

HELLINIKON - URBAN DEVELOPMENT MODEL AND SUSTAINABILITY

FORMER ATHENS AIRPORT & AGIOS KOSMAS COAST

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www.hellinikon.com



Hellinikon SA was founded on 31/3/11 with Law 3943 and is working towards:

1. Obtaining a detailed **understanding** of the site : Proceed with necessary restorative actions and precautions
Understand the site's capacities and plan development accordingly
2. Developing a **vision and urban development model** based on an integrated approach to **sustainability** : Achieve a viable development in the long term.
Provide high added value at regional and national level



VISION

Four main goals constitute the vision of Hellinikon SA:

To integrate with the surrounding environment, creating a lively and safe community.

To establish Hellinikon Development as a point of reference at national and international scale, offering new opportunities in highly competitive sectors and benefitting the regional and national economy.

To create a metropolitan pole with high standards in terms of infrastructure and approach to sustainability.

To respond to the needs for an accessible safe metropolitan park, enhanced public spaces and promotion of sustainability awareness.



Integration into the Urban Fabric and Context : **“ create a lively and safe community “**

Competitiveness : **“ create point of reference at national and international scale “**

Model Development : **“ ensure a sustainable development in the long-term “**

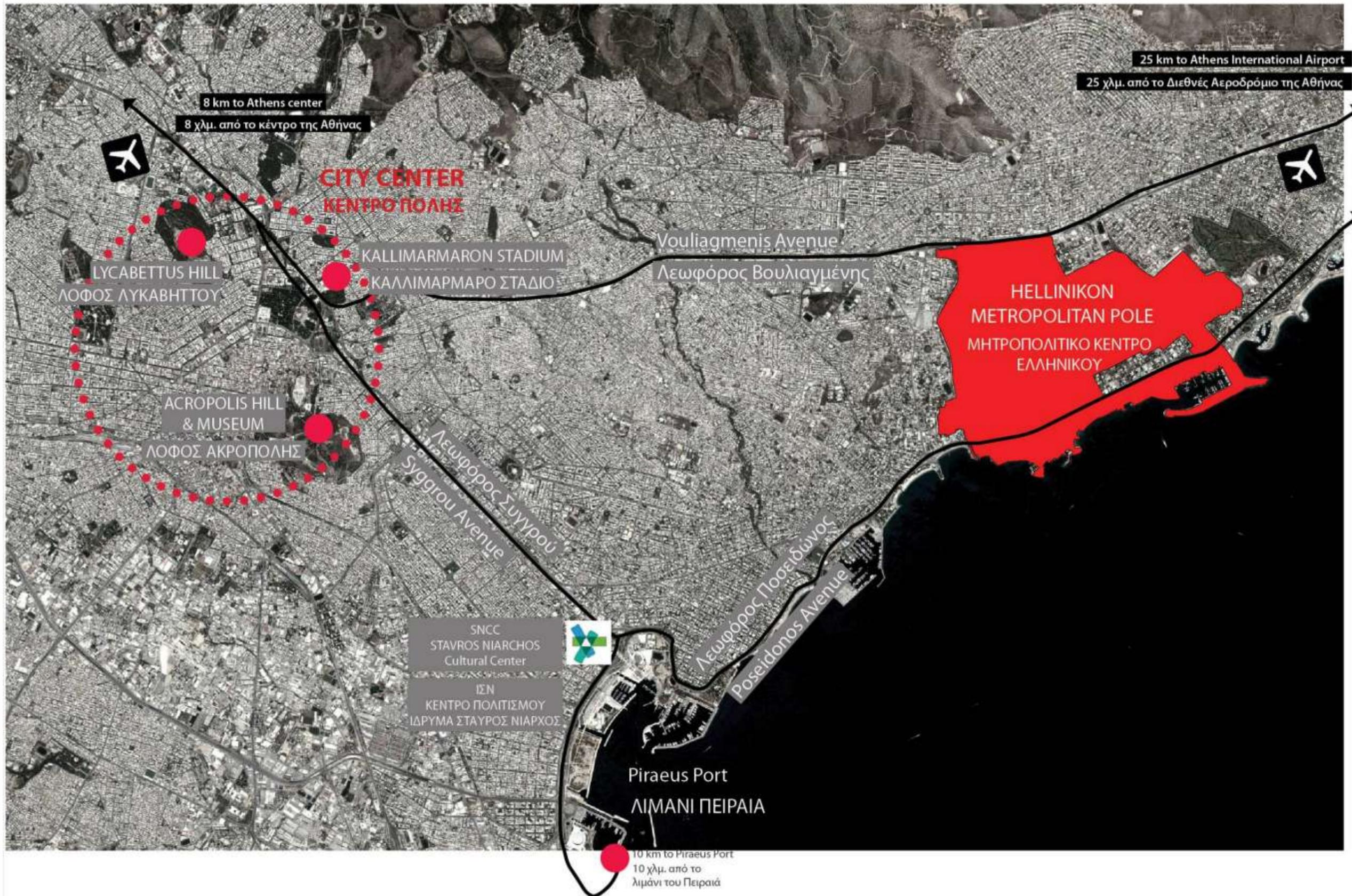
High Quality Park : **“ necessary for the metropolitan area of Athens “**





Site Analysis

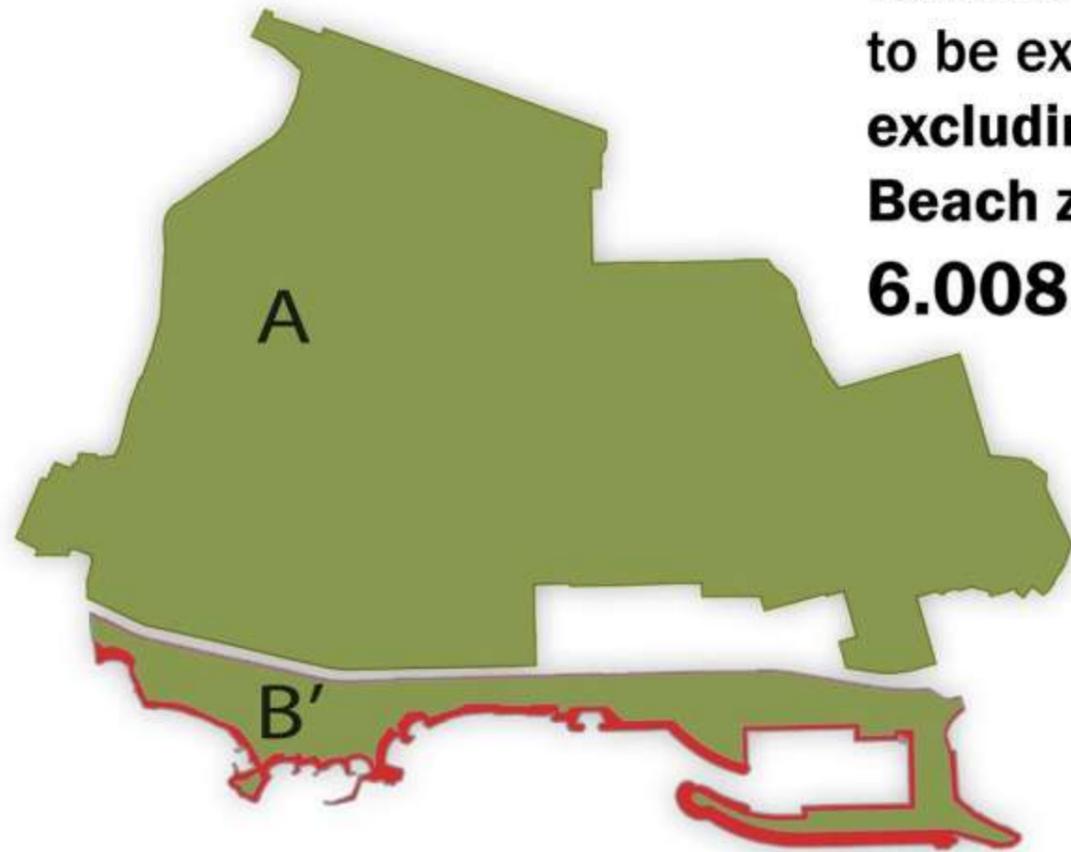
LOCATION | Proximity to City center and Airport



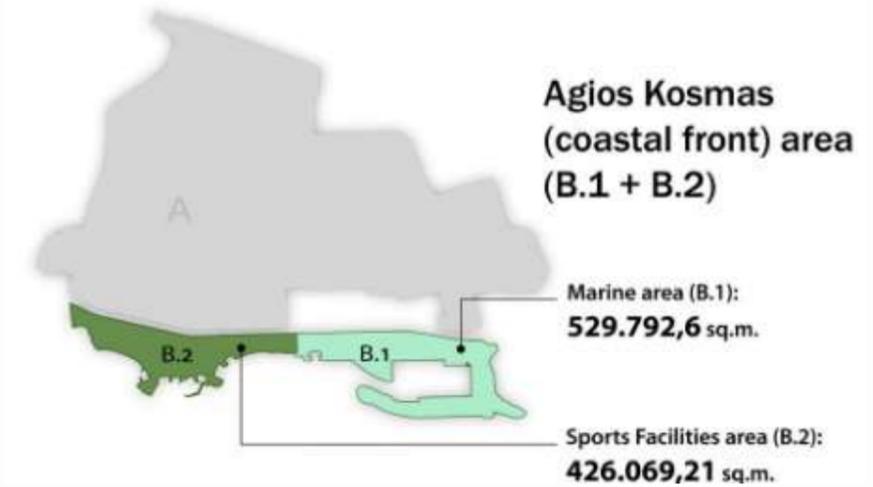
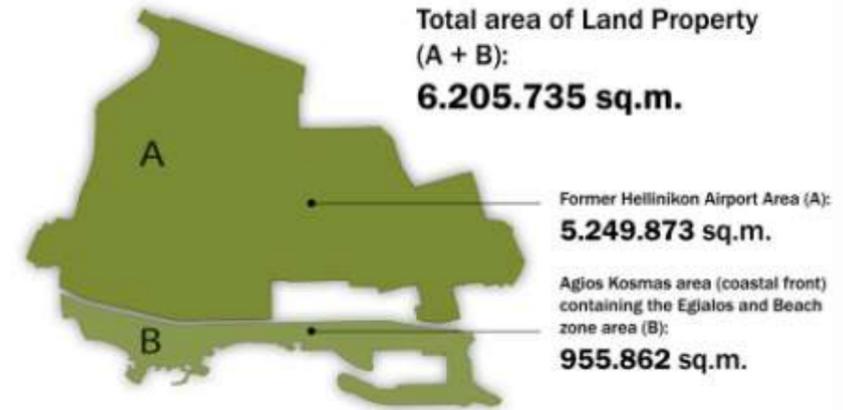
LOCATION | Site Area Analysis

What is the exact area to be exploited?

The Beach and Sea Shore areas must be extracted from the total area to be developed.



Total Land Property area to be exploited (A + B') excluding the Egialos and Beach zones' area: 6.008.241,41 sq.m.

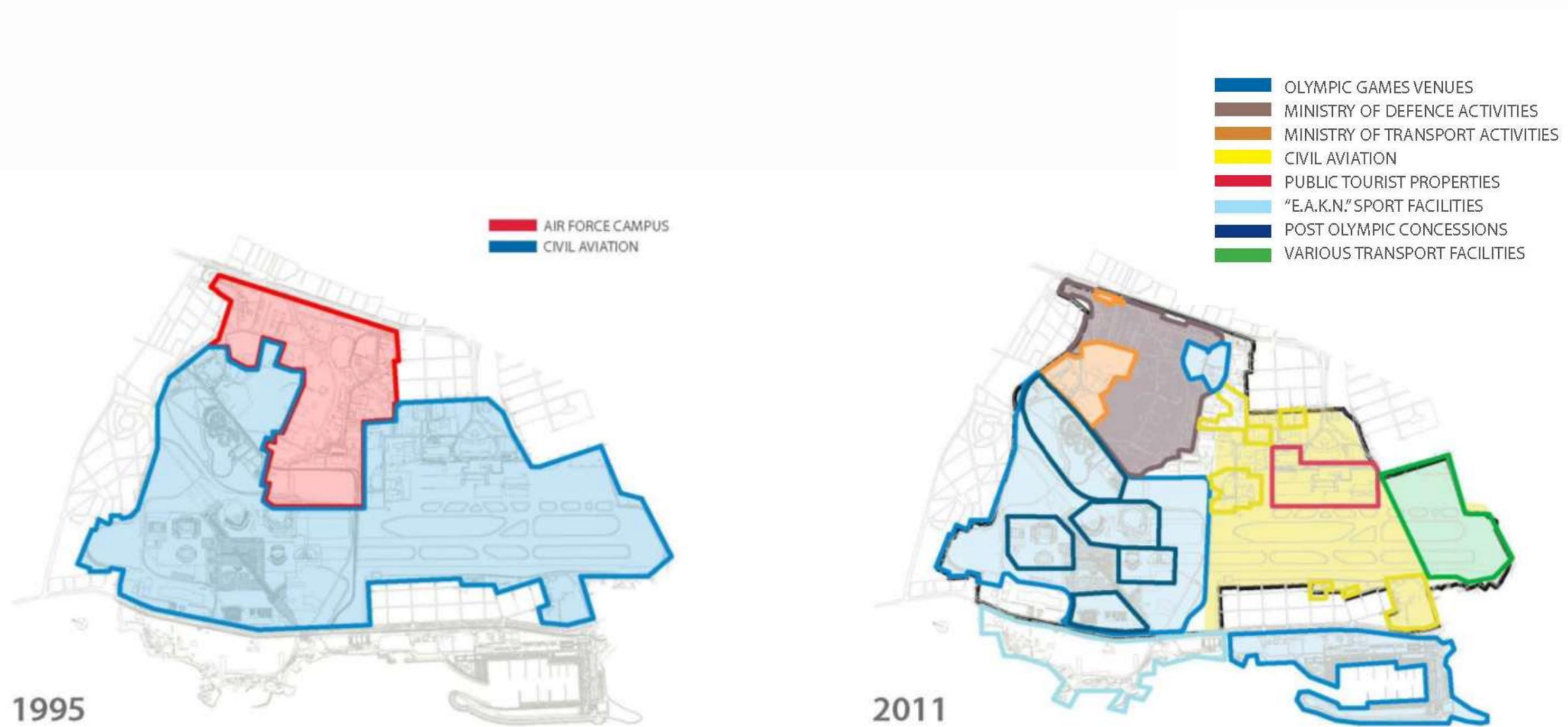


CURRENT STATE & CONSTRAINS | Timeline of Key Milestones



CURRENT STATE & CONSTRAINS | Site Segmentation

Successive and without proper planning addition of land uses for the last 60 years have led to the separation of the site into disconnected segments.



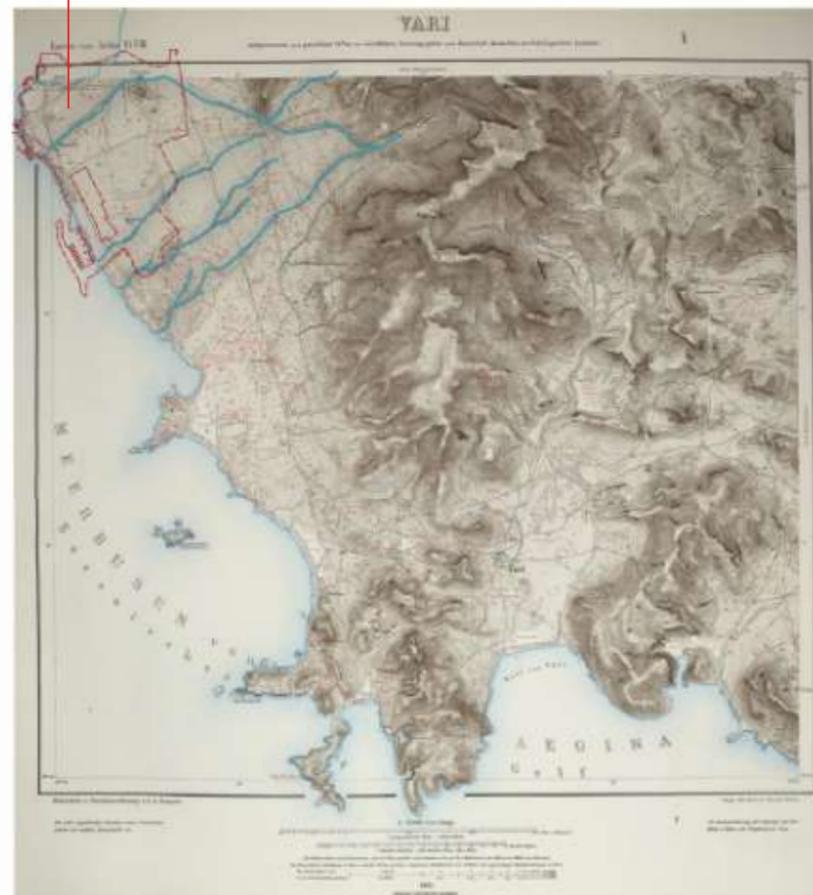
SITE CHARACTERISTICS | Terrain

The site has a slight inclination and an average height difference of 60 meters from its eastern boundary to the sea. Historical maps indicate that several streams used to cross the site transferring water from the nearby Hymettus mountain foot (about 1,00 km away). These streams were the natural connection corridors between the mountain and the sea. Today only one of them exists.

“Hasani” is the toponym that the central area of the former airport site had, during the long of Turkish Occupation.

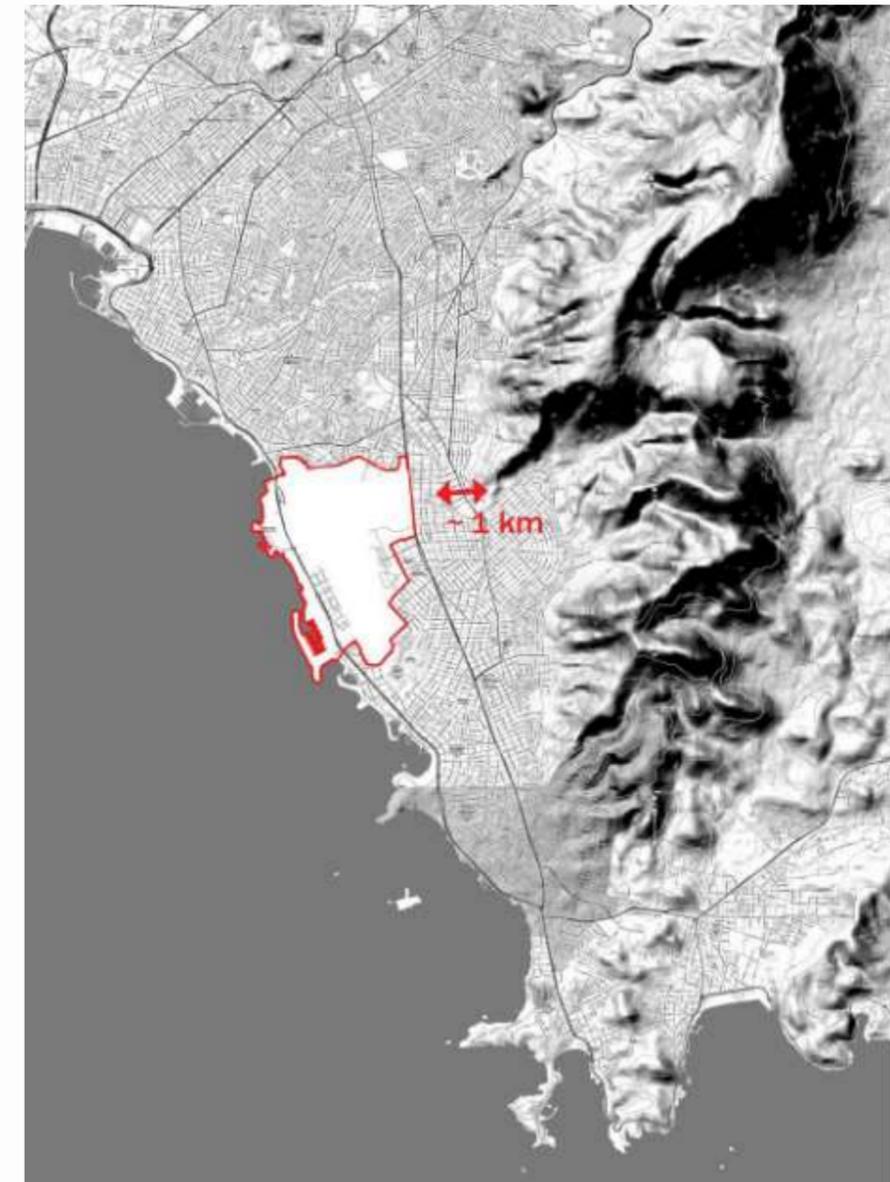
Etymologically, the term “Hasani” has the meaning of “Rough and Anomalous Land” and this is indicative of the geomorphologic character of the area before the establishment of the Airport*. It was a barren and rocky land that was crossed by many streams.

*source: research program “Development of the Area of the former Airport Site”



1885 map showing the site limit within the greater area and the old streams when they were existing.

Source: UNIVERSITÄTSBIBLIOTHEK HEIDELBERG online archive



SITE CHARACTERISTICS | Terrain

The continuous use of the site has caused large scale alterations to the site:

1. Streams have been covered or redirected causing flooding problems



Flattened terrain



Remaining Trachones stream



SITE CHARACTERISTICS | Terrain

The continuous use of the site has caused large scale alterations to the site:

2. Height differences up to 12m further fragment the site and disconnect it from the surrounding urban context



Altitude difference along the south east boundary of the site



Altitude difference along the west boundary of the site



SITE CHARACTERISTICS | Terrain

The continuous use of the site has caused large scale alterations to the site:

3. The coastline has been altered



SITE CHARACTERISTICS | Soil

The soil quality has been downgraded:

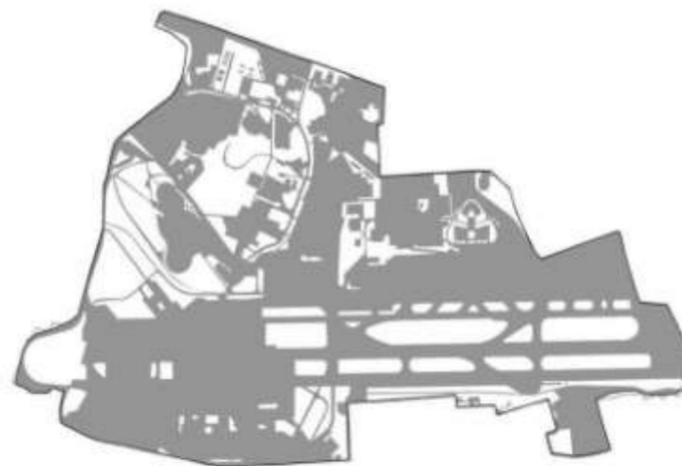
“Ένα μεγάλο τμήμα της έκτασης του αεροδρομίου του Ελληνικού καλύπτεται σήμερα με κτίρια, διαδρόμους, χώρους στάθμευσης, αποθήκες κλπ. Στο τμήμα αυτό, και εάν απομακρυνθούν οι παραπάνω εγκαταστάσεις, το “έδαφος” που θα αποδοθεί απλά δεν θα είναι έδαφος κατάλληλο για ανάπτυξη φυτών και δένδρων. Επομένως θα χρειασθεί η μεταφορά εδάφους ή η ουσιαστική βελτίωση του”.

**ΟΡΣΑ, Ερευνητικό πρόγραμμα
Ανάπτυξη του χώρου του Αεροδρομίου του Ελληνικού Έκθεση Α΄ Φάσης
ΕΜΠ, Μάρτιος 1996**

“Εκτός εξαιρέσεων... τα εδάφη είναι εντελώς αβαθή, με βάθος στη μεγαλύτερή τους έκταση από 5εκ μέχρι 15 έως 25 εκατοστά, με μεγάλο ποσοστό χαλικιών και λίθων, κάνοντας ακόμα και την δειγματοληψία προβληματική. ... Το γεγονός αυτό φανερώνει είτε ότι τα εδάφη προήλθαν από το μητρικό υλικό και το επιφανειακό εδαφικό υλικό διαβρωνόταν ή και το περισσότερο πιθανό κατά την κατασκευή των αεροδιαδρόμων το έδαφος μεταφέρθηκε για την οριζοντιοποίηση των διαδρόμων προσγείωσης και απογείωσης των αεροπλάνων. Η παρουσία αυτών δημιουργεί πρόβλημα στη μηχανική καλλιέργεια, στην εξασφάλιση ευνοϊκών συνθηκών ανάπτυξης του ριζικού συστήματος των φυτών, στη συγκρατούμενη και διαθέσιμη υγρασία αλλά και την ύπαρξη επαρκών θρεπτικών στοιχείων για τα φυτά.

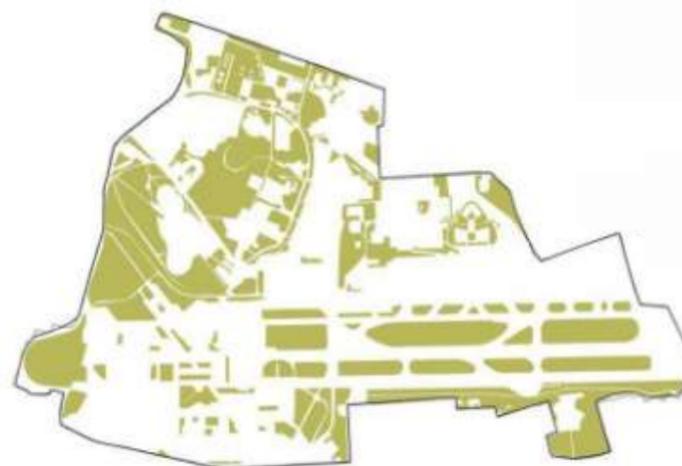
Οι ιδιότητες όμως των εδαφών και ιδιαίτερα το μικρό έως ανύπαρκτο βάθος, το μεγάλο ποσοστό χαλικιών απαιτεί τη προσθήκη χύματος με μεταφορά από άλλες τοποθεσίες με όλες τις οικονομικές συνέπειες και επιβαρύνσεις”.

**ΟΡΣΑ, Ερευνητικό πρόγραμμα
Ανάπτυξη του χώρου του Αεροδρομίου του Ελληνικού Έκθεση Β΄ Φάσης
ΕΜΠ, Φεβρουάριος 1999**



Paved area of the former airport

~ 65%



Unpaved area of the former airport

~ 35%



SITE CHARACTERISTICS | Contamination

Extended use of contaminants for decades on the site raises significant questions about possible levels of contamination.

Recorded land uses that may have caused soil and groundwater contamination:

1. Fuel tanks
2. Gas stations
3. Paint shops
4. Workshops using refrigerant and anti-corrosion substances
5. Toxic substances storage
6. Lubrication workshops
7. Sewage treatment / septic tanks
8. Electricity substations
9. Sheds
10. Misc. workshops
11. North stream
12. Tram depot
13. Car repair shop
14. Uncontrolled parking areas
15. Weapons storage



SITE CHARACTERISTICS | Contamination



SITE CHARACTERISTICS | Groundwater

Ground water resources are very limited and should be used with moderation:

“Όπως ήδη έχει σημειωθεί η συνολική περατότητα είναι σχετικά μικρή λόγω κυρίως της απουσίας δευτερογενούς πορώδους. Επίσης η άμεση κατείδυση στην περιοχή μελέτης αλλά και στην ευρύτερη περιοχή όπου απαντούν τα πετρώματα με καλή υδρογεωλογική συμπεριφορά, είναι σημαντικά μειωμένη, τόσο λόγω της χαμηλής πρωτογενούς περατότητας όσο και της μεγάλης οικιστικής ανάπτυξης που έχει σαν αποτέλεσμα να εμποδίζουν την άμεση κατείδυση του επιφανειακού νερού στο όλο σύστημα. Το γεγονός αυτό έχει σαν συνέπεια την αύξηση της επιφανειακής απορροής και τη μείωση της τροφοδοσίας των υπόγειων νερών από τις βροχοπτώσεις. Έτσι, η απόδοση οποιονδήποτε υδροληπτικών έργων αναμένεται να μην ξεπερνάει τα 20 m³/h για τις ανατολικές περιοχές ενώ για τις δυτικές, λόγω της γειννίασης με τη θάλασσα, η άντληση δεν πρέπει να ξεπερνάει τα 5-10 m³/24h. Η μεγαλύτερη ποσότητα άντλησης μπορεί να έχει αρνητικότερες συνέπειες με την εισχώρηση θαλάσσιου ύδατος προς την ενδοχώρα”.

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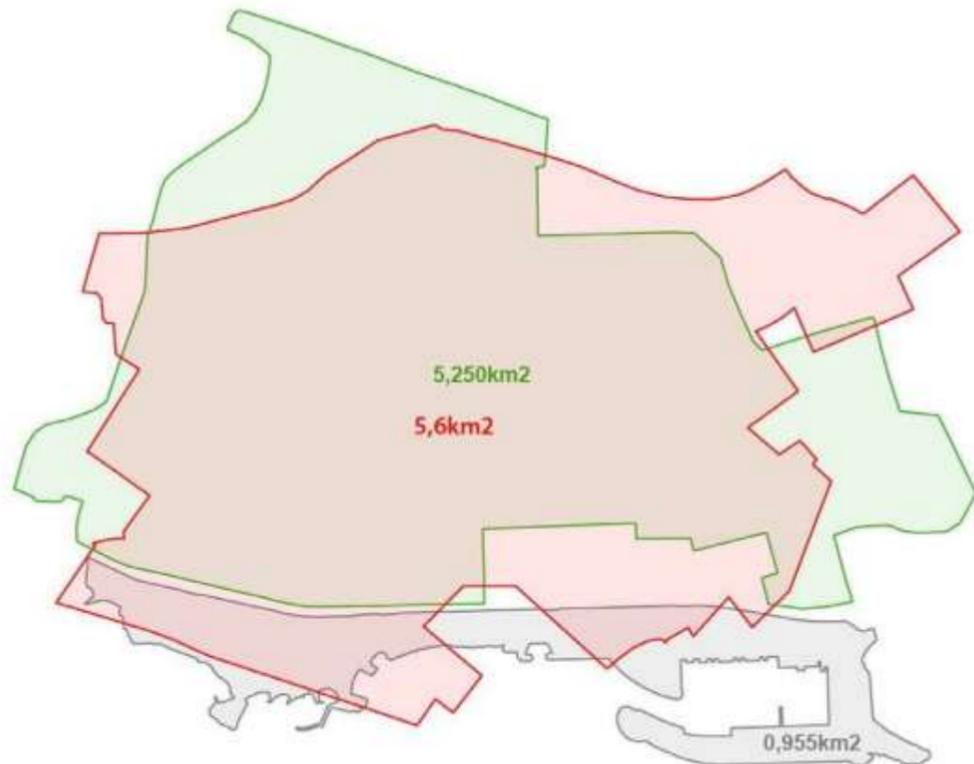
SITE CHARACTERISTICS | Scale comparison

1. Comparison in terms of use and scale

Riem Former Airport is an area of similar size and former use. The Riem development consisted of mixed land uses, such as business, commercial and residential, in a balanced formation with a metropolitan park.



Riem's park area :
2,1Km² - 37,5% of the total area



Messestadt Riem Former Munich Airport
total area size : 5,6 Km² -
90,7% of the Hellinikon area



SITE CHARACTERISTICS | Scale comparison

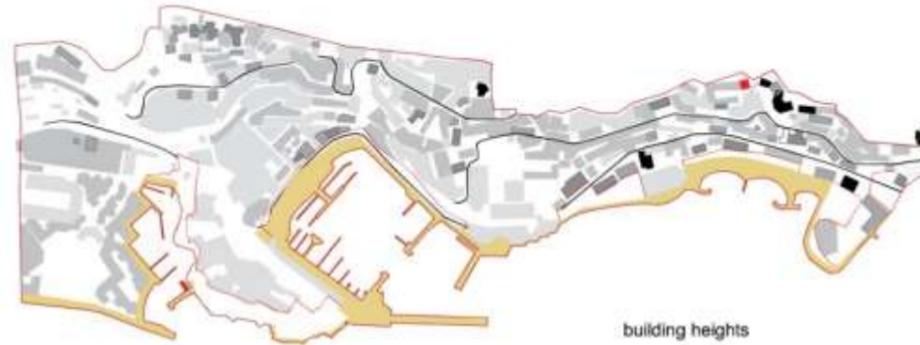
2. Comparison of coastline length

The example of Monaco is one of the most interesting, in terms of size coastline and in terms of density of the land uses developed within. The outcomes indicates that Monaco is only 33% of the Hellinikon Area but they both have the same coastline to develop. Monaco also has a 45% coverage and a 20% of green space.

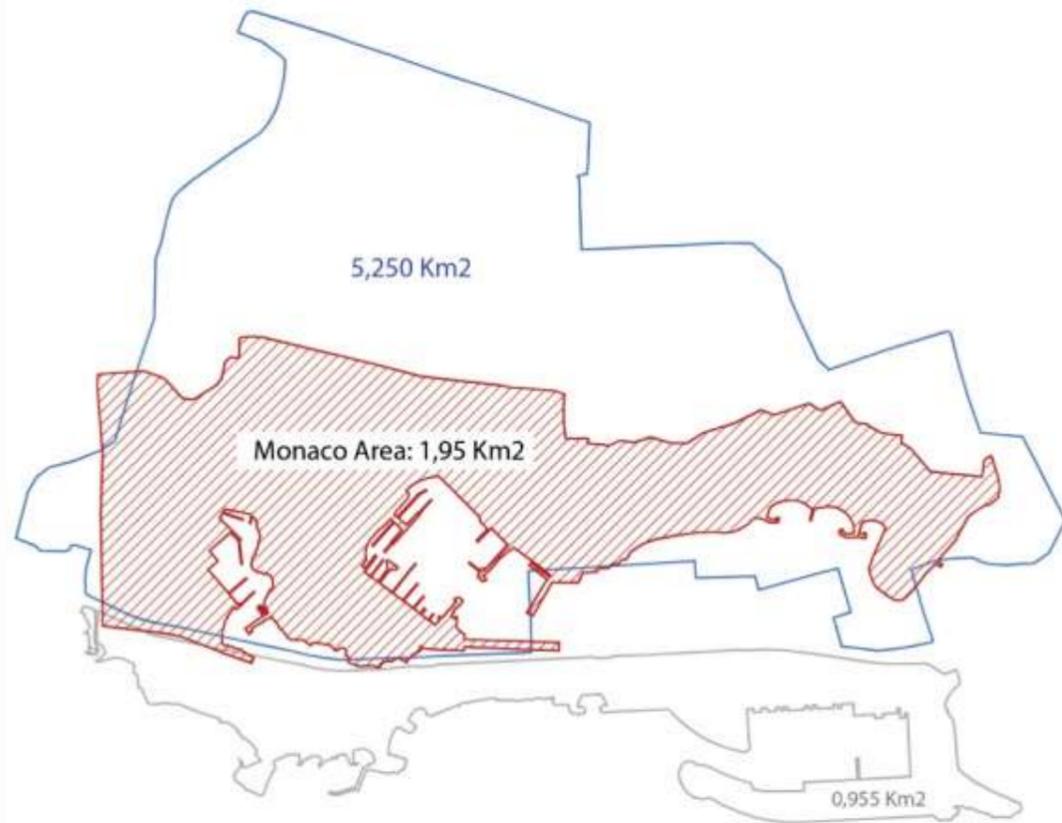
Land Area Size Analysis of Monaco:

total area size: 1.980.000 m²
 total surface of built area: 856012 m²
 total surface of green areas: 364849,57m²
 total area of marina & port: 205084,45 m²
 seafront length: 3182,75 m.

43,23% of the total Monaco Area
 18,42% of the total Monaco Area
 10,35% of the total Monaco Area

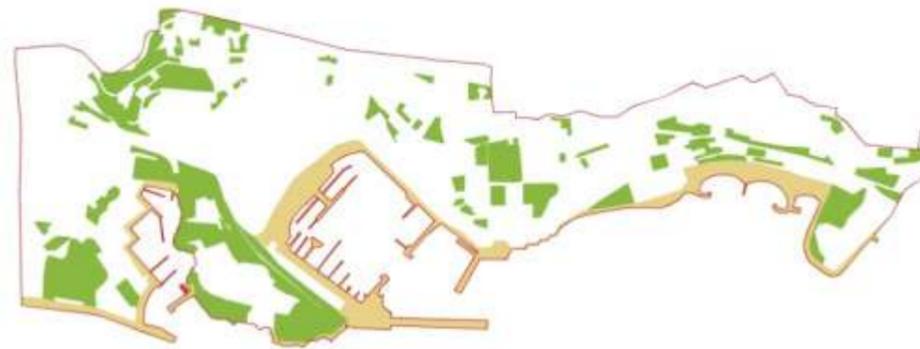


building heights
 h=12-15m
 h=30m
 h=35-50m
 h=55-80m
 h=85-110m
 h=170m



— Hellenikon Airport limit (Area: 5,250 Km2)
 — Seafront/Marina (Area: 0,955 Km2)
 ■ Monaco

0 100 250 500m



Land Area Size Analysis of Monaco:
 total area size: 1.980.000 m²
 total area of marina & port: 205.084,45 m² - 10,35% of the total Monaco Area
 seafront length: 3.182,75 m.



SITE CHARACTERISTICS | Scale comparison

3 . Comparison of metropolitan parks worldwide

Per Law, a metropolitan park of 2.000.000,00sq.m. must be included in the development that is 33,3% of the total land. Case studies of metropolitan parks worldwide indicate that for a balanced development this percentage should be combined with a dense surrounding urban fabric.

Central Park, New York, U.S.A.
~ 3.410.000 m²



Hyde Park & Kensington Gardens, London, G.B.
~ 2.530.000m²

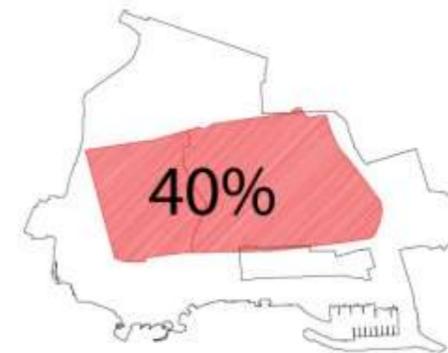
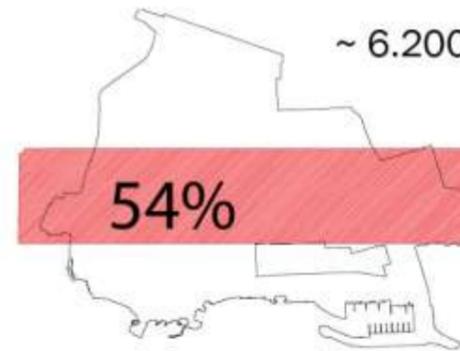


Parc de la Villette, Paris, France.
~ 550.000m²



Hellinikon Former Airport Site & Agios Kosmas Coastal Front Size.

~ 6.200.000 m²



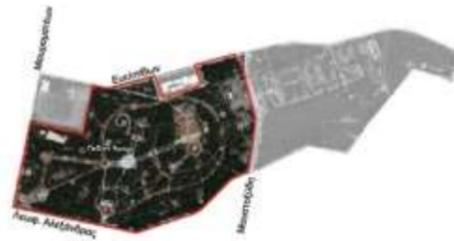
SITE CHARACTERISTICS | Scale comparison

3 . Comparison of metropolitan parks in Attica

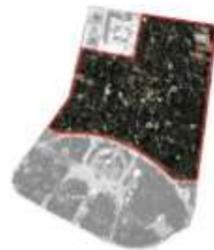
Antonis Tritsis Park, Athens.
~ 1.200.000 m².



Pedion Areos (excluding Evelpidon Park), Athens.
~ 270.000 m²

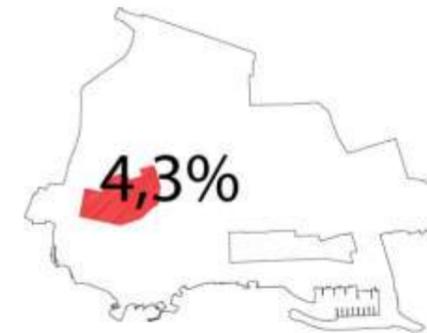
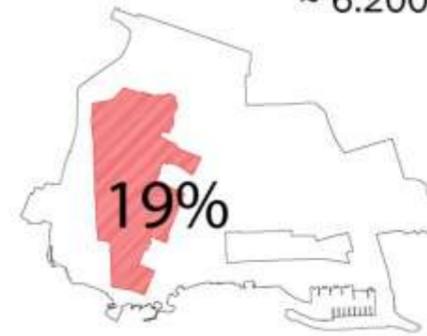


National Garden (excluding Zappeion Garden)
~ 160.000 m²



Hellinikon Former Airport Site & Agios Kosmas Coastal Front Size.

~ 6.200.000 m²

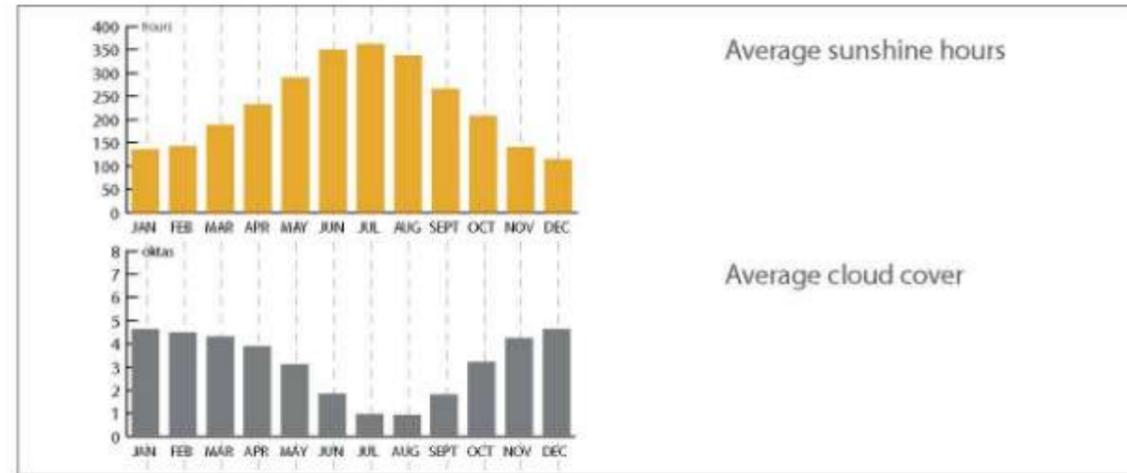
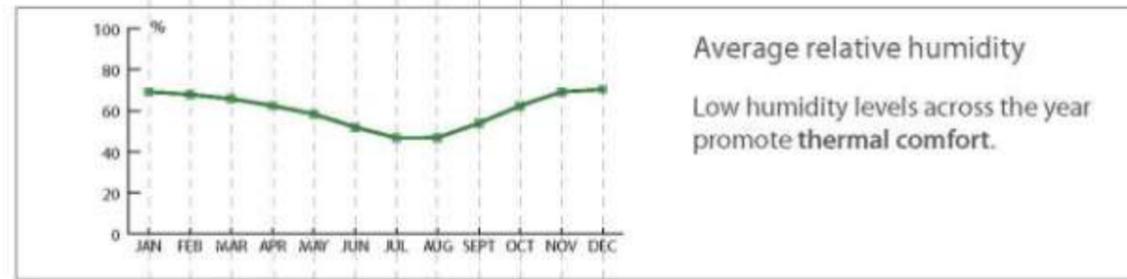
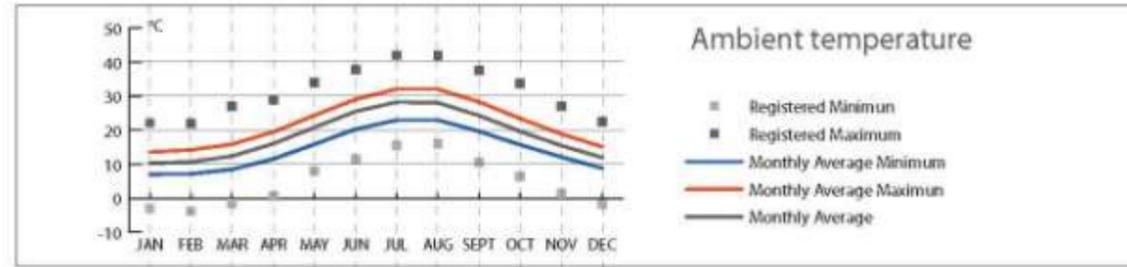


SITE CHARACTERISTICS | Climate

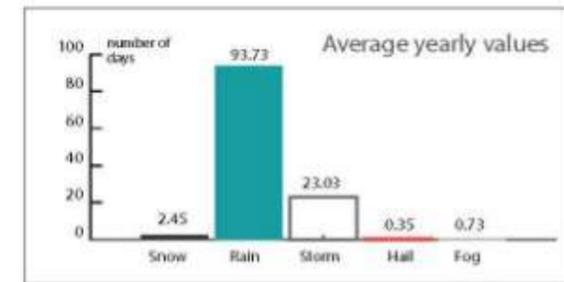
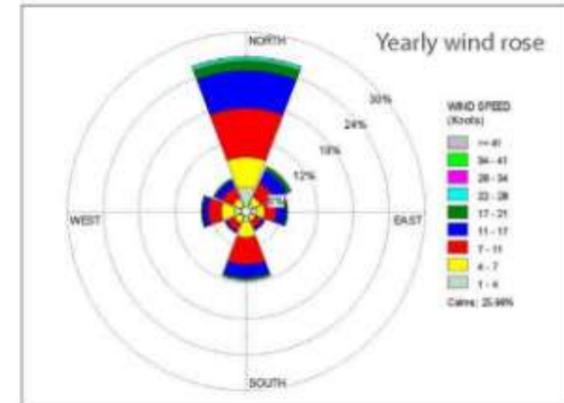
The site features a typical Mediterranean climate with mild winters, hot summers and low occurrence of intense phenomena like snow or fog.

The mild temperatures, low humidity and abundant sunshine provide the adequate conditions for a high quality of life and year long tourism in interaction with the Mediterranean landscape and environment.

High number of sunshine hours and low cloud cover throughout the year allow for passive solar building design and efficient application of solar energy technologies.



Low occurrence of extreme temperatures can maximise the effect of sustainable building design.



All statistic data are provided by the Hellenic National Meteorological Service based on measurements of the Hellinikon Airport weather station (WMO 16716, 23.44 E, 37.44 N, altitude 10m) for the period 1958-2010.

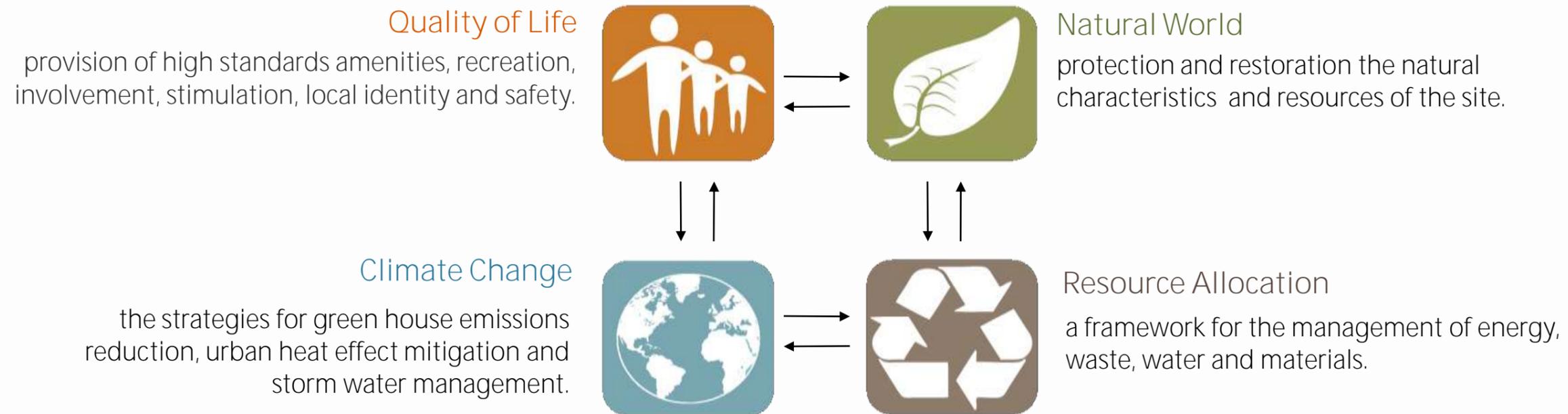




Urban Model

HELLINIKON URBAN MODEL | Sustainability

An integrated approach to sustainability is organised into 4 categories of criteria.



With emphasis on Mediterranean context:

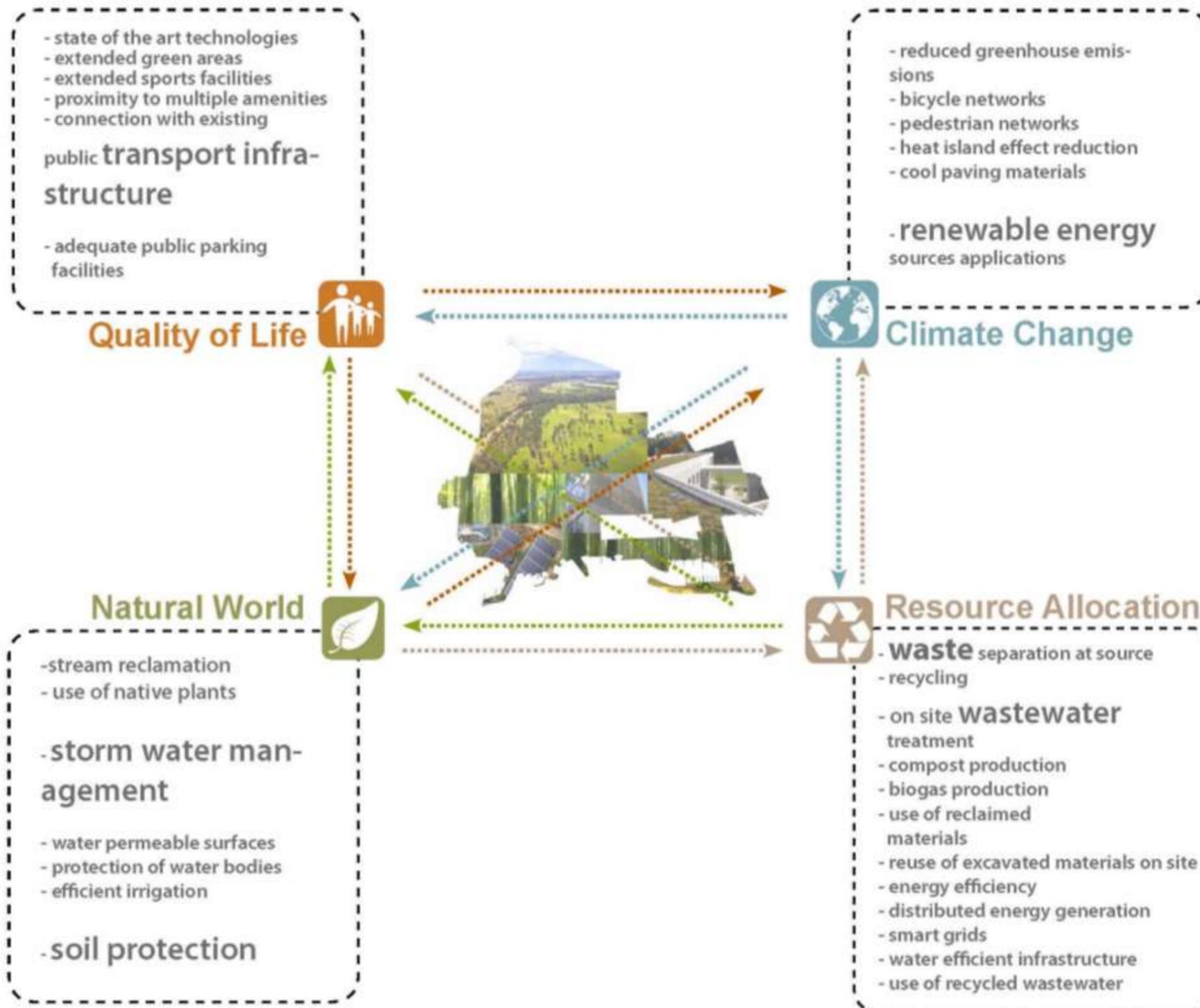
1. Water resources scarcity
2. Solar radiation abundance
3. High summer temperatures
4. Outdoor living

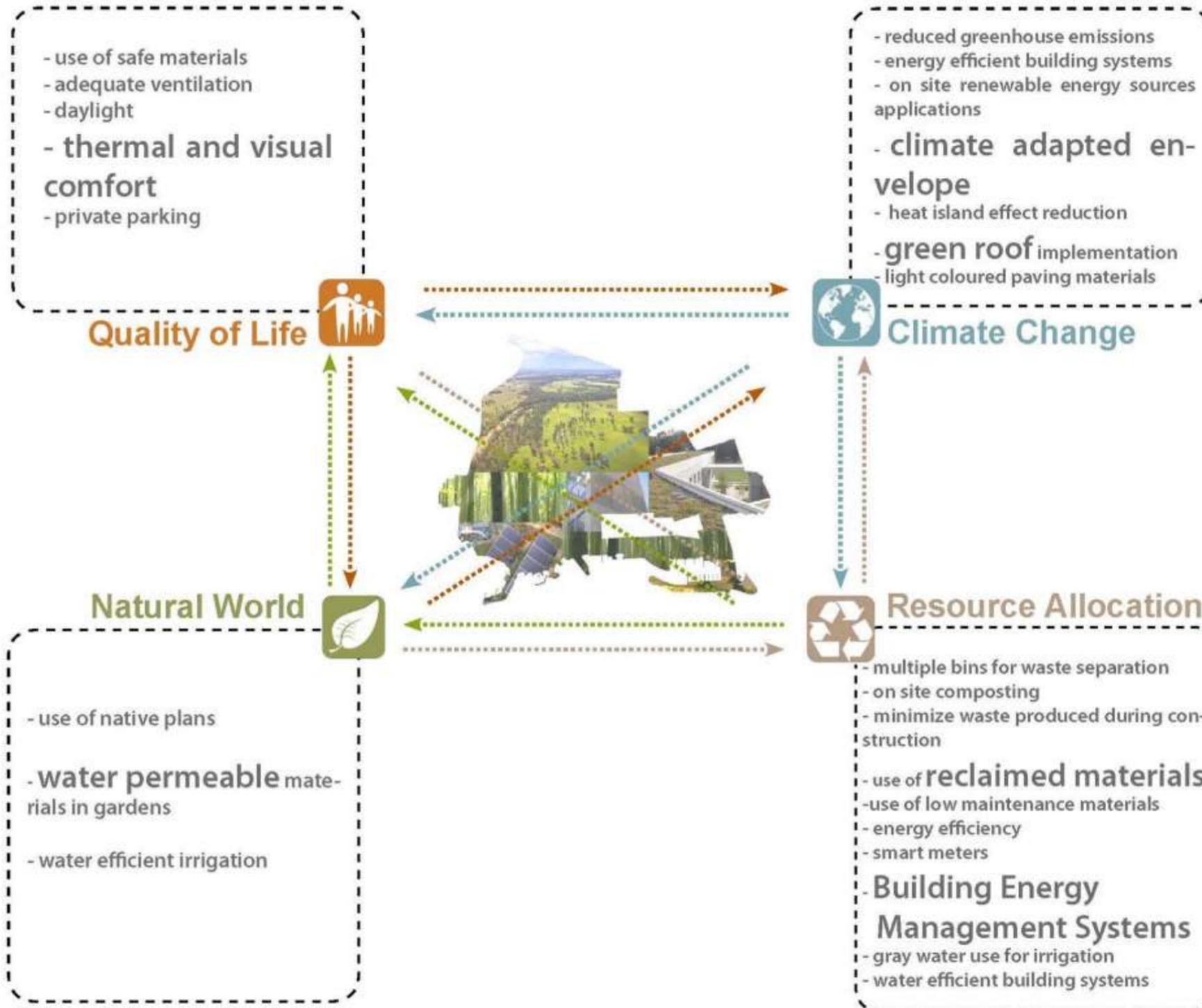
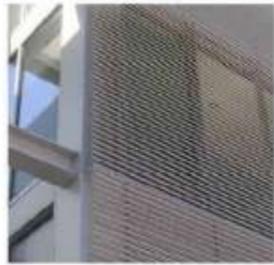


HELLINIKON URBAN MODEL | Sustainability

- The principles of sustainability will guide every action and decision through all the scales and phases.
- Emphasis will be given both to urban infrastructure and buildings





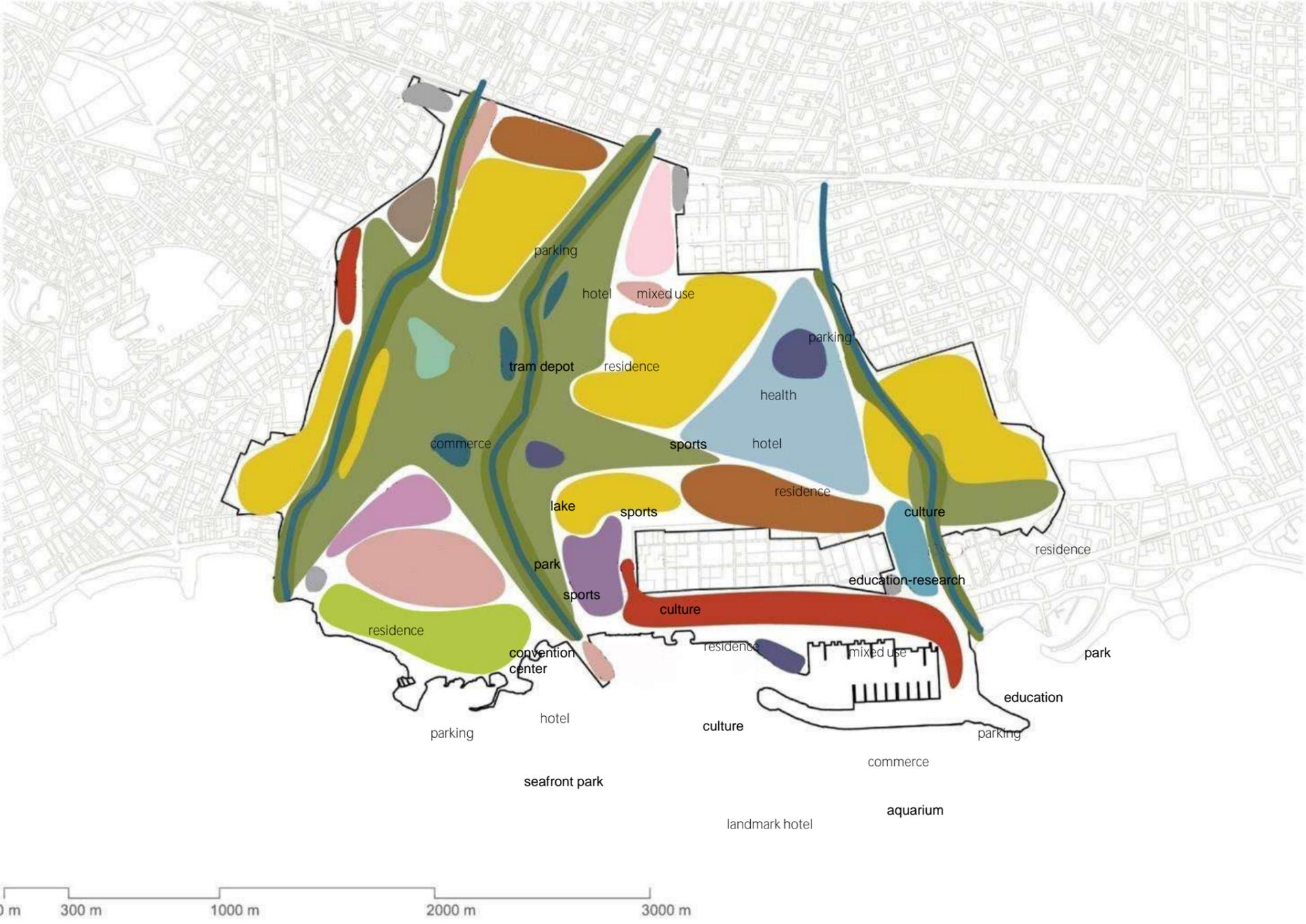




Quality of life



QUALITY OF LIFE | Mixed use development

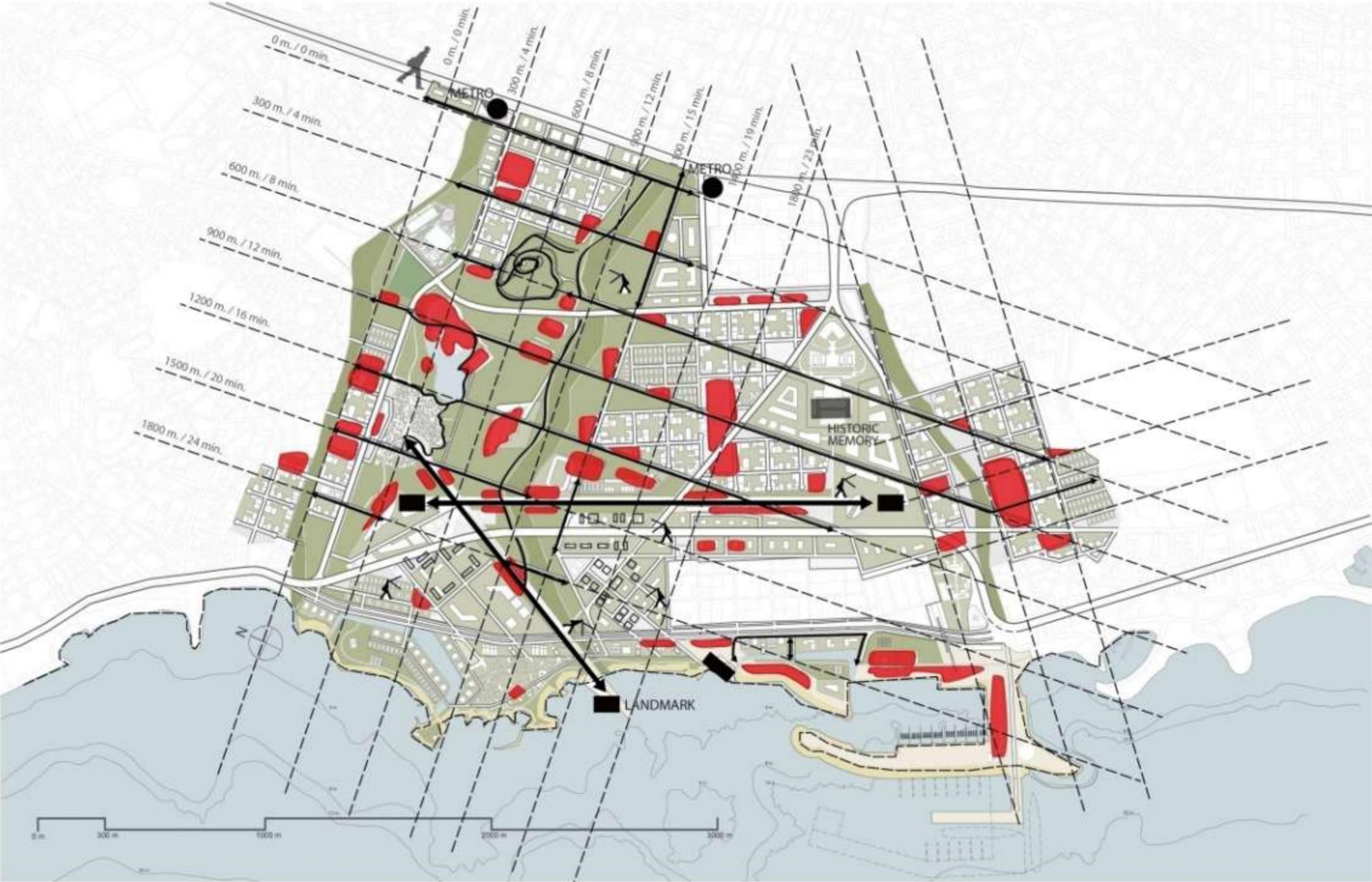


A mixed use development suggests a set of various land uses, which will provide a safe, stimulating, sustainable and self-sufficient environment. The combined uses will also create synergies boosting the economy and employment opportunities.

Access, Safety, Convenience, Financial development



QUALITY OF LIFE | Pedestrian network



A grid of 300mx300m (meaning 6 min walking distance) is suggested, where pedestrians can meet every 300m cultural or commercial activities in close proximity to the urban areas and other land uses.

This strategy enhances the sustainability awareness, minimizes car use and, at the same time, aims to develop a sense of safety to the pedestrians.

Access, Safety, Convenience, Wellbeing



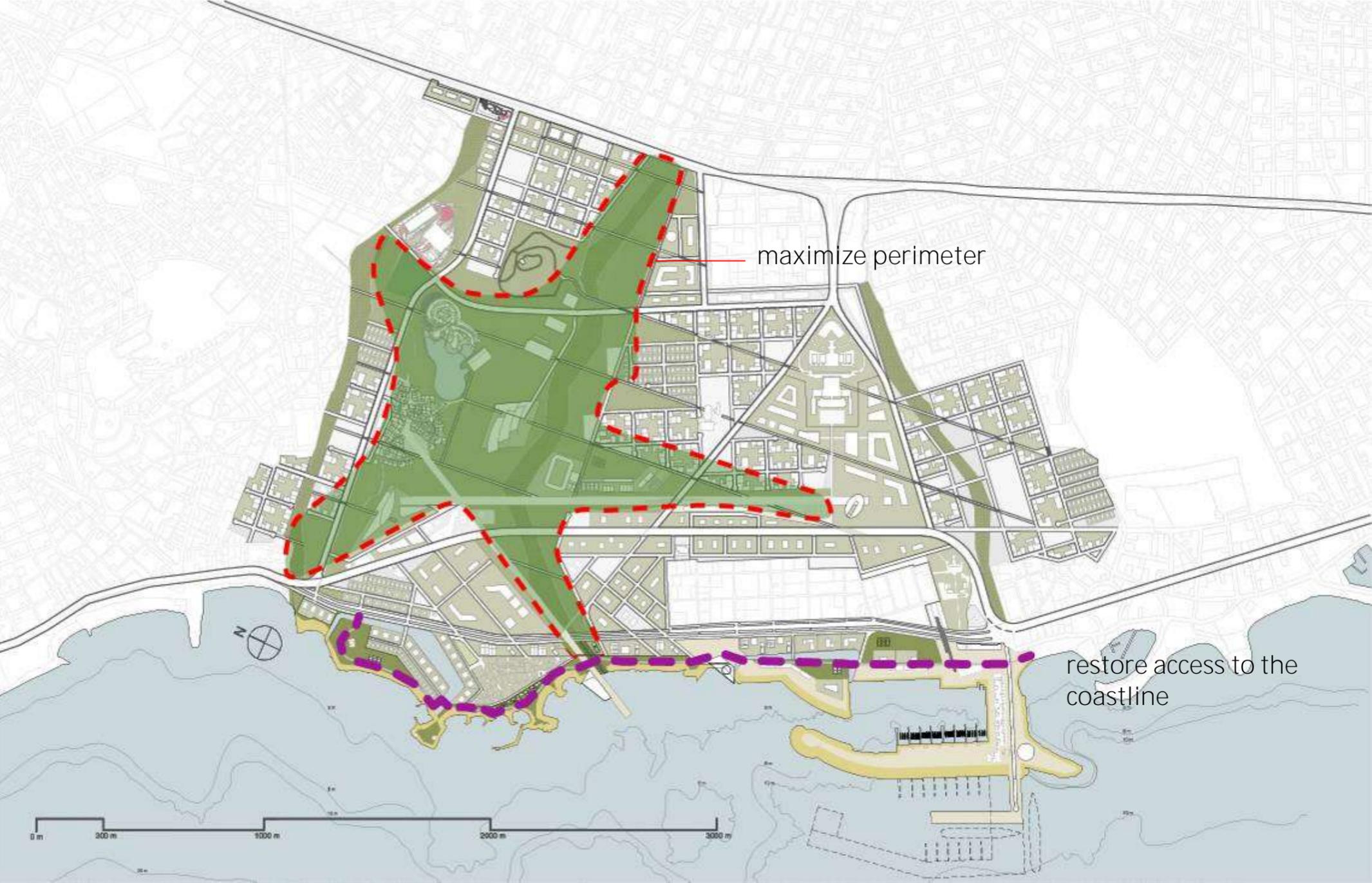
QUALITY OF LIFE | Maintained existing structures



Listed buildings are reused preserving the site's history and urban infrastructure is maintained saving resources required for its relocation.

Preservation of site's identity, preservation of public service infrastructure





Park: The starfish shape increases urban influence, safety and accessibility. The larger perimeter of the park will multiply the number and value of properties overlooking it. Additionally due to its greater proximity to built areas, the park's accessibility and the feeling of security will be increased.

Seaside promenade: restore the continuity of the coastline.

Extended access to sport venues, recreational and cultural facilities

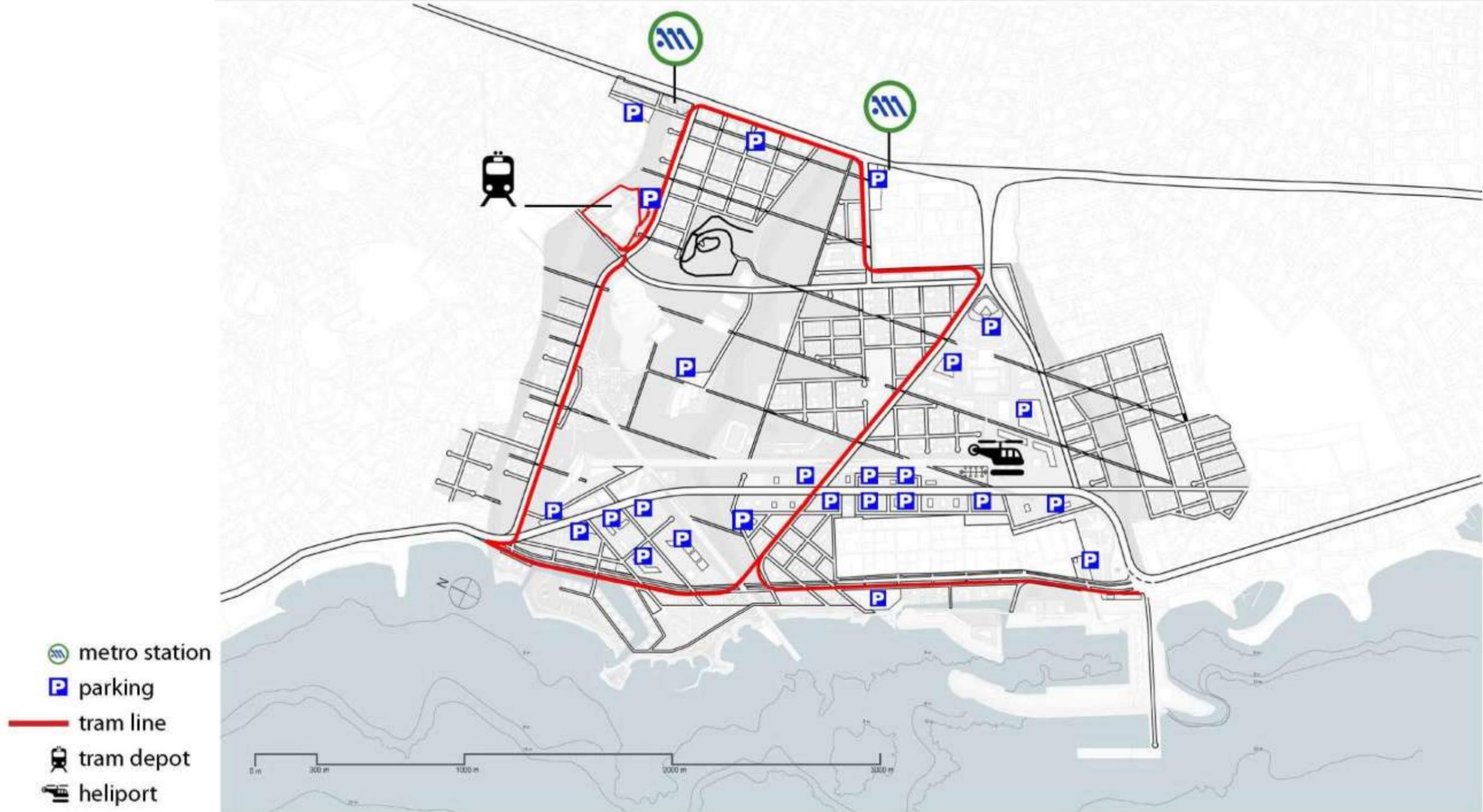
Improved air quality, Safety, Views





Climate change



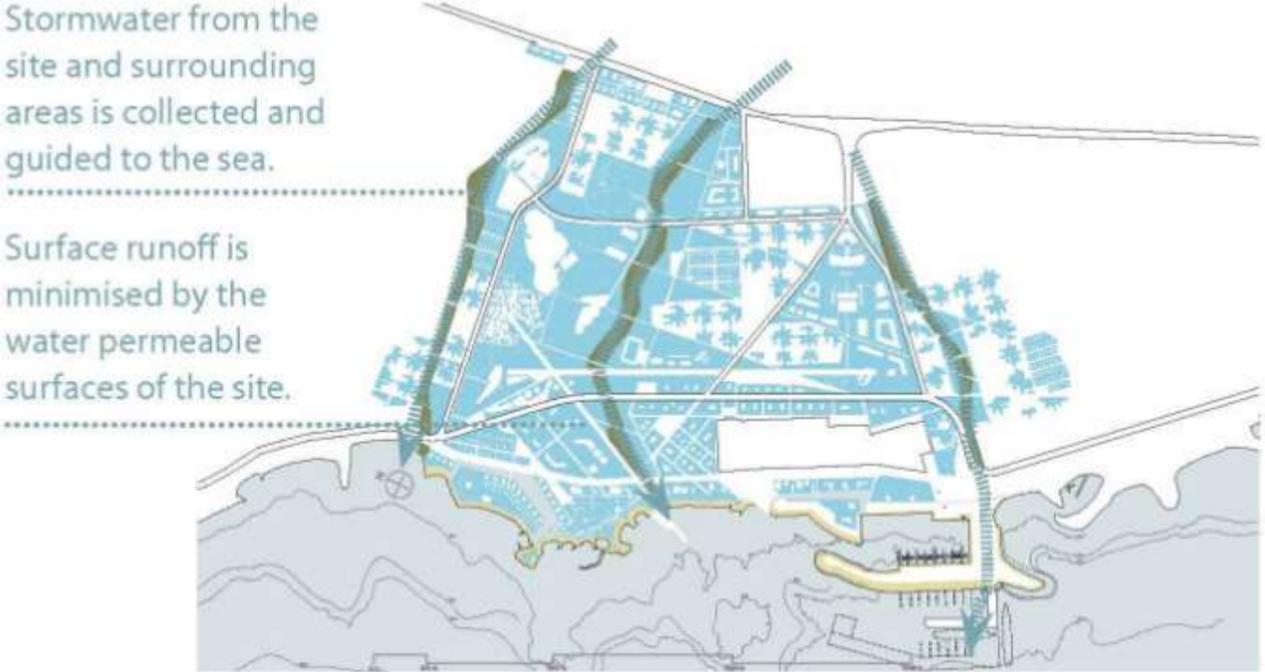


The development will promote a variety of transportation options aiming to maximize access to the site while minimising car usage and green house gas emissions. A sufficient number of parking areas will also be provided, based on demographic data estimations.

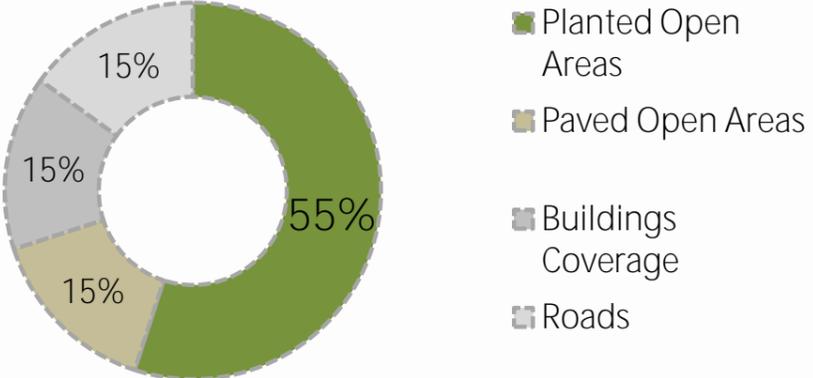
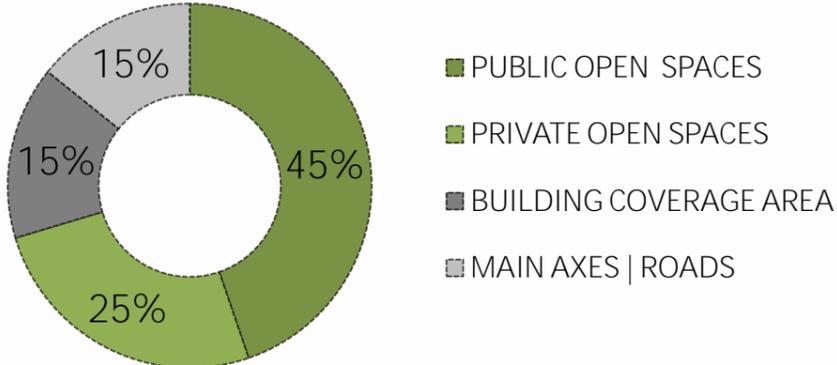
Reduce fossil fuel consumption and greenhouse emissions.



CLIMATE CHANGE | Planted areas and streams



Extended planted areas correspond to over 55% of the site:
 - surrounding air is cooled through evapotranspiration
 - less heat is stored within the urban fabric.



A new central stream is added to the existing ones. Extended buffer zones are created around all the streams. The softscapes of the site allow the absorbance of large quantities of rain water.

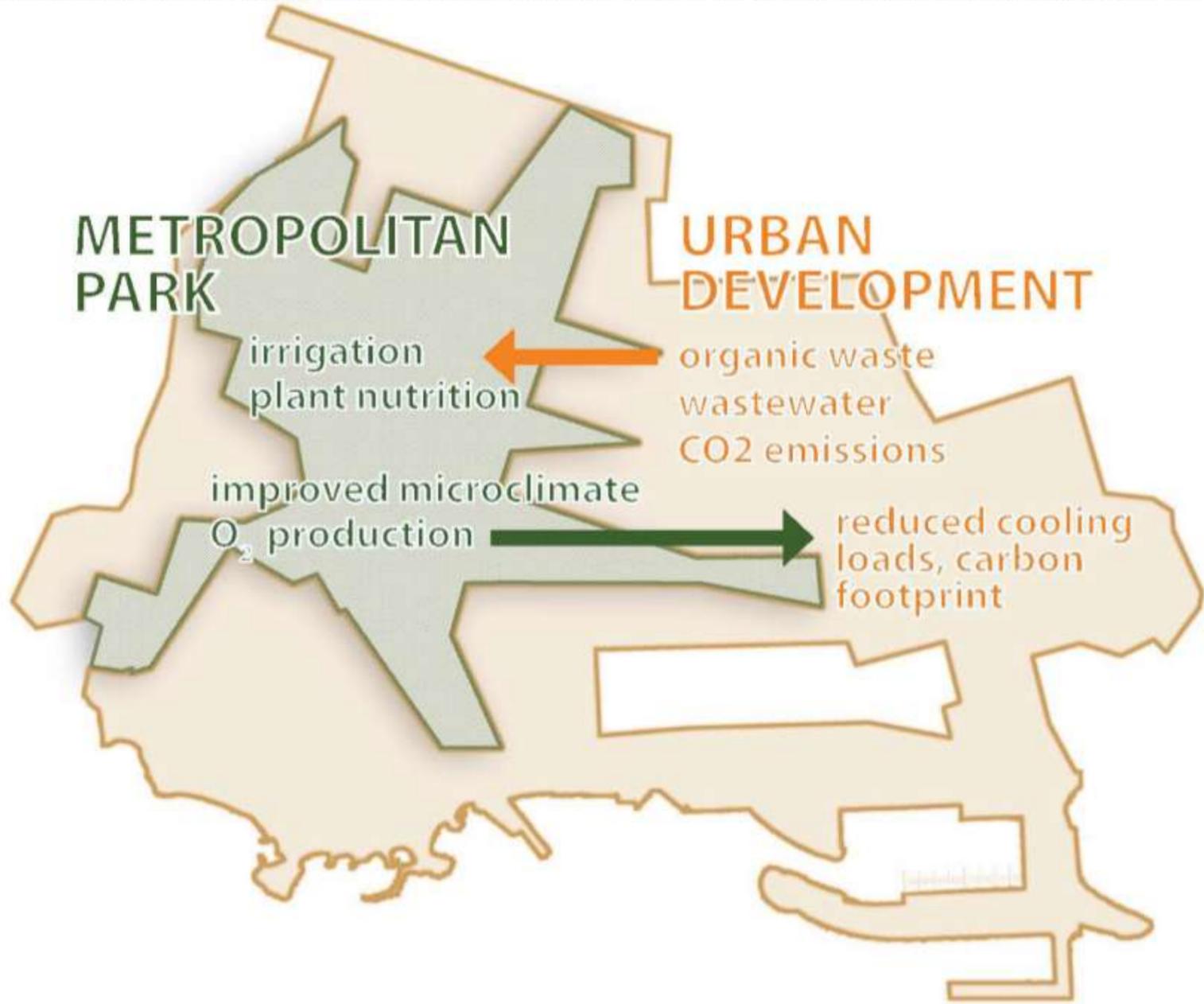




Resource Allocation



WASTE & WATER



- Create a resources balance within the site
- Preserve potable water
- Diverse waste from landfills
- Reduce volume of materials transported to and from the site





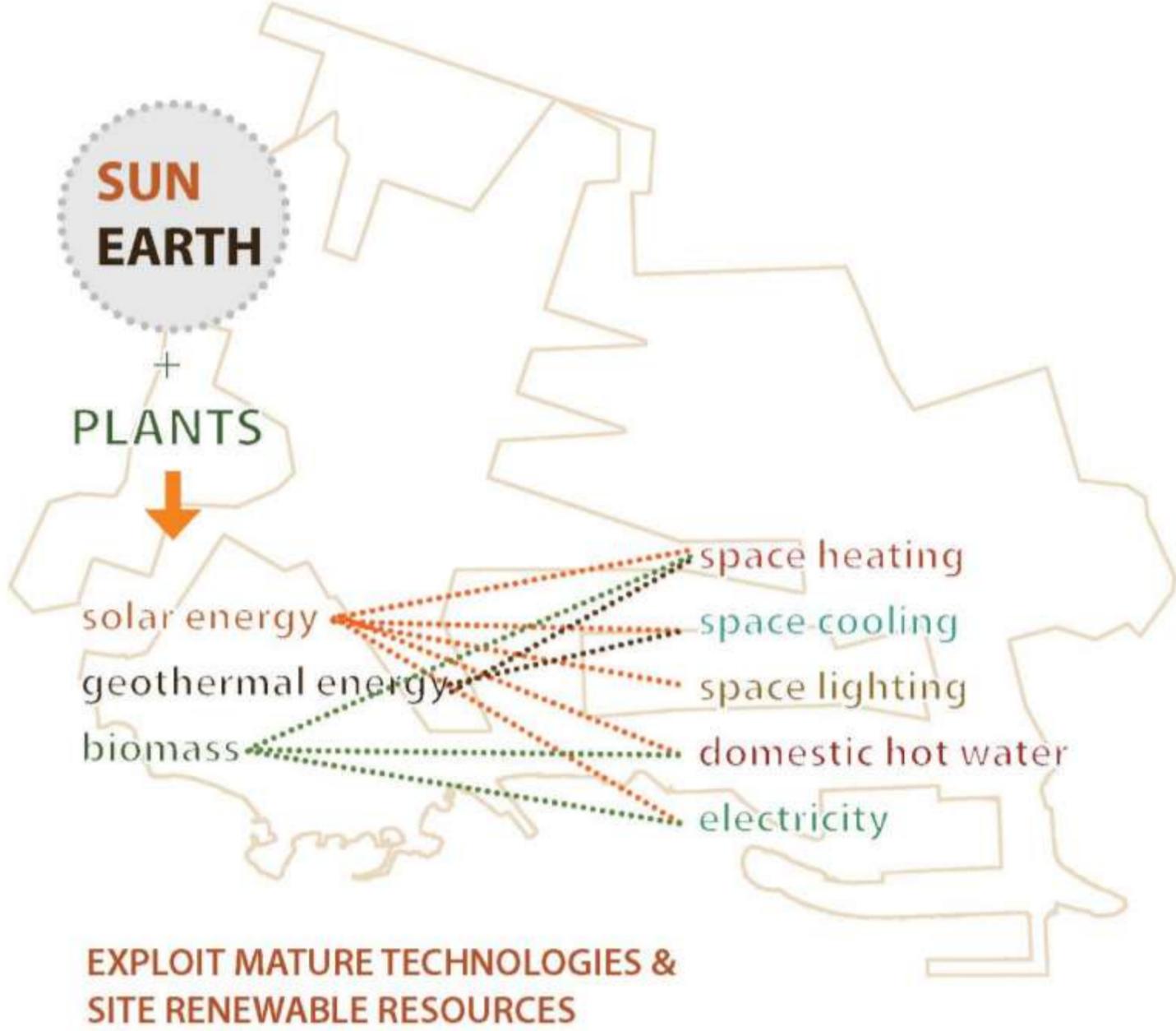
On site waste and waste-water treatment facilities aim to the self-sufficiency of the development and the minimisation of its environmental impact. Their location is intentionally close to public spaces in order to promote sustainability awareness.

- promote sustainability awareness
- minimise impact on existing urban infrastructure



RESOURCE ALLOCATION | Energy production and management strategy

ENERGY



EXPLOIT MATURE TECHNOLOGIES & SITE RENEWABLE RESOURCES

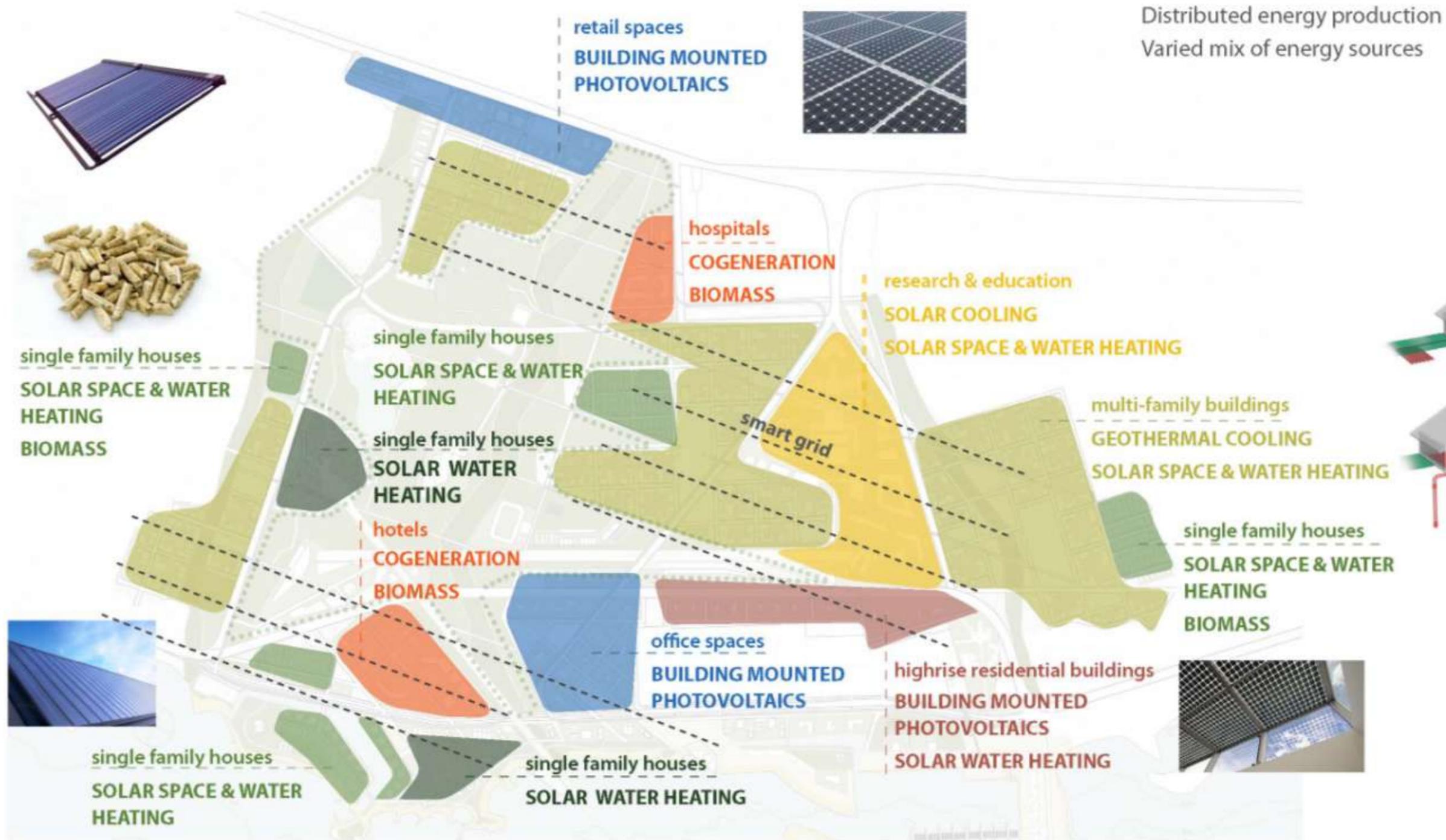


Minimise energy demand
Maximise renewable energy sources use

promote sustainability awareness
minimise impact on existing urban infrastructure
minimise use of non-renewable resources



RESOURCE ALLOCATION | Energy production and management strategy





Natural World



Hellinikon SA

NATURAL WORLD | Vegetation



Planting of Trees



Planting cluster of shrubs as a design synthesis tool for circulation and for constructing topography



Planning of Grass Surfaces and possible meadows



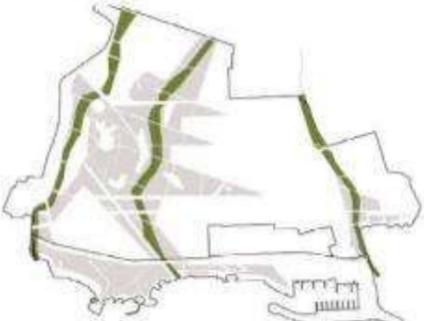
Planting of the coastal zone



- Mediterranean vegetation with climate adapted plants:
- low needs for fertilizer and water
 - prevent surface and ground water contamination
 - distinctive Mediterranean identity for the site and development



Streams

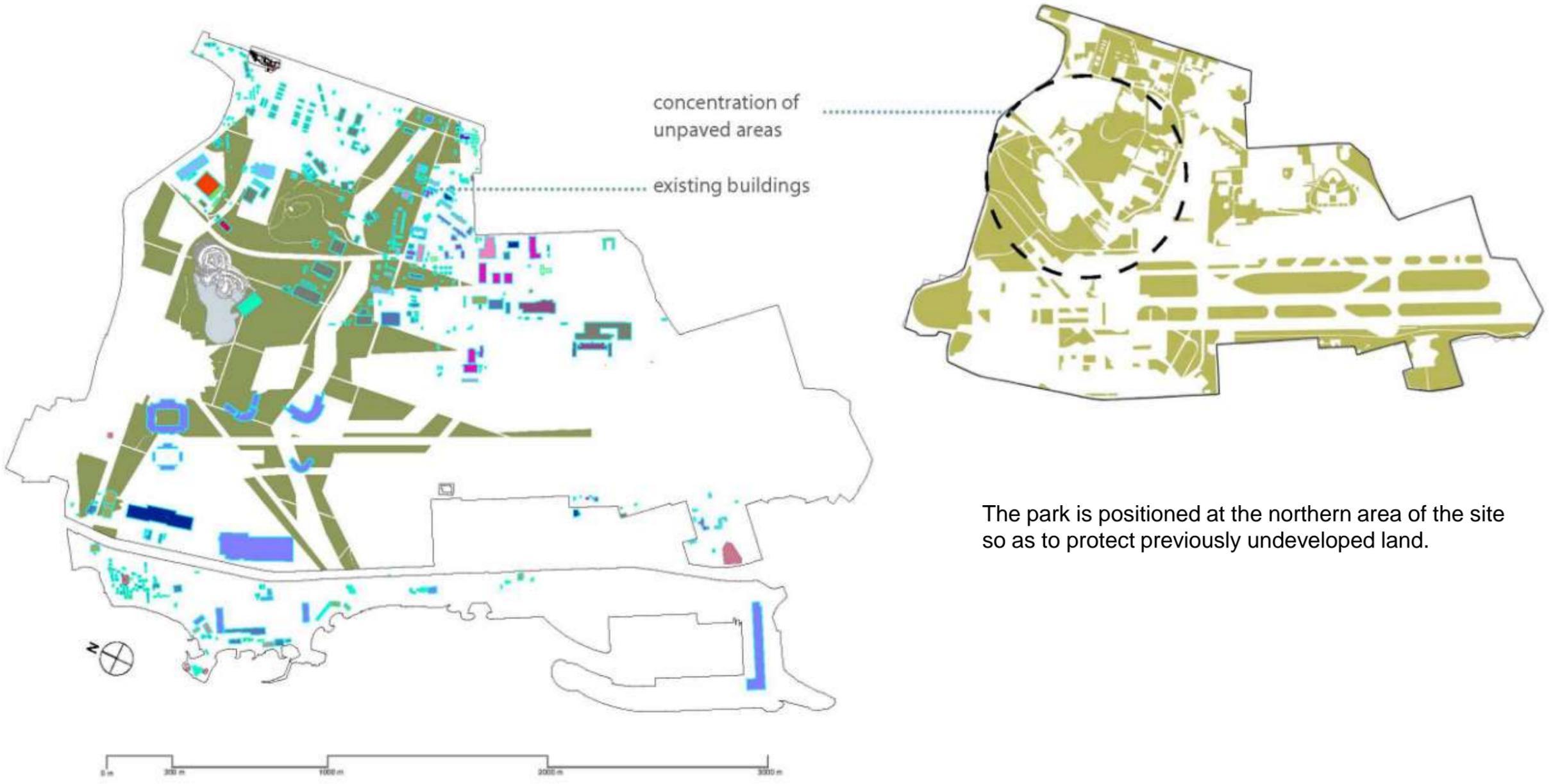


Linear and dense planting on the bank of the streams
Differentiation of the Topography
Water reservoirs



Park and stream combined increase the area and connectivity of habitats.
Vegetation buffers are created around streams.
Wildlife corridors between sea and mountain are expanded





URBAN MODEL



URBAN MODEL



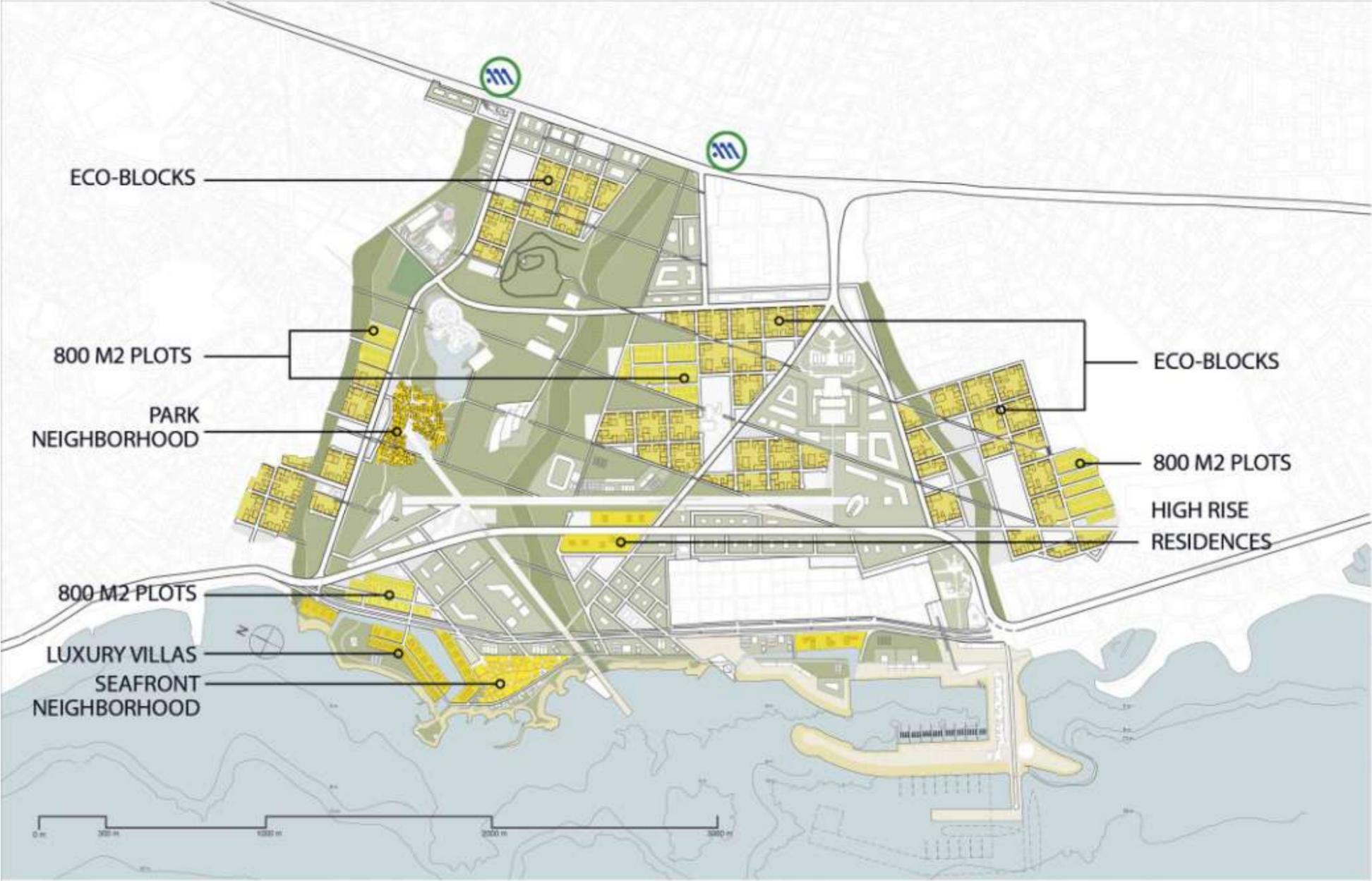
Hellinikon SA





Residential areas

RESIDENTIAL AREAS | Overview



A wide variety of residential typologies provide for a potent business plan and a diverse, safe community.



RESIDENTIAL AREAS | Eco blocks



	LAND USE	PLOT AREA	% TO RESIDENTIAL PLOT AREA	GFA	% to TOTAL RESIDENTIAL BUILT
RESIDENCE	ECOBLOCKS	664.923	60%	1.329.846	75%
	HIGH RISE RESIDENCE	44.125	4%	213.259	12%
	HIGH RISE RESIDENCE with Services	54.257	5%	54.257	3%
	RESIDENTIAL PLOTS	230.700	21%	113.797	6%
	MARINA RESIDENTIAL PLOTS	108.590	10%	70.684	4%
	TOTAL RESIDENTIAL PLOTS	1.102.596		1.781.843	





Hellinikon urban model



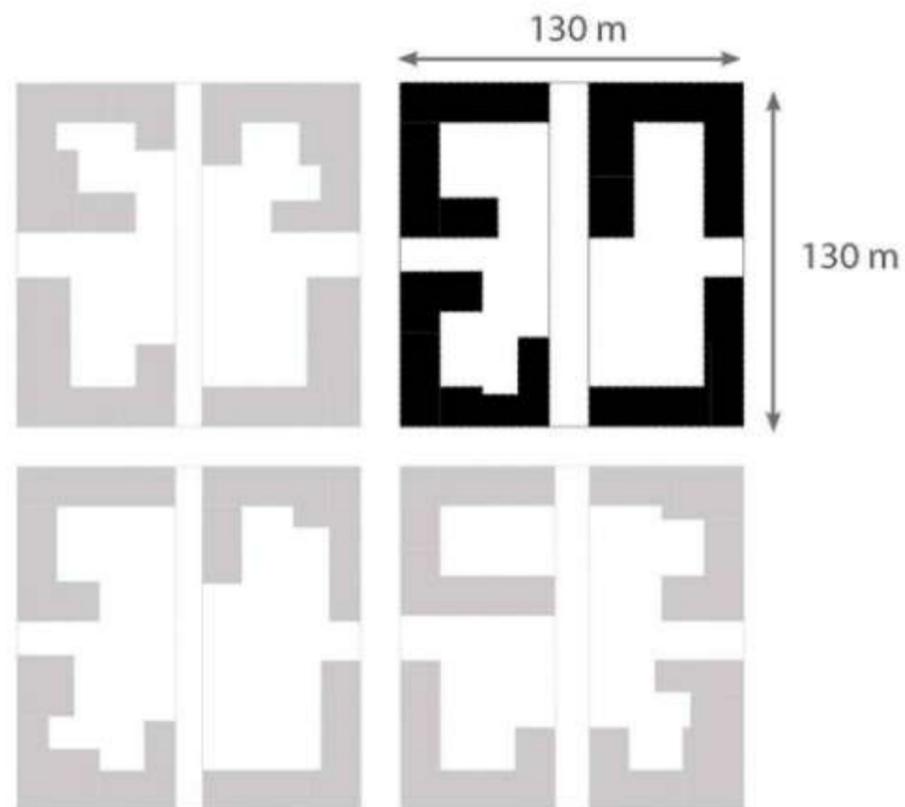
Barcelona



Elliniko municipality



Ecoblocks: a new **typology** of urban blocks

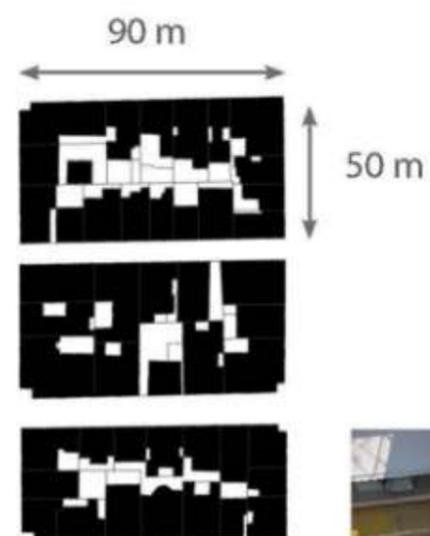


housing units organised a semi-private **courtyard**
maximum plot coverage: 50%
Gross Floor Area factor: 2.0



maximise benefits of open public space
mitigate urban heat island effect
reduce green house emissions

A **typical** urban block from Athens' centre



open space view

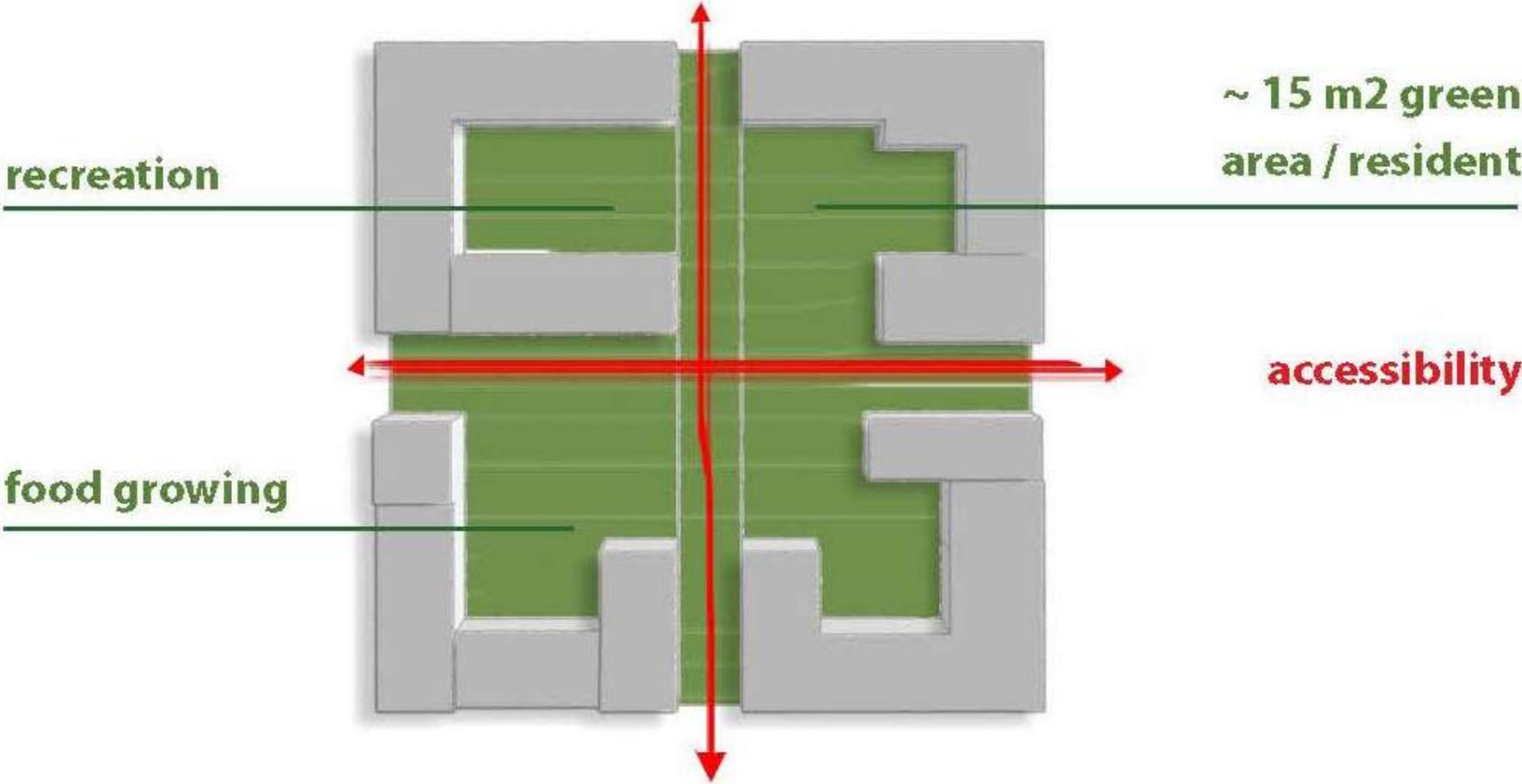


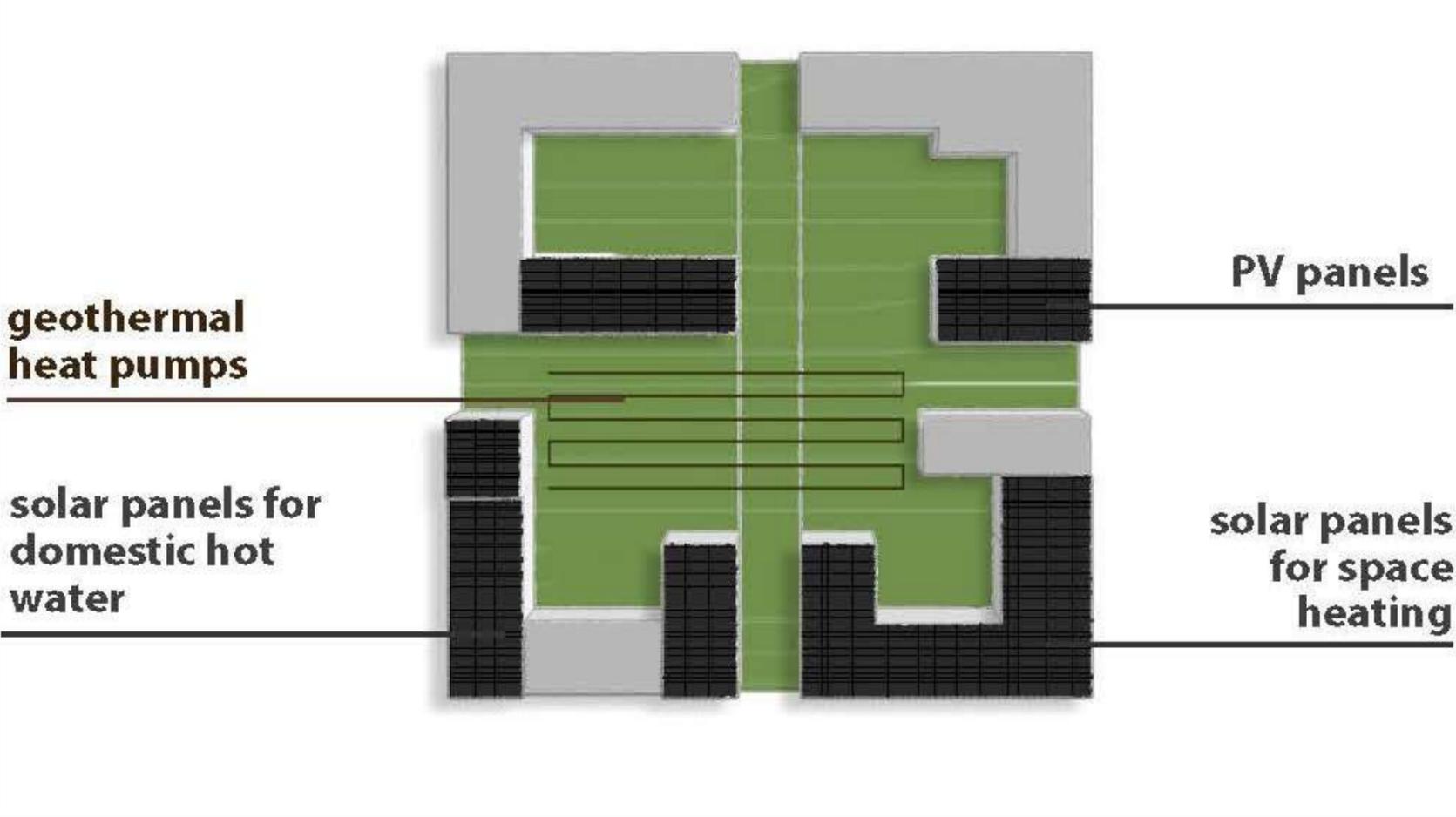
buildings constructed on **individual plots**
plot coverage ~ 70%
Gross Floor Area ~ 3.2

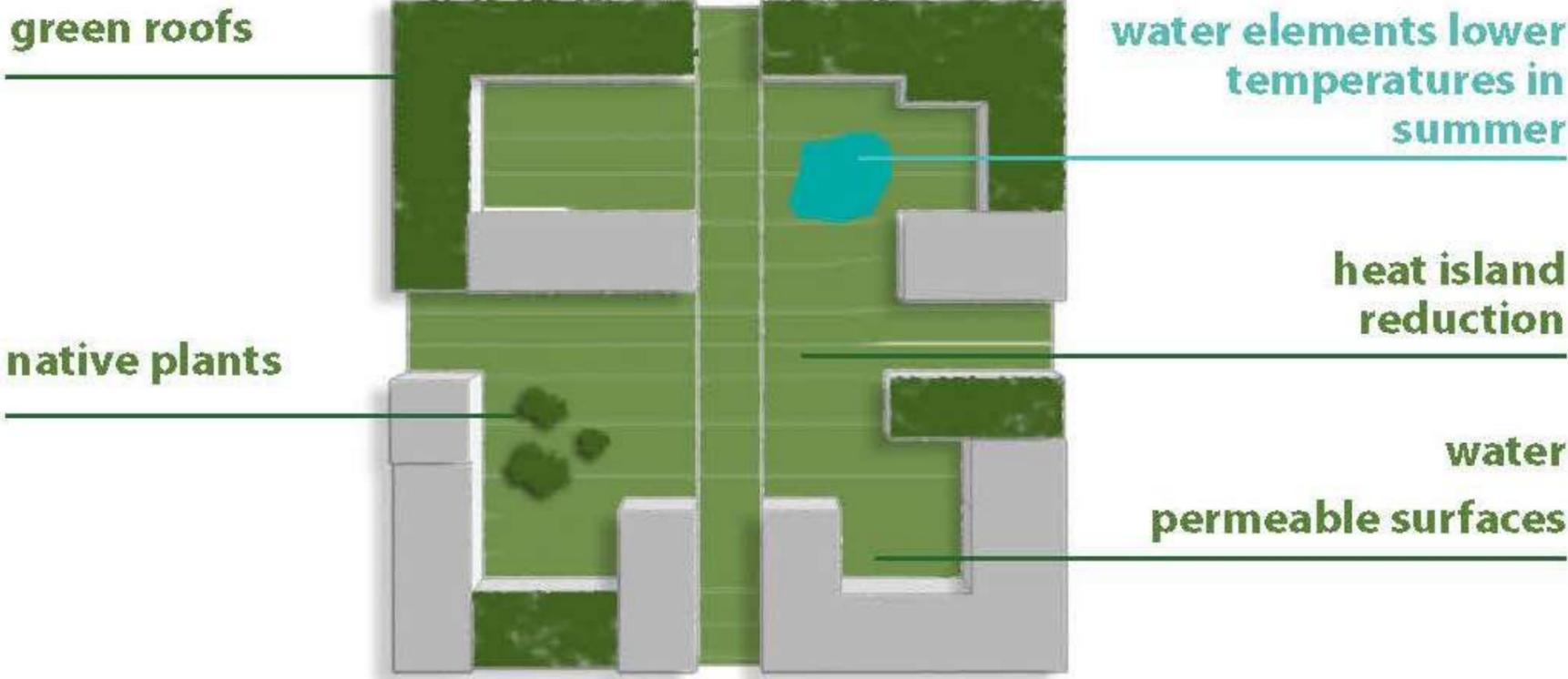


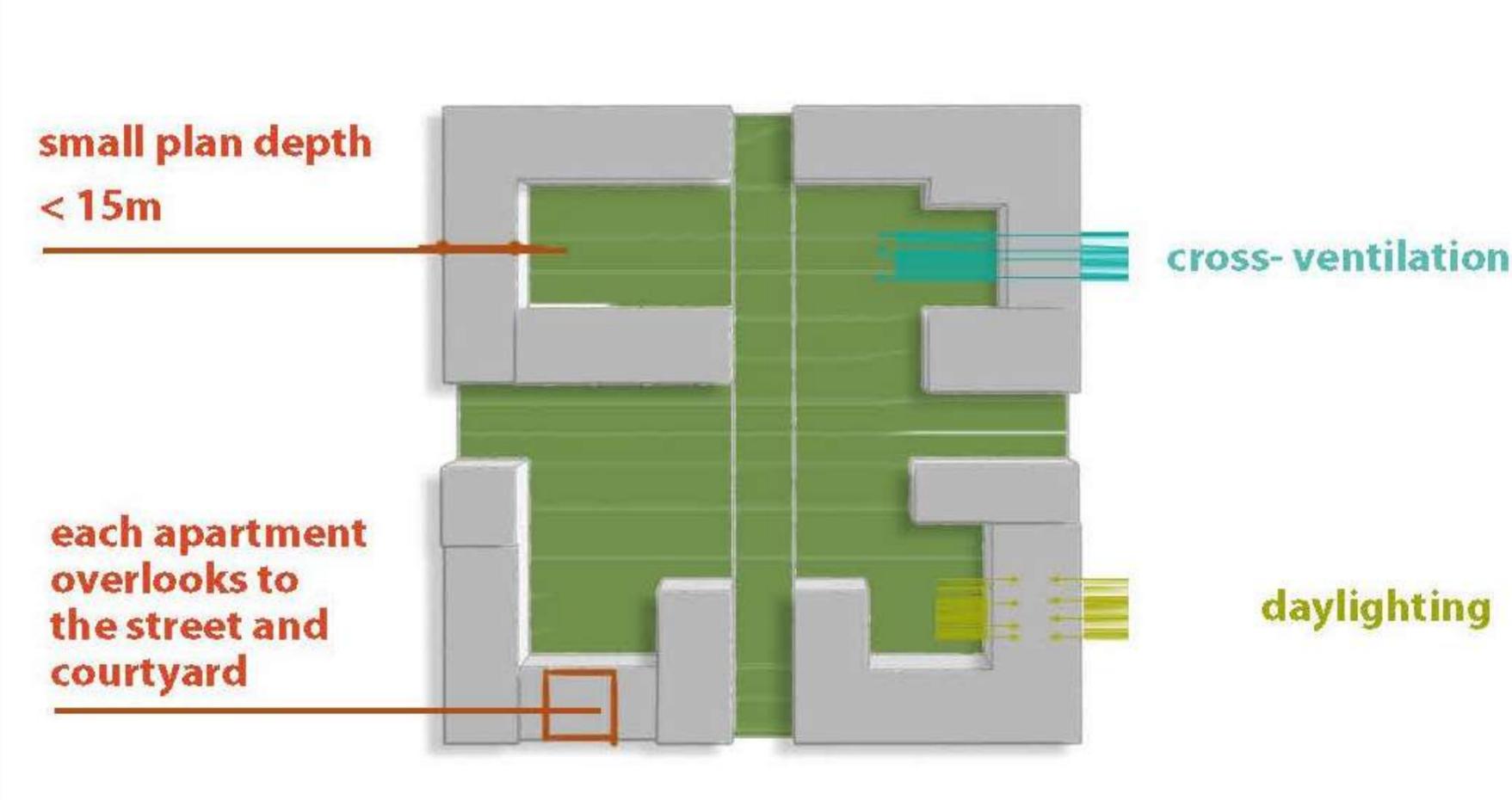
fragmentation of open urban space
isolated deteriorating spaces





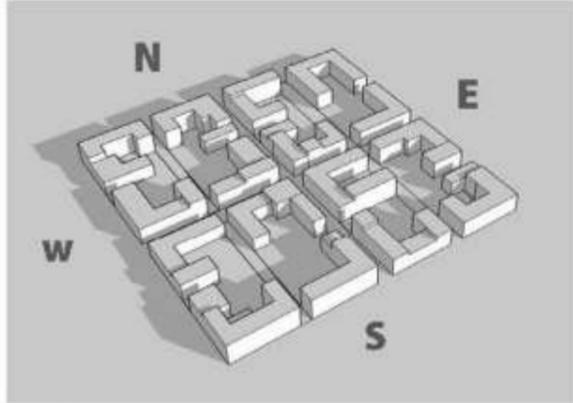




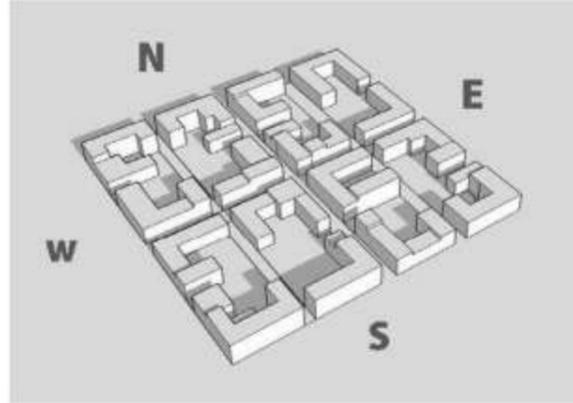


RESIDENTIAL AREAS | Eco blocks solar access

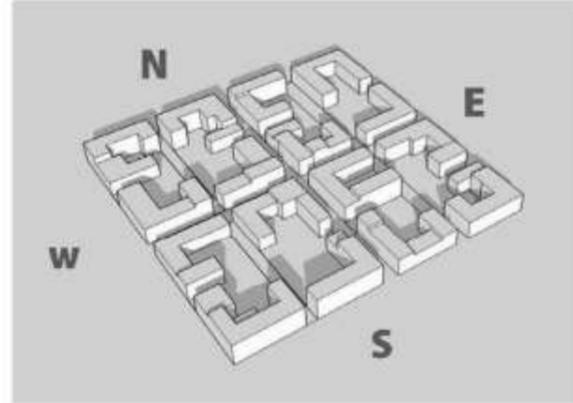
Winter solstice - 21 December



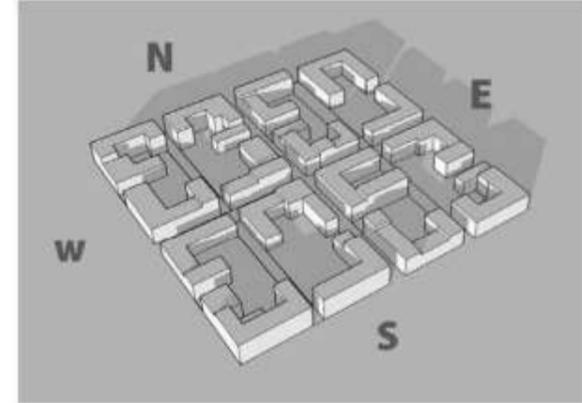
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12:00

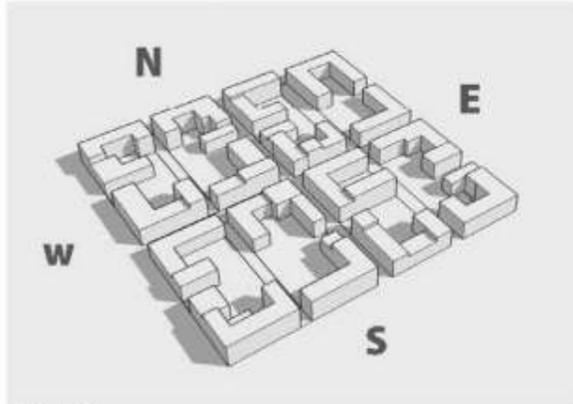


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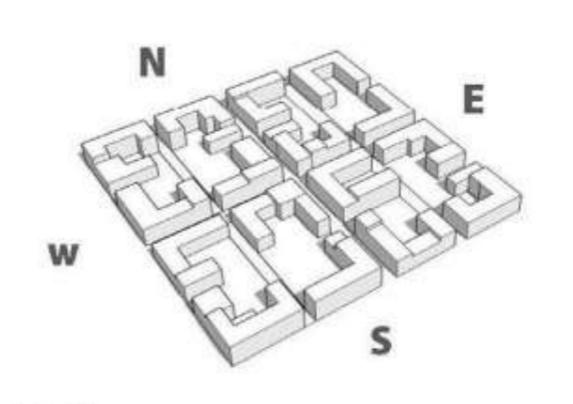


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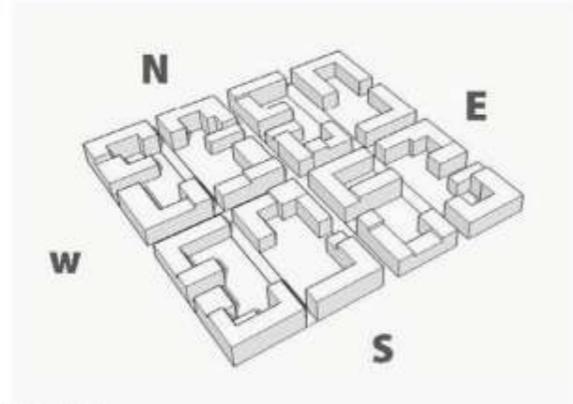
Autumn equinox - 21 March



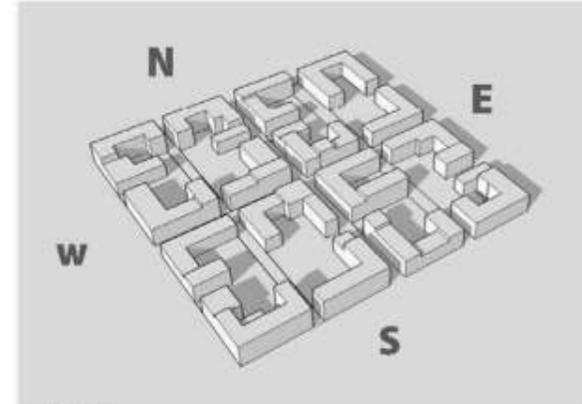
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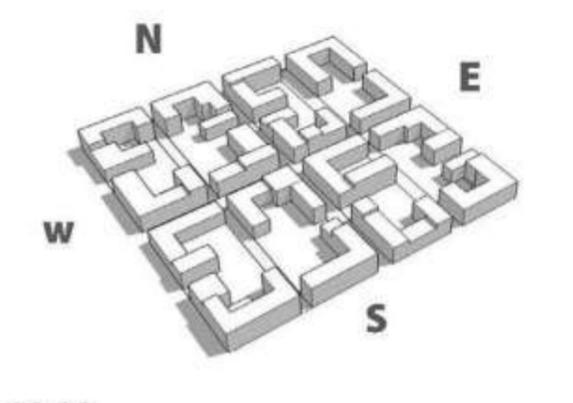


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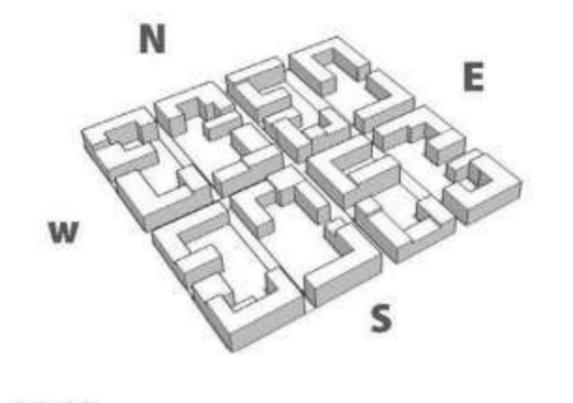


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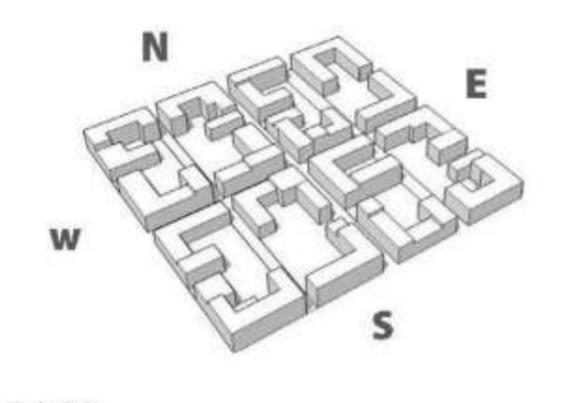
Summer solstice - 21 June



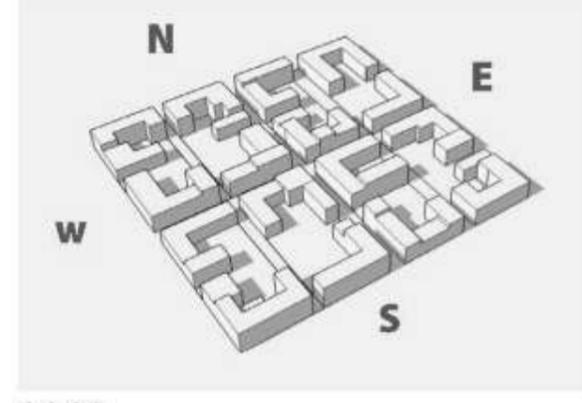
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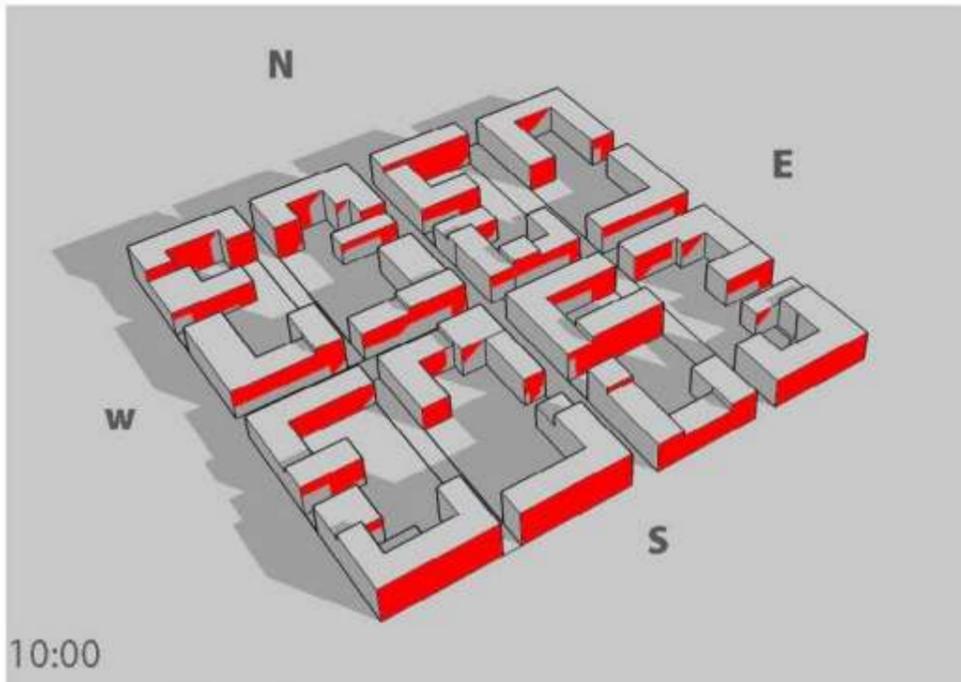
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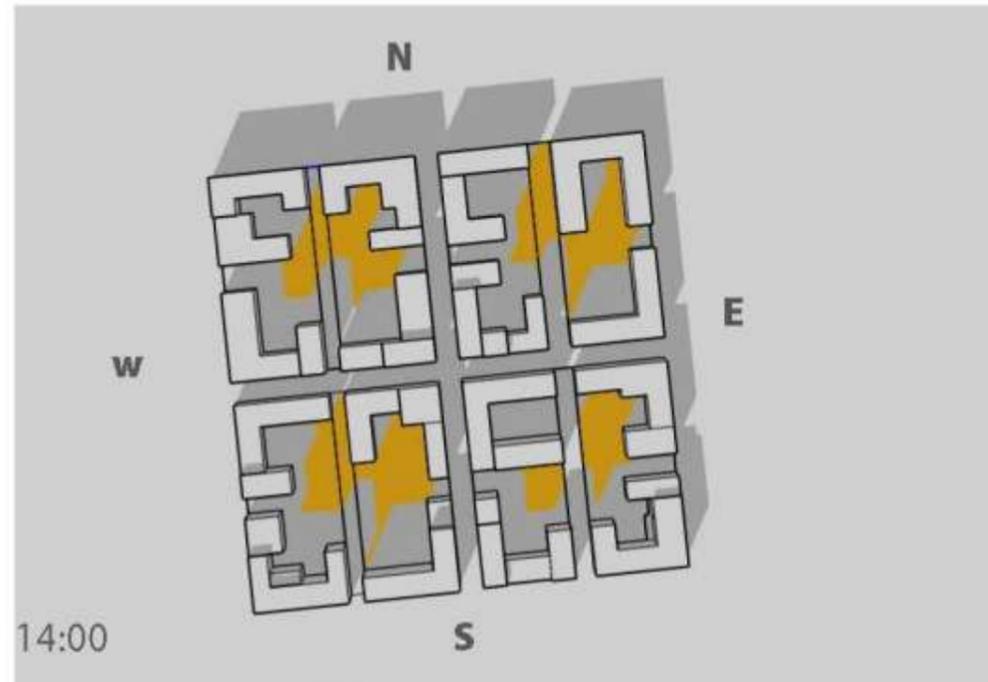
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Winter worst case scenario: 21 December

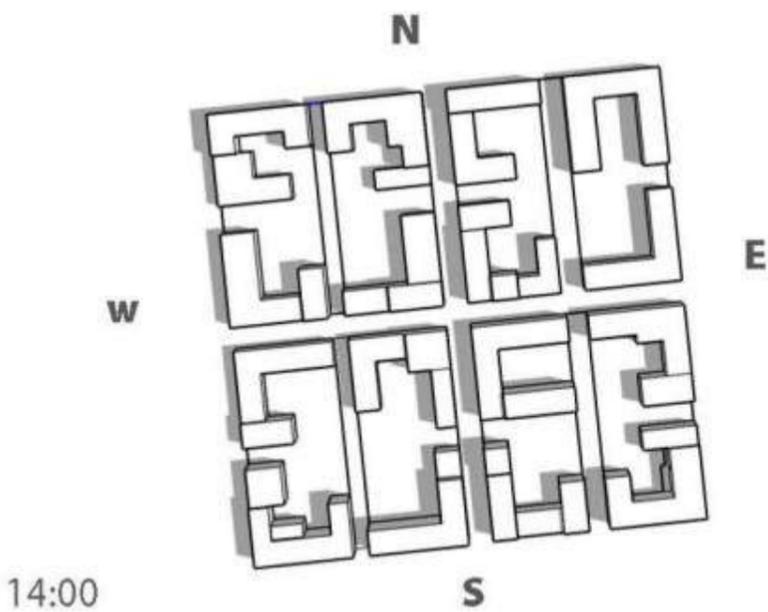


Most **south surfaces** can be exposed to the sun



Large **parts of the courtyard** can have solar access

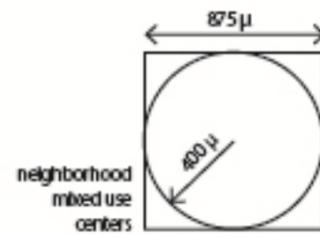
Summer worst case scenario: 21 June



Enclosed shape ensures that parts of the courtyard are always shaded



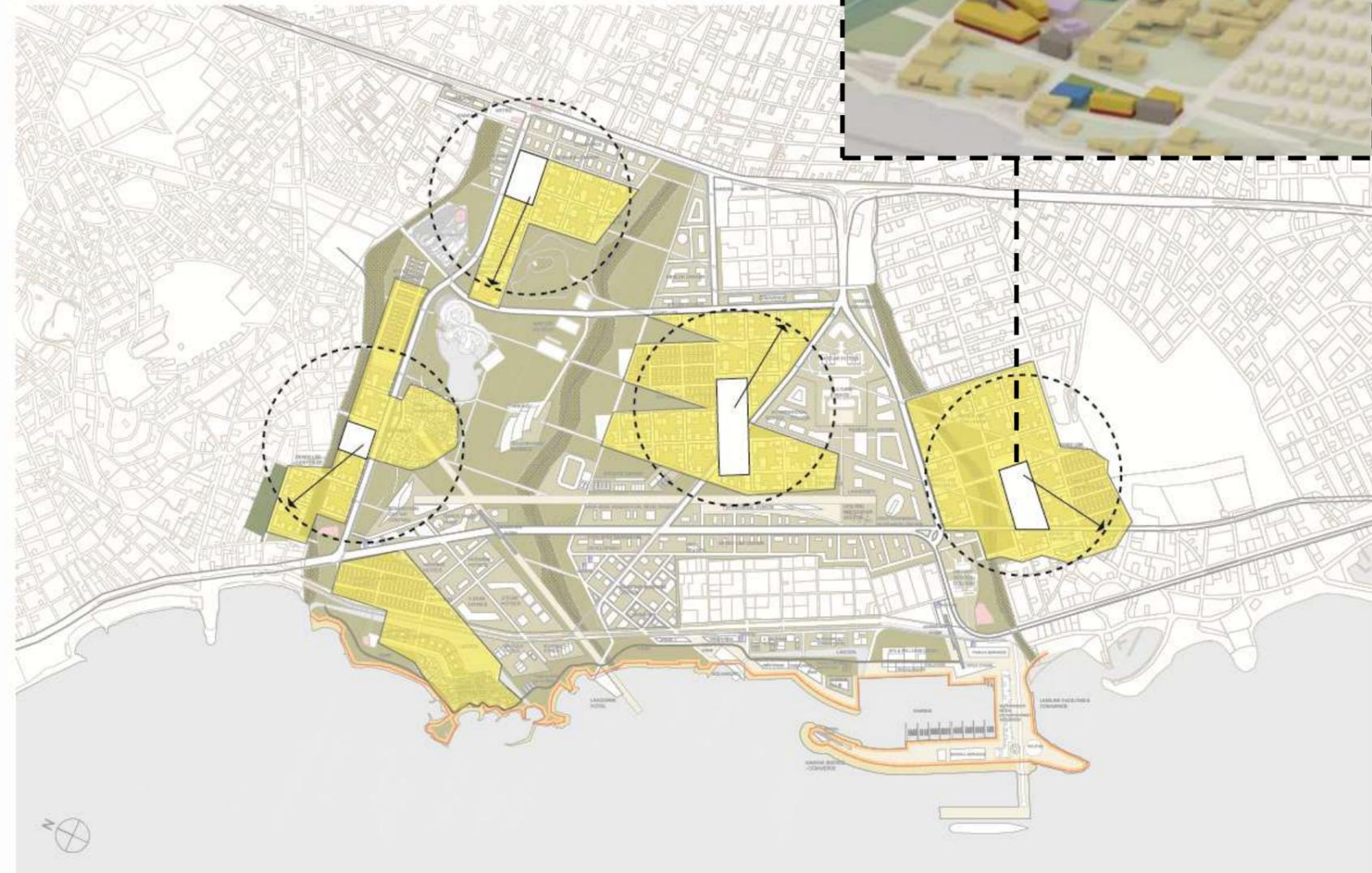
RESIDENTIAL AREAS | Neighborhood centers



Different types of mixed used centers are located within walking distance in each neighborhood.

The centers house a range of amenities and services:

- School complex (daycare center, kindergarten, primary and secondary school)
- Retail area
- Community amenities and closed public spaces
- Car parking buildings
- Athletic center
- Playground
- Park



RESIDENTIAL AREAS | Local centers

Smaller mixed used centers are located within walking distance in each cluster.

The centers house a range of amenities and services:

- Local school complex (daycare center and kindergarten)
- Small retail area
- Car parking buildings
- Playground
- Park





The former Hellinikon Airport area constitutes a unique site and an excellent opportunity for a multi-level development project with an international appeal.

