12,600 hectares)

Climate: Dry with low rainfall, average of 120mm a year

Habitants: estimated of 27,388 people in urban area + 15,000 in its Regional area (2021) for a total of 42,388 estimated habitants.

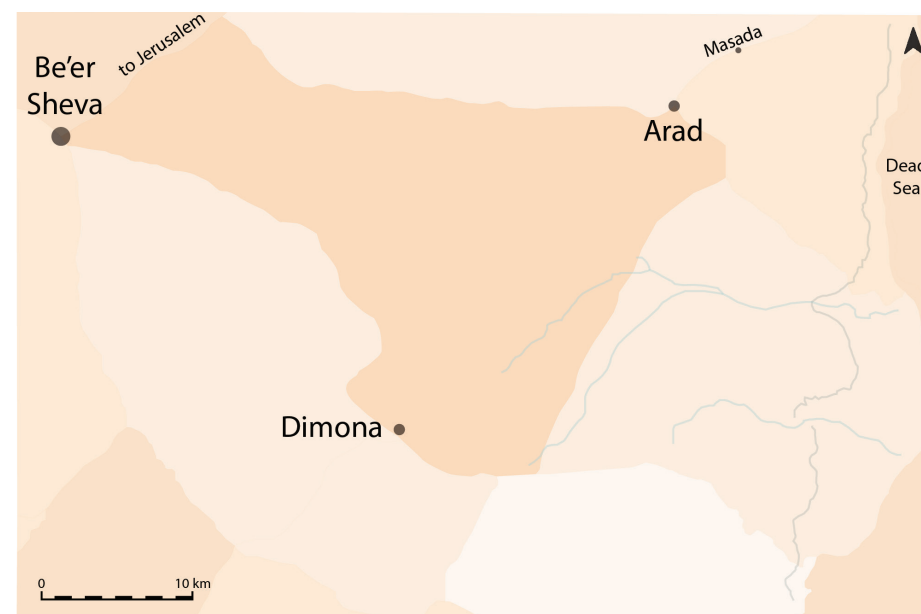


Fig 4. Map of Arad Development Region. Source: elaborated by the author.

12. Pletcher, K. (2021). Dead Sea. Encyclopedia Britannica. Available at: <https://www.britannica.com/place/Dead-Sea>

13. Central Bureau Statistics - CBS. (2019). Municipalities profile: Arad. Available at: https://www.cbs.gov.il/he/publications/doclib/2021/local_authorities19_1835/288_2560.pdf

2.1.2. Urbanization process in Israel during the 1950-1960

The 1950's - First generation of new cities¹⁴:

38 new cities were established in Israel between 1948-1957.¹⁵

Their definition also included old cities, whose small population core was unable to develop without a development plan and comprehensive government help.¹⁶

By analyzing what is the planned vision of their planning logic, reveals that they all relied on the same generative scheme of neighborhoods rich in greenery and disconnected from each other.

During the early 1950s, open green areas were positioned between the neighborhoods and between them and the urban center, as visible in figure 5.

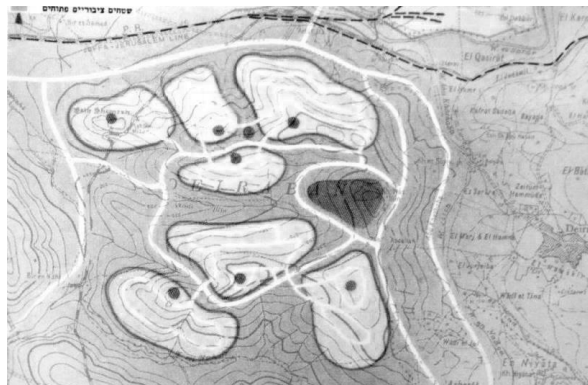


Fig 5. New city plan of Beit Shemesh.
Source: the 'Sharon Plan', 1951.

Within the 'Sharon Plan', the first Master Plan for Israel, named after its main planner, Architect Aryeh Sharon - it is mentioned as:

"The structure of the new cities is determined by dividing them into neighboring units... the fundamental idea is that each of them will be an independent unit, which most efficiently meets the needs of its residents".¹⁷



Fig 6. Southern neighborhoods in Ashkelon.
Source: the 'Sharon Plan', 1951.

Following by the Second Plan for Ashdod city, on the other hand, from 1959 planned by Yitzhak Perlstein and Aryeh Dodai, the neighborhoods are separated with wide roads for fast traffic.¹⁸

Either way, the perception of the neighborhood as an independent and isolated unit - has not changed.

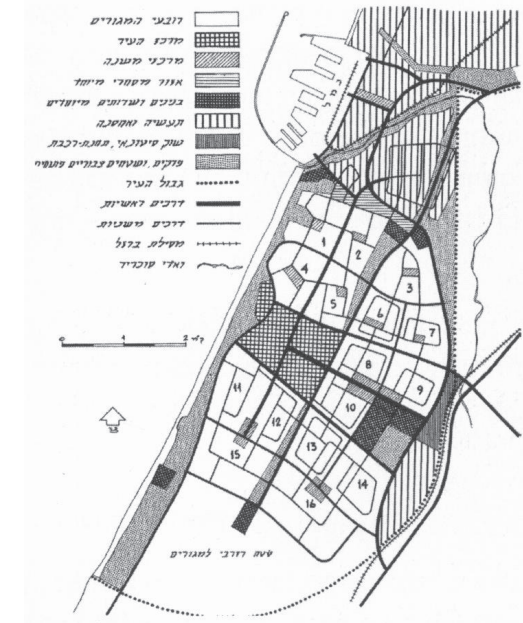


Fig 7. Ashdod plan by Perlstein and Dodai.
Source: Peldi, 1967.

14. Shadar, H. (2016). *On the Trail of Urbanism in the Planning of Arad, Ir-Habsor and Karmiel, at the beginning of the 1960s*. Published by University of Haifa, Israel. 9-13.
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16. Lichfield, N. (1970). *Israel's New Towns: A strategy for their Future*. Ministry of Housing, Israel.

17. Sharon, A. (1951). *Physical Planning in Israel*. Jerusalem: The Government Printer. 8-12.

18. Peldi, A. (1967). *Ashdod planning - reality - development trends: A socio-economic survey*. Ministry of Housing, Ministry of Commerce, Ashdod Local Council. 12-19.

The planning failures of the 50's should be noted, as the gap between urban plans and reality.¹⁹

Since most of the residents of the new cities were new immigrants who were settled in the new towns by the state, their ability to protest and initiative was low.

The immigrants, who were preoccupied with survival: learning the language, adapting mentally, finding work, and more, could not nurture their city and to actualize the plans.²⁰

In 1968 Yaakov Ben Sira described it when he wrote:

"Experience shows that the residents of neighborhoods do not have the power... to bear the burden of establishing public institutions, planting gardens, paving streets and sidewalks, and even fencing parking lots."

In neighborhoods in older and more established cities, the municipalities take care the needs of the public... in immigrant and disadvantaged neighborhoods, especially in the areas of a local authority that is economically and socially weak - the situation is much worse, and most of the public spaces are empty or worse - occupied by squatters".²¹

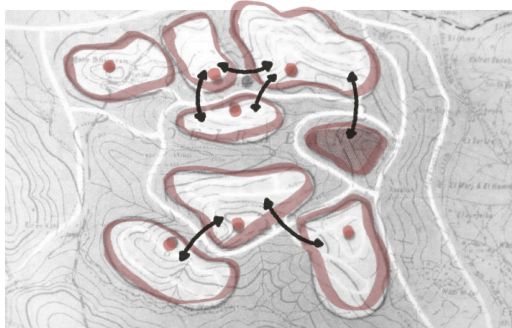


Fig 8. Diagram of direct connections between isolated quarters, new Beit Shemesh.
Source: overlapped by the author.

The inner-city detachments: the green areas, between the neighborhoods and within them, which were seen in the plans as green - did not fulfill their purpose. They remained desolate of vegetation and habitants.

The lack of irrigation did not allow the vegetation to grow.

The lack of defined ownership, the lack of space definition and the lack of intended uses - left the open spaces abandoned and unused.

The city was built sparsely and without a mix of uses between residence, commerce, and employment. The human friction that characterizes urban life is avoided, not only because the residents are new immigrants, but because of the physical distance.

Hanan Martens, who at the time was the head of the City Planning Unit in the Ministry of Housing, expressed about the first generation city planning:

"The romantic ideas that were imported from Central and Western Europe, in terms of garden cities and rural towns, did not match with the arid climatic conditions of Israel, both economically and in terms of the social needs of a modern urban society... The idea underlying under the planning of those first new cities was soon proven as a diligent failure..."²²

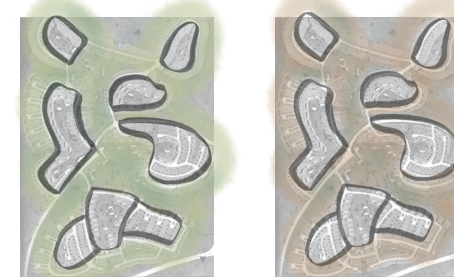


Fig 9. Diagram of southern Ashkelon, left- planned green urban areas, right- desolated reality.
Source: overlapped by the author.

19. Shadar, H. (2016). 14-17.

20. Berler, A. (1960). *Integration of New Society*. In International Seminar Conference on Housing, Summery of lectures. Tel Aviv. 70-77.

21. Ben Sira, Y. (1968). *Criteria for evaluating a city building and construction plan*. Society of Engineers and Architects in Israel, Institute for Construction and Technical Research, Ministry of Housing. Tel Aviv.

22. Martens, H. (1967). *Karmiel: a new city in the center of the Galilee*. Journal of the Association of Engineers and Architects in Israel, 25, 52-66.

2.1.2. Urbanization process in Israel during the 1950-1960

The 1960's - Second generation of new cities²³:

Realizing the technical failures in city planning of the past decade, a new ideological concept was at the door, the ideal city.

Criticism about British towns was expressed abroad, as J.M. Richards claims in his article²⁴, they were full of empty open spaces and lack of orientation, similar to Israel.

Formulated on these conclusions, new approach of a dense and continuous linear city, preferably a planar city, where construction could develop continuously was adapted.

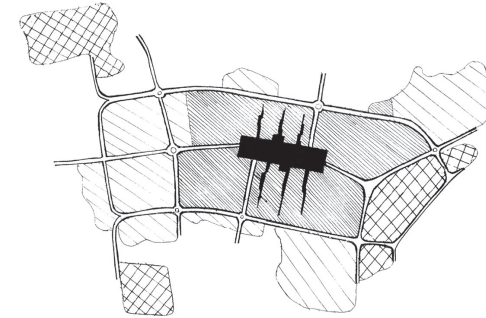


Fig 10. Plan of the city of Hook.
Source: Ritter, 1964.

A linear planning:

The town of Hook, by the Greater London Council, was planned to host 100,000 inhabitants. Although it was not realized, as Benevolo²⁵ said; it is still one of the most important new British towns.

The Hook design for a city was a compact city, surrounded by open park. In the city's core, the central business district (CBD) is positioned, and develops in linearity bonding the urban progression., filling the isles with low rise buildings, positioned with high density.

The street for a model in the Hook plan is pedestrian oriented, meaning that the main road is strictly non-motorized and leads directly to the CBD without crossing any roads.²⁶

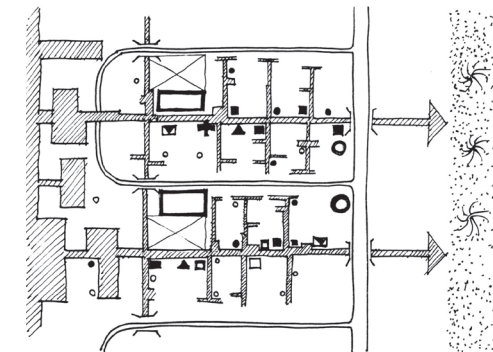


Fig 11. Hook scheme for a street, main functions along the streets.
Source: London Council, 1961.

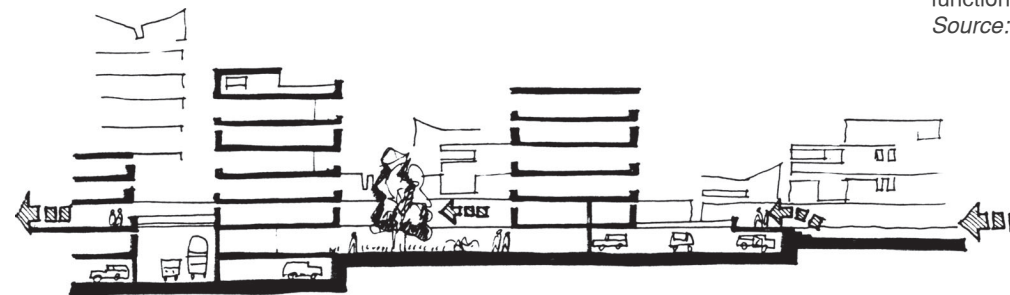


Fig 12. Hook street section. Source: London Council, 1961.

23. Shadar, H. (2016). *The linear city linearity without a city*. The Journal of Architecture, 21, 564-601. Available at: <https://doi.org/10.1080/13602365.2016.1192427>

24. Hugh, M. Hughes, J. (1961). *Twentieth century architecture and its histories*, Society of Architectural Historians of Great Britain. in, L. Cambell, ed., 2000, 57-86.

25. Benevolo, L. (1980). *The history of the city*. The MIT Press ed., 2000, Cambridge, Mass., 920-967.

26. Shadar, H. (2016). 566-571.



Fig 13. Street view in Hook. Source: London Council, 1961.

2.1.2. Arad urban growth according to Israel urbanization framework

At the beginning of the sixties, three new cities were planned: Arad, Ir Habesor (not carried out) and Karmiel.

These 3 new cities strongly resembled the Linear Planning in the early 1960's in Northern Europe and were particularly influenced by the British town of Hook.²⁷

The new Israeli cities corresponded to the non-realized project of Hook, by adopting the linear city scheme, focusing on a dense, pedestrian-oriented city with well-defined spaces, planned phased growth and traffic separation.²⁸

Arad was the first city to be planned by these new urban guidelines. The planning team consisted of 25 professionals, 14 of them were responsible for the physical aspects. Led by the chief Architect Alex Sher, a ex-soldier of the British army during the Second World War, who visited England to perceive the sense of the new towns before planning Arad.²⁹

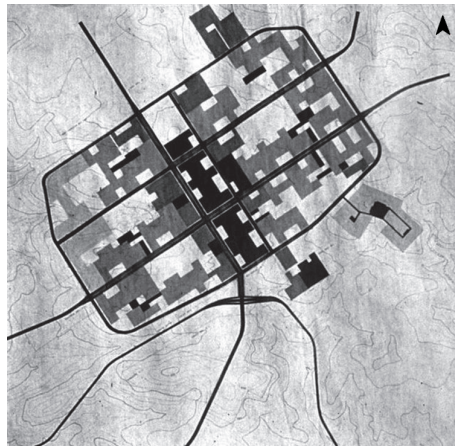


Fig 14. Distinctions of use Map of Arad.
Source: Architect Ilana Elrod.

Arch. Alex Sher mentioned in 1962, these fundamental principles inspired them to plan Arad as:

*"A high density compact construction.. as to the city center, the worthiest is the linear model, on both sides of which the residential quarters spread. This conception is highly important to a growing city. At the beginning, the city will settle on a relatively small area, but as it grows, the center will extend and grow along its axes".*³⁰

Arad core is divided into six sub-units, around the linear center, each sub-unit is planned for 5,000 habitants, exactly as in Hook. The 500 meters walking distance as a maximum between the city center and the last house, high dense center and lower on the perimeter, just as in Hook, and so on.³¹

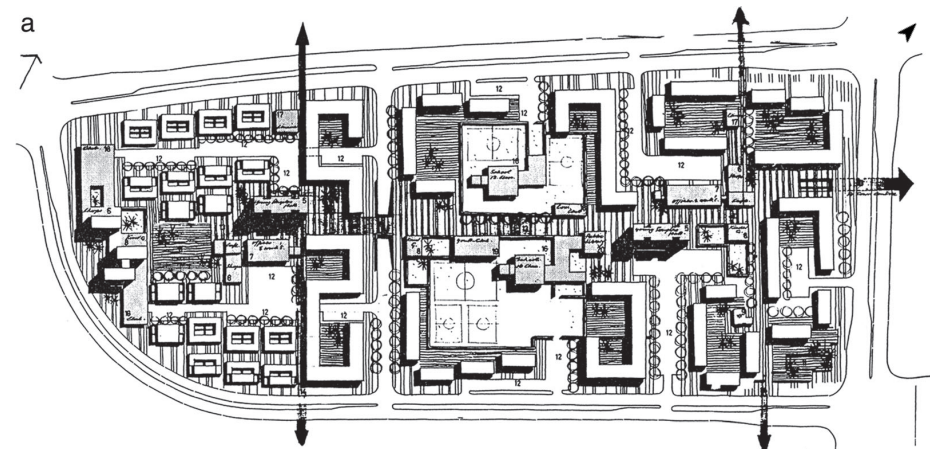


Fig 15. Construction Plan of Linear Ye'elim Quarter in Arad. Source: Shadar, 2016.

27. Shadar, H. (2016). 572-585.

28. Ibid.

29. Shadar, H. (2022). *Arad - an Experimental Town*. Published by The Council for Conservation of Heritage Sites in Israel. 12-29.

30. Sher, A. (1962). *Elementary ideas for the planning of the city of Arad*. archives of the Ministry of Construction and Housing, Arad district, file 6 A-19, Container C-4943.

31. Shadar, H. (2022). 36-47.

Ir Habesor (Habesor city) is also planned similar to the Hook model.

Six quarters were located on both sides of the linear nuclear, each designed for 8,000 residents. 500 meters distance from the CBD to the building, forming the city's dimensions, prioritizing pedestrians over traffic.³²

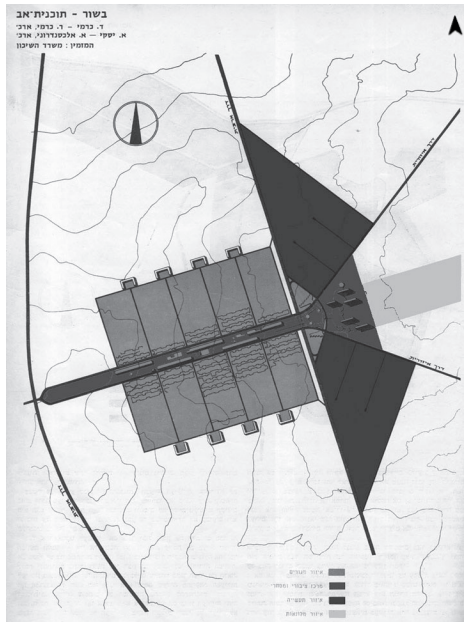


Fig 16. 'Airplane' Plan for Ir Habesor.
Source: Glikson, 1964.

The final design of the city was proposedly designed to resemble an airplane as an homage to the plan of Brasilia, as where found among the plans of Ir Habesor in the archive.³³

Unlike the plan for the new Brazilian capital, the body of the airplane, or the quarters, were designed to be denser, the town's new industrial zones were allocated at the 'wings'.



Fig 17. Plan of Brasilia. Source: Glikson, 1964.

Although it may be seen very similar planning to the Hook design, Arad and Ir Habesor, similar to parallel processes in different countries, combined the principals of Hook plan with the local conditions, to create unique local plans.

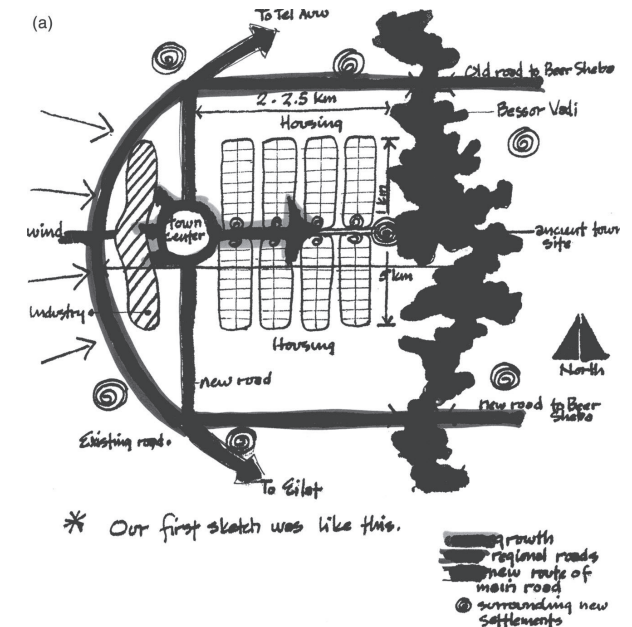


Fig 18. Sketch of Habesor city. Source: Ministry of Construction and Housing, 1961.

32. Shadar, H. (2016). 572-585.

33. Ministry of Construction and Housing. (1961). *Deputy Director Milman - Ir Habesor*. Archives of the Ministry of Construction and Housing, file n. 11, stored in container C-4969.

2.1.3. Special Urban planning instruments related to the project area

Planning and Construction Law 1965:³⁴

The current organization of the various urban planning instruments (plans and programs) is established by the law, based on hierarchical order. The law regulates the operations of the planning institutions in Israel from national level to local level. Appeals Committees, Regulatory Plans (national, provincial, municipal), Site preservation, road construction, arrangements for accessibility for disables, regulations licensing, etc. 137 amendments to the law have been enacted so far.

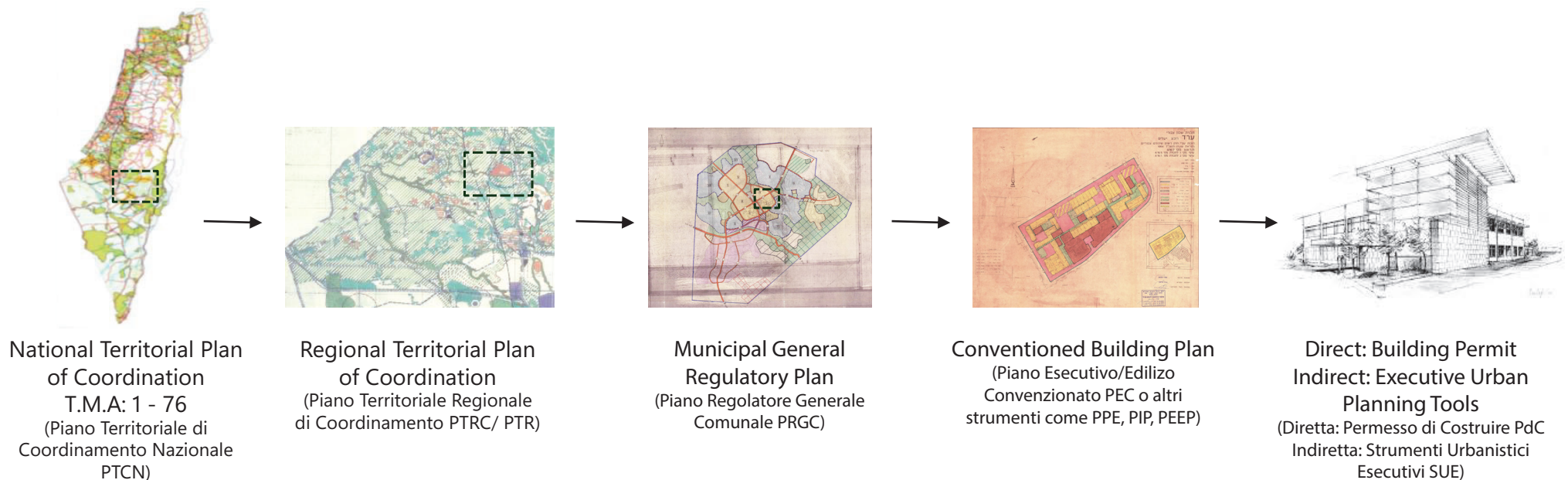


Fig 19. Hierarchical order of Plans according to the 1965 law. Source:elaborated by the author.

34. Kneset Israel. (1965). *Planning and Construction Law*. National Legislative Database. Available at: https://www.nevo.co.il/law_html/law01/044_001.htm

Public Housing Registration Law 1964:

After the establishment of the state, multitudes immigrated to Israel, and the country's population tripled within three years. In order to settle the immigrants quickly, it was decided to build hundreds of thousands of buildings under the framework of public housing in the fifties and sixties of the last century [temporary legislation].³⁵

Only later, due to the lack of legislation regarding to these buildings, in 1964 this law was issued. it regulates these buildings as public housing, about a year before the publication of the law for planning and construction.

Buildings included under this law can not be changed with conventional planning tools, because they technically belong to the state³⁶, and are 'leased' to residents for periods of 50 to 100 years. The conversion of public housing plan to another program is required.

As shown in figure 20, the Patio Housing complex, with this elaborate treat, is submitted under this public housing law, which would be study more in depth in the third chapter.

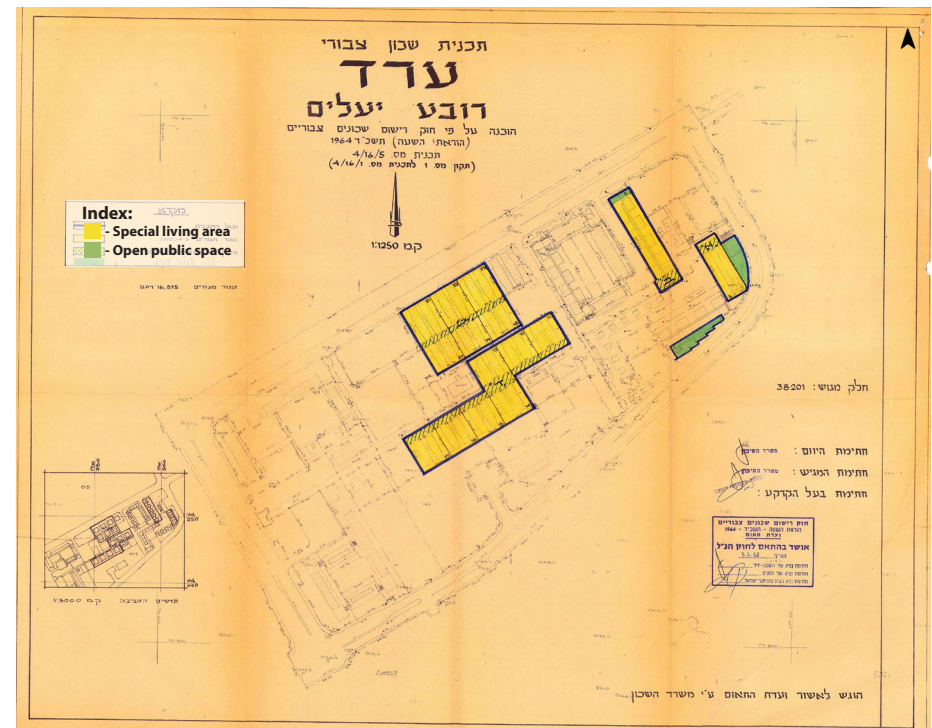


Fig 20. Public Housing Plan for 'Patio units' in the Ye'elim, Arad, 1964.
Source: National TABA database.

35. Kneset Israel. (1964). *Public Housing Registration Law [temporary law]*. National Legislative Database. Available at: https://www.nevo.co.il/law_html/law01/286_056.htm

36. Kneset Israel. (1969). *Israeli Land and Property Laws*. National Legislative Database. Available at: https://www.gov.il/he/departments/legalInfo/chok_hamekarkein_moch

2.1.3. Special Urban planning instruments related to the project area

T.M.A 38:

The National Regulatory Plan for strengthening existing buildings against earthquakes.³⁷

As part of T.M.A 38, in August 2000, the government decided through the inter-ministerial committee to operate new route: a densification plan.³⁸

The plan is designed to allow to add construction in built-up areas, based on existing infrastructure, without the need for evacuation of the residents, and its goal is to increase the utilization of the land through construction additions.

An important principle in the densification plan is to focus on a selected existing neighborhood and prepare a plan based as much as possible on existing infrastructures.

As planned in 2010 by Gannot Architects³⁹ for Ye'elim Quarter, Arad. Visible in figure 21, the upper plan is the existing state back then, and below the possible densification plan purpose, expressed as areas, mainly allocating expansion of buildings marked in pink color.

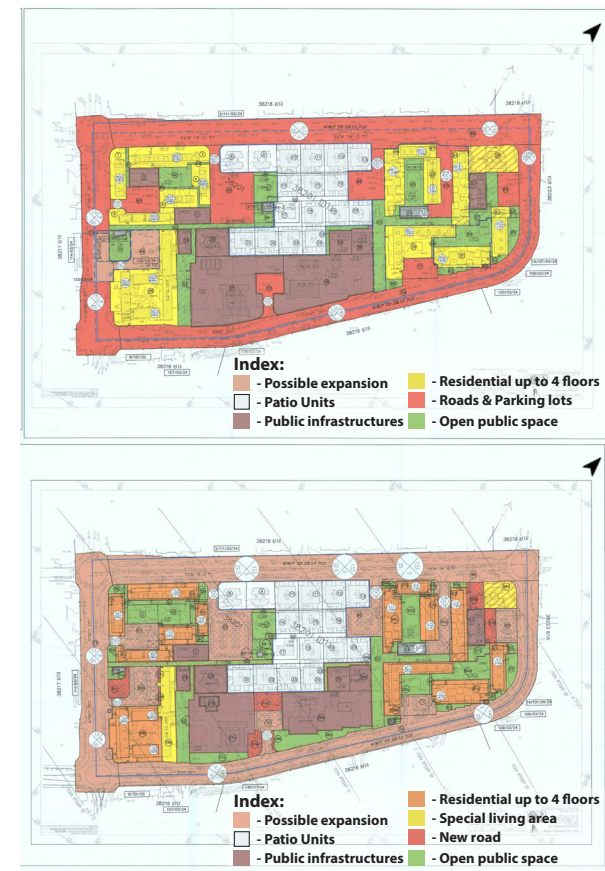


Fig 21. Application of T.M.A 38 - Densification Plan in Ye'elim neighborhood, 2010.
Source: National TABA database.

37. Kneset Israel. (2005). *T.M.A 38: National outline plan for strengthening existing buildings against earthquakes*. National Legislative Database. Available at: https://www.gov.il/he/departments/guides/tama38_introduction

38. Kneset Israel. (2016). *Law of the Governmental Authority for Urban Renewal*. Available at: https://www.nevo.co.il/law_html/law00/142343.htm

39. Ministry of Construction and Housing. (2010). *Plan 5/127/03/24 Arad: Consolidation and division of plots in the Ye'elim Quarter*. Available at: <https://www.tabanow.co.il/%D7%AA%D7%91%D7%A2%D7%A2%D7%A8%D7%93/5/127/03/24>

Neighborhood 360° Tool:

New Main Tool developed by the Ministry of Construction and Housing in 2019-2021.

This measuring tool is destined to help planners whose purpose is to implement sustainable planning, development, and construction of high-quality, healthy, and prosperous neighborhoods over time.⁴⁰

It includes 48 different indicators for planning and developing sustainable residential environments. Among these: collaborative social planning process, treatment of contaminated lands, affordable housing, accessibility to services, mix uses land, residential density, pedestrian streets, bicycle parking facilities, gardening and vegetation, shade, energy efficiency of street lighting, use of renewable energy sources, treatment of construction waste, and more.⁴¹

Neighborhood 360° Tool can be classified as the local national translation of the ONU states Sustainable Development Goals (SDGs)⁴², or Vision 2030, to a practical and useful tool.

The elaborate will focus mostly in two goals out of the 17, which are goal number 10: Reduced Inequalities and goal number 11: Sustainable cities and communities.



Fig 22. Neighborhood 360 Tool - indicators for planning and developing residential environments. Source: Ministry of Construction and Housing.



Fig 23. The UN 2030 Agenda for Sustainable Development: 17 Goals. Source: The United Nations.

40. Ministry of Construction and Housing. (2021). *Neighborhood 360: indicators for planning and developing residential environments*. Available at: <http://www.nd360.org/about/>

41. Klimor, T. (2021). *Urban Regeneration 360*. Center for Urban and Regional Studies, Technion, Israel Institute of Technology. Available at: https://4c8fd124-8327-4fc9-940b-06a250a28302.filesusr.com/ugd/20bf09_b136f5f2228e452a83b4591f2623e0e0.pdf

42. United Nations Organization. (2015). *Transforming Our World: 2030 Agenda for Sustainable Development*. Published by: Department for Public Information United Nations. Available at: <https://unric.org/it/wp-content/uploads/sites/3/2019/11/SDG-presentazione.pdf>



Fig 24. Photo of Tel Arad National Park, 2016. Source: Yosef Yaari.

2.2. Arad over the years

2.2.1. Ancient Roots

The ancient city of Arad, nowadays named Tel-Arad, was a vital road point on the border of the inhabited area of Mount Hebron.

From Arad, roads branched off to the Dead Sea, Arava, Moab, and Edom in the east and southeast in correspondence. Sinai in the southwest, and thence to Egypt.⁴³

The Dead Sea served as a source for salt, which was essential for food preservation, bitumen, used for sealing and gluing, like attaching knives to handles.⁴⁴

Connection to all areas was made by convoys of beasts, which needed water and fodder.

Needs of the passengers were met by the ancient city of Arad.

The settlement was established at the southern base of Mount Hebron and served as a 'refresh point'.

Groups camped on their way from the north, before continuing to the difficult desert section and vice versa towards the inhabited area of Hebron.⁴⁵

Usually, ancient settlements were established in high places, which were easy to protect. Arad is exceptional in this regard.

Tel Arad was not built on the high rocky ridge found nearby, but in relatively low rise, about 580 m above sea level, in area consists of clay and soft soil, which becomes muddy during rainfall.⁴⁶

The city was horseshoe-shaped spring, in the lowest part of which the water was stored. The average annual rainfall was 170 mm, semi-arid climate.

However, today evidence is accumulating that during the city's existence the climate was more humid, but to what extent we do not yet know clearly.⁴⁷

43. Amiran, R., Ilan, O., Saban, M., Githart, R. (1984). *Site map - The early Canaanite city of Arad*. Tourism department and printing press of Arad Municipality.

44. Division of Antiquities - Ministry of Education and Culture. (1963). *Second excavation season in Tel Arad*. Archaeological News, 8, 1-6.

45. Amiran, D. (1997). *Tel Arad and the modern city of Arad: differences in function and location*. Eretz Israel - Studies of the land and its antiquities, 25, 241-243.

46. Amiran, R., Ilan, O., Saban, M., Githart, R. (1985). *Stories by Archaeologists: Arad as an ancient Canaanite city*. Moreshet Derech, 10, 7-15.

47. Ibid.

2.2.1. Ancient Roots

The ancient city of Arad is a stratification result of settlements, that showcases the historical incarnations that went through it, for a total number of five distinguishable different layers, ordered from oldest to newest:⁴⁸

V Layer: Tel-Arad must ancient finds dated the oldest settlement as a Chalcolithic village dated to the fourth millennium BC.

The settlement established its seat on a bowl-like hill, which its center is naturally lower than its edges. There is reason to believe that this topography, in which the surface runoff naturally drains into the center, was one of the factors in choosing the location, and indeed in its center, the city's central water reservoir was already installed at that time.

IV Layer: In the Early Bronze Age I (3200-2950 BC), another village was established, the population lived mainly in natural caves and crevices. Dwellings of both periods were huts made of perishable materials and caves carved into the rock. Fragments of stone walls indicate that solid construction existed too. Economy was based on agriculture, animals, and trading with Egypt.

III Layer: In the Early Bronze Age II (2950-2650 BC), the transition between Stratum 4 and 3 was a natural continuation of the population. The settlement reaches its peak, developing into a fortified city. Many remains of large buildings were found, indicating a design with concrete thought of urbanization with a network of streets and division of the city into quarters. Arad was apparently the only city in the Negev and its main center, as a part of the urbanization process which occurred throughout Canaan, until it was abandoned in 2650 BC.

II Layer: After about 1600 years (970-930 BC), the site reoccupied, and brought restoration of the buildings from Stratum 3, with various changes, both in the general planning and in the renovation of the houses. A Royal fortress was built by King Solomon on the northeast corner of the long-forgotten city. Most of the architectural and cultural finds found today are from this stratum. This glorious period was commanded by the final destruction, as testimonies by the fire in the found in the houses rooms.

I Layer: Reflects the stay of the residents who returned to the place after the destruction, who lived there for some time before the final abandonment. We do not have direct or indirect information about the causes of the final destruction of the settlement and its abandonment



Fig 25.



Fig 26.



Fig 27.



Fig 28.



Fig 29.

Fig 27. Storage jars of a special type: at the top of the handle, there are jugs for diluting the liquid in the vessels.

Fig 28. Clay box mimics the typical 'Aradi house'.

Fig 29. Decorated Pottery from Arad.

Ancient artifacts found on site:
Fig 25. Examples of flint tools and blades.
Fig 26. Fragment of Egyptian jar, engraved Menes's name, first king of Unified Egypt, 1st dynasty.

48. Association for the exploration of the land of Israel and its Antiquities. (1980). *Primitive - Quarterly for Antiquities in the Land of Israel*. Jerusalem: Merkaz Printing. Figures 25-29. Source: *Ibid*.

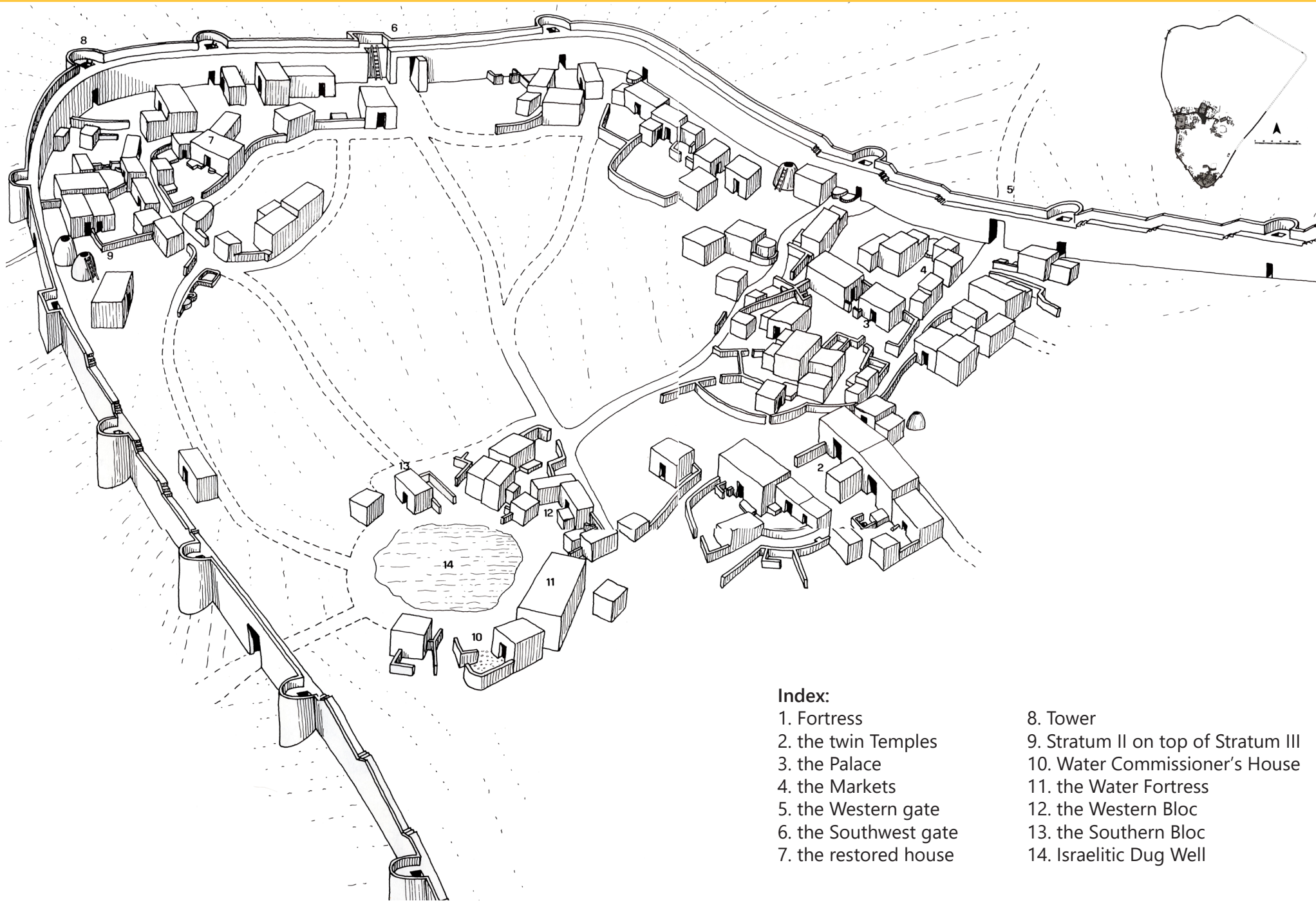


Fig 30. Axonometric view of Arad in its peak, from the Early Bronze Age II (2950-2650 BC). Source: Amiran, R. 1984. Elaborated by the author.



Fig 31. Photo of Modern Arad, 2021. Source: Yosef Yaari.

2.2.2. Modern Arad:

Early days 1920-1970

- 1920** First modern attempt to settle near Tel Arad. The effort to do so failed, the area was abandoned, after several unsuccessful tries to find water at a reasonable depth.⁴⁹
- 1960** The Government decided to establish the new town of Arad at this area, which was bare from any basic network of roads, electricity, and other modern facilities. Arad is the first town in the country where the design of the Master Plan preceded to the beginning of construction. Arad town was planned in order to provide an urban center for this region.⁵⁰
- 1961** Planning and administrative team, Led by Luba Eliav and Yitzhak Pundak, arrives in the prechosen spot to start the detailed planning of the new town. Around the planning table, set three national experienced architects; Arch. David Best, Arch. Ilana Elrod, and arch. Yona Pitelson. The realization of the first group of huts takes place.⁵¹
- 1962** First families arrived to live in the Rishonim ("First") neighborhood, consisted of 200 prefabricated asbestos units, as non-permeant housing solution.⁵²
- 1963** Start of construction of first permanent neighborhood, the Ye'elim Quarter, including 900 housing units initially.
- 1964** Work continues on the Ye'elim neighborhood.
- 1966** Next to Ye'elim, the city commercial isle was perceived, in which were situated part of the administrative and commercial services. Simultaneously, the start of construction of two new neighborhoods, Avishur (900 housing units) and Tellalim quarter (800 planned homes).
- 1967** The formation of Hatzavim quarter was established, it is the first neighborhood of private houses. Includes 160 houses, planned each one separately, under the regulation, norms and guidelines perceived in the PRGC and in the PPE/PEC of the area.⁵³
- 1970** Earthwork starts in Hardof, the second private homes neighborhood, under the same initiative guidelines of Hatzavim neighborhood.

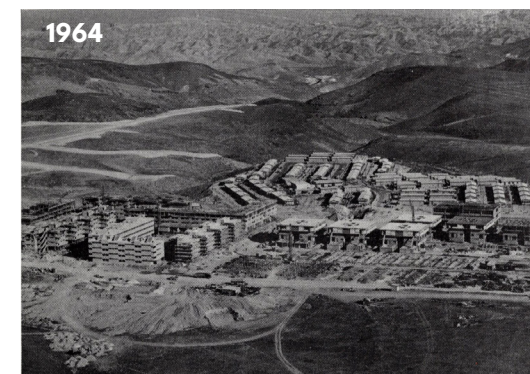


Fig 32. Bird-Eye view Photos of Arad. Source: Yosef Yaari.

49. Ilan, Y. (1983).

50. Peri, O. (2017). *Arad and me: The story of the founding of my city*. Israel: Graur Printing Industries Ltd.

51. Shadar, H. (2022).

52. Hilah Studio. (1970).

53. Arad Municipality. (1967). *Amendments to First Municipal General Regulatory Plan of Arad from 1961*. Arad, Israel: Planning Administration of the State of Israel. Available at: <https://apps.land.gov.il/IturTabotData/tabot/darom/6004096.pdf>

2.2.2. Modern Arad:

From Development Town to City 1983-2022

- 1983** Arad Festival began with initiative of Mayor Avraham Shochat, which later became main attraction to the city.
- 1995** Arad was announced as a city, as the settlement reaches 20,000 residents.⁵⁴ In July, three teenagers were killed in the disaster of the Arad Festival. The festival was a renowned brand, and the disaster became one of the symbols of failure in the city.
- 2004** Large group of residents has gathered and opposed the activities of industrial activities and to prevent the construction of a Phosphate Mine in the Arad area, distanced only 4 km from the city. which could increase significantly co-morbidities of the residents and even destroy the city's tourism industry.⁵⁵
- 2012** A new Masterplan for Arad is promoted by mayor⁵⁶, Tali Ploskov, the plan passed initial approval by the government, has been since stored in the drawer, eventually not materializing because the mayor left the office.
- 2015** The correct city's mayor was elected, Lawyer Nissan Ben Hamo, a return resident, whom was raised in Arad, correctly on he's second administration.
- 2020** Arad Municipality led by Mayor Ben Hamo, announced by a public manifest⁵⁷, its intentions to promote a new Master Plan for the city, since the current one is still the original from 1961. The planning will take place hand to hand with a residents participance process program.
- 2021** First design phase of the new Masterplan, as the initial proposal is being prepared by a team of planners and professionals consultants, led by the architect Yair Avigdor from Minad Architects.⁵⁸
- 2022** Signing of the Roof agreement with the Ministry of Housing and Construction, after years of negotiations between the government office and the city administration. Development plans to the city amounting to a whopping amooount of 1.4 billion NIS (circa 400 million Euro), of which 250 million NIS (~70 million Euro), will be direct investment in the city of Arad.⁵⁹



Fig 33. Arad's CBD in Festival 1992. Source: Koko.



Fig 34. Signing of the Roof agreement, a wide financial aid, significant moment for Arad, 2022. Source: Airit Eshet Mor.

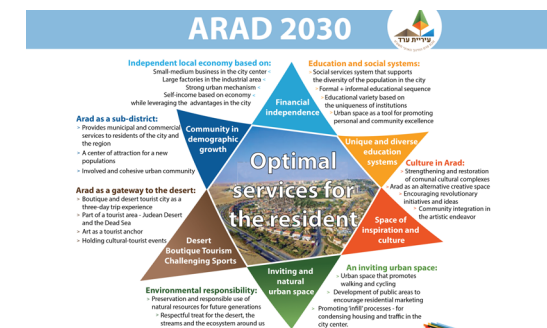


Fig 35. Vision for Arad in 2030 as part of the new Masterplan. Source: Arad Municipality.

54. Arad Municipality. (2021). *The History of Arad*. Available at:

<https://www.arad.muni.il/%D7%94%D7%94%D7%99%D7%A1%D7%98%D7%95%D7%A8%D7%99%D7%94-%D7%A9%D7%9C-%D7%A2%D7%A8%D7%93/>

55. Amit, H. (2016). *Barir Field: The last battle against ICL*. The Marker. Available at: <https://www.themarker.com/markerweek/1.2811872>

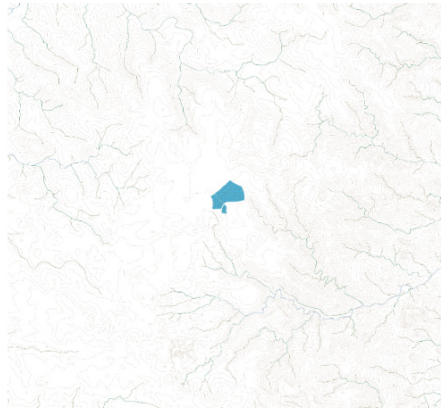
56. Israel Land Authority: Planning Department. (2012). Arad in full swing - new Executive Plan has been approved for the development and upgrade of the entrance to the city. Jerusalem, Israel: ILA Spokesperson department. Available at: <https://www.gov.il/he/departments/news/1213-pr-02092012>

57. Arad Municipality. (2020). Available at: <https://www.arad.muni.il/uploads/n/1611576222.9546.pdf>

58. Minad Studio. (2020).

59. Grastenpeled, E. (2022). *Arad: Roof agreement was signed for the development of the city*. Bizportal: online magazine. Available at: <https://www.bizportal.co.il/realestates/news/article/806315>

Arad City Development



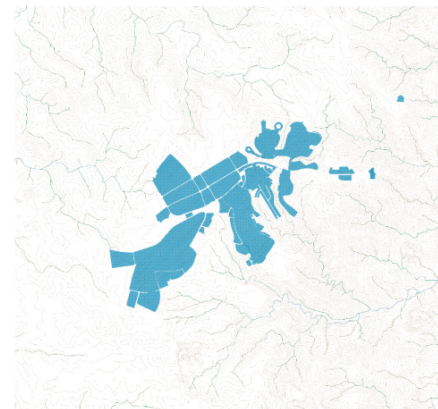
1961

Establishment of the city. Realization of front camp and Rishonim neighborhood.⁶⁰ (today the camp is the municipality building).



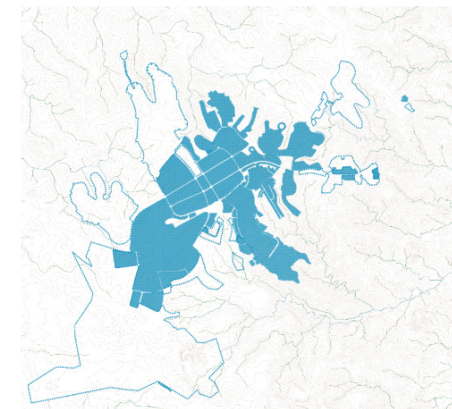
1970-1980

Construction of Neighborhoods in the center and the suburbs, a hotel, construction on the southern raising and establishment of the industrial area.⁶¹



1980-1990

Building of the Shaked and Rotem neighborhoods. Expansion of all the northern residential areas.⁶²



1990-2022

Development and filling of the vacant areas between the neighborhoods.

Approved outline - further spread out on spurs, in addition to condensing inward of the free areas.⁶³

Fig 36. Maps of the city's growth by quarters and years.
Source: the author.

60. Hilah Studio. (1970). *Arad - Story of a town 1962-1970*. pp. 3-6. Israel: Amni Offset Printers.

61. Ilan, Y. (1983). *Arad 1983*. Jerusalem, Israel: Hamakor Printing Ltd.

62. Ibid.

63. Minad Studio. (2020). *Comprehensive master plan for Arad: Meeting with the city plenum presentation*. The Planning Administration of the State of Israel & Arad Municipality.

2.3. Arad city Economy

As part of the government plan⁶⁴, a number of cities have been re-established in the northern Negev. This plan is nowadays not officially neglected, but neither promoted actively.

The idea was to raise towns which are also used by workers in factories based on the area's natural resources.

The new Arad⁶⁵ is thought as main hub for the development of the area and a comfortable place to live near the factories.

the economy of Arad is based on industry and tourism, which together provide employment for about 55% of the population (2019).⁶⁶

Most work in large industrial plans in the region, which are factories for extractions and elaboration of natural minerals (such as potash, bromine, magnesium, and phosphates. In the industrial quarter, during the 80's and the 90', the count of industrial fabrics were as high as 15, including metalworking, textiles, construction, plastics, etc.

Tourism, Holiday, and health Center are the second most important part in the economy.⁶⁷ The city and its surroundings are rich with location-based features that makes the city optimal for exploration.

The particular positioning of Arad on a ridge that overlooks the Dead Sea on one side, and the broad semi-arid expanses of the Negev on the other, grants Arad with advantage for various types of tourism⁶⁸:

Medically oriented tourism: the dry air of the desert is particularly beneficial for those who suffers from respiratory ailments.

The Dead Sea: Arad is the nearest town, 25-minute drive away from this natural phenomenon, along the coastline there are natural sulfur springs, mud baths, medical facilities, diverse Hiking trails in nature, Qumran National Park, etc.

Archaeological sites: such as Tel-Arad(5min), Masada (15min), Ein Gedi (30 min), and the Judean desert itself. All these attraction points make Arad an idea base for exploring the area.

In the last decade Arad has suffered from general instability, causing a lack of a congruent city vision.

This situation was led by political uncertainty, few changes in the mayor position, until the election of the current mayor in 2015, Nissan Ben Hamo, who's in position ever since.

It is important to highlight the economic situation nowadays in Arad, which is not an easy one, since less factories remained open, and the new generation is looking for different opportunities elsewhere.

64. Kotler, Y. (1961). *The new plan for the settlement of the Negev*. Haaretz, Published by: The National Library of Israel. Available at: <https://www.nli.org.il/he/newspapers/harets/1961/01/06/01/article/51/?e=-----he-20--1--img-txIN%7ctxTI-----1>

65. Ibid.

66. Central Bureau Statistics - CBS. (2019). *Municipalities profile: Arad*. Publication n. 1835. Available at: https://www.cbs.gov.il/he/publications/doclib/2021/local_authorities19_1835/288_2560.pdf

67. Ibid.

68. Ilan, Y. (1983). 38-43.



Fig 37. Photo of the Dead Sea coastline. Source: Eyal Tamir.

2.4. City Population

In its first years, the town used an application form, as the only tool on which its new residents were chosen.⁶⁹ You would have to indicate your profession, age, family state and the reasoning of wanting to settle.

Afterwards, your application would be approved or less, and a house would be pre-allocated to them based on number of people. This tool was neglected in the late sixties, due to low ask forms.

The small town moved to absorbed new immigrants, who came in the 60's from Romania mainly, but still the rate growth of the population was significantly lower from the previsions.

At the end of 1966, Arad counted less than 2500 residents, when forecasts expected to pass 10,000 habitants in this year.⁷⁰

In the early 70's, a big facility for reception and housing has allowed a large immigration from other countries, mainly from English-speaking ones.⁷¹

During the 80's newcomers from Ethiopia came, and also some families moved to Arad from other cities.

In the 1990s thousands of new habitants arrived from the former Soviet Union, bringing the town's population for more than 50% of immigrants.⁷²

This created a diverse and fascinating mosaic of cultures in Arad, bringing a lot of positive values, such as wide differentiation of professions, but also have challenged the city's array of services.

After the new millennial, the majority of new incomers are from the religious community of Gur (20% of Arad residents in 2021), and Bedouin for the region of Arad who moves to the city itself.⁷³

Following data from the Central Bureau Statistics [CBS] 2021:⁷⁴

Estimated number of residents is 27,388 people.

Annual growth rate of 1.5%

Arad is ranked 4 out of 10 in the socio-economic index.

Matriculation Diploma from high school rate was 51.5% as of 2019.

Average monthly salary was 7,297 NIS (~1911.5 €), while national average is 9,634 NIS (~2,523.7 €).

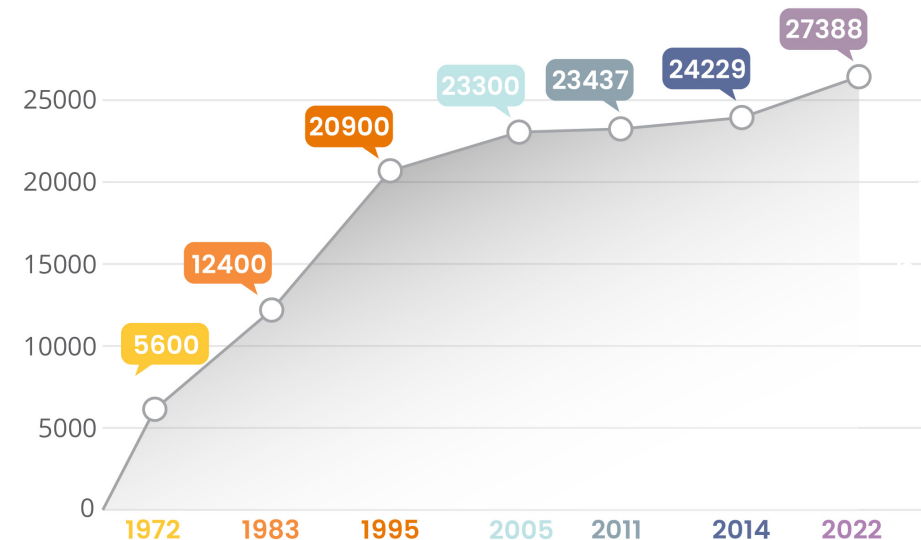


Fig 38. Population Growth Graph. Source: elaborated by the author.

69. Erez, R., Roiter, M., Sofer, G. (1990). *Arad & the next generation: data, analysis, conclusions, and recommendations for action*. Jerusalem: Prat Institute Ltd. 28-29.

70. Ilan, Y. (1983). 14-16.

71. Ibid, 52-53.

72. Sever, R. (2018). And I gathered you from the nations - processes of ascension and assimilation. Available at:

<https://www.taubcenter.org.il/wp-content/uploads/2020/12/8%D7%A2%D7%9C%D7%99%D7%99%D7%94%D7%95%D7%A7%D7%9C%D7%99%D7%98%D7%94.pdf>

73. Central Bureau Statistics - CBS. (2021). *Municipalities profile: Arad*. Publication n. 1835.

Available at: https://www.cbs.gov.il/he/publications/doclib/2021/local_authorities19_1835/288_2560.pdf

74. Ibid.

Following the national trend, Arad is nowadays in constant growth, with a majority of younger population. Thanks to the growing trend, the housing demand is following and increasing constantly as well. this argument reinforces the design choice to build and densify the Patio complex units.

Out of Arad total number of residents, which is 27,388:⁷⁵ 56% are in ages 15 to 65, almost 30% are in between the ages of 0 to 14, while only 14% of its population is over 65 years old.⁷⁶

As to genders, the city is close to equal state. Female populates as 50.9% percent, or 13,940 of Arad habitants, and 49.1%, or 13,448 of males.⁷⁷

Population Density is estimated between 212-273 residents each square kilometer,⁷⁸ it is considerably low in comparison to Tel Aviv, Israel where the population density resides by 9107 people to square kilometer,⁷⁹ or compared to Turin, Italy with 6527 habitants for each square kilometer.⁸⁰

Almost half of the households in Arad consist of two people, families of threes are in 15% percent from total, adding up to 4 components are 16% percent of the city's households, and counting more than five occupants are 22% percent.⁸¹

Arad city's residents live mostly (38% percent) in bigger houses of 5+ rooms, then 35% percent of its habitants live in four rooms homes, and in last, 27% are living in apartments with up to three rooms.⁸²

Residents Age Distribution

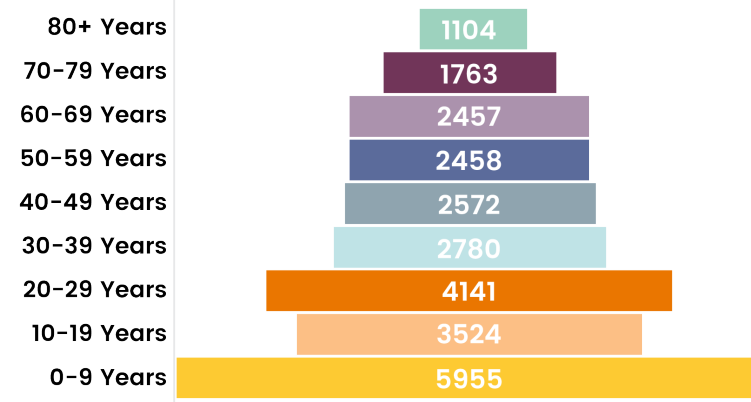


Fig 39. Pyramid of Arad's Age Distribution. Source: elaborated by author.

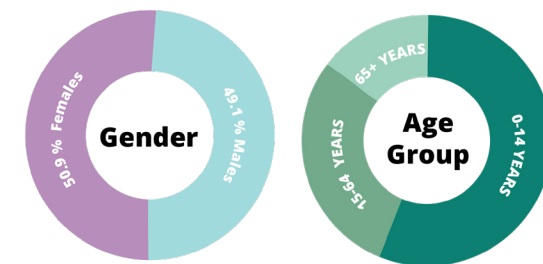


Fig 40-1. Pie Charts of Arad's Gender & Age Groups. Source: author.

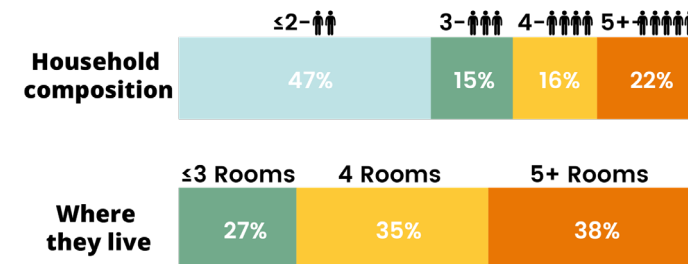


Fig 42-3. Arad's residents Household form & where they live. Source: author.

75. Central Bureau Statistics - CBS. (2021).

76. Brinkhoff, T. (2019). *Arad - city in Israel: Population Data*. Available at: https://www.citypopulation.de/en/israel/admin/hadarom/2560_arad/

77. Ibid.

78. Ibid.

79. Central Bureau Statistics - CBS. (2021). *Tel Aviv-Jaffa: General data - year 2021*. Available at:

<https://www.cbs.gov.il/he/Settlements/Pages/%D7%99%D7%99%D7%A9%D7%95%D7%91%D7%99%D7%9D/%D7%AA%D7%9C%20%D7%95.aspx>

80. ISTAT. (2020). *Comune di Torino: Maps, analyses & statistics on resident population*. Available at: <https://ugeo.urbistat.com/AdminStat/it/it/demografia/dati-sintesi/torino/1272/4>

81. Sharvit, Y. (2022). *Housing for households in Israel*. Available at: https://muni-index.co.il/2022/06/10/israeli_household_housing/

82. Ibid.

Arad & the next generation - data, analysis, conclusions, and recommendations for action:⁸³

Thanks to extensive research over the years, we can portray the city's population needs and opinions.

Two main works were produced during the 90's and involved conductive research on the city's population topic:

The research book Arad & the next generation - data, analysis, conclusions, and recommendations for action, released in 1990 and tackles the hard questions of Arad next generation.

As the work states, the departure of young people from small and relatively remote places to large urban centers for the purpose of acquiring a profession through studies, and for the purpose of stimulus and pleasures of life, is a natural and long-standing phenomenon.

Nevertheless, the local leadership in Arad sees with great importance the issue, and therefore thoroughly examines the rate of the phenomenon, assessments on this issue, handing formulates directions and an action plan.

Main motives for this documentation research:

If Arad is considered a success story of desert settlement, the leaving of younger generation is seen as a problem, obscuring this success.

The extent of the departure in Arad exceeds what can be seen as a reasonable rate.

Fear that the continuation and growth of the phenomenon may feed a general trend

Conclusions of the document were quite shaky, as they were:

Leaving: About 70% of the locals leaves Arad in the three years after military service (ages 21-24).

After that the picture tends to remain balanced, those who remain usually continue to live in the city, those who leave usually do not return to the city. About 40% Most of the leavers, go from the city in favor of higher education.

Smaller groups (9-14% each) go to work, abroad, or move to their partner's hometown.

Remaining: About 30% of the locals continue to live in Arad about three years after military service, most of the remaining population turn to work (about 45% of them) and to studies (20%).

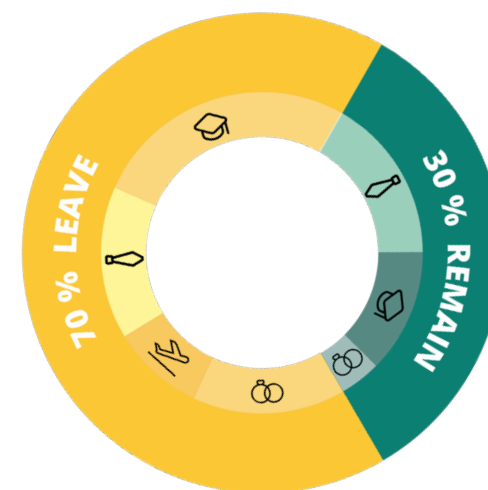


Fig 44. Leaving Arad vs. Staying in town.
Source: elaborated by the author.

83. Erez, R., Roiter, M., Sofer, G. (1990).

General attitudes towards Arad:



The perspective of all the groups asked towards Arad is positive. They emphasize aspects of intimacy and quality of life that characterize the city as a place that "cares."



Almost all respondents express worries about the future: fear from changing the character of the city, aging, the entry of new populations, and their main concern was the possibility of employment and encouragement of the younger people.



Young people living outside Arad:
Most respondents do not deny the possibility of returning to Arad, however:

- Do not consider this option particularly realistic.
- Do not intend to be active in the context of the subject. ("If they offered me ..")



Young people serving in the army:

- Complaining about boredom, disconnection when visits Arad.
- Emphasize the need for social framework that will give them a partial answer to social needs during the holidays.
- Emphasize the vitality of an active advisory system and guidance towards the end of military service.



Young people in seventh and eighth grade:

- Express embarrassment, appreciate and concern for them from authorities, at the same time express passivity and boredom.
- Emphasize the gap between them and the parents on the subject of connection to the place.
- Arad is perceived by their parents as a central experience in shaping lives, it is not perceived as such in the eyes of young.
- Doubts are usually expressed as to whether they will remain in place after the army.

Summary of recommendations:

1. Strengthening the Aradic feeling in the education system:
 - Active exposure throughout the education period to study topics about the unique local nature.
 - Integration of Community Involvement as a fundamental part of all the education in the place.
2. Treatment of students:
 - Create early contact between Arad - student - future employer.
 - Guidance and encouragement for studies in Be'er Sheva.
 - Establishment of "mini campus" in Arad.
3. Population of job seekers:
 - Initiating and operating a program that combines training, and employment, immediately after discharge from the army.
4. Industry:
 - Development and operation of a joint project with ICL and other entities (such as the University of the Negev, the Technion) for exposure and guidance for industrial chemistry studies.
5. Tourism:
 - Running a short-term program of training, employment and promotion in collaboration with the Dead Sea and Arad Hotels.
 - Running a medium-long-term program combined with a high school hotel studies program.
6. Soldiers during the period of military service:
 - Activating a social and cultural framework suitable for soldiers, additional services to enrich social life during the holidays.
 - Active professional and occupational guidance towards the end of the period.
7. Information system:
 - Planning and operating a comprehensive and updated data set about the people of Arad, their place, and their situation by various relevant factors.

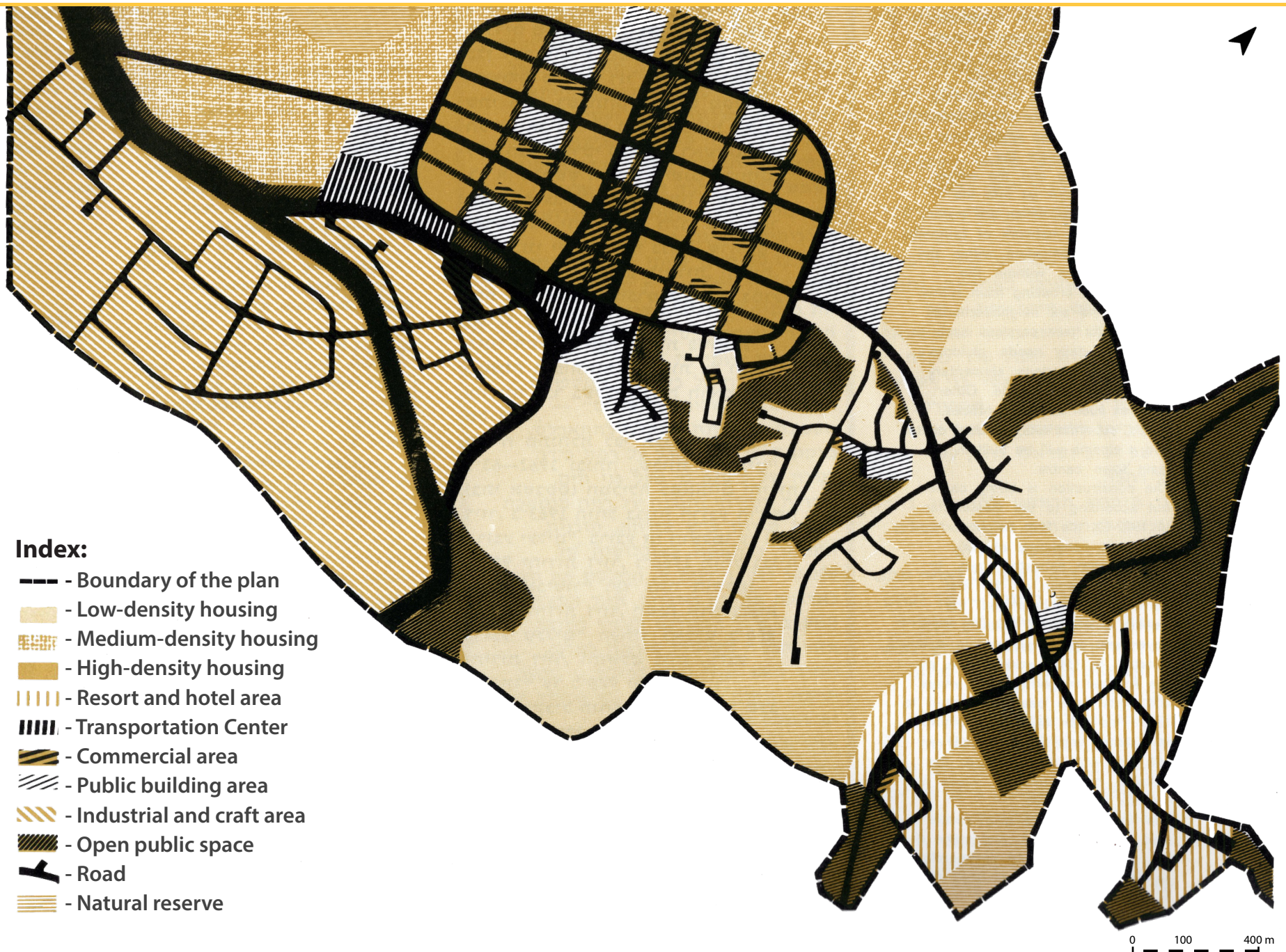


Fig 45. Arad Development Survey: First Master plan 1961. Source: Hilah Studio, elaborated by author.

2.5. Municipal General Regulatory Plans

2.5.1. Original Master Plan - 1961

Arad is the 28th development town in Israel. It is the first of them where surveys, tests and planning preceded to the siting of the town. A Masterplan was drawn up for a town of 50,000 habitants, as the first pre-designed city.⁸⁴

The original plan divides the town into **four main sections**.⁸⁵

1. Industrial sector:

Sited to the south-west of the town, so that the prevailing winds, which comes from north-east, would carry any smoke or smells away from the living areas.

2. Central concentrated living section:

Made up from six main neighborhoods, containing approximately 6000 homes.

In its core, the General Square is located, with services. The roads circulate the quarters and the city center but not invading it. Instead, parking lots are located on the perimeter of quarters, which are motorized traffic free zones.

A network of footpaths enables the circulation within the quarters without the necessity of crossing main roads. Each quarter contains its own basic services (shops, kindergartens, elementary schools, and a

synagogue). We can identify the Ye'elim Quarter in the central district of the plan, as the first neighborhood to be built shortly after.

3. Private housing regions:

To the east, under a special government policy of 'Build Your Home', based on the allocation of land for the construction of detached houses, according to a private planning of each owner.

4. Recreation area:

At the eastern edge of the plateau, overlooking the Dead Sea and the mountains of Moab. Includes hotels, health clinics, panoramic walk view that leads the edge where an observation point is located.

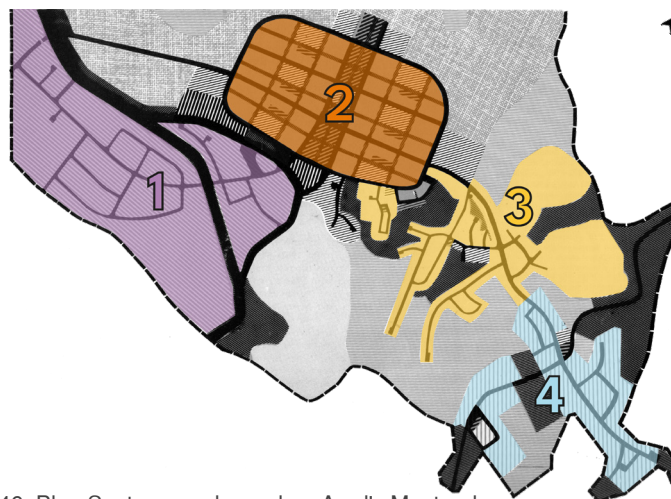


Fig 46. Plan Sectors overlapped on Arad's Masterplan.
Source: elaborated by author.

84. Sheder, H., Oz, O. (2012).

85. Ilan, Y. (1983). p. 126

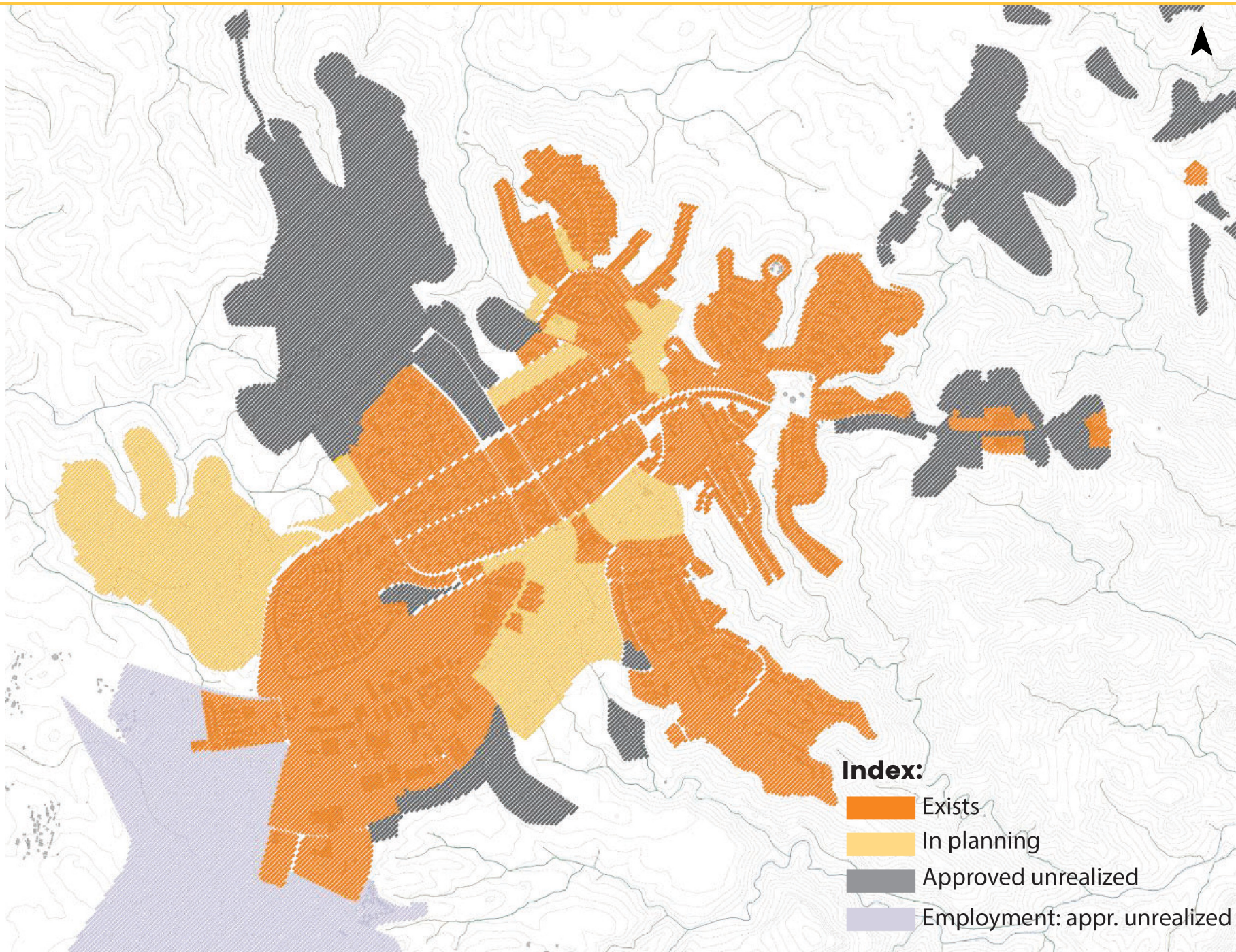


Fig 47. Diagram of the new M.G.R.P. planning guidelines, 2020. Source: Minad Studio, elaborated by author.

2.5. Municipal General Regulatory Plans

2.5.2. New Master Plan - 2020

In 2020, the Arad Municipality announced its intentions to promote a new Masterplan for the city.⁸⁶

The new Municipal General Regulatory Plan, or M.G.R.P. for the city, takes a quite unique approach, as a residents participation program will accompany the design process. The plan is prepared by a team of planners and professionals consultants, led by the architect Yair Avigdor from Manad Architects.

Today, the city has an approved planning stock containing four new neighborhoods: Rishonim, Yehoshafat, Rechasim and Nofim. These will contain 5000 new residential units, and would allow Arad to double its population.

As reported in the manifest, the city's Municipality, and the Planning Director of the Ministry of Finance main Outlines:⁸⁷

- The new plan is a physical one and will set the city's planning policy and development directions until 2040.
- Open invitation for the residents of Arad to participate in varied steps of the new Masterplan for the city. Throughout all the planning stages, there will be a public participation process managed by Modus, which will include open meetings for the habitants, a survey of residents, and working groups. The opinion of the residents should and need to be expressed in the various subjects.
- Taking action mainly in strategy for important issues for the city's future: expected size of the population and allocating areas for expansion, the future estimated traffic and development of roads in Arad, open public spaces and their uses, public services According to populations needs, the layout of the commercial/work areas, environmental issues and so on..

12.02.2020 First open meeting integrating the residents of the city (in person).

08.09.2020 Presentation meeting with the city plenum about a new Masterplan for Arad.

14.10.2020 Second open meeting including the residents (via Zoom).

05.12.2020 Comprehensive Masterplan for the city of Arad Phase A: Documentation of an existing situation, report of 367 pages, surveying the city's aspects from many different points of view.

01.09.2021 Initial design proposal is being prepared by a team of planners and professionals consultants from Manad Architects and Ehud Best Architects and Orchki Architects.

07.07.2022 Signing of the roof agreement with the Ministry of Housing and Construction, after years of negotiations between the government office and the city administration.

Development plans to the city amounting to a whopping 1.4 billion NIS (circa 400 million Euro), of which there will be direct investment in the city in the amount of 250 million NIS (~70 million Euro).⁸⁸

86. Arad Municipality. (2020). *New Municipal General Regulatory Plan for Arad: Phase A Report - Documentation of the current situation*. Arad, Israel: Planning Administration of the State of Israel. Available at: <http://www.arad.muni.il/uploads/n/1611576222.9546.pdf>

87. Minad Studio. (2020). *Comprehensive master plan for Arad: Meeting with the city plenum presentation*. The Planning Administration of the State of Israel & Arad Municipality.

88. Grastenpeled, E. (2022). *Arad: Roof agreement was signed for the development of the city*. Available at: <https://www.bizportal.co.il/realestates/news/article/806315>

2.5.3. Division of Arad city nowadays

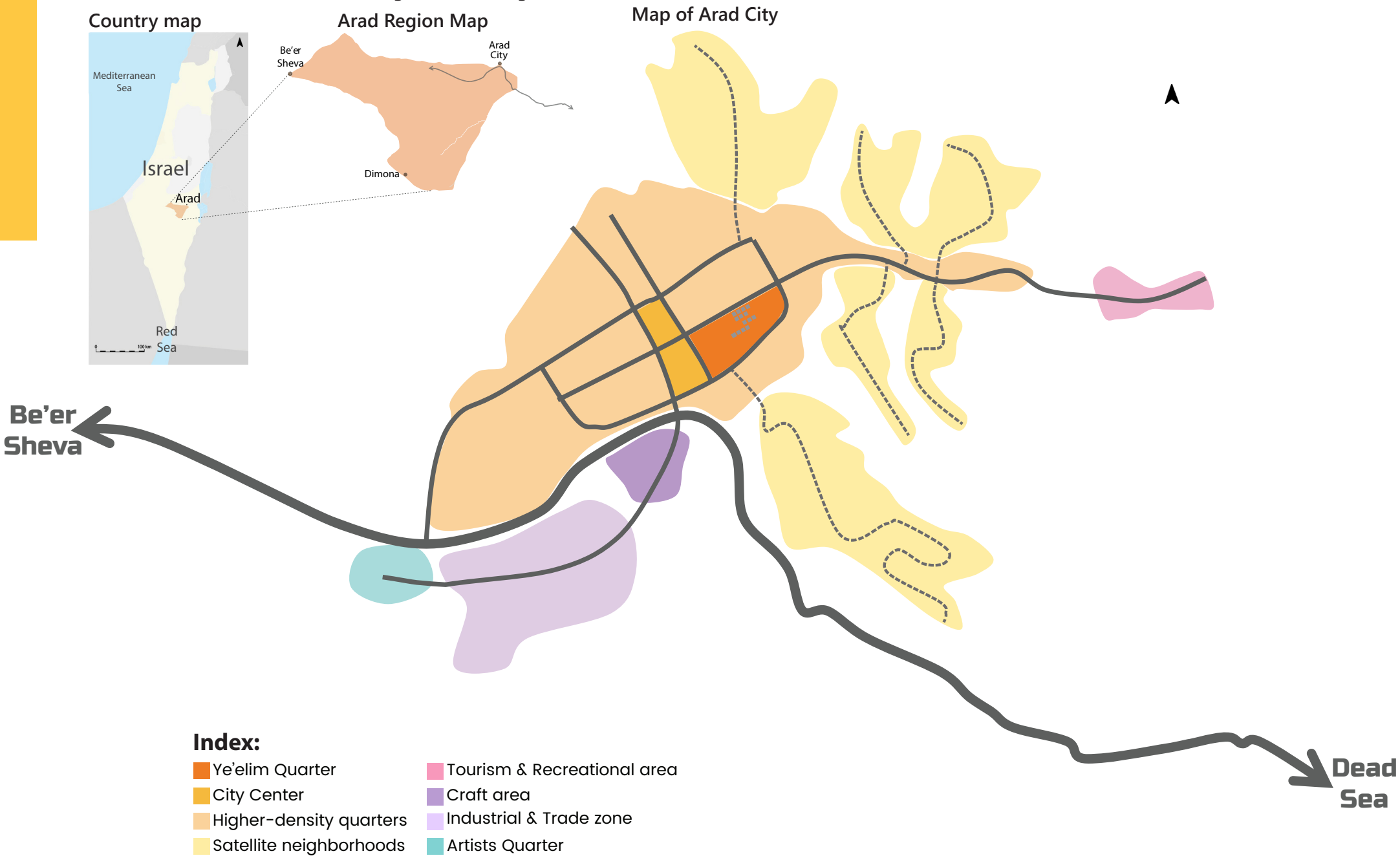


Fig 48. Distribution of uses in the city - current situation, 2022. Source: elaborated by author.

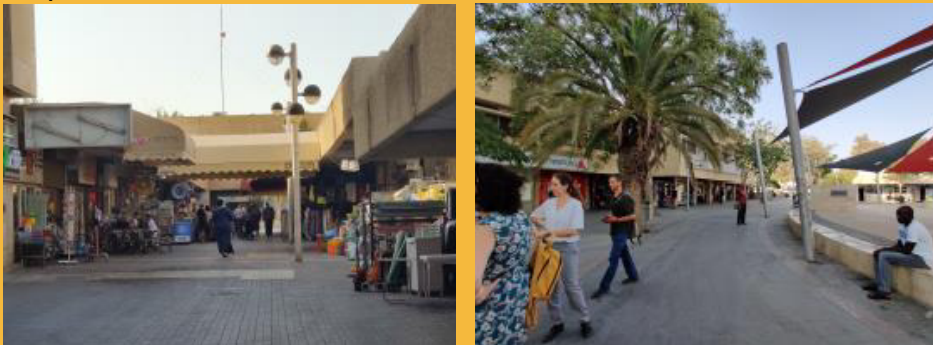
Ye'elim Quarter



Satellite neighborhoods



City Center



Tourism & Recreational area



Higher-density quarters



Industrial & Trade zone



Fig 49. Photos of Arad, 2022. Source: the author.

2.5.3. Division of Arad city nowadays

Functions & Road type Map:

Data:

Total Area: ~126 km² [12600 Hectares]

City Area: ~15.96 km² [1596 Hectares]

Built Footprint Area: ~1,05 km² [105 Hectares]

Open spaces: ~14.91 km² [1491 Hectares]

Population: ~27,388 residents

City density population: 171 resi. to km²

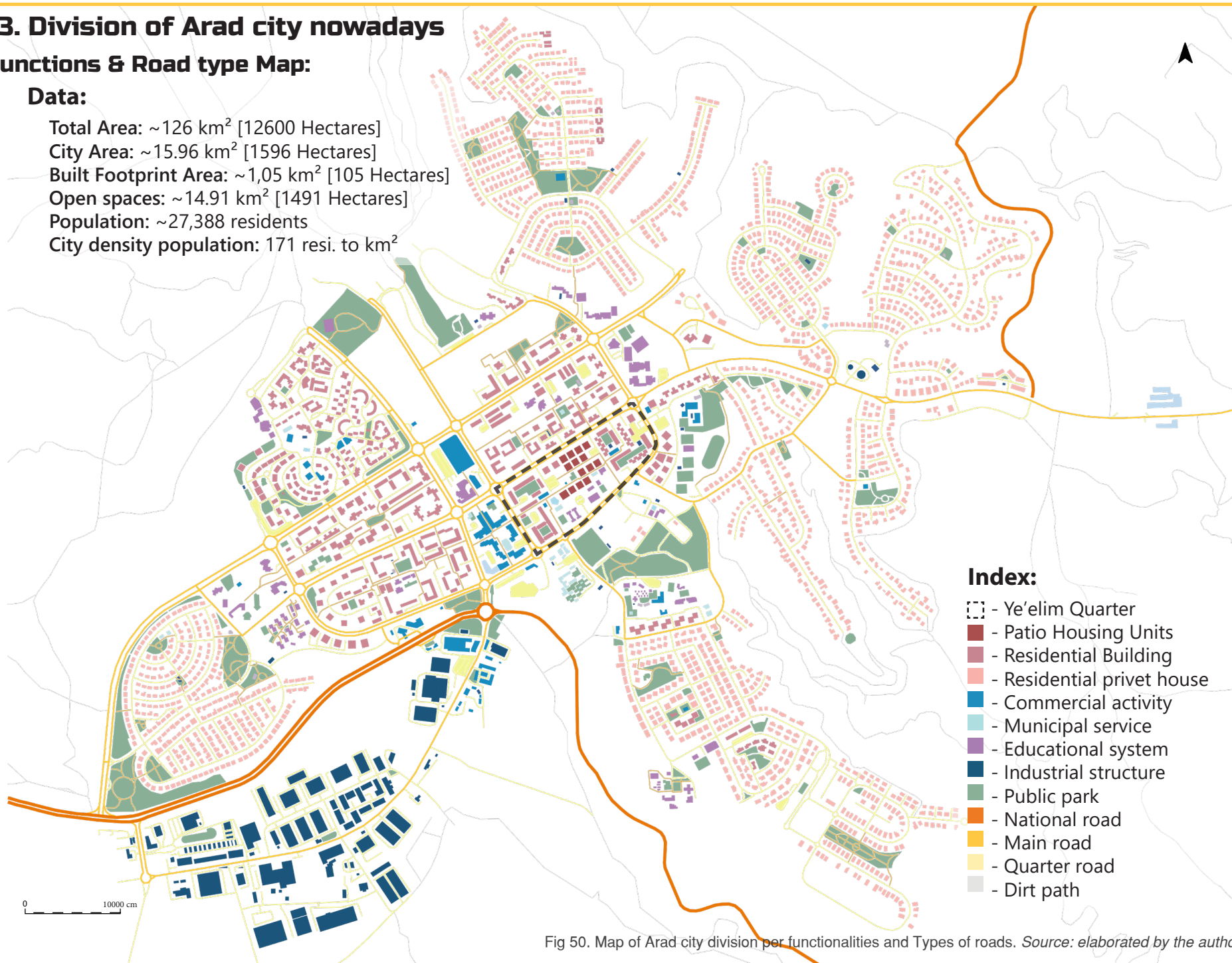


Fig 50. Map of Arad city division per functionalities and Types of roads. Source: elaborated by the author.

Close up of Ye'elim Quarter

Functions & Road type Map:

Data:

Ye'elim Total Area: ~102,925 m² [10.3 Hectares]

Built Footprint Area: ~20,090 m² [2.1 Hectares]

Open spaces: ~82,335 m² [8.2 Hectares]

Residential units: ~838 apartments.

Population: ~2500 residents

Quarter density population: 24 resi. to km²

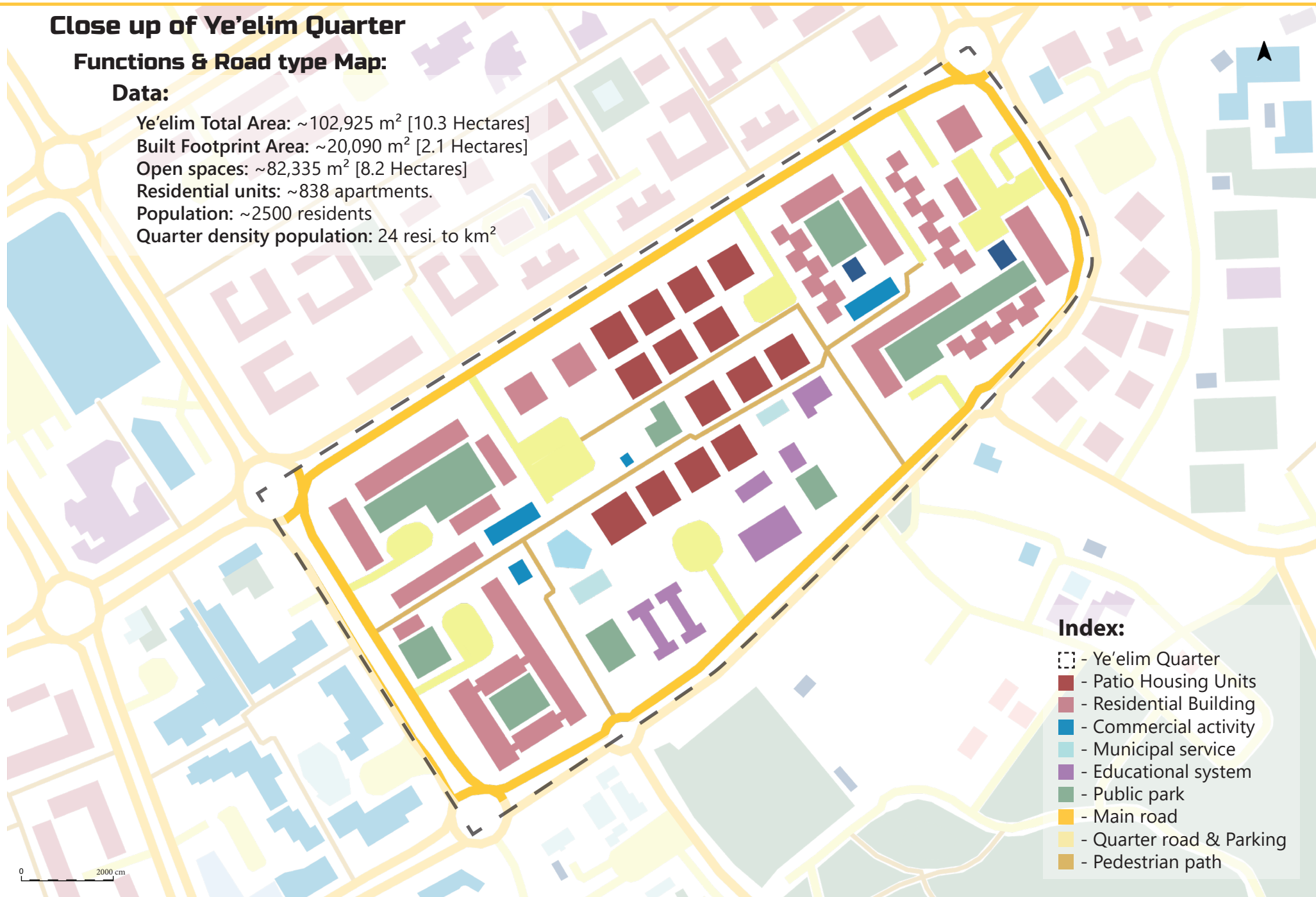


Fig 51. Map of Ye'elim Quarter, division per functionalities. Source: elaborated by the author.

3.1. General Background

As the first permanent neighborhood built in Arad in 1962, designed by the team of 14 architects and planners, it is also the first pre-planned from scratch quarter in the country.⁸⁹

The architects, as well as the whole pioneer group, moved to Arad during its planning, to get to know and feel the conditions of the place.⁹⁰

Ye'elim by definition is the animal Ibex, a specie of a wild mountain goat, which is a native protected animal in Arad's area.⁹¹

The neighborhood itself is named after the Ye'elim Stream, a seasonal stream which runs partially with water after rainfalls. Its trail descends from the city's entrance, and ends eventually at the Dead Sea (about 18 km in length).⁹²



Fig 52. Two Ibexes, 2019. Source: Eyal Tamir.

Two types of Quarters:

- the city's core 4 medium dense neighborhoods: Ye'elim, Avishur, Levaot and Tllalim. In the middle of them relays Arad city center, with various services from commercial, sanitary, education and entertainment. These city core quarters are planned with emphasize on the human scale, the pedestrian user is thought in a preliminary position, shaded and with minimal encounters with machinery roads.

2. Satellite neighborhoods: with a clear separation between them and Arad core quarters, eliminating the possibility to pass through the quarters as a pedestrian and forcing the residents to use carbonate based solutions. lower density residential areas expressed in private houses type of constructions.



Fig 53. Ye'elim Seasonal steam, 2016. Source: Gil Orberg.

89. Shadar, H. (2022). *Arad - an Experimental Town*. Published by The Council for Conservation of Heritage Sites in Israel.

90. Sheder, H., Oz, O. (2012).

91. Perez, Y. (2018). *Shechunat Haye'elim (the ibex neighborhood)* [Exhibition catalogue]. Israel Museum, Tel Aviv. Available at: <https://www.eretzmuseum.org.il/e/382/>

92. Ibid.



Fig 54. Ye'elim Quarter in Birdseye view, 2022. *Source: the author.*



Fig 55. Photos of Ye'elim Quarter during years of construction 1962-1964. Source: Yosef Yaari.

3.2. Planners

Architect Ilana Alrod⁹³ upon her graduation as an Architect from the Technion University, traveled to Brazil to participate in the planning of the new city Brasilia.

An experience which she describes as a “unique challenge at the time”, allowing her to acquire a set of tools in planning new cities. Alrod express her gratitude and honor towards the team leaders: city's planner Lucio Costa and the architect Oscar Niemeyer.⁹⁴

With her return, she served in the military under the Engineering Corps and then, with the experience she gained in modern urban planning, Alrod was called by the city's founder and mayor Luba Eliav, to join the city's planning team.⁹⁵

In 1960, Alrod moved to Arad to live while designing the town. She first planned with Architects David Best and Yona Pitelzon, a front camp, Rishonim Quarter, which was a temporary accommodation for the staff, offices, and services.

Afterwards, the three architects planned the Ye'elim Quarter, in which the Patio Housing Units is located, these were designed and build in 1961-1963, by Gerald Zappert, South African architect who came to Israel for and eventually returned to Johannesburg.⁹⁶



Fig 56. Arch. Ilana Elrod, 2018.
Source: Hayut Kali.



Fig 57. Barracks for the planners: an inner courtyard in the front camp, 1961.
Source: Arch. Ilana Elrod.

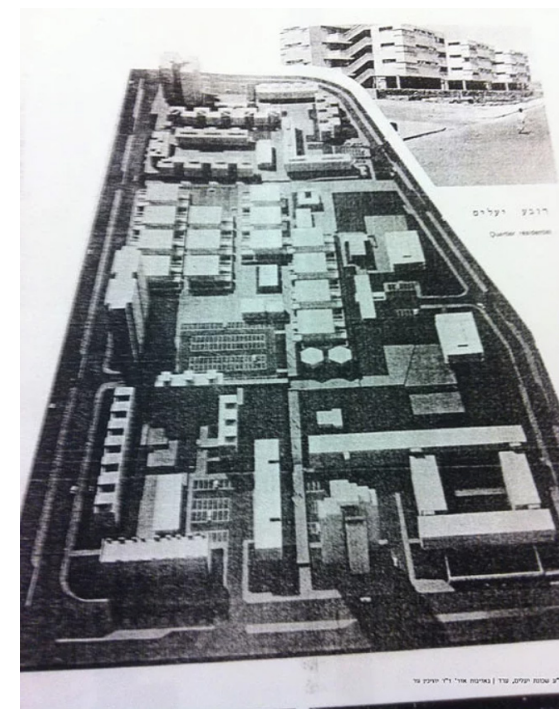


Fig 58. Ye'elim Quarter model and photos for marketing, 1967. Source: Arch. David Best.

93. Architect Ilana Elrod: 1936 - Today, Born in Tel Aviv, Israeli architect who was a part of Arad's city planners.

94. Hayut, K. (2020). *Special interview: The architect and cultural creator Ilana Elrod*. Available at: <https://www.theblock.co.il/2020/03/07>

95. Ibid.

96. Ilan, Y. (1983). p. 14.

3.3. Planing Guidelines

Functions:

Basing on the local climate as a main guideline in the planning, as it is characterized by high temperatures during the day, and comfortable temperature drop, partially windy, in the evening and nighttime, which is a distinctive character of the area.⁹⁷

Depending on its climatic nature, the team of architects designed Ye'elim neighborhood, which includes in total 900 residential unites and series of public services, stretching on an area of around 102,925 sqm (~0.12 sq. km).⁹⁸

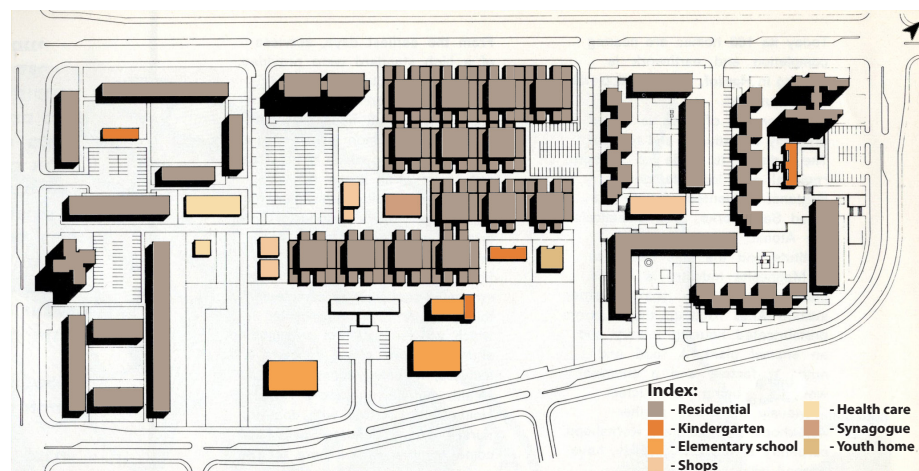


Fig 59. Plan of Intended uses based on the original Masterplan of Ye'elim Quarter, 1970.

Source: Hilah Studio, overlapped graphics by the author.

Central pedestrian pathway:

Free from meeting points with roads of motorized vehicles. This important decision was applied as a main role in all the cities central districts.⁹⁹

The implementation of the pedestrian pathway as a main distribution along the residential quarters, allows a guaranteed safe access for all kinds of users, from adults to kids, to all public structures, creating public open aggregation points for its varied residents. Parking areas are located around the isle perimeter.

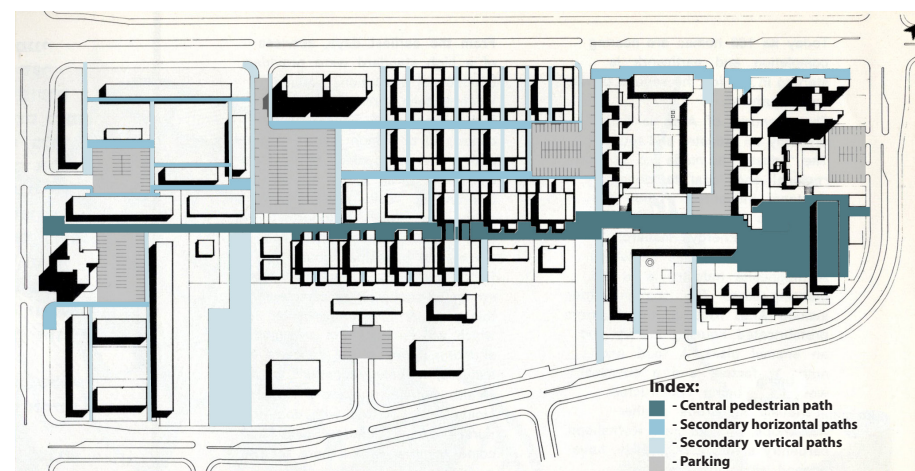


Figure 60. Sweet Mobility based on the original Masterplan of Ye'elim Quarter, 1970.

Source: Ibid, overlapped graphics by the author.

97. Shadar, H. (2016). *On the Trail of Urbanism in the Planning of Arad, Ir-Habsor and Karmiel, at the beginning of the 1960s*. Published by University of Haifa, Israel.

Available at: <https://www.jstor.org/stable/26597511>

98. Brinkhoff, T. (2019). *Arad - city in Israel: Population Data*. Available at: https://www.citypopulation.de/en/israel/admin/hadarom/2560_arad/

99. Yacobson, M. (2012). *My dear son: Zolotov, v. & Best, D. Architects*. Available at: <https://xnet.ynet.co.il/architecture/articles/0,14710,L-3095493,00.html>



Fig 61. Bird view of the Ye'elim Neighborhood, with an emphasis on its main path. *Source: The Author.*

3.3. Planing Guidelines

3.3.1. Patio Housing Units as Special Housing Project ¹⁰⁰

As mentioned previously in the chapter of Urban planning instruments, the Public Housing Registration Law from 1964, is a tool that was issued in order to regulate buildings that were built before the normal national law for planning and construction.

This law from 1964 govern the Patio housing units as a special urban zone of planning,¹⁰¹ buildings included under this law cannot be changed with conventional planning tools, because they technically belong to the state, they are 'rented' to its residents from the state and not sold, this implements a difficulty in intervention.

In the new Master Plan of 2020,¹⁰² the Patio Housing complex is not included, drives from the fact that the Patio Units are previously associated with plan from higher hierarchy, which is the Public Housing Law from 1964 mentioned above.

This may be implied by the fact that Patio units buildings may have been destined for conservation. also, since the structures at the edges of the plan are intended for condensation as shown in the Densification Plan from 2010, it is expected that their orientation is intended for preservation.

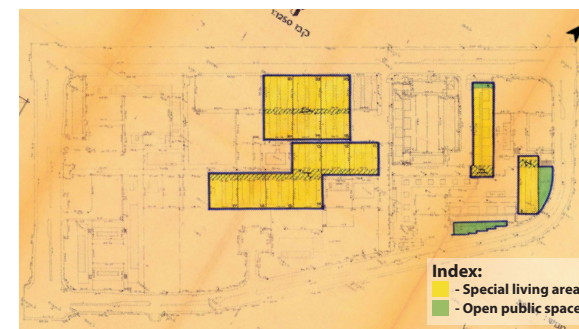


Fig 62. Public Housing Plan for 'Patio units' in Ye'elim Arad, 1968. Source: National TABA database.



Fig 63. Dividing the Ye'elim neighborhood into zones according to the 1964 Public Housing Law. Source: National TABA database.

100. Kneset Israel. (1964). *Public Housing Registration Law [temporary law]*. National Legislative Database. Available at: https://www.nevo.co.il/law_html/law01/286_056.htm

101. Kneset Israel. (1968). *Israeli Land and Property Laws*. National Legislative Database. Available at: https://www.gov.il/he/departments/legalInfo/chok_hamekarkein_moch

102. Arad Municipality. (2020). *New Municipal General Regulatory Plan for Arad: Phase A Report - Documentation of the current situation*. Arad, Israel: Planning Administration of the State of Israel. Available at: <https://www.arad.muni.il/uploads/n/1611576222.9546.pdf>

3.3.4. Ye'elim according to the General Master Plan 2020

The new Municipal General Regulatory Plan, refers to Ye'elim Quarter by implementing an important previous T.M.A 38 (National Densification Plan) from 2010, taken into consideration while planning the new Master Plan for the city in 2020.

Ye'elim & Rishonim Quarters Thickening Plan 2010 [5-127-03-24] Arch. A. Gannot ¹⁰³

The program is part of a condensing track founded in 2000, T.M.A. 38 this National Plan, thickens serial structures. According to Gannot's Master Plan for Ye'elim, the residential buildings will rise up to a height of 8 floors and 372 new units will be added to the existing 838 apartments, for a total of +45% percent of new residential areas.

Important to mention, that the of Ye'elim quarter densification do not include the Patio Housing complex, as visible in figure 62, marked in white. It drives from the fact that it is previously associated with another plan from an higher hierarchy, as mentioned in special Urban planning instruments, the Public Housing Registration Law from 1964. the area dedicated to densification is highlighted in pink color.

Ye'elim as part of the Arad 2022 city center renewal planning by Best Architects ¹⁰⁴

The project includes a detailed plan for the renewal of the city center district and the four core neighborhoods, which are Ye'elim, Avishur, Levaot and Tlallim.

The purpose of the project is to strengthen and adapt the city to the needs of population growth while cultivating the city as a green, sustainable, comfortable and safe, accessible and innovative system.

Principles of planning by densification of the neighborhoods while adding residences, and maintaining the principle of walkability - the pedestrian routes that connect the core neighborhoods of the city.

Best Architects' plan offers the addition of about 250 new housing units in the Ye'elim neighborhood, or about 30% more than the current situation.

Main focus of the densification plan is the concentration of new residential buildings with a height of 8 floors in four of the five parking lots that are used to sustain the Ye'elim quarter.

In October 2022, the Israeli Association of Architects awarded first place in the urban planning and design category, to this project of renewal and densification of the urban center of Arad.

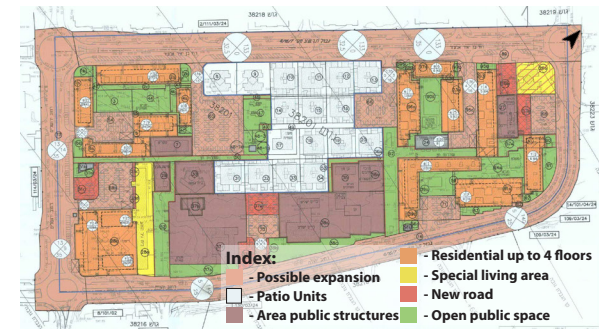


Fig 64. T.M.A 38: Ye'elim quarter Densification, 2010. Pink- possible densification, White- the Patio 14 units. Source: National TABA database.



Fig 65. Noli map of the Ye'elim quarter, in blue are the areas proposed for new construction, 2022. Source: Best Architects.



Fig 66. New Master Plan for Ye'elim neighborhood, replacing parking lots with new residential construction, 2022. Source: Best Architects.

103. Anat Gannot: Israeli Architect, founded her Architecture firm in 1987 with Paul Gannot.

104. Kastel, D. N. (2022). From Arad's city center to the Caron Theater Jerusalem: these are the winners of the 2022 Israeli Architecture Award. Real Estate Center Magazine. Available at: <https://www.nadlancenter.co.il/article/6577>

3.3. Planing Guidelines

3.3.3. Arad stone - Local law for the city's appearance¹⁰⁵

Arad stone¹⁰⁶ - metamorphic limestone quarried in the Arad region. Its colour is purple brown with white veins, and also in an intense black shade with a combination of white veins, a unique colour which is not common in Israel.

An extremely hard stone with low absorption, suitable as a granulate coating of surfaces and walls, for ground coverings and paths. The raw material is carefully sorted in order to obtain a uniform shade and no foreign substances.

From the founding of the city in 1960 until today, all buildings in Arad are obliged to incorporate Arad stone in the building. Whether on the ground floor of the building or as a wall around the area, or anywhere that needs to be resistant to natural and human damage. This is an important example of a concept of sustainability in which the reference to local material from zero kilometres is prioritized over other resources.

In the city of Arad, a variety of sites are found where the use of Arad stone is implied. A wide range of examples, from delimiting construction walls, to small independent constructions, to supporting walls, urban paving, and more.



Fig 67. Photo of Arad stone, a local limestone, 2018.
Source: T. Tamra.



Fig 68. Wall of interlocking Arad stones, hewn similarly to standard building bricks, 2022. Source: the author.



Fig 69. Partition built of Arad stone, carved into irregular, pointed stone fragments, 2022. Source: the author.



Fig 70. Arad stones combined together, with a rounded shape appearance 2022. Source: the author.

105. Spokesperson department of the Arad Municipality. (2021). *Information Report for Arad residents 2020-2021*. Arad, Israel: Arad Municipality Printing Office. Available at: <https://www.arad.muni.il/uploads/n/1622636540.6491.pdf>

106. Tamra, T. (2021). *Stone and Mineral Industries - Arad*. Serfdom 81 Ltd. Available at: https://www.zmitut.co.il/?m_id=39&sm_id=9&page=5



Fig 71. Small warehouse building made of Arad stone, in the background, a Patio Unit in Ye'elim, Arad. 2022. *Source: the author.*



Fig 72. Main facade of the health center, built mostly with Arad stones, in Ye'elim neighborhood, Arad. 2022. *Source: the author.*



Fig 73. Private house in a satellite quarter in Arad, the border wall of the house is made out of Arad stone. 2022. *Source: the author.*



Fig 74. Observation point made of Arad stone and concrete, in Moav boardwalk, east of Arad recreational area, 2020. *Source: Maayan Kuperstein.*

3.4. Ye'elim Residents

The Ye'elim neighborhood consists of a very wide cultural and ethnic diversity, from veterans who have inhabited the neighborhood since its inception to asylum seekers from warring countries.¹⁰⁷

Estimating today about 2500 residents live in the neighborhood, in approximately 500 housing units, according to the Bureau Statistics.¹⁰⁸

Over the years, the residents of the neighborhood formed a group called "Ye'elim Neighborhood Activists"¹⁰⁹, the group holds periodic

meetings to discuss the neighborhood's situation, and to promote social activity initiatives for its residents.

In 2010, part of the group's activity was presented in an exhibition at the Israel Museum. The subject of the exhibition was the residents of the neighborhood and their documentation in photos, in order to raise awareness of the neighborhood's condition today.



Fig 75. Photos of residents of Ye'elim neighborhood, 2010. Source: Israel Museum.

107. Peri, O. (2017). *Arad and me: The story of the founding of my city*. Israel: Graur Printing Industries Ltd.

108. Central Bureau Statistics - CBS. (2019). *Municipalities profile: Arad*. Publication n. 1835. Available at: https://www.cbs.gov.il/he/publications/doclib/2021/local_authorities19_1835/288_2560.pdf

109. Israel's Museum. (2018). *Ye'elim neighborhood Exhibition*, curated by: Perez, Y. Jerusalem, Israel. Available at: <https://www.erezmuseum.org.il/e/382/>

Carhartt Ye'elim 2018 - Social Involvement process in Planning¹¹⁰

As part of the new Master Plan for the city of Arad, in 2020, the residents of the Ye'elim neighborhood were invited to take part in the joint process of re-planning the neighborhood.

For about 5 days, workshops were held that included the residents of the neighborhood and with them a planning team from the fields of urban planning worked together from morning to evening to formulate the plan.



Fig 76. The Carhartt Workshop takes place with various stake holders, 2018. Source: Irit Dror.



Fig 77. Concluding conversation of the workshop for urban planning of Arad, 2018. Source: Irit Dror.

In the Carhartt, the residents of the Ye'elim expressed themselves in a variety of ways, from problems of public areas, through needs that are currently unanswered, to their wishes for the future of the neighborhood.

During the days, the municipality staff, representatives of the Ministry of Construction and Housing and representatives of the Mirage Fund, which initiated and contributed to the existence of the social involvement process, also participated.



Fig 78. Mayor Nissan Ben Hamo lectures on the urban vision for Arad, 2018. Source: Irit Dror.



Fig 79. Sketch of Arad's core map, result of the Carharet workshop, 2018. Source: Irit Dror.

110. Dror, I. Arch. (2018). *Carhartt Arad - Renewal of the Old Neighborhoods and the Center Commercial Center*. Available at: <http://iritdror.co.il/gallery/%d7%a9%d7%90%d7%a8%d7%a8%d7%98-%d7%a2%d7%a8%d7%93/>



Fig 80. Plan view of the Patio Housing units in its context, taken by a drone, 2022. *Source: the author.*

3.5. The Patio Housing Units

General Data:

Located in the heart of Ye'elim Quarter, highlighted in red color on the neighborhood's map.

As a complex:

Total n. of Patio residential buildings: 14 units

Population: 308 nuclear families

Footprint: 13,795 square meters (7.5% out of Ye'elim ~103 km²)

Total steppable surfaces: 42,406 sqm in all units

Floors: 4 Floors in total, with 3 floors above ground level

Patio Unit - 1 Single building:

Each unit contains: 22 apartments

Footprint: 1085 sqm

Steppable surface: 3689 sqm in all 4 floors

Residential spaces: 2545 sqm

Balcony areas: 973 sqm (26% of all steppable surfaces)

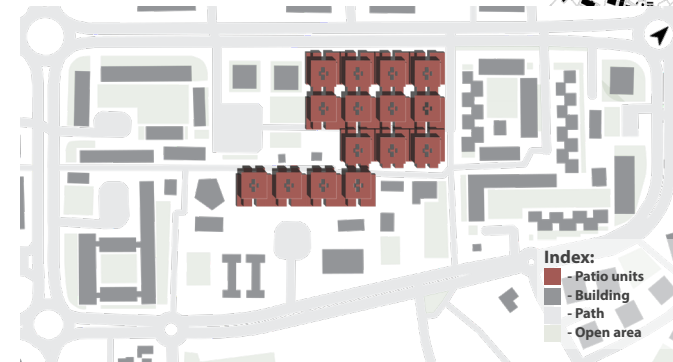


Fig 81. Patio units complex location in Ye'elim Quarter, out of scale. Source: the author.

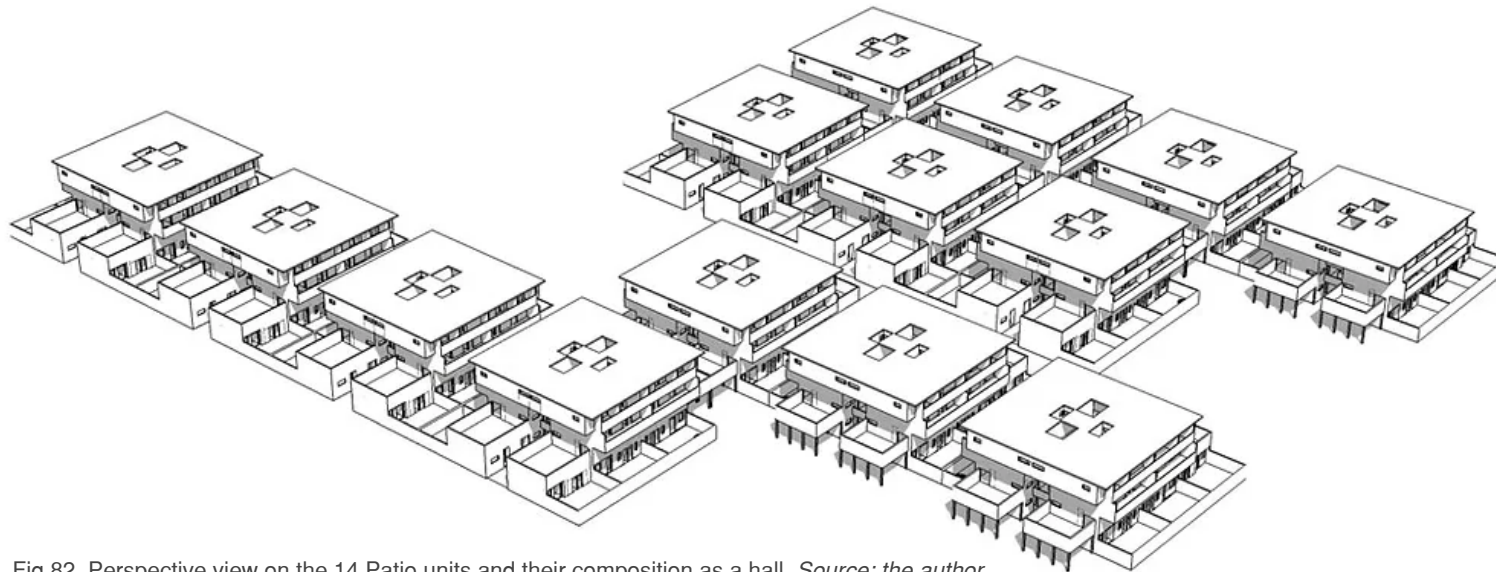


Fig 82. Perspective view on the 14 Patio units and their composition as a hall. Source: the author.

3.5. The Patio Housing Units

To deal with the desert climate, the Patio houses were developed in the first neighbourhood, the Ye'elim neighbourhood.

The apartment plans were designed in 1961 by Gerald Zappert¹¹¹, a South African architect who came to Israel for Zionist reasons and eventually returned to Johannesburg. However, it is entirely possible that the entire initial planning team was behind them, since the public spaces between the houses, inside and under them created the traffic system of the neighbourhood.

The Patio units were first called "Arad houses", and the head of Arad planners from 1962, Yona Pitelson, wrote the following about them:

"The residences offered as the first type of construction in Arad, a dense construction which nevertheless gives a maximum of privacy to each apartment.

*The open and public areas are limited, in their place, each apartment on the ground floor receives a private yard, surrounded by a relatively high fence, protects against the winds. These gardens, in different dimensions, develop on all floors, serve as covered passages and create shading for the floor below. Such systems of houses, adjacent to one another's courtyards, completely cover an area, yet allow shaded passageways areas, which give pedestrians contact in two perpendicular directions".*¹¹²



Fig 83. Perspective drawing of the Patio Units. Source: Batia Roded.



Fig 84. Photo of the Patio Housing Units, 2022. Source: the author.

The Patio as a recurring motif in the construction of housing units:

- **The staircases:** Unlike conventional four-story square houses that contain a closed staircase in the center, the patio houses were designed so that the staircase remains open to the ground and the sky. The space of the stairs thus fulfills a double role, beyond its technical side: it breaks through the mass of the patio houses, and takes part in the alley system in the neighborhood.

- **Large private courtyards:** Contrary to the design of normal residences, the patio houses are divided so that a large part of the house remains an open balcony, which can be closed in the future and allows the floor occupants to expand their apartment, as the family grows and improving its economic conditions.

The space created is open from both directions and is as wide as an alley, so that when the buildings join each other they define interior traffic path, allows passage through a sequence of patios. In this way, an indoor and shady 'street' for pedestrians is created within the neighborhood, as part of the pedestrian traffic system that characterizes the original planning of the city of Arad.

Nowadays, the area is visibly neglected as documented on the site inspection visit.

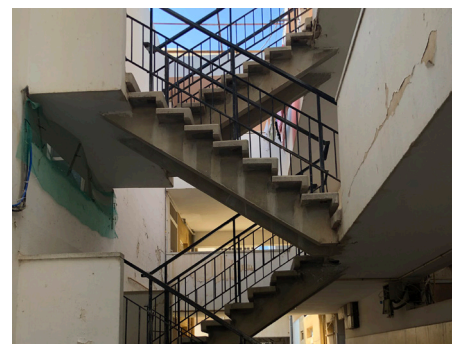


Fig 85. Open staircase inside the Patio Housing, 2022. Source: the author.



Fig 86. Large private garden at floor ground level. Source: the author.

111. Shadar, H. (2022). 24-26

112. Yacobson, M. (2017). *Not only trouble and dust: Students celebrate Arad's Architectural Qualities*. Available at: <https://xnet.ynet.co.il/articles/0,7340,L-5023692,00.html>



Fig 87. Bird view of the Patio Housing units, 2022. *Source: the author.*

4.1. Objectives of the design

4.1.1. Technical & Functional Redevelopment

Ye'elim total area is covering 102,925 sqm, out of which 20,090 sqm are occupied by the building's footprint, a 20% percent of the quarter floor area. Residential spaces counts 838 apartments, populating 2500 people, with a relatively low density factor of 24 residents for km².

For analysis of the existing situation, taking in consideration all of the research, the following points emerged:

- Poor level of maintenance and cleanliness of public spaces.
- Addition of water, sewage and electricity systems, in a way that endangers the public, running along the facades of the buildings, instead of in their proper and legal place.
- Construction of illegal building additions, mainly manifested in the construction of illegal warehouses and balconies.
- Insufficient open shops in commercial center of the quarter.
- Possibility of expansion and densification of new residential buildings in the neighborhood, assigned by the Ye'elim 2010 Densification Plan, under the T.M.A 38 laws, adding to the existing state which is 70,315 square meters, up to 50% more.
- It is not foreseen by the quarter Densification Plan of 2010 any additional dedicated spaces for public services, as the quarter is currently able to provide all the adapted facilities its residents, and moreover for a future expansion of 30% of new residents.

The changes to implement for the benefit of the residents are those that can be made directly without the need for approval of changes in the functional goal of areas in the district, which sometimes takes years.

- Restoring the neighborhood to a habitable area from a sanitary and hygienic point of view.
- Evaluation of all the systems that could pose a risk must be carried out, and they must be brought back to the proper standard.
- List of illegal structures and take action to get them removed from the area or regulated by law.
- Responding to the request to densify residential areas by planning the addition of new residential areas.
- Not planning new public buildings, but to focus on improving and renovating the existing ones in the neighborhood.



Fig 88. Low maintenance and dirty area inside the Patio, 2021.
Source: Shlomi Tabachnik.



Fig 89. General sense of insecurity and exposed electrical wires, Patio facade, 2022. Source: the author.



Fig 90. Abusive warehouse under the staircase a Patio unit, 2022.
Source: the author.



Fig 91. Construction of an illegal balcony, in the Patio units, 2022.
Source: the author.

Types of Building Functions - Ye'elim Quarter:



Fig 92. Mapping Ye'elim Quarter structures by different functionalities. *Source: elaborated by the author.*

4.1. Objectives of the design

4.1.2. Improvement & maintenance and of access

It can be said that in general the level of accessibility to the Ye'elim neighborhood is high. The neighborhood is connected with the rest of the city of Arad, by an orthogonal road system, which combines different types of paths.

Today, the Ye'elim neighborhood is surrounded by a main urban transportation route, which links it to the rest of the city's districts in a continuous and accessible manner, in addition to the fact that it is already situated in the city center itself.

The course of roads is divided into three different types, as can be seen in Figure AAA: city main transportation roads, secondary roads within neighborhoods and parking lots, and finally paths dedicated for pedestrians, with the most prominent of which is the central axis that crosses the Ye'elim quarter along its length and within the Patio units area.

After visiting the project site, the points that came up where the accessibility system for the neighborhood could be improved:

- Maintenance and renewal of the neighborhood roads and parking lots.
- Re-paving all the sidewalks and pedestrian paths, because in the current state most of the pavers are broken and crooked.
- Due to scarcity of streetlights during the hours of darkness and therefore also missing of a general sense of security. Suggesting the renovation of the lighting system, using low consumption lightening solutions.



Fig 93. View of the main transportation route that surrounds the quarter and confines with the Patio houses, 2022. *Source: the author.*



Fig 95. Main walking axis that crosses the Ye'elim quarter along its length, 2022. *Source: the author.*



Fig 95. View of the main walking axis, shaded spaces are created under the Patio housing complex, 2022. *Source: the author.*



Fig 96. Scarcity of streetlights during the hours of darkness, 2022. *Source: the author.*

Types of Roads - Ye'elim Quarter:

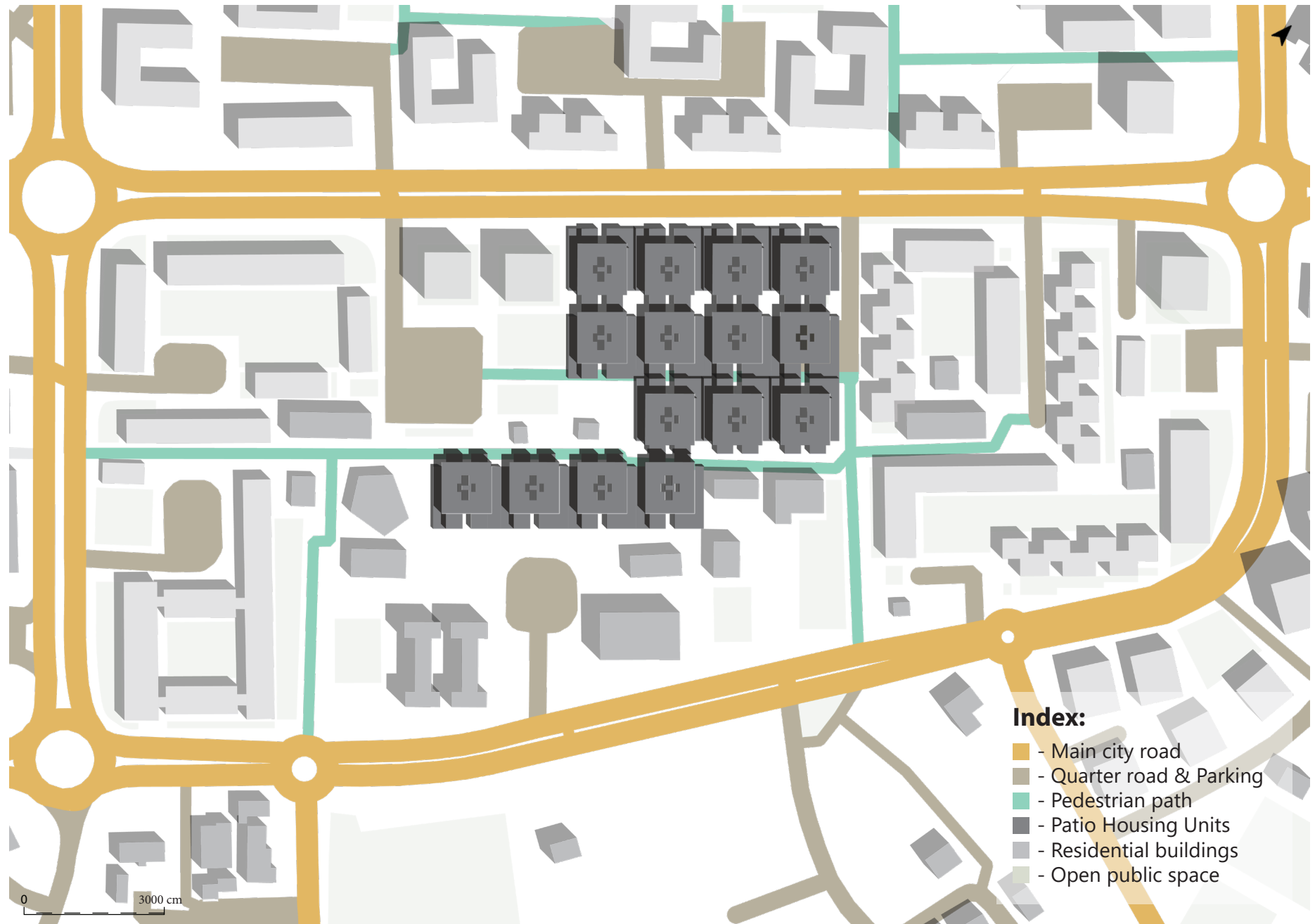


Fig 97. Subdivision of Ye'elim Quarter roads by type. Source: elaborated by the author.

4.1. Objectives of the design

4.1.3. Outdoor public spaces & Wellbeing of the residents

Although a large area of the Ye'elim neighborhood is dedicated to open public spaces, circa ~82,335 m² [8.2 Hectares] out of Ye'elim total area of around ~102,925 m² [10.3 Hectares], most of it is not properly maintained these days.

The existing public spaces in the neighborhood are mostly parks and public gardens combined with playgrounds.

After reviewing the areas, it can be said that sixty percent of open public spaces are not maintained at all today. they are found in a state of progressive neglect, instead of green gardens, there are sandy desert patches throughout the neighborhood.

About twenty percent of the public gardens are at a level of reasonable maintenance, in which there are playgrounds for children and meeting areas for residents.

The remaining 20 percent are very well maintained gardens, where the lawns are confusing and there are trees for natural shading of the plot.

Low level of maintenance and cleanliness of the public spaces is evident beyond the streets of the district, residents' waste, construction waste and a host of other hazards can be found.

The Ya'alim neighborhood is relatively shaded, thanks to the thought that went into planning the neighborhood, but it is evident that there are not enough benches in shaded areas, or in the neighborhood in general.

This creates an uninviting situation, in which the residents of the neighborhood and their guests cannot find a public space suitable for their needs.



Fig 98. Most well maintained garden in the Ye'elim quarter, surrounded by four buildings, to the left of the Patio units, 2022. *Source: the author.*

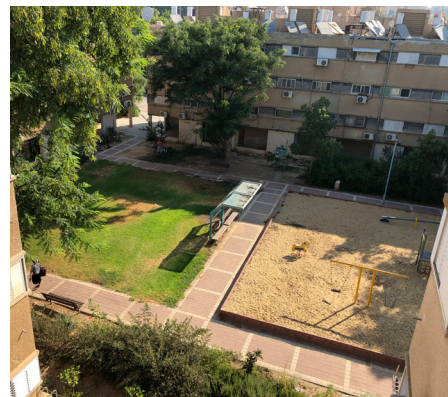


Fig 99. Semi-maintained garden in the center of the neighborhood, surrounded as well by residential buildings, 2022. *Source: the author.*



Fig 100. On the edge of the Patio houses, a neglected public garden, 2022. *Source: the author.*



Fig 101. Second largest garden in the neighborhood, in a state of advanced disrepair, 2022. *Source: the author.*

Quality of open Public Space - Ye'elim Quarter:

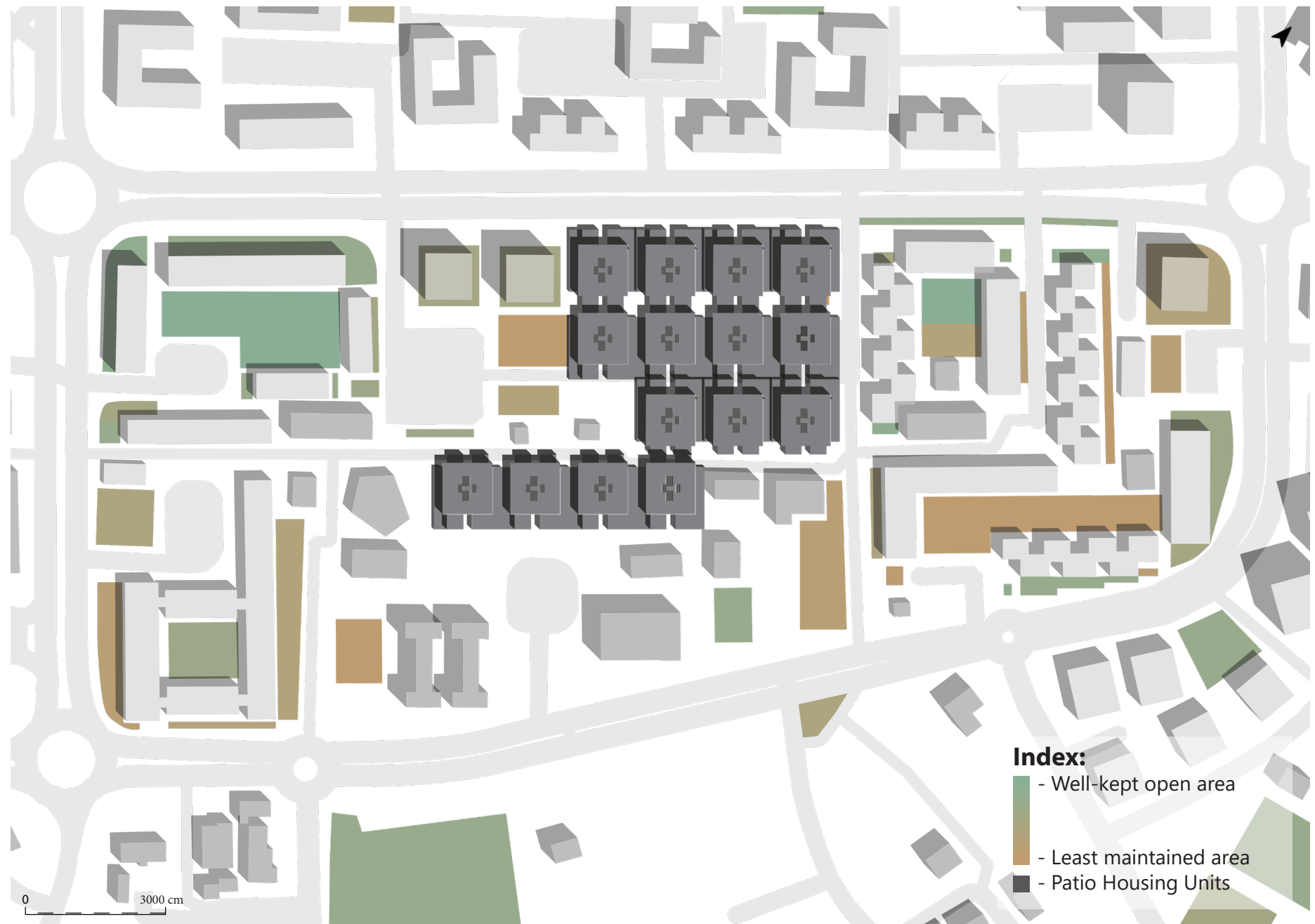


Fig 102. Mapping Ye'elim Quarter - Quality of open public spaces. Source: elaborated by the author.

4.2. Design strategies

4.2.1. Morphology of residential unit

Choosing the Patio residential units as the area where the project will be carried out was decided for several reasons.

First of these is that in the city of Arad a significant increase in the population of residents is expected in the next 10 years, hence the planning of urban densification under T.M.A Law 38, which allows densification of up to 50 percent more than the existing one in Ye'elim neighborhood.

The location of the quarter in the center of the city of Arad, as one of its core neighborhoods, gives it a clear advantage in the importance of urban densification compared to other neighborhoods.

Within Ye'elim neighborhood, the Patio Houses complex was chosen for the thickening of urban fabric, as the area for the project, because it has the most predominant character in the quarter. This area is rich in architectural virtues.

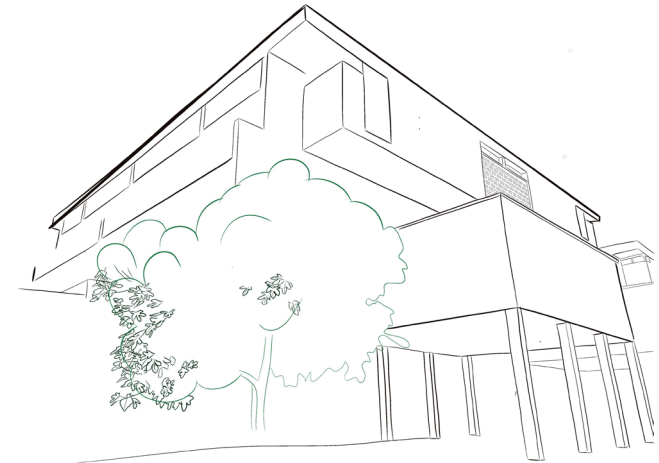


Fig 103. Street view drawing of Patio residential unit.
Source: elaborated by the author.

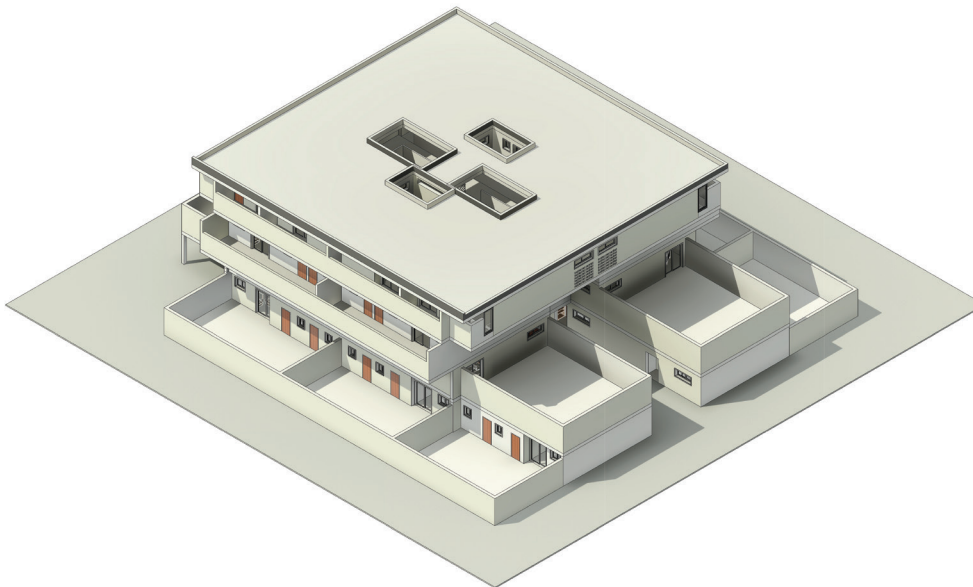


Fig 104. View of the Patio houses today, with numerous unapproved construction additions, 2022. Source: the author.

The patio units contain apartments of two to four rooms, designed to house a diverse space of types of nuclear families. These residential units rise to a height of three stories above the ground, and on each floor a large area of the apartment area is dedicated to the balcony (about twenty-six percent).

This design decision was taken with the first thought, in which the families living in these apartments will be able to expand their living space over the years, according to the growth of the family.

Patio Housing Unit - Isometric view as Original in 1964



Today, after 60 years since the construction of the complex, most of the apartments were expanded in an illegal way, which is not controlled under the planning and construction procedures. It creates a dangerous situation, in which the illegal construction additions were not designed properly and it is not known whether they can withstand the loads placed on them. In addition to this, uncontrolled closing of spaces leads to a situation where the original rooms of the apartments are unfit for living, due to a lack of ventilation and lighting.

Patio Housing Unit - Isometric view as Today 2022

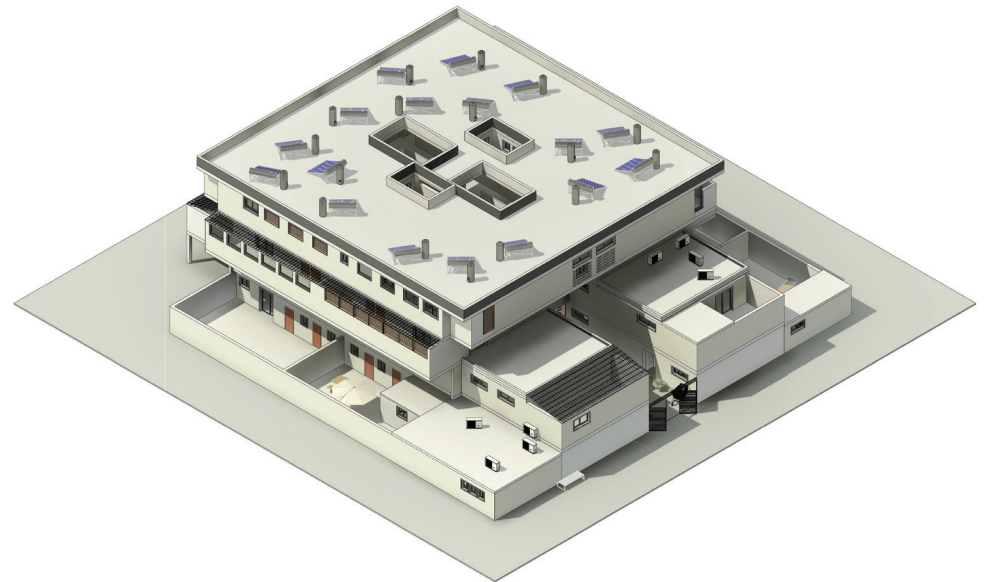


Fig 105. Axonometry of the original Patio residential unit, 1964. *Source: elaborated by the author.* Fig 106. Axonometry of the residential unit nowadays, 2022. *Source: elaborated by the author.*

4.2. Design strategies

4.2.1. Morphology of residential unit

To redesign the Patio unit, the original plans from 1964, were taken from the municipal archives, and had to be converted from manual drawing to digital drawing.

In order to perform this operation in the most efficient and accurate way, the original drawings were verified with direct measurements taken on the site, then digitalized to a BIM [Building Information Modeling] file in Revit Autodesk program.

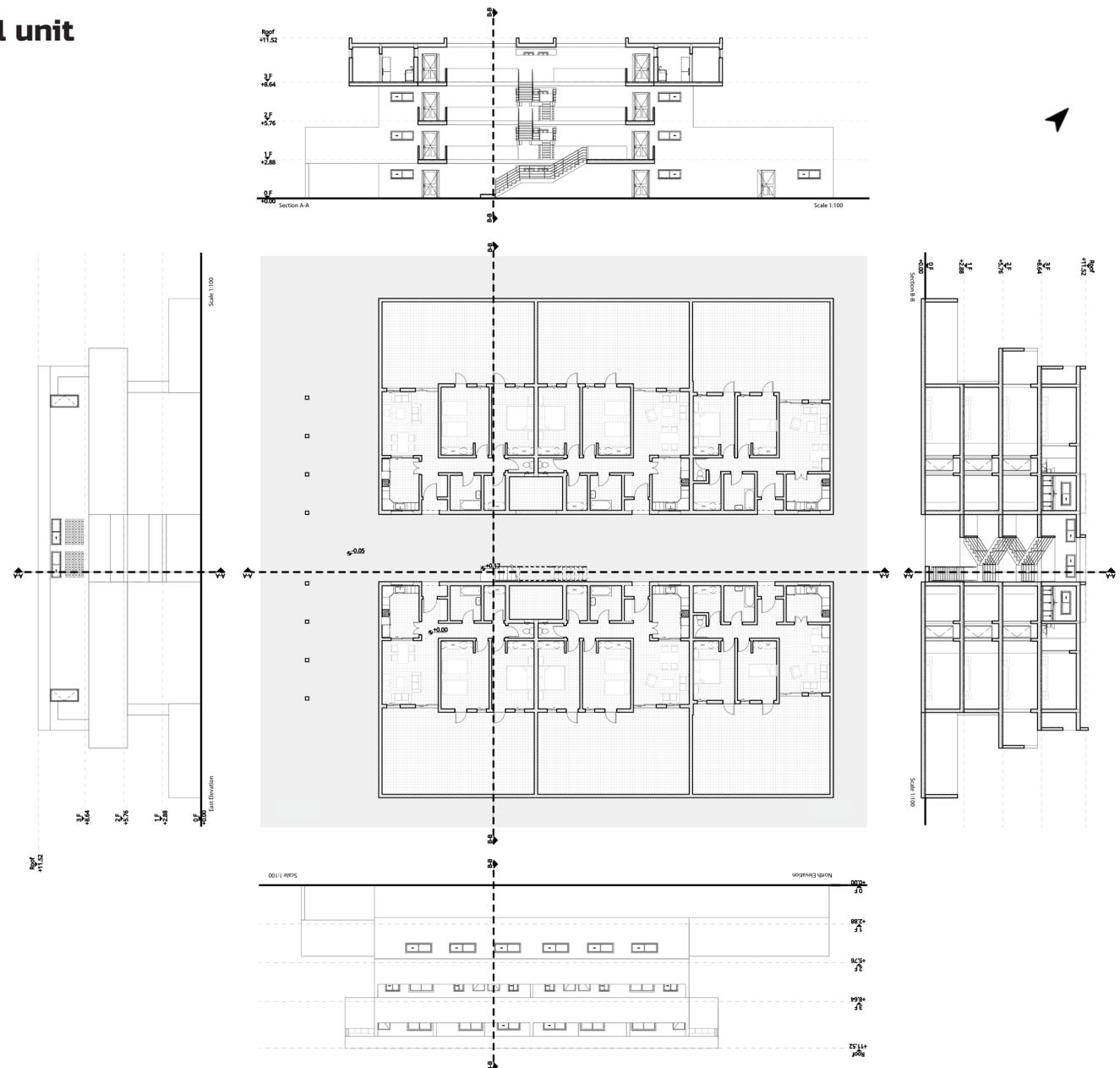


Fig 107. Original 1964 Patio unit, Ground Floor plan, two sections & two facades, Out of scale. *Source: elaborated by the author.*

1964 - First Floor Plan of Patio Unit

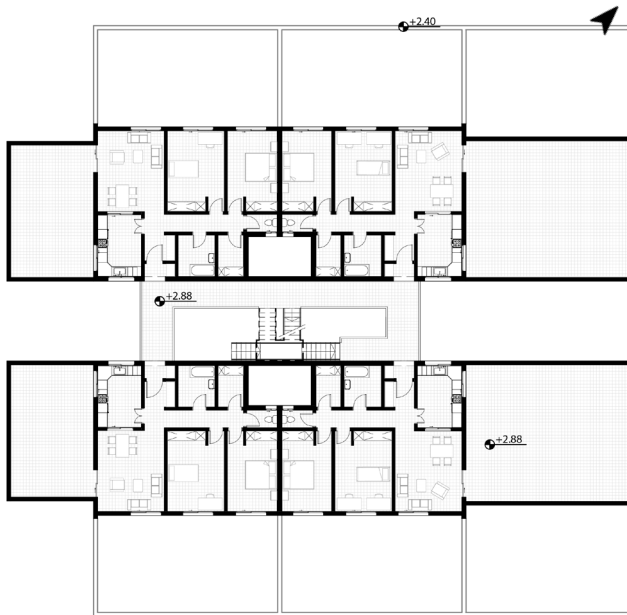


Fig 108. Original 1964 Patio unit, First Floor plan,
4 apartments of 3 bedrooms, Out of scale.
Source: elaborated by the author.

1964 - Second Floor Plan of Patio Unit

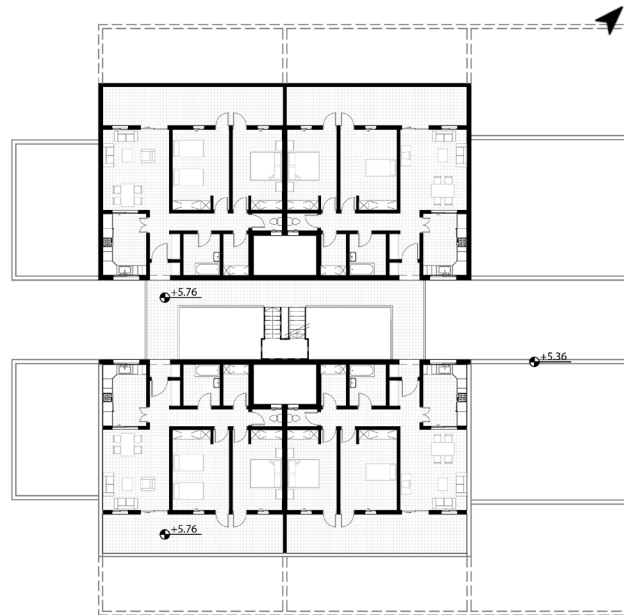


Fig 109. Original 1964 Patio unit, Second Floor plan,
4 apartments of 3 bedrooms, Out of scale.
Source: elaborated by the author.

1964 - Third Floor Plan of Patio Unit

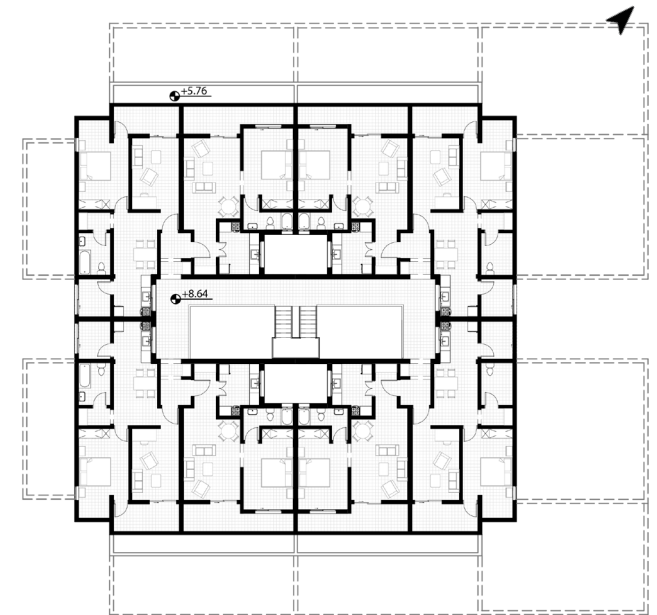


Fig 110. Original 1964 Patio unit, First Floor plan,
8 apartments of 2 bedrooms, Out of scale.
Source: elaborated by the author.

4.2. Design strategies

4.2.2. Spaces distribution inside the Patio Units

Actual State Analysis of the Ground Floor Plan as planned in 1964 in comparison to nowadays 2022, and with recommendations for restoration.

Drawing of Ground Floor
Patio Housing Unit 1964

Scale 1:200 cm

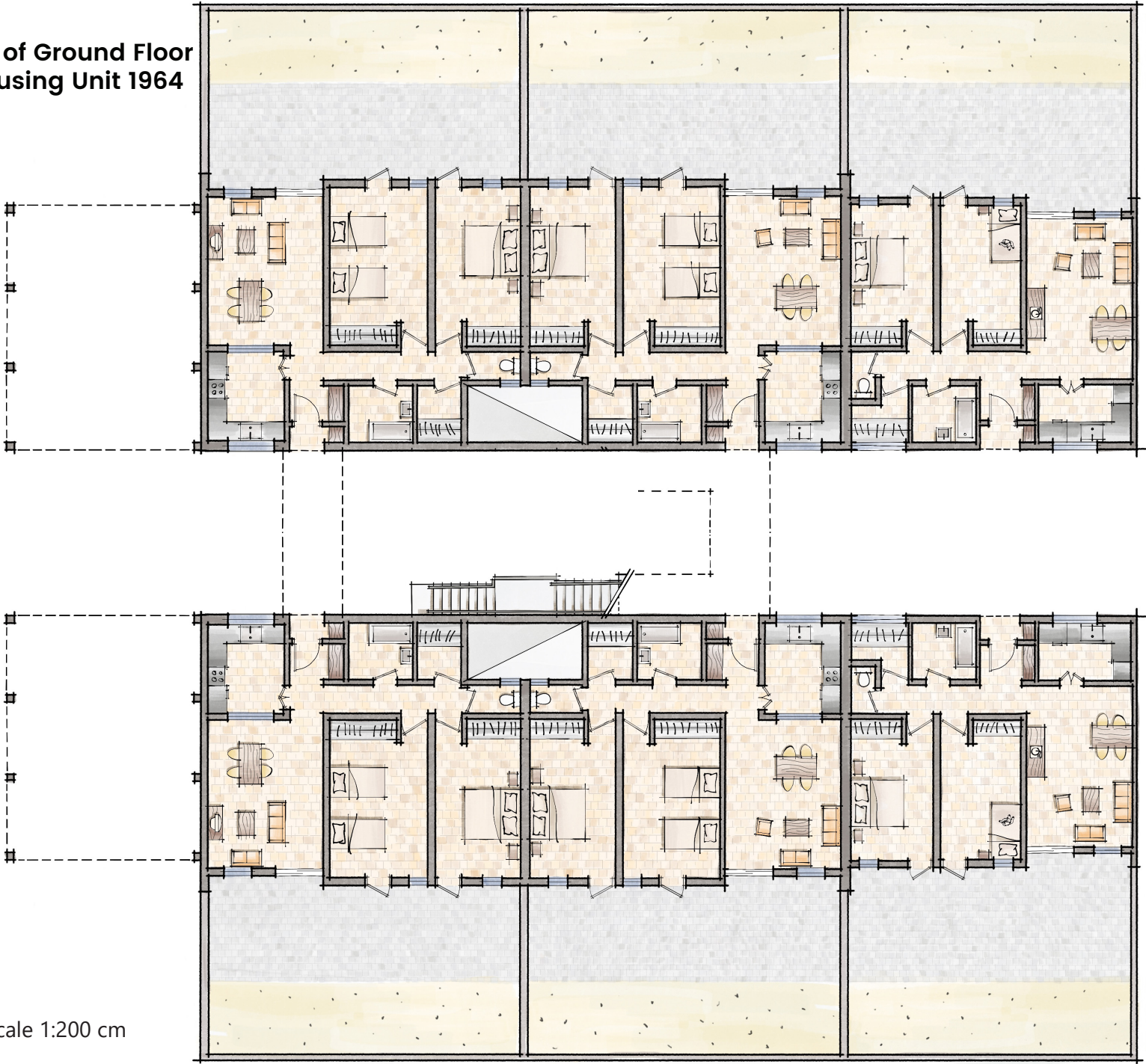


Fig 111. Patio residential unit Ground Floor plan in 2022, scale 1:200. Source: elaborated by the author.

Ground Floor Plan Patio Housing Unit 1964



Scale 1:200 cm

Fig 112. Original Patio residential unit Ground Floor plan in 1964, scale 1:200. Source: elaborated by the author.

Ground Floor Plan Patio Housing Unit 2020

Presence of residential environments without appropriate aeration and ventilation systems is evident. These problematic spaces are highlighted in red.



Fig 113. Problematic spaces in the ground floor plan of the patio unit, lack of natural lighting, ventilation and air exchange, are highlighted in red. scale 1:200. Source: Elaborated by the author.

Ground Floor Plan Patio Housing Unit Restored

Ripristination plan, which bring the distribution of the internal environments back to a normality state. Guaranteeing all the residentsal areas with the necessary conditions of hygiene and ventilation.



Fig 114. Restoration of Patio residential unit, Ground Floor plan of the project, spaces restored to a regulated conditions are highlighted in green.
scale 1:200. Source: elaborated by the author.

4.2. Design strategies

4.2.1. Superimposition of new residential adjunct

Existing Units

22 Apartments
Tot. Area: 3029m²
Built area: 2086m²
Balcony area: 943m²

Third Floor

8 Apartments
Tot. Area: 640m²
Built area: 530m²
Balcony area: 110m²

Second Floor

4 Apartments
Tot. Area: 560m²
Built area: 446m²
Balcony area: 114m²

First Floor

4 Apartments
Tot. Area: 744m²
Built area: 500m²
Balcony area: 244m²

Ground Floor

6 Apartments
Tot. Area: 1085m²
Built area: 610m²
Garden area: 475m²

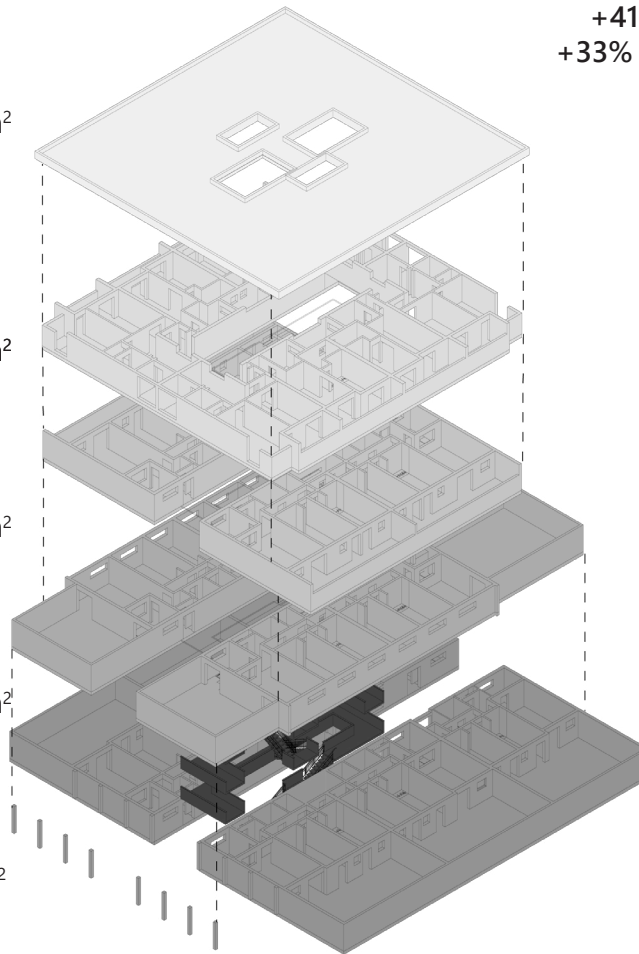


Fig 115. Exploded axonometric view of the existing Patio building, after reprintination and before the new junction.
Source: elaborated by the author.

Existing vs. New
+41% New Built area
+33% Total augmentation

New construction

12 Apartments
Tot. Area: 1050m²
Built area: 892m²
Balcony area: 158m²

Seventh Floor

4 Apartments
Tot. Area: 420m²
Built area: 372m²
Balcony area: 48m²

Sixth Floor

4 Apartments
Tot. Area: 364m²
Built area: 292m²
Balcony area: 72m²

Fifth Floor

4 Apartments
Tot. Area: 266m²
Built area: 228m²
Balcony area: 38m²

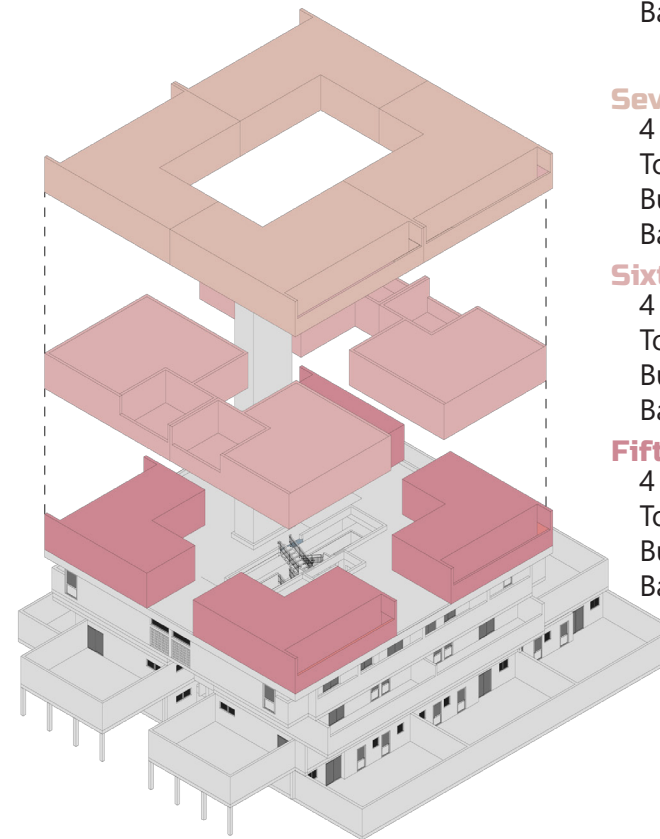


Fig 116. Exploded axonometric view of the Patio housing unit with the new floors added. Source: elaborated by the author.

The decision to develop the existing patio building upwards, while maintaining the existing design style, stems from several key reasons:

- The project aims to comply with the regulations and construction laws specific to this area. As explained earlier, in 2010¹¹³ the municipality of Arad planned an outline plan for the densification of the Ye'elim neighborhood, in which specific instructions were given for the design of the urban densification.
- First, the outline plan approves the augmentation of density of the Ye'elim quarter for up to 50 percent more than the existing situation. The proposal planning design offers about 40 percent of new construction in the Patio apartment complex, a significant percentage of condensation, without the usage of new land areas.

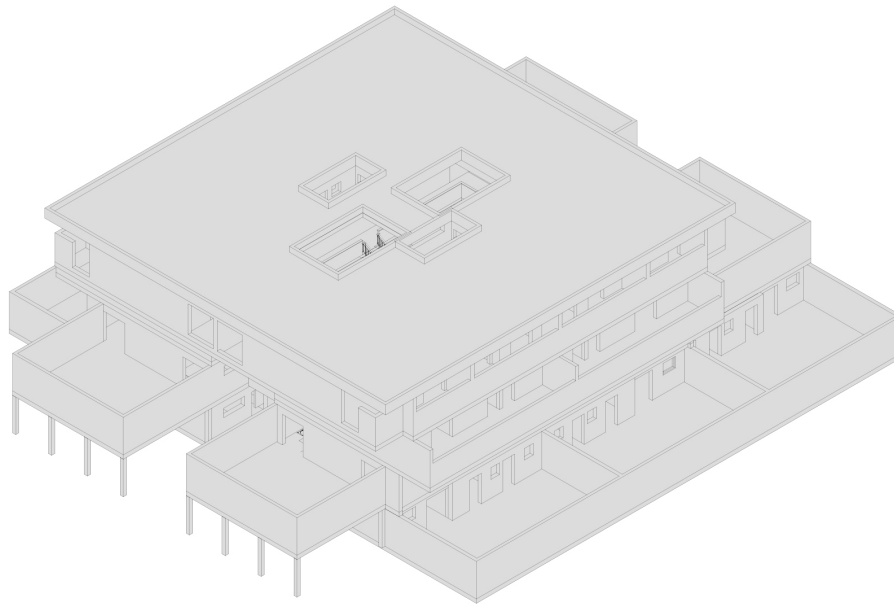


Fig 117. 3D view of the Patio building before the addition of the new construction.
Source: elaborated by the author.

- Among these guidelines, there is a regulation that emanates the buildings height for a maximum of 8 floors. The new residential adjunct proposed in this project is of three new floors, in addition to the four existing floors, for a total of 7 floors (6 above ground level).
- Another regulation refers to the visibility of the facades of the new construction and the continuity of the existing facades. The guideline is referring to the key proportions of the existing building, suggesting proper integration of the new additions with it. Under this regulation, the planner is asked to avoid the usage of materials with very different visibility on the existing facades, to exercise discretion in order to create a continuous line with the existing building.

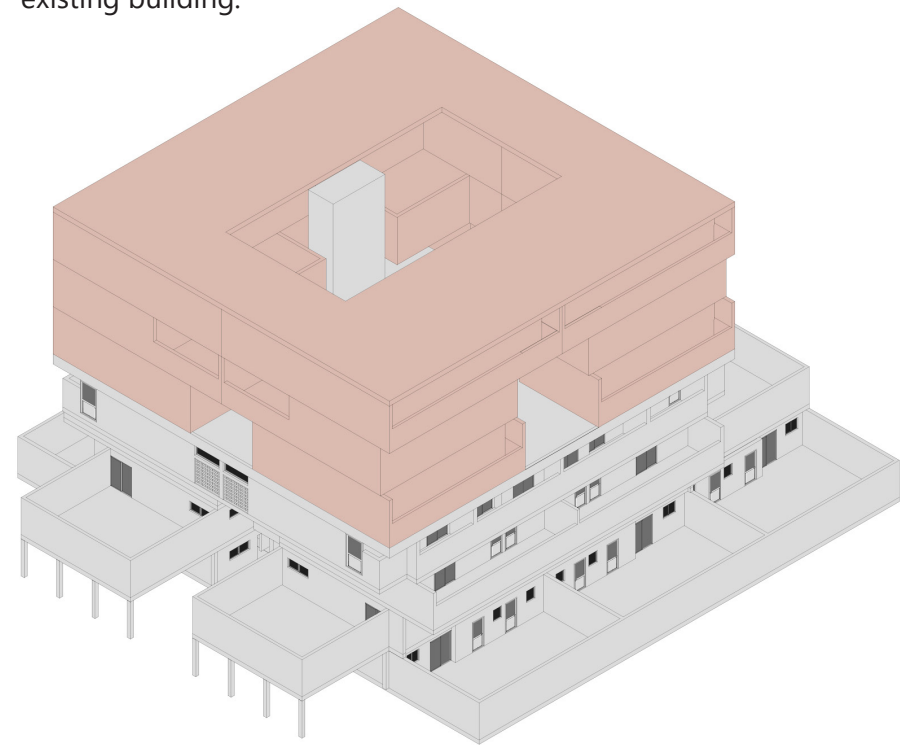


Fig 118. 3D view of the Patio building with the new construction addition placed on top of it.
Source: elaborated by the author.

113. Ministry of Construction and Housing. (2010). *Plan 5/127/03/24 Arad: Consolidation and division of plots in the Ye'elim Quarter*. Available at: <https://www.tabanow.co.il/%D7%AA%D7%91%D7%A2/%D7%A2%D7%A8%D7%93/5/127/03/24>

5.1. Benefits to the city of Arad from the project

5.1.1. Revitalizing core quarters

In a future, immediate and long-term view, paying attention to the neighborhood's location in the center of the city, can yield fruits in a variety of different fields.

First, the absolute proximity to public facilities and municipal buildings, all of which are within a 10 minute walking distance, where most of the walk is shaded, makes the Ye'elim neighborhood a sought-after residential location.

Due to the neglect in the current state of the neighborhood, from outdated residential buildings to unmaintained public spaces, the neighborhood is not welcoming and the city's residents are reluctant to live there.

The proposed project attempts to improve the visibility of the neighborhood while paying considerable attention to its current and future residents.

From analyzing the current state of the open public areas to improving them by adding benches, shaded meeting areas, children's play facilities, urban sports facilities, and proper lighting during the hours of darkness.

Examining the types of roads that exist in the area and platform for their maintenance, placing great emphasis on the central pedestrian axis that crosses the Ye'elim quarter along its length.

Improving living conditions in the neighborhood by extraordinary maintenance of all electricity, water, gas and sewer systems, returning them back to a safe state.

All those mentioned above point in the direction of urban renewal, aiming for the Yaalim neighborhood to be a safer and more welcoming place to live in.

In accordance with the population trend, predicting constant growth of estimated of at least 30 percent more citizens by 2030.¹¹⁴

To attract these citizens as new residents in the neighborhood, the project offers the addition of new residential buildings, which integrate into the existing urban fabric, and are woven over the existing Patio units, which are a hallmark of the city.

Above each one of the fourteen Patio buildings, three new residential floors will be added, each containing 4 residential apartments, offering living solutions in the form of apartments measuring 70, 90 and 110 square meters.

The new construction is adding 40 percent to the existing construction, a response to the Densification Plan¹¹⁵ for the Ye'elim neighborhood, which anticipates an urban density of up to 50 percent more than the existing state.

114. Brinkhoff, T. (2019). *Arad - city in Israel: Population Data*. Available at: https://www.citypopulation.de/en/israel/admin/hadarom/2560_arad/

115. Ministry of Construction and Housing. (2010). Available at: <https://www.tabanow.co.il/%D7%AA%D7%91%D7%A2/%D7%A2%D7%A8%D7%93/5/127/03/24>

5.1.2. Meeting with the Mayor of Arad

On October 25, 2022, I had the opportunity to meet the Mayor of Arad, Lawyer Nissan Ben Hamo,¹¹⁶ and we talked about a wide variety of topics in a short timing frame.

First, as befits the people of Arad, as residents of a city that has grown in number of residents (about 30,000 today), but is still perceived by the habitants as a small town where everyone knows everyone, the mayor asked me who my parents were, in order to know if he knew them, and indeed he did.

Later, I introduced myself and my actions, an architecture student doing the researching thesis in her hometown, Arad, while striving to reach a true and deep understanding of the current situation. I was interested in asking the mayor about the future plans for the Ye'elim neighborhood and in particular about the patio unit complex.

Nissan answered with surprising news, after more than 20 years in which the neighborhood was not renovated at all in a broad manner, only by localized interventions.

Recently the municipality of Arad raised 16 and a half million shekels (approximately 4 and a half million euros), for the benefit of improving the visibility of the Patio building complex.

Great news, it was hard to hide the wide smile that stretched across my face when I heard this exciting announcement. The mayor explained on the renovation plan for the Patio, saying that since the budget is relatively limited, the planning and preservation of the area will include only a partial response to the most urgent needs.

First, making an up-to-date, accurate assessment of the flaws in the area, from repairing safety hazards of infrastructure systems in the Patio area, to renovating the stairwells, restoring the facades of the buildings, and re-paving the complex.

Since the government budget that was raised is approved, the Engineering Department of the municipality is already working to assess the existing situation and plan the intervention.

I have every hope that the planning will indeed give birth to a new reality in the Ye'elim neighborhood and in particular in the Patio houses. I started the project a few months ago, it didn't seem likely to have hope for a renovation of the area, working on the project with the full belief that this area is full of hidden potential waiting to be realized. Glad to discover that the local urban reality matches my planning aspiration for the area.

116. Spokesperson department of the Arad Municipality. (2022). *Arad's city Mayor*. Arad, Israel.
Available at: <https://www.arad.muni.il/%D7%A8%D7%90%D7%A9-%D7%94%D7%A2%D7%99%D7%A8/>

5.2. Diagnosis of critical points

Looking ahead, it is important to note several aspects that deserve to be further explored and developed in more depth:

- Integration of the renovated Patio houses into the neighborhood landscape: although the new residential additions take into account the height index of the buildings in the neighborhood, it is appropriate to check the integration of the new construction addition into the existing urban fabric.
- In-depth study of the connection detail between the existing Patio houses and the new building addition proposed in the project, confirm the feasibility of the construction at all. The structural load support system of the existing building, which is built in reinforced concrete skeleton method, must be calculated, to make sure that the building can indeed carry the new loads that will be added to it. After understanding the situation today, it is possible to propose, if necessary, strengthening and hardening of the existing structure, whether with the help of a hidden skeleton system or a exoskeleton system that surrounds the building.
- Distributive systems within the buildings: must be verified that the planning does allow continuity of distribution system of the spaces. The patio houses are endowed with an extraordinary connectivity system in the communal spaces, which allows maximum utilization of these spaces. It is fundamental to allow the continuity of the existing set of stairs, and the addition of two elevators in the ventilation shafts that exist today, to make all floors of the building accessible to all users.
- Detailed planning of the new public spaces that are allocated on the building's fourth floor, on the former rooftop of the Patio unit.

5.3. Outcome of the work

Urban and architectural planning always takes part under laws, regulations and arrangements from higher hierarchy, from municipal planning plan and mandates to governmental law and orders. In order to plan a practical project, one must first thoroughly learn what planning tools are available to the planner in the area where the project is located.

These are data that require a certain skill to locate and are usually not easily accessible.

After an in-depth examination of the laws for planning in the Patio area, I found out that there are indeed clear instructions for how to plan in the Ye'elim neighborhood, from areas designated for construction, the percentage of the construction addition, through infrastructure systems, to the level of finishing materials of the facades.

Second, since the area in which the project takes part is an existing veteran urban area, an in-depth study of the residents of the neighborhood is required, who they are, what are their current and future needs.

Such a study allows greater sensitivity in the planning of the project, understanding that the population layers of the quarter are many and different from each other.

The project tries to respond to the regulator's requirements, combined with the needs of the existing and future residents of the neighborhood.

The revitalization of the neighborhood, which includes the expansion of the living areas, above the existing Patio units, alongside to the planning of the open spaces, roads and buildings with giving great attention to the quality of the spaces purposed.

Another important aspect was to be able to collect, document and make accessible the information related to the city of Arad. As of today, there is great difficulty in searching and finding relevant materials about the city, both in the local language and in the English language.

Although the existing database is large, it is not concentrated in one place where information can be accessed and retrieved.

During the research work, I gathered and documented every piece of information related to the city of Arad, and in specific of the Ye'elim quarter and the Patio houses.

From magazine articles from the founding of the city in 1960, to posts on social networks where residents usually feel more comfortable expressing their wishes.

Collecting and creating an orderly list at the end of this elaborate, translated into English in order to ensure a greater exposure of readers.

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