INCLUSIVITY PARADOX

SHAI SHENTAL ATOON

TECHNION
Israel Institute
of Technology

Shai Shental Atoon

INCLUSIVITY PARADOX

Final Project

Technology Studio

Instructors | Prof. Arch. Etan Kimmel, Arch. David Robins

Research Seminar

Instructors | Arch. Hadar Porat

Architecture and Town Planning Program

Faculty of Architecture and Town Planning, Technion

2025

TECHNION
Israel Institute
of Technology

Faculty of
Architecture and Town Planning

Contents

Inclusivity Paradox

“Inclusivity Paradox” redefines the boulevard principles as a therapeutic urban spine as an inclusive, sensory-aware, and emotionally responsive environment designed through the lens of neuro-urbanism. It begins with the understanding that there is no truly “normative” population, and cities must embrace physical, and sensory diversity.

Using post-traumatic individuals as a reference group, the project explores how environments that soothe heightened sensitivity can improve well-being for all, positioning architecture as an active participant in emotional resilience and recovery.

Through the integration of neuro-architectural principles, the design translates emotional and sensory needs into spatial strategies: layered public-to-private gradients, opportunities for retreat and choice, and rhythmic green connections. The boulevard becomes a continuous pedestrian network providing safety, calm, and community interactions. These elements form an urban code for emotional resilience as a toolkit for future inclusive cities.

Complementing this is a system of affordable housing clusters, modular, flexible, and community-oriented, organized around shared gardens and public courtyards that soften urban density and foster social cohesion. Together, these interventions transform the city into a living urban laboratory of inclusion, where trauma, memory, nature, and city coexist in a continuous framework of choice, safety, and belonging.

The Normative Paradox

We think we are planning for the majority of the population, which is the “normative” part, but the population includes many minority groups. Does a “normative” population even exist? Our population consists of many groups, including individuals who are visually or hearing impaired, using crutches, wheelchairs, or canes, as well as pregnant individuals, people of different ages and heights, and more (Figure 1). To avoid doubt, we mainly plan for another group, often referred to as the “Normative Society”. However, this society is the minority.[1]

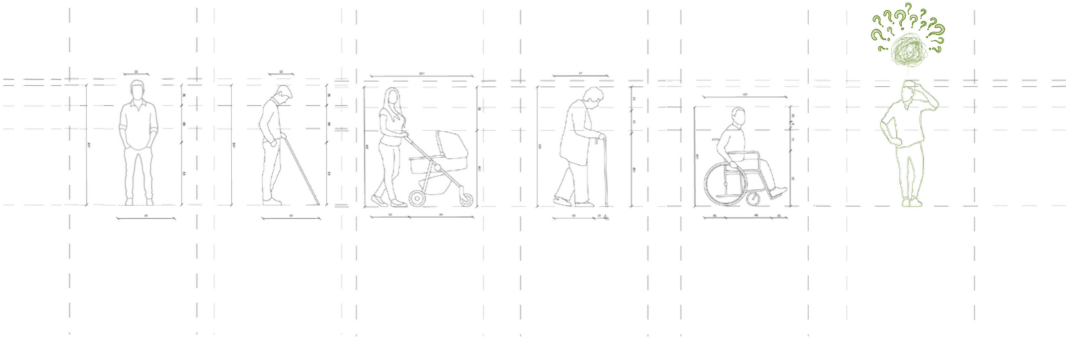


Figure 1. Population Groups Catalog

We all experience the world through a unique lens, but people with PTSD interact differently with their surroundings through heightened senses. Our spaces shape how we live, move, and feel, and designing spaces is not just about functionality, but also ensures everyone, including those who experience the world differently, feels considered and supported.

1 TEDx Talks. “How Architecture Can Create Dignity for All | John Cary | TEDxSanFrancisco.” YouTube video, 14:58. October 23, 2017. https://www.youtube.com/watch?v=0H-6iIyQ9Bs

Our cities can be more inclusive, responsive, and supportive for all, benefiting individuals with PTSD and the broader community by challenging conventional architecture and emphasizing sensory aware design.

The problem begins with the environment that does not understand the effect that urban overstimulation has on PTSD, through overstimulation of their more sensitive senses, which creates many difficulties in participating and being a part of the urban environment. Overstimulation triggers traumatic memories and causes discomfort and even fear, which in extreme situations can cloud all senses and create alienation and disorientation.[2]

The overall incidence of mental conditions is around 25%, which indicates that one in every four individuals will require mental health treatment at some point in their lives. The Globe Health Organization has recognized mental disorders as one of the top 10 causes of disability as early as 1996.[3]

PTSD is a mental condition that can result from natural catastrophes, physical traumas, the death of a loved one, or war duty.[4] This issue is especially significant in Israel, considering the geopolitical

2 Clancy, Kevin J., et al. "Intrinsic Sensory Disinhibition Contributes to Intrusive Re-Experiencing in Combat Veterans." Scientific Reports 10, no. 936 (2020).

3 Geller-Nitzan, Netta. "The Cry of Psychiatric Patients in Light of the Petition on Minimum Living Space." Tel Aviv University Law Review, 2022. Accessed February 24, 2025. (In Hebrew). https://www.taulawreview.sites.tau.ac.il/post/gellernitzan

4 Yuen, Belinda, and Leonora Y. C. Chan, eds. The Inclusive City: Urban Planning for Diversity and Social Cohesion. Chapter 18. Springer. https://link.springer.com/chapter/10.5822/978-1-61091-756-8_27

circumstances, frequent exposure to traumatic events, and high prevalence of PTSD among its citizens.

The designed environment may trigger symptoms and create triggers that make it difficult to cope by overstimulating the senses through noise, crowded environments, and lack of privacy, which actually cause flashbacks and thus disorientation, social distancing, and alienation (Figure 2). Therefore, PTSD constitutes a significant reference group in that their senses are more sensitive and heightened, and thus more affected by the environment. This means that if we can appeal to heightened senses, we can design spaces that benefit all population groups, thereby creating a new branch of inclusive cities.

OVERSTIMULATION

FLASHBACKS

DISORIENTATION

ALIENATION

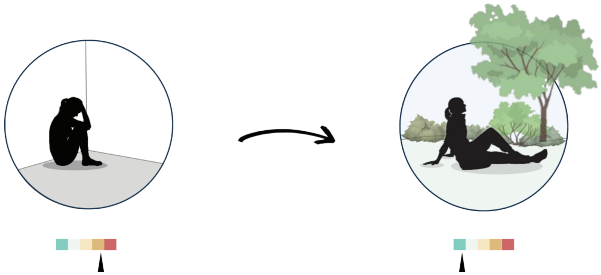
Figure 2. Environmental Urban Triggers and PTSD Symptoms

The designed environment may trigger symptoms and create triggers that make it difficult to cope by overstimulating the senses through noise, crowded environments, and lack of privacy, which actually cause flashbacks and thus disorientation, social distancing, and alienation. Therefore, PTSD constitutes a significant reference group in that their senses are more sensitive and heightened, and thus more affected by the environment. This means that if we can appeal to heightened senses, we can design spaces that benefit all population groups, thereby creating a new branch of inclusive cities.

The ongoing misalignment between urban environments, architectural design, and the sensory and psychological realities of individuals with PTSD underscores a deeper societal issue, both globally and in Israel.

This issue led to this project's research question –

HOW CAN WE CREATE SPATIAL ALTERNATIVES
THAT PROMOTE DAILY WELL-BEING
AND PROVIDE A RETREAT FOR COMMUNITIES WITH PTSD?



In recent years, our cities have been defined of main avenues that, instead of addressing the urban scale, have been replaced by massive, multi-lane, endless highways. The result of urban planning for cars is, of course, more cars and traffic jams, and if we plan for people and the creation of places, that is precisely what we will get (Figure 3).[5]

In the modern boulevards, with their many lanes and tall towers, we forget about street level and human scale. We leave our apartment in our building, go down to the parking lot, drive to the office parking lot and head straight for it. There is no street, no encounters and interactions with the urban environment, and the community disintegrates (Figure 4).

Instead of repetitive towers that emphasize human movement only uphill, this project offers an urban alternative with a changing form that encourages walkability and returns people to the street (Figure 5).

5 Kent, Fred, and Project for Public Spaces. “Transportation as Place.” Project for Public Spaces. https://www.pps.org/article/transportationasplace







"IF YOU PLAN CITIES
FOR CARS AND TRAFFIC,
YOU GET CARS AND TRAFFIC.
IF YOU PLAN FOR PEOPLE AND PLACES,
YOU GET PEOPLE AND PLACES."

Fred Kent, Project for Public Spaces








Figure 3: Planning for Cars

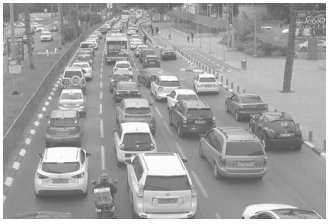



Figure 4. Modern City Section Concept

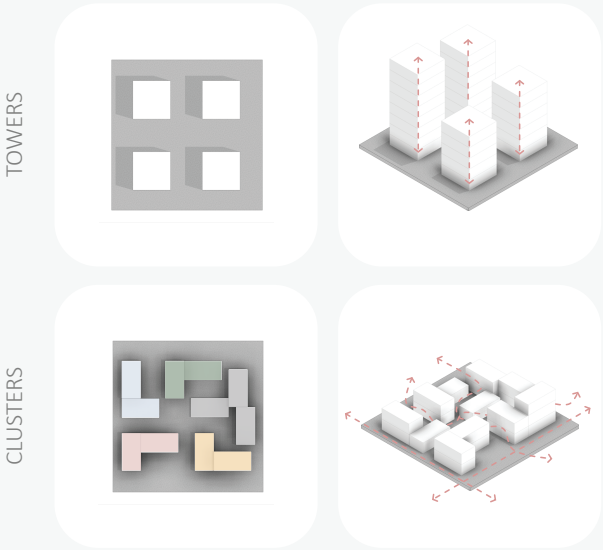


Figure 5. Alternative Urbanism

The Inclusive City

In recent years, cities worldwide have been developing new planning policies to ensure that future cities provide everyone with equal opportunities.

The concept of the "Inclusive City" is defined as an urban model that ensures equitable access, participation, and spatial justice within the built environment. According to Robin Hambleton, an inclusive city is governed by place-based democratic institutions that enable all citizens to participate fully in society. Inclusive city principles redefine urban planning, emphasizing "just results while caring for the natural environment."[6] This approach reframes the city as an active catalyst for well-being and dignity, requiring architects to design environments that support diverse users and address structural inequalities through accessible public space, integrated mobility, mixed-use development, and democratic processes.

Global inclusive city projects demonstrate that specialized designs can actively reduce stress and support emotional regulation, core principles of trauma-informed urbanism. Paris's redesign of the Champs-Élysées demonstrates how reducing traffic pressure and reconnecting fragmented green spaces create calmer, more

6 Hambleton, Robin. Leading the Inclusive City: Place-Based Innovation for a Bounded Planet. Bristol: Policy Press, 2015. https://www.researchgate.net/publication/270569059_Leading_the_Inclusive_City_Place-Based_Innovation_for_a_Bounded_Planet

predictable environments for overstimulated users.[7] Copenhagen's pedestrianization strategy similarly shows that reallocating space from cars to walking and cycling produces slower, safer urban rhythms that reduce anxiety.[8] Another example is Oslo's small-scale waterfront improvements, which show how simple additions, such as increased seating and inclusive amenities, can significantly enhance comfort and trust in public spaces.[9]

The concept of the "Inclusive City" represents a paradigm shift in urban planning, one that acknowledges the heterogeneity of urban populations and the need to design environments that respond to diverse physical and psychological needs. Landmark legislation such as the Americans with Disabilities Act (ADA), founded in 1990, institutionalized this shift by framing accessibility as a civil right and mandating universal design principles in the built environment. The ADA's legacy demonstrates how policy and design can transform exclusion into participation, embedding equity into the physical fabric of cities.[10]

---

7 APUR. Two Major Green Spaces in Paris: The Champ de Mars and the Champs-Élysées – A Prospective Analysis. (In French). https://www.apur.org/fr/climat-environnement/nature/grands-espaces-verts-parisiens-champ-mars-champs-elysees-diagnostic-0

8 Hambleton, Robin. Leading the Inclusive City: Place-Based Innovation for a Bounded Planet. Bristol: Policy Press, 2015. https://www.researchgate.net/publication/270569059_Leading_the_Inclusive_City_Place-Based_Innovation_for_a_Bounded_Planet

9 Yuen, Belinda, and Leonora Y. C. Chan, eds. The Inclusive City: Urban Planning for Diversity and Social Cohesion. Chapter 18. Springer. https://link.springer.com/chapter/10.5822/978-1-61091-756-8_27.

10 Scotch, Richard K. From Good Will to Civil Rights: Transforming Federal Disability Policy. Philadelphia: Temple University Press, 2001.

Architects must realize the significant impact of accessible design on everyone, not just individuals with impairments. We may all relate to someone who has a handicap or a momentary impairment. Architects who focus on how access can make the built world more equal and meaningful, rather than viewing it as a regulatory burden, can emphasize the societal purpose accessible architecture can help achieve.[11]

Progress toward inclusive cities has transformed urban planning, embedding accessibility as a fundamental principle. However, physical disability is just one of the many disabilities that exist in our society. To this day, no genuine attempt has been made to think about urban and street planning through the needs of people dealing with mental and emotional disabilities, such as PTSD.

This project extends the discourse of inclusivity beyond the physical realm towards emotional and psychological accessibility. By reimagining the boulevard as a therapeutic urban spine, the project proposes a new planning code, grounded in neuro-architectural and trauma-informed principles, positioning emotional wellbeing as an integral dimension of inclusive urbanism.

11 Crosbie, Michael J. “Why Do Architects Still Struggle with Disability Requirements?” ArchDaily, January 8, 2019. Accessed December 16, 2024. https://www.archdaily.com/909025/why-are-architects-still-struggling-with-disability-requirements

Urban Senses and PTSD

Urbanism and architecture may trigger symptoms and make coping with trauma more difficult. Noise, crowded places, a lack of privacy, and a lack of emotional support can worsen the situation.[12] It is critical to recognize that the environment has a vital part in coping with PTSD. Thus, architecture and urbanism may be both a problem and a solution.

Urban environments can be overwhelming for individuals with PTSD, which is characterized by increased sensory and emotional responses.[13] Excessive noise, visual clutter, and crowd density trigger distress. The constant exposure to alarms, heavy traffic, and dense crowds can lead to heightened anxiety, disorientation, and avoidance of public spaces. Understanding these triggers is essential in designing supportive urban environments. These components can elicit intense psychological responses such as dread, confusion, and alienation, further preventing people with PTSD from fully engaging in urban life.[14]

---

12 Mueller-Pfeiffer, Christian, Miriam Schick, Thomas Schulte-Vels, Roger L. O'Gorman, Lars Michels, Christine Martin-Soelch, James Blair, Markus Rufer, Ulrich Schnyder, Timothy A. Zeffiro, and Gregor Hasler. "Atypical Visual Processing in Post-Traumatic Stress Disorder." NeuroImage: Clinical (2013). https://doi.org/10.1016/j.nicl.2013.08.009

13 Kimball, J. G., et al. "Sensory Modulation Challenges: One Missing Piece in the Puzzle of PTSD." American Journal of Occupational Therapy (2023). https://www.tandfonline.com/doi/full/10.1080/0164212X.2022.2131695

14 El Helou, Maria A. "Towards a Post-Traumatic Urban Design That Heals Cities' Inhabitants Suffering From PTSD." Journal of Contemporary Urban Affairs 4, no. 1 (2020): 79–90. https://ijcua.com/index.php/ijcua/article/view/176

Juhani Pallasmaa, in Architecture of the Seven Senses (1994), emphasizes the sensory and psychological connection between the human body and the built environment, highlighting architecture's critical role in shaping human experience. He claims that architecture engages our senses and other sensory perceptions to inform our understanding of space. Overstimulation disrupts the balance, leading to sensory deficits and disorientation. For individuals with PTSD, such disruptions are magnified, turning the built environment into a source of distress rather than comfort or refuge.[15]

The prevalence of PTSD has surged in Israel due to ongoing geopolitical conflicts and security threats. Since October 7th, data indicate a near doubling of PTSD cases, alongside increased rates of depression and anxiety.[16] This reality underscores the urgent need to consider PTSD-sensitive urban planning that accommodates the unique mental health challenges faced by Israeli residents.

Urban spaces play a crucial role in either exacerbating or alleviating PTSD symptoms. Research shows that environmental factors such as noise and spatial density can worsen hyperarousal and trigger traumatic responses in daily life.[17] Conversely, evidence shows that green and quiet areas, access to natural light, and well-designed

15 Juhani, Pallasmaa. Architecture of the Seven Senses. 1994, 40–49.

16 Israeli Ministry of Health. Mental Health Report 2023: PTSD Trends Following National Trauma Events. Tel Aviv: Ministry of Health, 2023.

17 Bayer, Y. M. "Sound of Sirens, Echoes of Trauma: Socioeconomic Determinants Correlated with PTSD Symptoms During the May 2021 Hamas-Israel Conflict." Journal of Risk, Hazards & Crisis in Public Policy (2024). https://www.tandfonline.com/doi/full/10.1080/13537121.2024.2342136

public spaces integrated with nature can mitigate symptoms and support emotional recovery.[18]

Israeli cities, including Tel Aviv, Jerusalem, and Sderot, provide distinct case studies of how urban space interacts with trauma. In Sderot, for example, the prevalence of bomb shelters integrated into playgrounds reflects a necessary yet psychologically complex relationship between everyday life and security infrastructure. The emphasis on rapid access to shelters is vital, but the challenge remains in balancing security with a sense of normalcy.

As Israel continues to grapple with increasing cases of PTSD, urban planners must prioritize trauma-sensitive design strategies. This includes incorporating green corridors, reducing excessive stimuli in high-traffic zones, and designing public spaces that promote psychological resilience. By embedding mental health considerations into urban planning policies, cities can evolve into spaces that not only accommodate trauma survivors but actively contribute to their healing.

Despite the high prevalence of PTSD in Israel, there is a lack of awareness about how urban spaces and architectural design impact mental health. Public and private spaces are often designed without considering the unique sensory and psychological needs of vulnerable populations. This oversight perpetuates environments that prioritize functionality and efficiency over inclusivity and well-

18 Webb, Elizabeth K., et al. "Neighborhood Resources Associated with Psychological Resilience and PTSD." International Journal of Environmental Research and Public Health 21, no. 5 (2024). https://jamanetwork.com/journals/jamapsychiatry/fullarticle/2821946

being.[19]

The PTSD social group is not the target user for this project, but the reference group. Their vulnerability and heightened senses can serve as a reference point to create a set of planning guidelines that reach the collective and aim for an inclusive city with well-being opportunities within a redesigned urbanism.

19 McCay, Layla, Ingrid Bremer, Tarik Endale, Marjia Jannati, and Jihyun Yi. "Urban Design and Mental Health." In Mental Health and Illness in the City, edited by P. Munk-Jørgensen et al. Singapore: Springer Nature, 2019. https://www.researchgate.net/publication/315864757_Urban_Design_and_Mental_Health

Urban Healing

Trauma is not just an individual experience. It can affect entire communities, and the collective impact can profoundly influence emotional well-being, social cohesion, and safety. Community trauma weakens social connections, fosters isolation, and disrupts the sense of belonging, making it a shared rather than personal experience.

Cities must adopt a trauma-informed approach, prioritizing safe, supportive environments that promote social well-being and community resilience. While physical environments influence social interactions and how they are experienced, certain design elements, such as dark pathways or narrow sidewalks next to high traffic roads, can heighten anxiety and trigger distress. In contrast, open layouts, clear sightlines, and uncluttered spaces can help foster a more comforting and inclusive urban experience.[20]

Research on the relationship between mental health and urban design remains limited, particularly in addressing PTSD. While anecdotal evidence suggests that certain architectural elements impact well-being, comprehensive, evidence-based guidelines for PTSD-sensitive design are absent. Still, research has shown that green spaces may buffer such effects and are associated with

20 “Pathway to Becoming a Trauma-Informed City, The.” Social Connectedness. https://www.socialconnectednes.org/the-pathway-to-becoming-a-trauma-informed-city/

reducing depression, anxiety, and stress.[21]

People living with PTSD need contact with nature to reduce mental stress and increase their sense of security. Many urban environments lack natural elements or green spaces that provide peace and calm. The disconnection from nature prevents the possibility of venturing out and relaxing, making improving mental health complex.

Traditional urban development often focuses solely on physical infrastructure. Integrating trauma-informed principles into cities can minimize psychological impact, strengthen the social fabric, and help people reach a more resilient state of mind.[22]

Many people with PTSD experience constant vigilance, leading to insecurity and discomfort, which can be worsened by overstimulating urban environments. As a result, they may avoid public spaces, reinforcing isolation. Neighborhoods, especially those from the mid-20th century, often lack infrastructure and social cohesion, heightening fear and alienation. Additionally, triggering architecture, such as dark spaces, long hallways, and enclosed areas without clear exits, can evoke trauma and a loss of control. Safe, quiet, and well-designed urban spaces are essential

21 "Calm in Chaos: Creating Refuge Spaces in the Theme Park Setting for People with Autism Spectrum Disorder and Post-Traumatic Stress Disorder." Herald Open Access. https://www.heraldopenaccess.us/openaccess/calm-in-chaos-creating-refuge-spaces-in-the-theme-park-setting-for-people-with-autism-spectrum-disorder-and-post-traumatic-stress-disorder/

22 "Investigating Architectural and Space Design Considerations for Post-Traumatic Stress Disorder (PTSD) Patients." Proceedings of the Human Factors and Ergonomics Society Annual Meeting (2018). https://doi.org/10.1177/1541931218621390

for fostering security and recovery.[23]

Neuro-Urbanism asks how external frames affect and are interpreted by our internal neurological structures, influencing our moods and behaviors.[24]

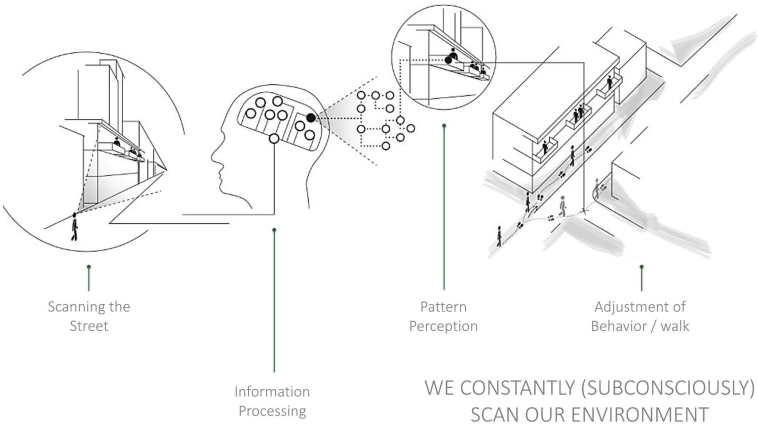


Figure 6. Nuero-Urbanism

Foster + Partners. “Brain, Body, Building: Neuroarchitecture and Design.” Foster + Partners Insights

Research indicates that medications for PTSD are not always effective and do not address emotional needs, raising the question of architecture’s role in healing. While architecture cannot replace medical treatment, it can provide supportive spaces that alleviate stress and meet emotional needs such as security and peace.

23 SEMH Symptoms. “The Neurological Basis of Impulsivity in SEMH.” https://semhsymptoms.co.uk/the-neurological-basis-of-impulsivity-in-semh/

24 Foster + Partners. “Brain, Body, Building: Neuroarchitecture and Design.” Foster + Partners Insights. https://www.fosterandpartners.com/insights/plus-journal/brain-body-building-neuroarchitecture-and-design

Designing environments with mental well-being in mind fosters healing and reduces stress. Therapeutic spaces, such as quiet public areas, urban gardens, and healing spaces in community buildings, transform functional spaces into retreats that offer tranquility amidst urban noise.

Incorporating sensory design enhances these restorative environments. Thoughtful designs that include symmetrical navigation, sound management for calmness, and access to natural light and greenery can significantly lower stress and support emotional healing. By focusing on these aspects, we can create spaces that serve a functional purpose and promote mental resilience.

Inclusive City 2.0

Building connections with others, engaging with the community, spending time in nature, and staying physically active—through walking or other movement—are key factors in helping individuals with PTSD manage anxiety and reduce stress in urban and public spaces. ("What Causes Anxiety? The Role of Genetics, Environment, and Lifestyle." Dr. Kelkar Hospital.[25]

The project is working on the issue of inclusive cities. These cities contain and adapt to different population groups, including groups with disabilities, when this project focuses on mental disabilities. In this way, the population suffering from post-traumatic stress disorder forms a reference group for re-planning the urban environment to create general well-being.

We all respond to the environment through the senses which perceive it and translate it neurologically into sensations that affect well-being.[26] Post-traumatic stress disorder is a significant reference group in that their senses are more sensitive and heightened and are thus more affected by the environment. If we can appeal to heightened senses, we can design spaces that benefit all population groups, thereby creating a new branch of inclusive cities.

25 "What Causes Anxiety? The Role of Genetics, Environment, and Lifestyle." Dr. Kelkar Hospital. https://drkelkarhospital.com/what-causes-anxiety-genetics-environment-lifestyle

26 Suurenbroek, Frank, and Gideon Spanjar. Neuroarchitecture: Designing High-Rise Cities at Eye Level. Amsterdam University of Applied Sciences, 2017. https://www.nai010.com/en/product/neuroarchitecture-e-book/

Restorative City

PTSD is not necessarily a personal limitation, and trauma can also be collective and urban, even political (Figure 7).[27] This understanding led to examining significant cities that have experienced collective trauma to examine urban planning in favor of a renewed set of principles that will encourage well-being and enable collective coping with PTSD (Figure 8).

Ashdod is among the largest and most populous cities in Israel, along with its location in relation to Gaza, which places it in the top spots in terms of alarm dispersal rates during the “Iron Swords” war and among the cities with a high percentage of urban collective PTSD (Figure 9).

Figure 7. Scale of Trauma

27 Lerner, Adam B. Collective Trauma and the Making of International Politics. Oxford: Oxford University Press, 2022. https://academic.oup.com/book/41477/chapter-abstract/352868820?redirectedFrom=fulltext

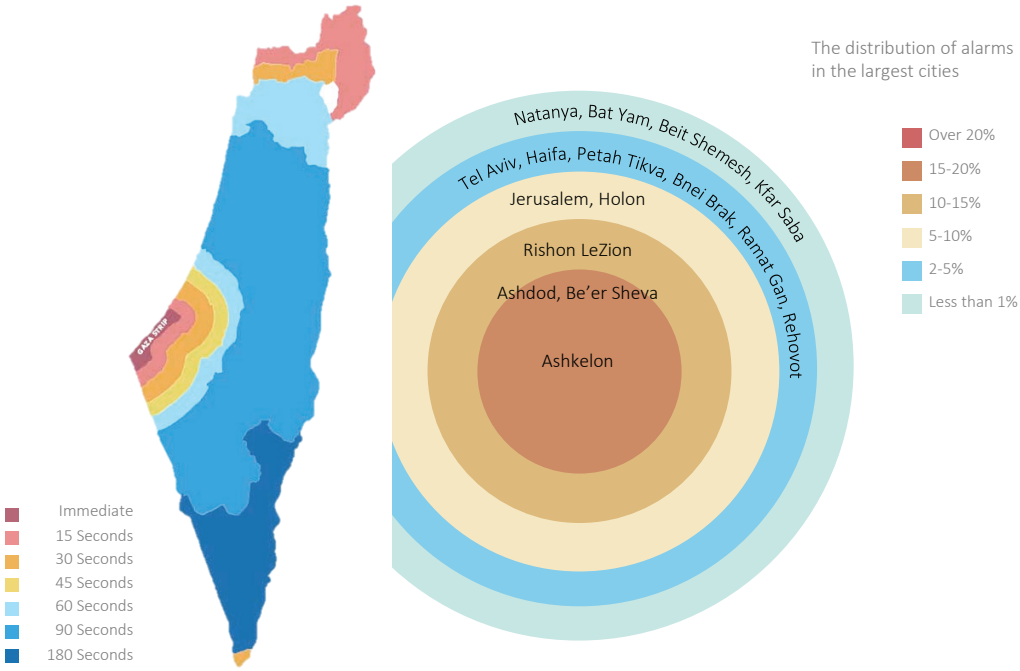


Figure 8. Distribution of alarms in the larges cities in Israel since October 7th.

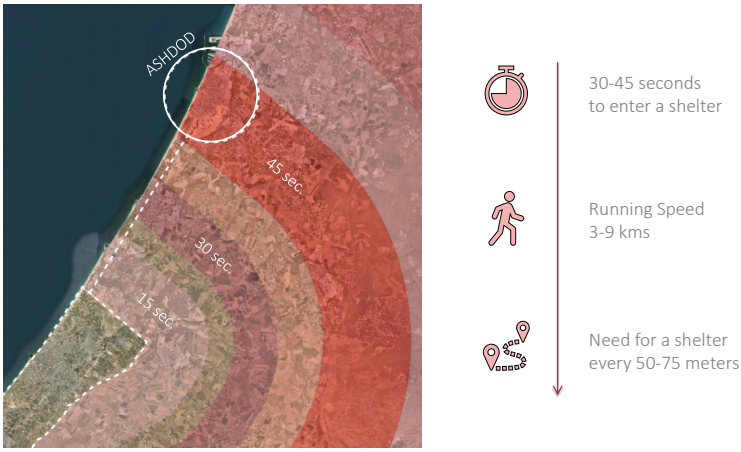
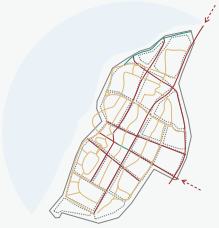


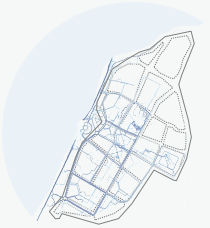
Figure 9. Ashdod Location and Emergency Regulaitons

Ashdod's urban structure reveals a fundamental mismatch between its extensive natural areas surrounding it and the fragmented, weakly integrated open spaces within the city. The urban development of defined neighborhoods has produced persistent social and spatial discontinuities, limiting cohesive urban life, weakening community cohesion and amplifying residents' sense of isolation. This fragmentation is reinforced by car-oriented arterial roads that lack shade, greenery, and thermal comfort infrastructure, even though these corridors account for most of the city's pedestrian traffic. Together, these conditions underscore the need for a more inclusive, trauma-informed urban strategy capable of repairing the structural imbalances in the city and restoring a connected, human-centered public realm (Figure 10).

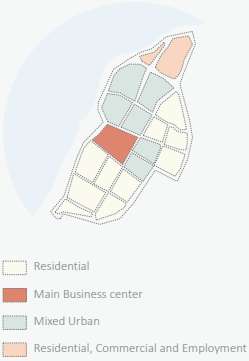
There is quality urban nature, surrounding the city without a clear connection to all the neighborhoods and an imbalance between the districts in the number of green spaces



The main roads are vehicle-based and do not encourage walkability, gentle movements, and outdoor activity in the urban space.



The main streets are not walkable and do not have thermal comfort due to lack of trees,
heatmaps show walking activities on main streets and not inside the neighborhoods.



Land designations and uses for all districts.

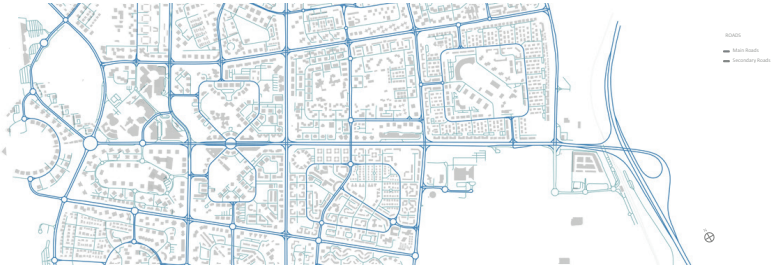
Figure 10. Ashdod's Urban Structure

However, these very conditions also point to Ashdod's untapped potential. The rich urban-nature systems surrounding the city form a continuous ecological ring that, if strategically connected inward, could support nature-based healing and strengthen environmental resilience. The main boulevards that traverse Ashdod from north to south and east to west function as natural stitching lines between the green periphery, the urban core, and the sea. These transversal corridors hold significant potential to restore community life, expand accessible green spaces, and reintroduce nature into the city's everyday experience, forming the backbone for more cohesive, inclusive, and therapeutically oriented urban structure (Figure 11).

Figure 11. Ashdod's Urban Opportunities

Ashdod is a case study with great potential for connecting nature and the city. However, the existing urban advantages are being harmed by poor, congested planning of Menachem Begin Boulevard, empty and unplanned areas, inactive facades, planning conditional on vehicles rather than soft movements, which prevent the development of the avenue and the city, alongside the paradox of post-trauma containment.

Ashdod is very crowded in terms of population and construction, but many areas are empty and unused, intended for roads and planned for vehicle traffic. However, there is potential for open, green areas and for a connection between the main avenue and the city's natural surroundings.



Another essential aspect of this project is recognizing that green spaces are not merely objects to be observed. They serve as environments for engaging all the senses. Many green spaces fail to promote healing because they primarily function as passive observation points, lacking opportunities for non-visual sensory

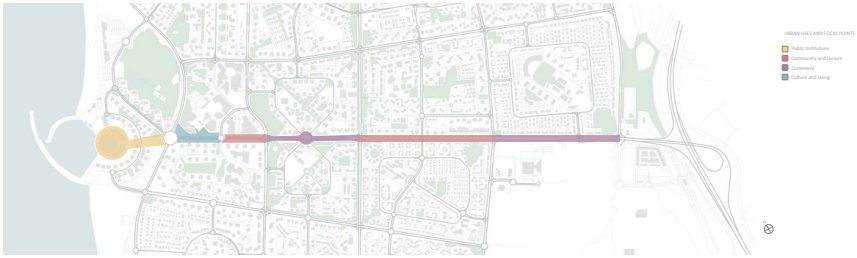
experiences. Furthermore, green spaces foster social interactions, connecting individuals and building community.

The recommendation for proximity to open spaces is based on studies that show that proximity directly affects frequency of use, mental health, and stress reduction. Moreover, the recommendation is for a minimum distance of 100-300 meters, with a 100-meter radius having a direct emotional impact. (World Health Organization (WHO, European Environment Agency (EEA))

In terms of uses along the boulevard, we can already see a division in its changing nature between areas where it crosses residential neighborhoods and public, commercial, and cultural areas.

This distinction led to an understanding that the boulevard has the potential for dynamism at its central points.

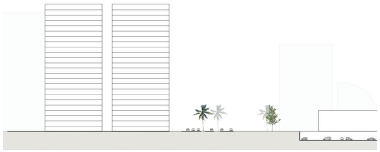
That dynamism divides the boulevard into sections of varying character, from commercial and entertainment areas to quieter areas suited to residence, culture, and leisure. Thus, the boulevard has the potential to vary in intensity and adapt to its users' changing psychological needs.



When looking at the existing street section of Menachem Begin Boulevard, there is a sharp difference between the height of the construction and the street, thereby eliminating human scale and resulting in a shortage of green spaces and landscaping that would encourage walkability and use of the street level.

EXISTING

Section A



Section B

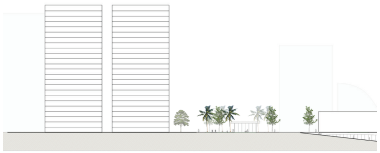
Section C

Section D

The goal of the project is to create a wide green boulevard that provides urban continuity and a green, active lung in the city, establishes public and community centers, and strengthens connections between people, nature, and the sea through the central boulevard. This project proposes to fill gaps and bring life back to the street by reducing the number of vehicle lanes, adding public transportation along the boulevard, and installing green intersections that mask height differences and create a suburban, peaceful feeling.

PROPOSED

Section A



Section B

Section C

Section D

This project looks at the boulevard on three levels:

1. Urban – good urbanism for everyone, planning principles and tools for planning the avenue and improving it so that it comes alive, functions better, and produces a better urbanism.

2. Mental – essentially post-traumatic, inclusive urbanism that allows for principles such as choice, refuge, a sense of security, by classifying open spaces and activities in the public space alongside a space of privacy and community.

3. Security – a sense of physical and emotional security, providing private areas that allow for various interactions and a supportive community, alongside the refuge of urban intensity

SECURE

SENSE OF SECURITY

A range of private areas and interactions, creating a supporting community and an escape from the city's intensity

MENTAL

INCLUSIVE URBANISM

Choice, Community, Content through a classification of open spaces and activities in the public space

URBAN

BETTER URBANISM FOR ALL

Planning Principles and Tools to improve the boulevard so that it Lives and Functions

The goal is to redesign the urban avenue using planning principles and tools for better urbanism, applicable to any urban avenue. When trying to create spatial tools that make it easier to deal with the built space, with the understanding that there is a connection between post-traumatic coping and the emotional feelings felt by each person in the urban environment, the principles that accompanied this project are based on community spaces and encounters, orientation and choice, strengthening the connection between humans and nature, encouraging walkability, exposure and concealment.

Building cities that serve all residents, especially marginalized groups, is essential. Inclusive urban planning must prioritize accessibility and emotional safety, particularly for those with mental health challenges like PTSD. By embracing sensory-aware design, we can create resilient environments that foster well-being and empower engagement, leading to healthier communities for everyone.

Figure 12. Existing Menachem Begin Boulevard

Figure 13. Proposed Menachem Begin Boulevard

Linear Neighborhood

The section of the boulevard on which the project is focused extends from Ashdod's central station in the east to the beginning of the promenade towards the marina, with a Cultural Square to the north and a future high-rise neighborhood to the south (Figure 12). This area has a lot of wasted space and many car lanes, yet it has the potential to connect people, foster culture, and create a supportive community.

The project proposes a renewed section of the boulevard (Figure 13). To the east, a light rail station has been added to the central station, connecting the entire boulevard with accessible, fast public transportation. Alongside it is a new urban market square that will connect the city center to the marina and connect the north of the city to the south, creating encounters and interactions between people through a vibrant space. South of the Cultural Square, before the city skyline rises to the height of the new high-rise residential neighborhood to the south, a linear modular neighborhood is planned to provide low-cost housing through rapid, adaptive construction, with a suburban character that supports walkability and fosters a supportive community. Furthermore, to the west, a connection to the Ashdod marina through a wide commercial boulevard that crosses a new park.

The linear neighborhood consists of modular housing units assembled in repetitive and adaptive variations. The goal is to create a system of residential units that breaks urban continuity and establishes quiet passages that connect in different, freer directions, while introducing a new sequence of pocket gardens of varying sizes to provide space for social gatherings.

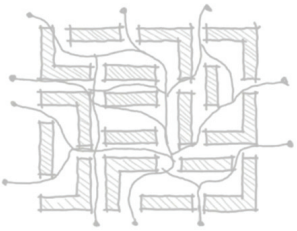
This neighborhood offers enhanced lives through not only the social aspects of integrated living but also the benefits of selective shared spaces. By achieving a balance between moments of privacy and aspects of communal living, the model drives down both living and environmental costs.

Cluster living is an adaptable housing cooperative model in which a diverse set of housing typologies is provided through a design process that results in an architectural outcome that caters to many lifestyles and lifestyle changes over time.

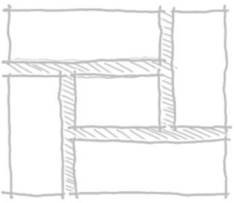
Through strong relationships between internal and external, this linear neighborhood provides high-quality communal spaces that encourage interaction and relationships with the broader community, also considered through human scale and materiality that link the clusters to their neighboring properties and the boulevard, helping people connect and reinforcing the importance of a strong supporting community (Figure 13).

In three-dimensional thinking, the modules create a segregation of the familiar residential blocks toward green spaces, which blur the height differences between the street and the residential towers, create a range of social opportunities and choices through exposure and concealment, and connect residential units in a new way (Figure 14).

COURT YARDS

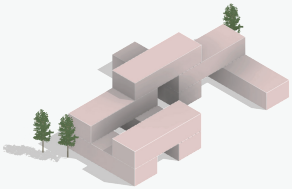


CONNECTIONS

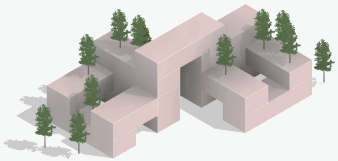


QUIET PATHS

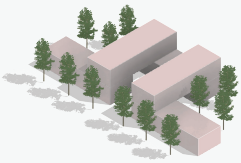
Figure 13. Cluster Principles



Segregation Towards Green Spaces
To Blur Building Height Differences
And Distribute Light, Air, And Sound



Exposing And Concealment
For A Range Of Choices



Connective Path Between Clusters

Figure 14. Three-Dimensional Cluster Principles

The system consists of five modules. A commercial module integrated into the linear neighborhood, two entrance modules for the residential units, one of which is an independent one-bedroom apartment, and two modules for typical floors, which can vary in terms of furniture and suitability for tenants and their lifestyles. (Figure 15)

Figure 15. Modular Units Catalog

This creates a sequence of residential opportunities, adaptable to changing living units, resulting in a versatile community that accommodates different population groups. (Figure 16)

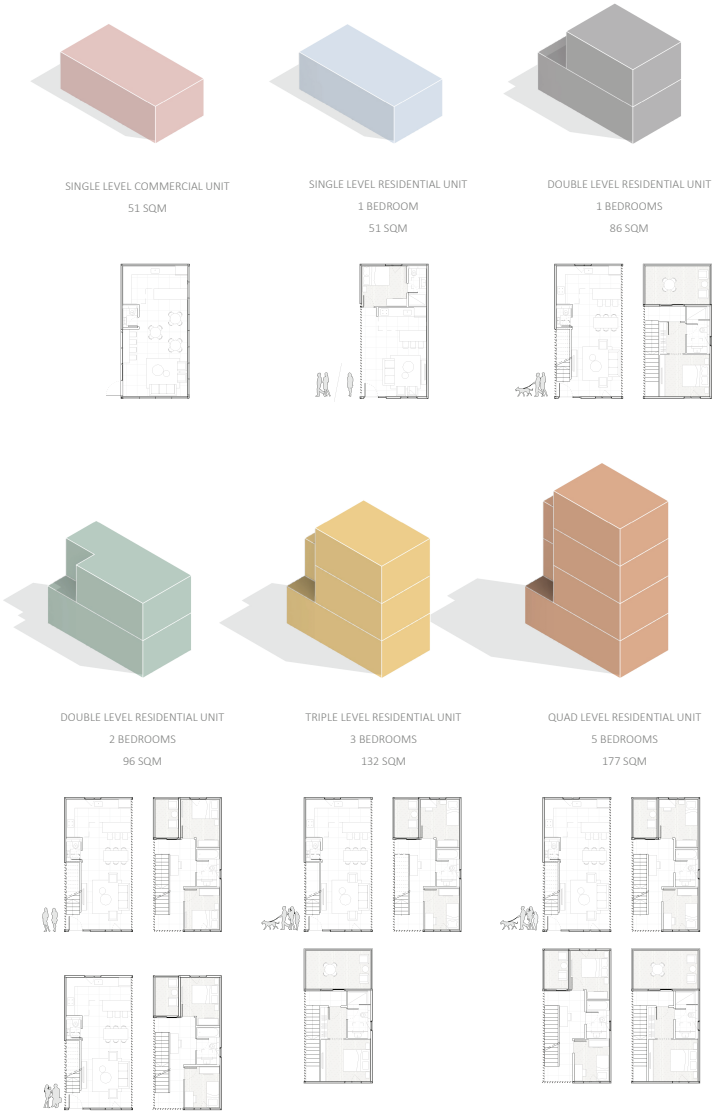
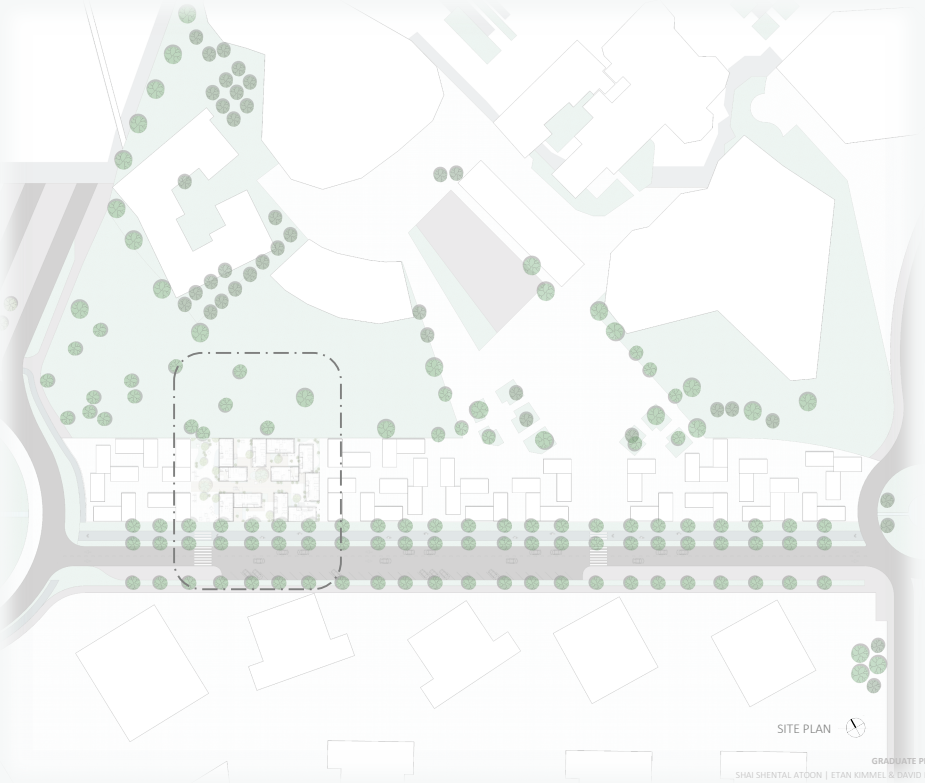


Figure 16. Residential Units Typology

Cluster Life

We will focus on one of the clusters to understand the neighborhood system in depth. Each cluster consists of several sub-clusters that connect residential and commercial units into different variations. The focused cluster consists of five sub-clusters with varying housing units. The cluster comprises three commercial units and eleven residential modules, totaling 21 modular units. (Figure 17)



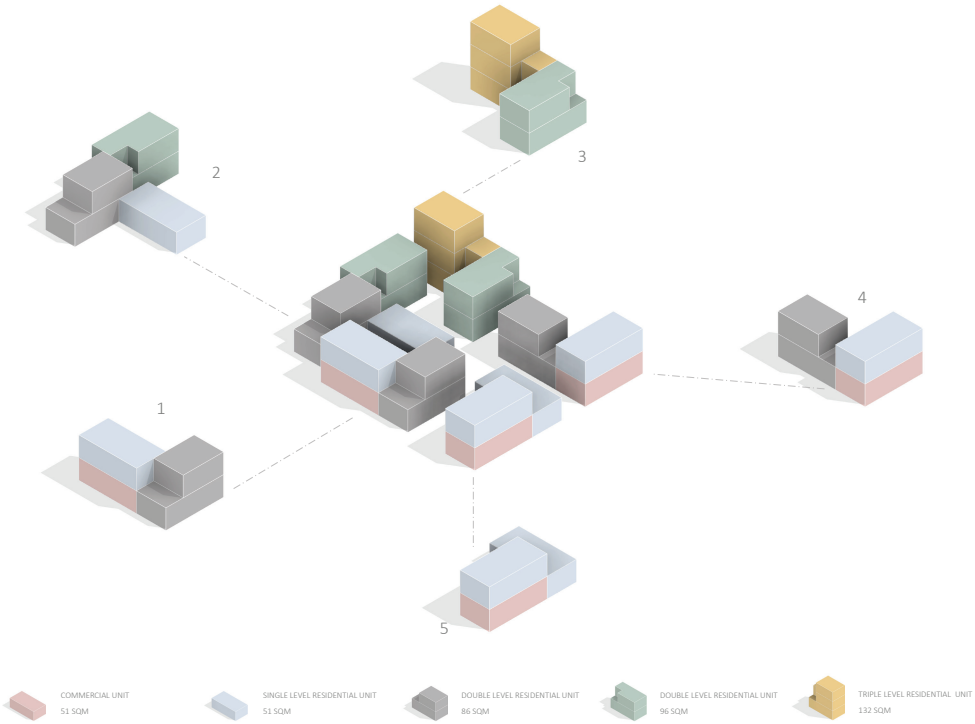
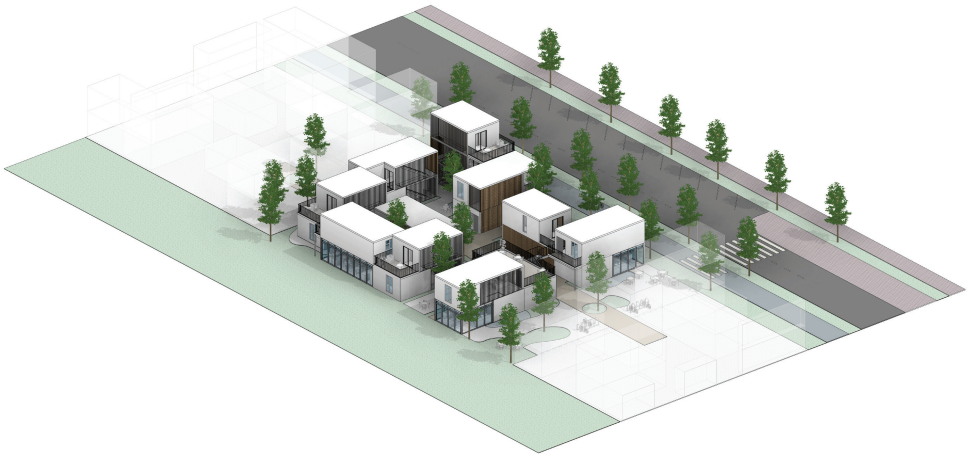
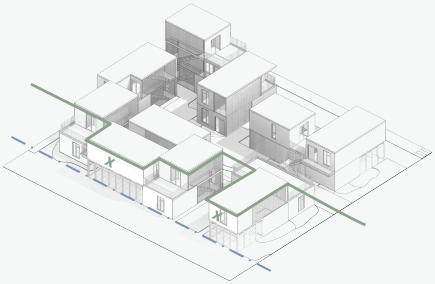


Figure 17. Clusters and Sub-Clusters

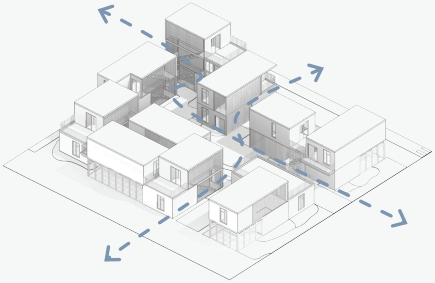


Each cluster is designed according to a fixed set of principles. Since the avenue occupies the entire width of the area, the modules allow for a three-dimensional play that produces a positive-negative effect, returning air to the adjacent street level. The design pushed standard setback requirements and built up to the site boundary, but gives back with negative areas, ultimately balancing boundary encroachment. This segregated form allows for natural light and ventilation within the cluster, while maintaining a similar rhythmic streetscape.



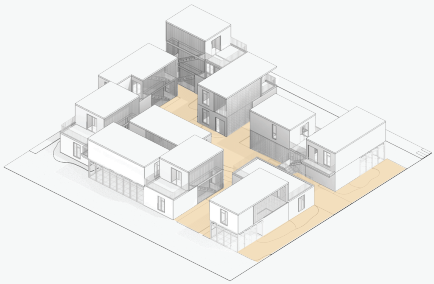
SETBACK

The design pushed standard setback requirements and build up to the boundary of the site but gives back with negative areas ultimately balancing boundary encroachment.



STREETSCAPE TYPOLOGY

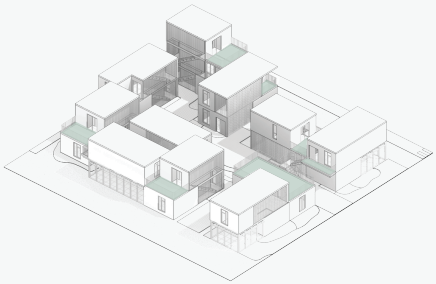
Segregated form to allow for natural ventilation of the cluster, While maintaining similar rhythmic streetscape presence.



COMMUNAL

Communal areas are central and accessible for all residents to enjoy.

At ground level, community spaces of varying sizes are central and accessible to residents. In terms of privacy and residential forms, each housing unit has a private balcony that looks inward to the pocket gardens or outward to urban green areas, and each residential unit is allocated a private, separate entrance to emphasize the suburb and distance the idea of an apartment within an intensive complex or building.



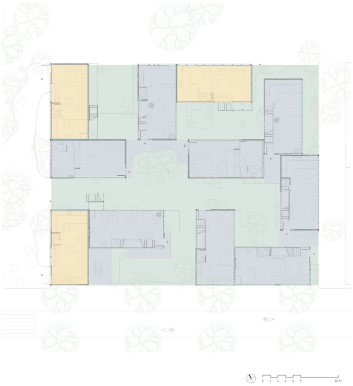
PRIVATE TERACE

Allocated for every unit a private outdoor area space for residents to enjoy.

ACCESS

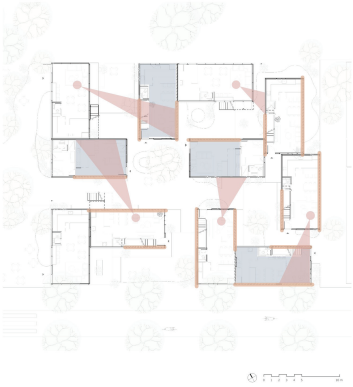
All residents have their own front door entrances, to ensure the experience of ones' own home rather that a unit in a complex.

At the plan level, there is a division between private and public spaces, resulting in a ratio of almost 1:1 between private and communal areas. Since the modules border each other, the unit design and connections between them provide privacy by minimizing direct views. When there is no solution for positioning, the bordering walls are made of louvers that allow light and air to enter the modules while still providing privacy, and the direct views are directed to less private areas in the housing units. In terms of circulation, the paths within the cluster become free and intuitive according to the needs of each tenant and user.



PUBLIC vs. PRIVATE

The cluster offers a balance of private and communal areas at an approximate ratio of 1:1.



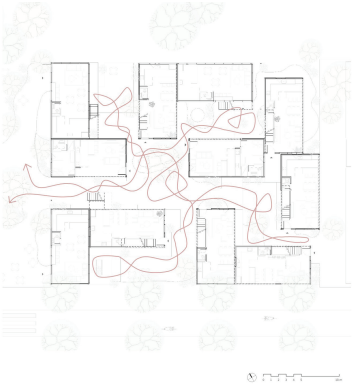
PRIVACY OUTLOOKS

Positioning that minimizes direct looking between units. When needed direct looks are into a less private areas, or concealment with wooden louver systems, creating a balance between privacy and natural ventilation and lighting in each unit.

Over 50% of the block's footprint is designated for green areas of varying sizes, allowing a choice in the level of privacy. This also creates a direct connection between the housing units and the green areas, which constitute a continuation of life in the cluster. The pocket gardens are placed centrally within each cluster, providing every residential unit with views and access to the communal spaces, which serve as a new urban take on the suburban backyard. Each cluster forms a micro-community within the neighborhood, fostering closer interaction and stronger connections with neighbors. The combinations of modules and their placements encourage diversity and integration of varying households and lifestyles, similar to the traditional neighborhood street.

GREEN SPACES

Over 50% of open green space in each cluster for residents to enjoy in addition to terrace and rooftop areas.

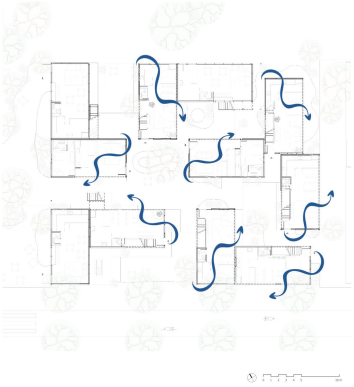


CIRCULATION

Circulation is organized radial and central, designed so residents are subconsciously promoted to interact with one another building the sense of community.

INDOOR / OUTDOOR LIVING

Seamless transition created between indoor and outdoor, the external becoming an extension of the living space of each unit.

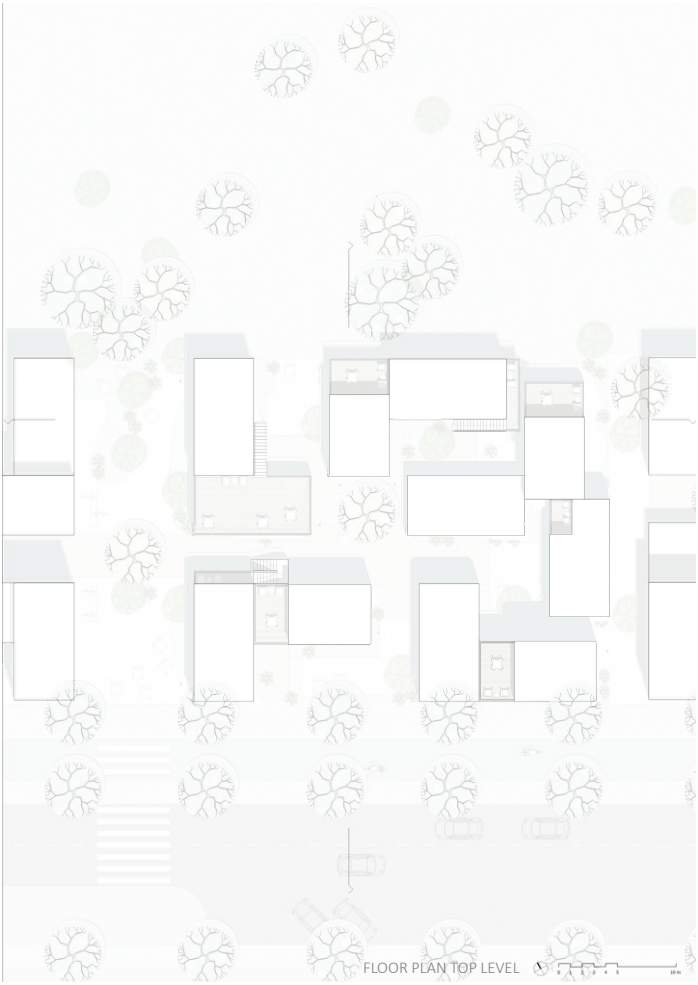


CROSS VENTILATION

Tetris modular approach allows plenty of breathability and natural ventilation across each unit.


FLOOR PLAN GROUND LEVEL

LOOR PLAN TYPICAL LEVEL



FLOOR PLAN TOP LEVEL

System Adaptability and Replicability

The neighborhood borders the new avenue to the south and the green spaces leading to the Cultural Square to the north, allowing residents a connection with the street and the urban environment, as well as an escape to quieter places between the units, in a variable range of private and open spaces according to emotional need, which create connections between the housing units in quiet passages that are masked from the urban intensity.

The new street section is divided by green buffer zones that give a sense of space from the high-rise neighborhoods and from urban intensity, masking height differences and reducing vehicle traffic in this boulevard's section while encouraging walkability and cycling along the linear residential boulevard.

The facade, although repetitive, still creates dynamism with visible escape routes from the street to the private pocket gardens, enabling the principles of choice and security, and giving a sense of orientation and control in a moment of mental need.

3D SOUTH ELEVATION

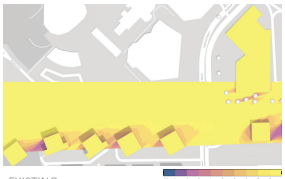
The linear neighborhood also provides the boulevard with a climatic solution. In an examination of the boulevard in terms of wind, sun, and climatic comfort, the linear neighborhood acts like a breakwater by breaking the drafts of wind and shading the boulevard, thus making the boulevard more comfortable and pleasant, encouraging not only walkability but also the use of the street level for socializing and meeting people.

WIND ANALYSIS

EXISTING

PROPOSED

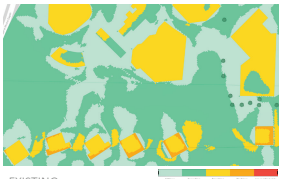
SUN ANALYSIS



EXISTING

PROPOSED

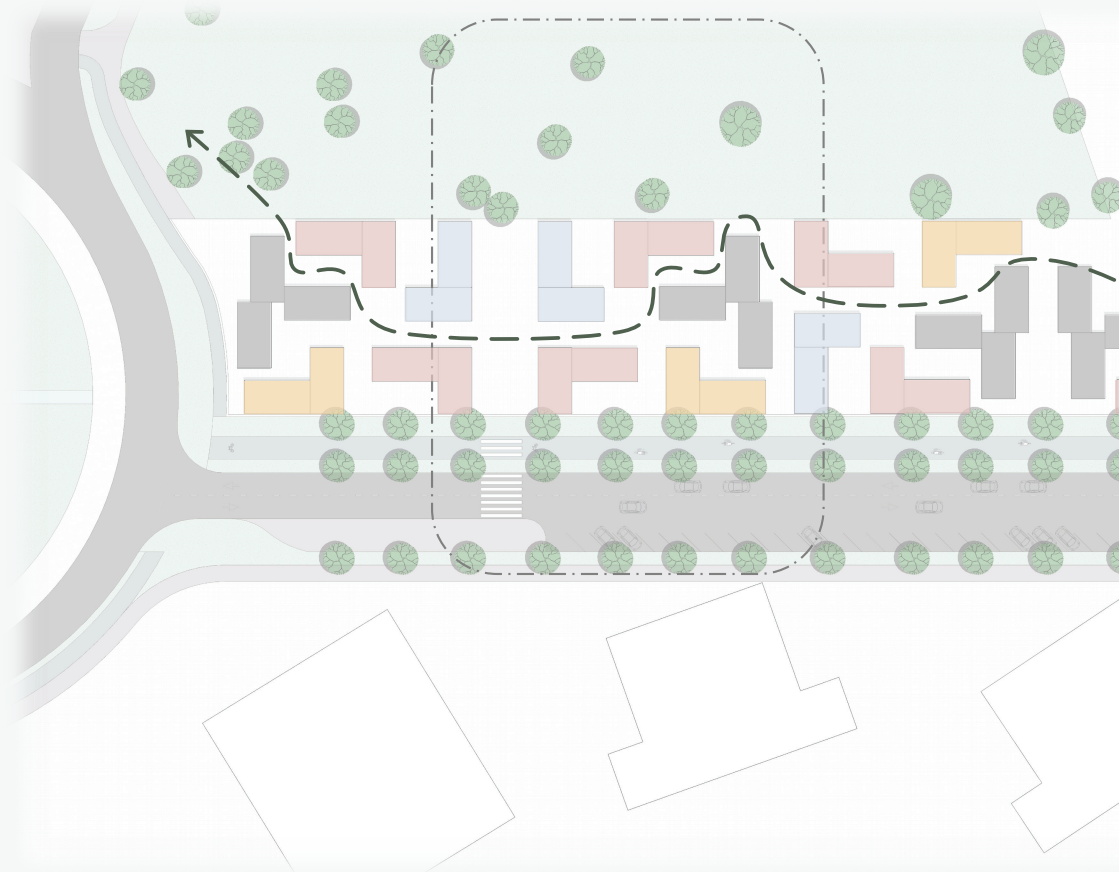
COMFORT ANALYSIS



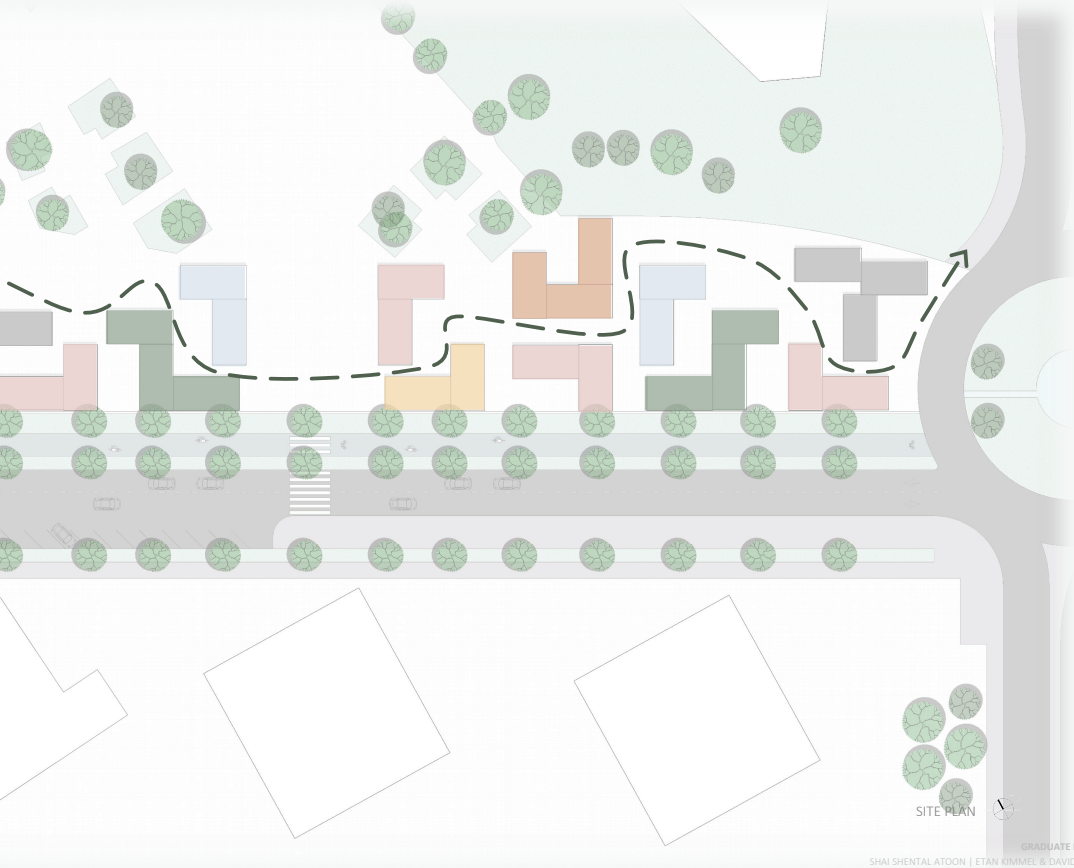
EXISTING

PROPOSED

The design is replicable over the whole linear neighborhood configuration. The concept of five distinct neighbor clusters allows easy replicability by mirroring and rotating the clusters. This can be done with consideration of how the courtyards of the clusters link to form a continuous, shared, open space that allows circulation through the neighborhood. The large open spaces between the configurations maintain the suburban qualities of greenery and light while increasing site permeability.



This system is adaptable to a range of sites and has the potential to significantly increase density while retaining suburban qualities in the middle of the modern city. The design can expand additively across the city fabric through the continued addition of clusters. This could enable denser development, better connections, and enhance street activity through a larger, more diverse population.



SITE PLAN

Figure 18. Cluster Life

Bibliography

APUR. Two Major Green Spaces in Paris: The Champ de Mars and the Champs-Élysées – A Prospective Analysis. (In French).

https://www.apur.org/fr/climat-environnement/nature/grands-espaces-verts-parisiens-champ-mars-champs-elysees-diagnostic-0;

https://www.apur.org/sites/default/files/documents/jardins_champs_elysees_diagnostic_0.pdf.

Bayer, Y. M. "Sound of Sirens, Echoes of Trauma: Socioeconomic Determinants Correlated with PTSD Symptoms During the May 2021 Hamas-Israel Conflict." Journal of Risk, Hazards & Crisis in Public Policy (2024). https://www.tandfonline.com/doi/full/10.1080/13537121.2024.2342136.

Clancy, Kevin J., et al. "Intrinsic Sensory Disinhibition Contributes to Intrusive Re-Experiencing in Combat Veterans." Scientific Reports 10, no. 936 (2020).

Crosbie, Michael J. "Why Do Architects Still Struggle with Disability Requirements?" ArchDaily, January 8, 2019. Accessed December 16, 2024. https://www.archdaily.com/909025/why-are-architects-still-struggling-with-disability-requirements.

El Helou, Maria A. "Towards a Post-Traumatic Urban Design That Heals Cities' Inhabitants Suffering From PTSD." Journal of Contemporary Urban Affairs 4, no. 1 (2020): 79–90. https://ijcua.com/index.php/ijcua/article/view/176.

Kent, Fred, and Project for Public Spaces. "Transportation as Place." Project for Public Spaces. https://www.pps.org/article/transportationasplace

Foster + Partners. "Brain, Body, Building: Neuroarchitecture and Design." Foster +

Partners Insights. https://www.fosterandpartners.com/insights/plus-journal/brain-body-building-neuroarchitecture-and-design.

Geller-Nitzan, Netta. “The Cry of Psychiatric Patients in Light of the Petition on Minimum Living Space.” Tel Aviv University Law Review, 2022. Accessed February 24, 2025. (In Hebrew). https://www.taulawreview.sites.tau.ac.il/post/gellernitzan.

Hambleton, Robin. Leading the Inclusive City: Place-Based Innovation for a Bounded Planet. Bristol: Policy Press, 2015. https://www.researchgate.net/publication/270569059_Leading_the_Inclusive_City_Place-Based_Innovation_for_a_Bounded_Planet.

Israeli Ministry of Health. Mental Health Report 2023: PTSD Trends Following National Trauma Events. Tel Aviv: Ministry of Health, 2023.

Juhani, Pallasmaa. Architecture of the Seven Senses. 1994, 40–49.

Kimball, J. G., et al. “Sensory Modulation Challenges: One Missing Piece in the Puzzle of PTSD.” American Journal of Occupational Therapy (2023). https://www.tandfonline.com/doi/full/10.1080/0164212X.2022.2131695.

Lerner, Adam B. Collective Trauma and the Making of International Politics. Oxford: Oxford University Press, 2022. https://academic.oup.com/book/41477/chapter-abstract/352868820?redirectedFrom=fulltext.

McCay, Layla, Ingrid Bremer, Tarik Endale, Marjia Jannati, and Jihyun Yi. “Urban Design and Mental Health.” In Mental Health and Illness in the City, edited by P. Munk-Jørgensen et al. Singapore: Springer Nature, 2019. https://www.researchgate.net/publication/315864757_Urban_Design_and_Mental_Health.

Mueller-Pfeiffer, Christian, Miriam Schick, Thomas Schulte-Vels, Roger L. O’Gorman,

Lars Michels, Christine Martin-Soelch, James Blair, Markus Rufer, Ulrich Schnyder, Timothy A. Zeffiro, and Gregor Hasler. “Atypical Visual Processing in Post-Traumatic Stress Disorder.” NeuroImage: Clinical (2013). https://doi.org/10.1016/j.nicl.2013.08.009.

“Calm in Chaos: Creating Refuge Spaces in the Theme Park Setting for People with Autism Spectrum Disorder and Post-Traumatic Stress Disorder.” Herald Open Access. https://www.heraldopenaccess.us/openaccess/calm-in-chaos-creating-refuge-spaces-in-the-theme-park-setting-for-people-with-autism-spectrum-disorder-and-post-traumatic-stress-disorder/.

“Investigating Architectural and Space Design Considerations for Post-Traumatic Stress Disorder (PTSD) Patients.” Proceedings of the Human Factors and Ergonomics Society Annual Meeting (2018). https://doi.org/10.1177/1541931218621390.

“Pathway to Becoming a Trauma-Informed City, The.” Social Connectedness. https://www.socialconnectednes.org/the-pathway-to-becoming-a-trauma-informed-city/.

Scotch, Richard K. From Good Will to Civil Rights: Transforming Federal Disability Policy. Philadelphia: Temple University Press, 2001.

SEMH Symptoms. “The Neurological Basis of Impulsivity in SEMH.” https://semhsymptoms.co.uk/the-neurological-basis-of-impulsivity-in-semh/.

Suurenbroek, Frank, and Gideon Spanjar. Neuroarchitecture: Designing High-Rise Cities at Eye Level. Amsterdam University of Applied Sciences, 2017. https://www.nai010.com/en/product/neuroarchitecture-e-book/

TEDx Talks. “How Architecture Can Create Dignity for All | John Cary | TEDxSanFrancisco.” YouTube video, 14:58. October 23, 2017. https://www.youtube.com/watch?v=0H-6iIyQ9Bs.

Webb, Elizabeth K., et al. “Neighborhood Resources Associated with Psychological Resilience and PTSD.” International Journal of Environmental Research and Public Health 21, no. 5 (2024). https://jamanetwork.com/journals/jamapsychiatry/fullarticle/2821946.

Yehuda, Rachel, and Alexander C. McFarlane. “The Impact of PTSD on Civilian Populations.” Journal of Traumatic Stress 21, no. 1 (2008): 15–24.

Yuen, Belinda, and Leonora Y. C. Chan, eds. The Inclusive City: Urban Planning for Diversity and Social Cohesion. Chapter 18. Springer. https://link.springer.com/chapter/10.5822/978-1-61091-756-8_27.

“What Causes Anxiety? The Role of Genetics, Environment, and Lifestyle.” Dr. Kelkar Hospital. https://drkelkarhospital.com/what-causes-anxiety-genetics-environment-lifestyle.