GRECO-PIRELLI RE-GREENERATION

POLITECNICO DI MILANO - Polo Territoriale di Lecco
Master of science in Architectutal Engineering

SMDP - Sustainable Multi-disciplinary Planning Studio 2018-2019
Prof. Massimo Tadi & Nolesini Franck

GROUP N.13

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SheikhHassani Navid
Tabatabaei Ailin
Tajik Ramyar



OUTLINE

INTRODUCTION & LOCALIZATION

IMM METHODOLOGY ANALYSIS

OBJECTIVES

URBAN DESIGN

CONCEPT PLAN

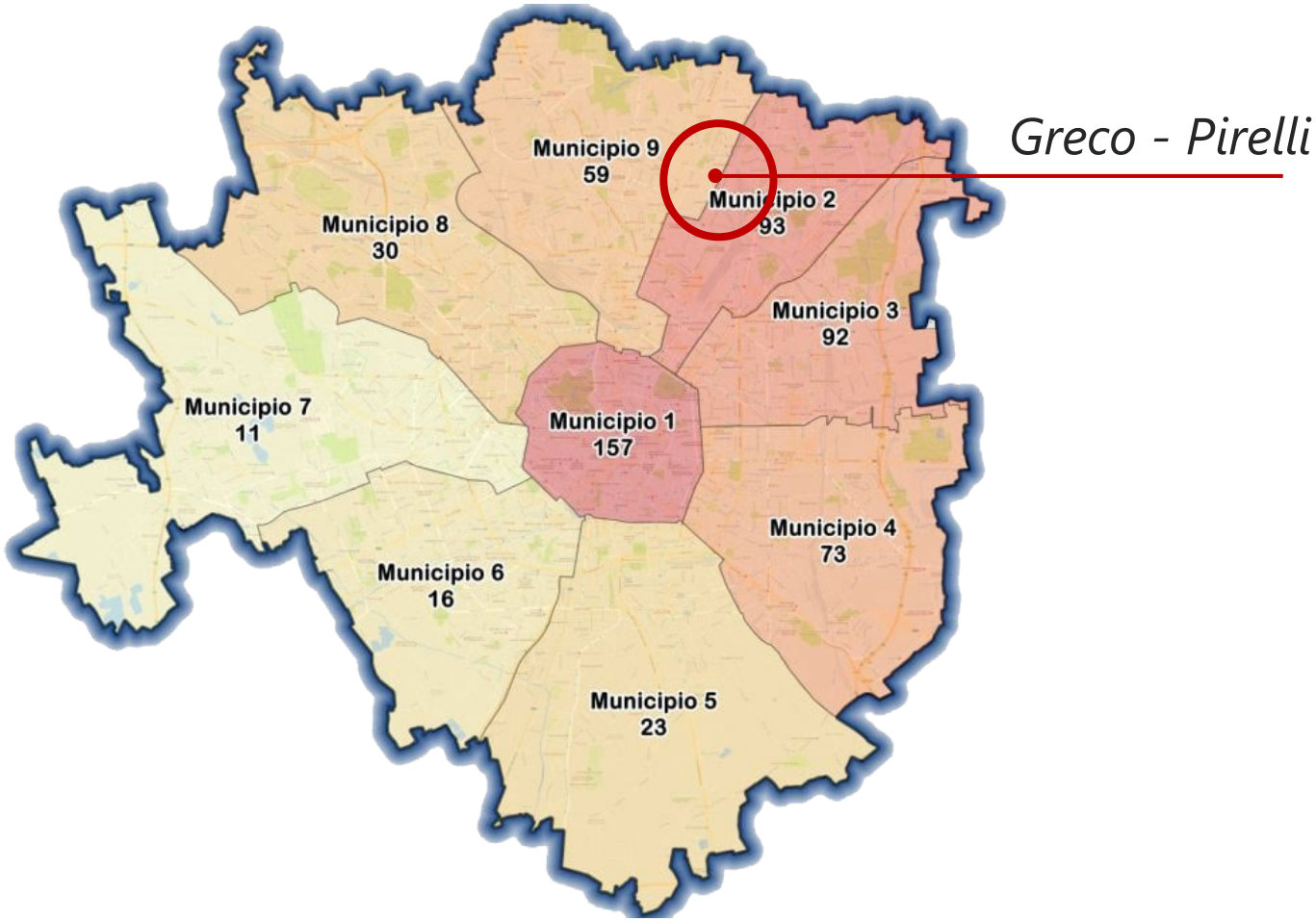
ARCHITECTURAL DESING

TECHNOLOGICAL DESING

PROJECT LOCATION



Milano district map



Regione Lombardia

Comune di Milano

1948

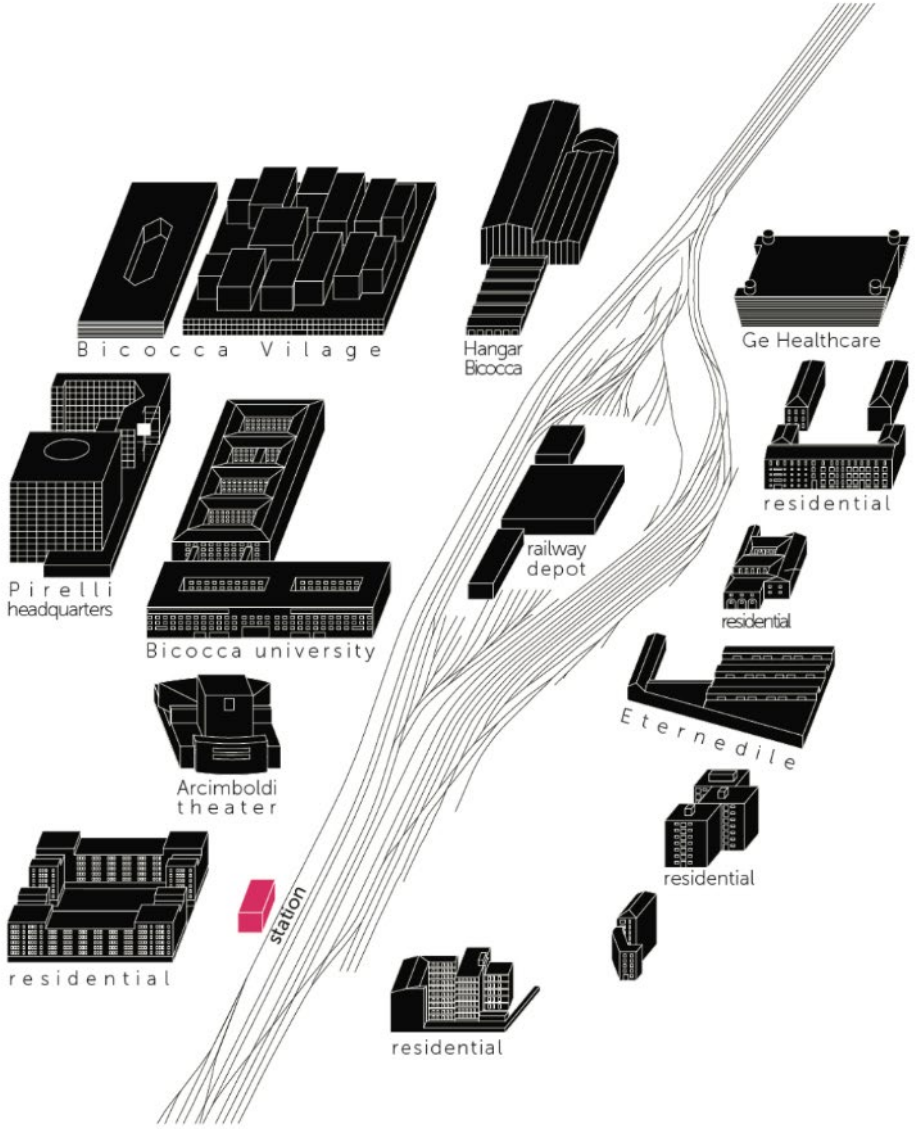


Milano, Pirelli

GENERAL OVERVIEW



- Hangar Bicocca
- Industries
- Bicocca Village
- Sports center
- Pirelli headquarters
- Bicocca university
- Arcimboldi theater
- Residential
- Greco-Breda railway
- spatial cesures



SITE VISIT



SPEAKING WITH LOCAL PEOPLE…

'Lack of public services in Precotto'

'Traffic jam due to lack of street that over cross the station'

'Parco Nord is not comfortable to reach by walk or bike'

'Precotto's green areas are badly managed'

'Station underground passage is not safe during night time'

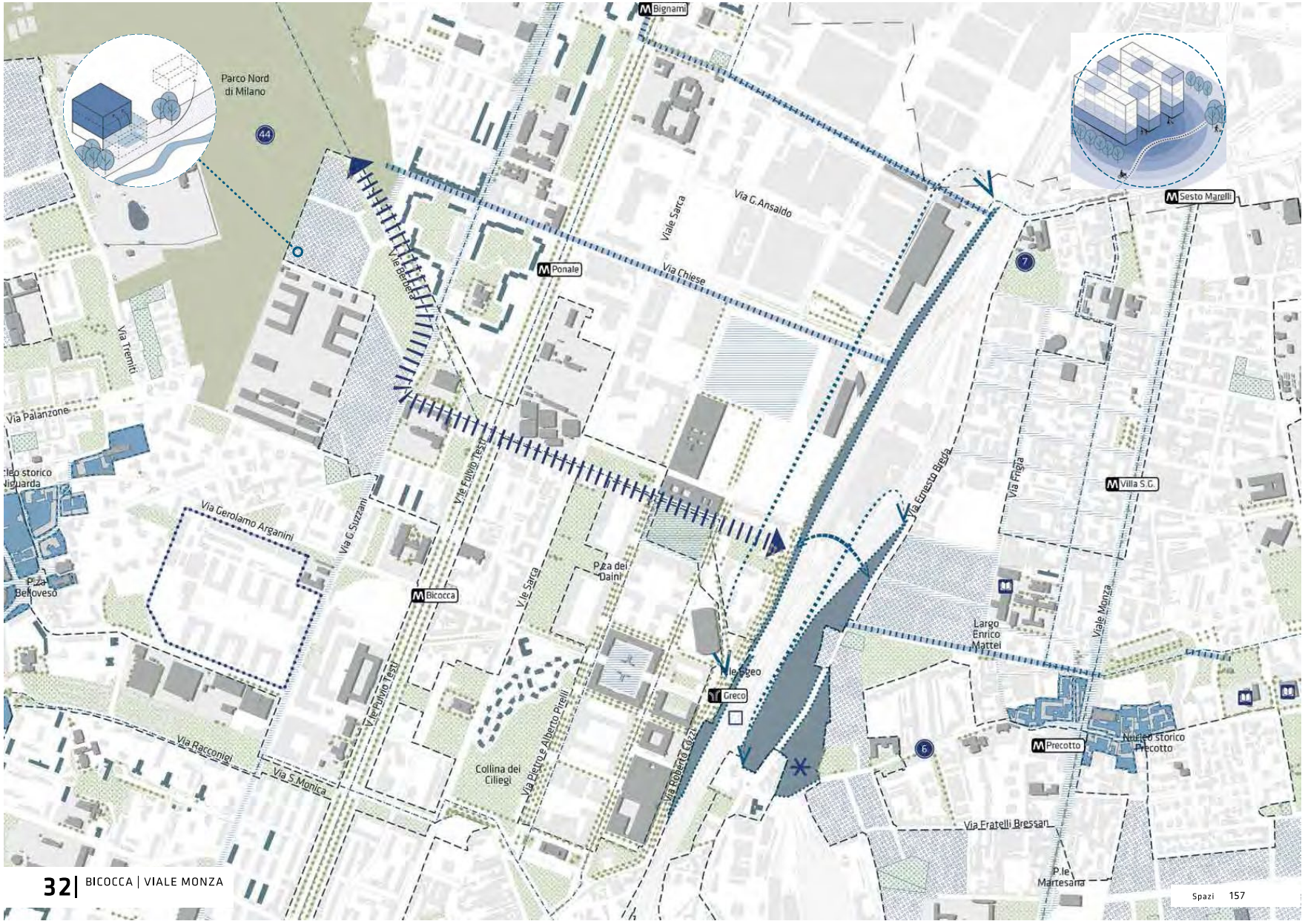






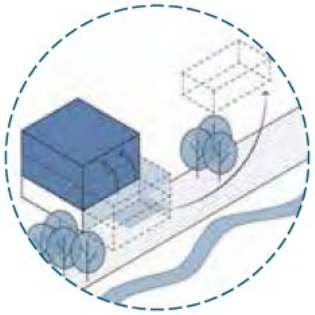
PLANNED PROJECTS

MILANO 2030

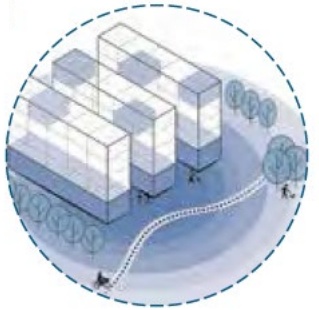


MAIN OBJECTIVES

Environmental Regeneration



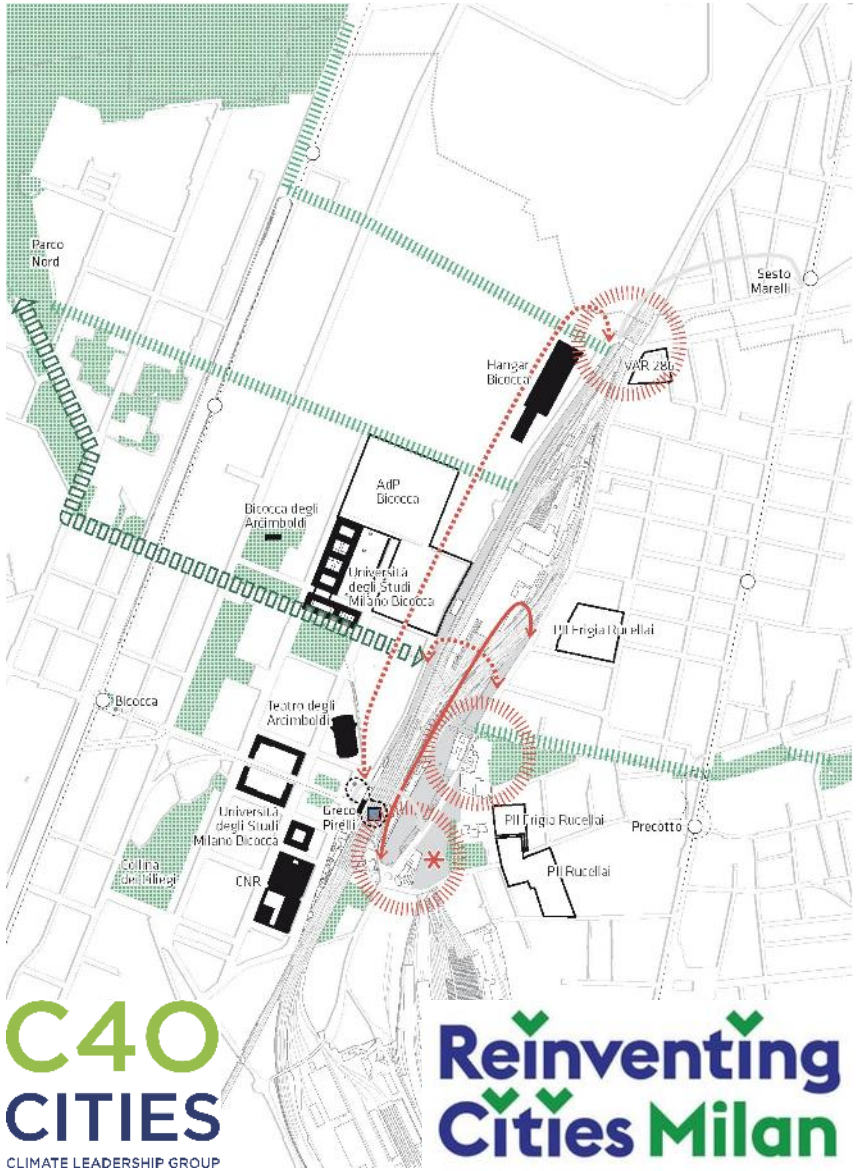
Regeneration ERP districts



PLANNED PROJECTS

REINVENTING CITIES, C40 COMPETITION





MAIN OBJECTIVES

Affordable rented housing

Intermediate housing

Social rented housing

Student housing

Green areas and related equipment

Connection of Bicocca and Precotto district

Connection of existing bike and pedestrian paths

Ri-generation of existing urban orchards

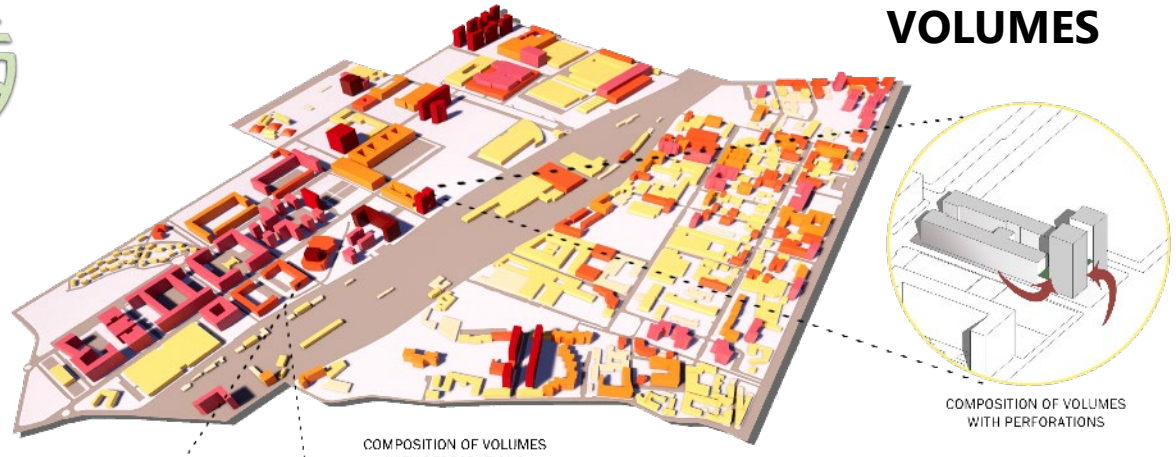
IMM METHODOLOGY ANALYSIS

IMM

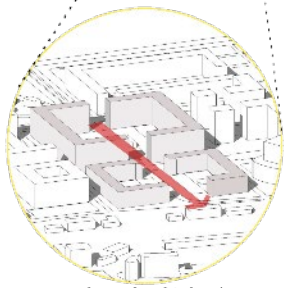


HORIZONTAL INVESTIGATIO

VOLUMES

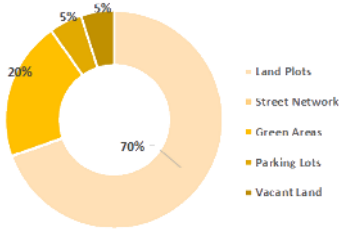


COMPOSITION OF VOLUMES WITH PERFORATIONS

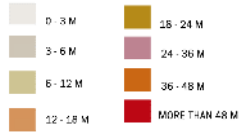


VOLUMES RESPECTING PEDESTRIAN AXIS

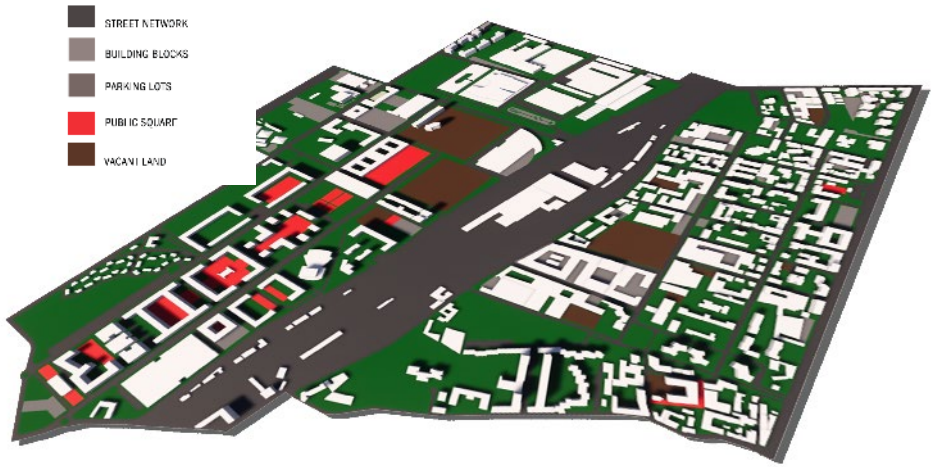
COMPOSITION OF VOLUMES WITH PERFORATIONS



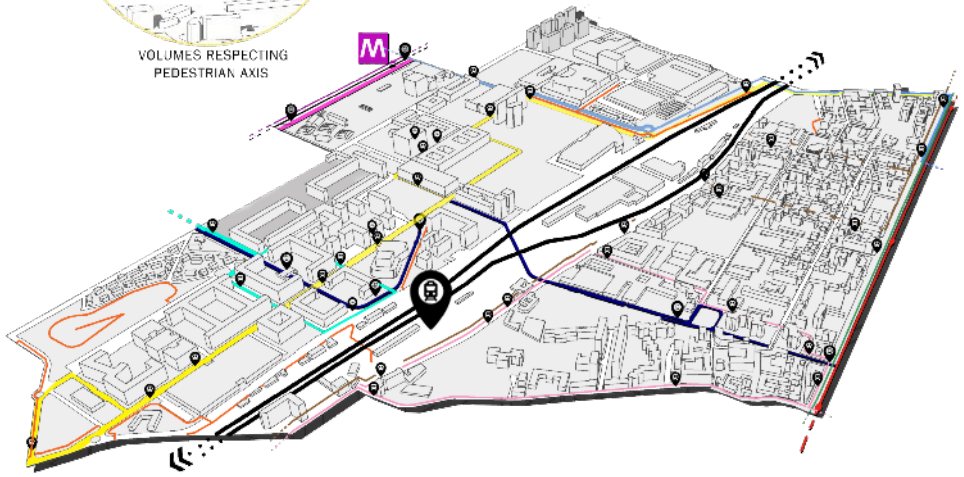
BUILDINGS HEIGHT



VOIDS



LINKS - TRANSPORTATION





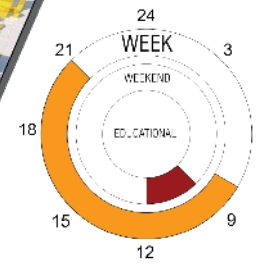
TYPES OF USES

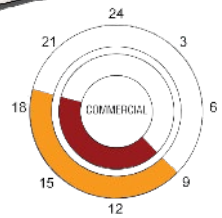
PUBLIC FACILITIES

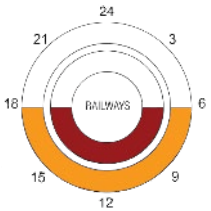


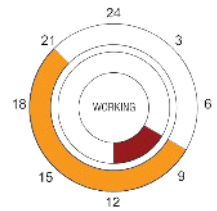
PRIVATE FACILITIES

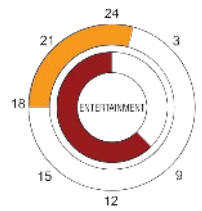












IMM METHODOLOGY ANALYSIS

IMM

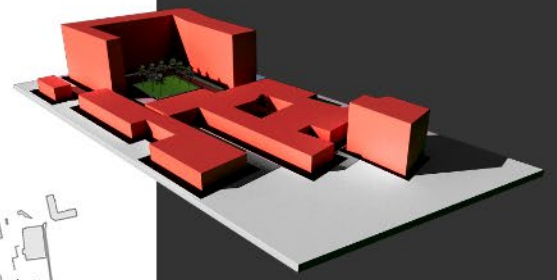


VERTICAL INVESTIGATIO

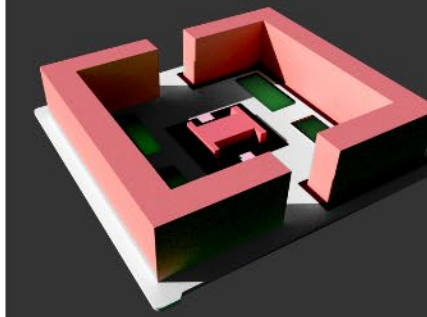
POROSITY

VOLUME & VOIDS

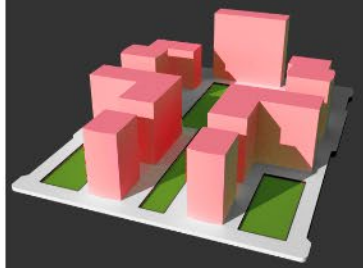
COMPACTNESS



TOTAL AREA *28696 mq*
BUILT AREA *9756 mq*
POROSITY *66%*



TOTAL AREA *21730 mq*
BUILT AREA *6682 mq*
POROSITY *69.24%*



TOTAL AREA *27725 mq*
BUILT AREA *6013 mq*
POROSITY *78.31%*

PERCENTAGE OF POROSITY

0 - 40	70 - 80
40 - 50	80 - 90
50 - 60	90 - 100
60 -70	GREEN AREA

PROXIMITY

VOLUME & FUNCTIONS

COMPACTNESS



400 m

5-10 minutes walkable

LEVEL OF PROXIMITY

- High proximity
- Medium proximity
- Low proximity

N

Key Functions

Educational
Public Services
Commercial
University Residentials
Office
Industrial
Religious
Cultural
Sport

2

Via Chiese
Medium Proximity
Recreational Zone



3



Via Luigi Emanueli
Contrast between
the two zones
High Proximity

1

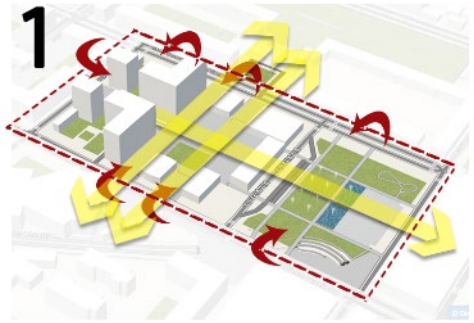


Via Bernardo Rucellai
Facing the proposed site
Low proximity

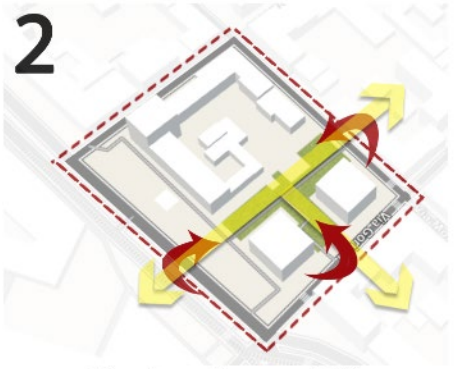
PERMEABILITY

VOID & VOLUME / LINK-TRANSPORTATION

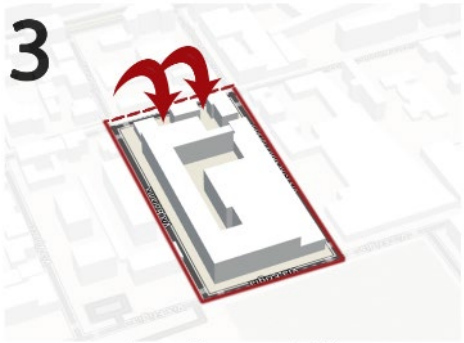
COMPACTNESS



High Permeability



Medium Permeability

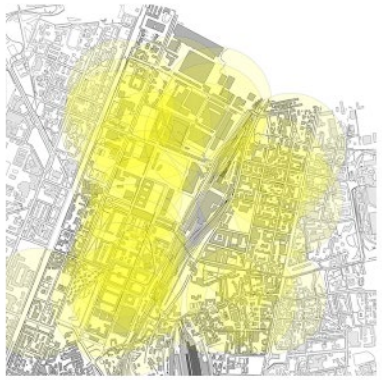


Low Permeability



DIVERSITY
FUNCTIONS & VOIDS

NECESSARY & REGULAR ACTIVITIES



NECESSARY AND REGULAR

Educational Facility
Office
Train Station
Food Market

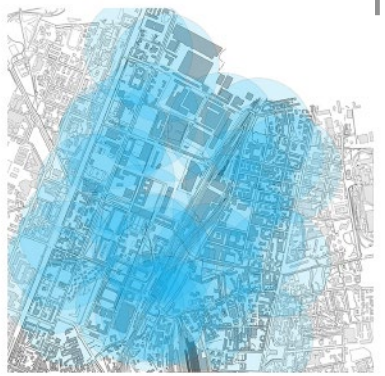
NECESSARY & OCCASIONAL ACTIVITIES



NECESSARY AND OCCASIONAL

Market Place
Public service
Petrol station
Bank
Pharmacy
Post office

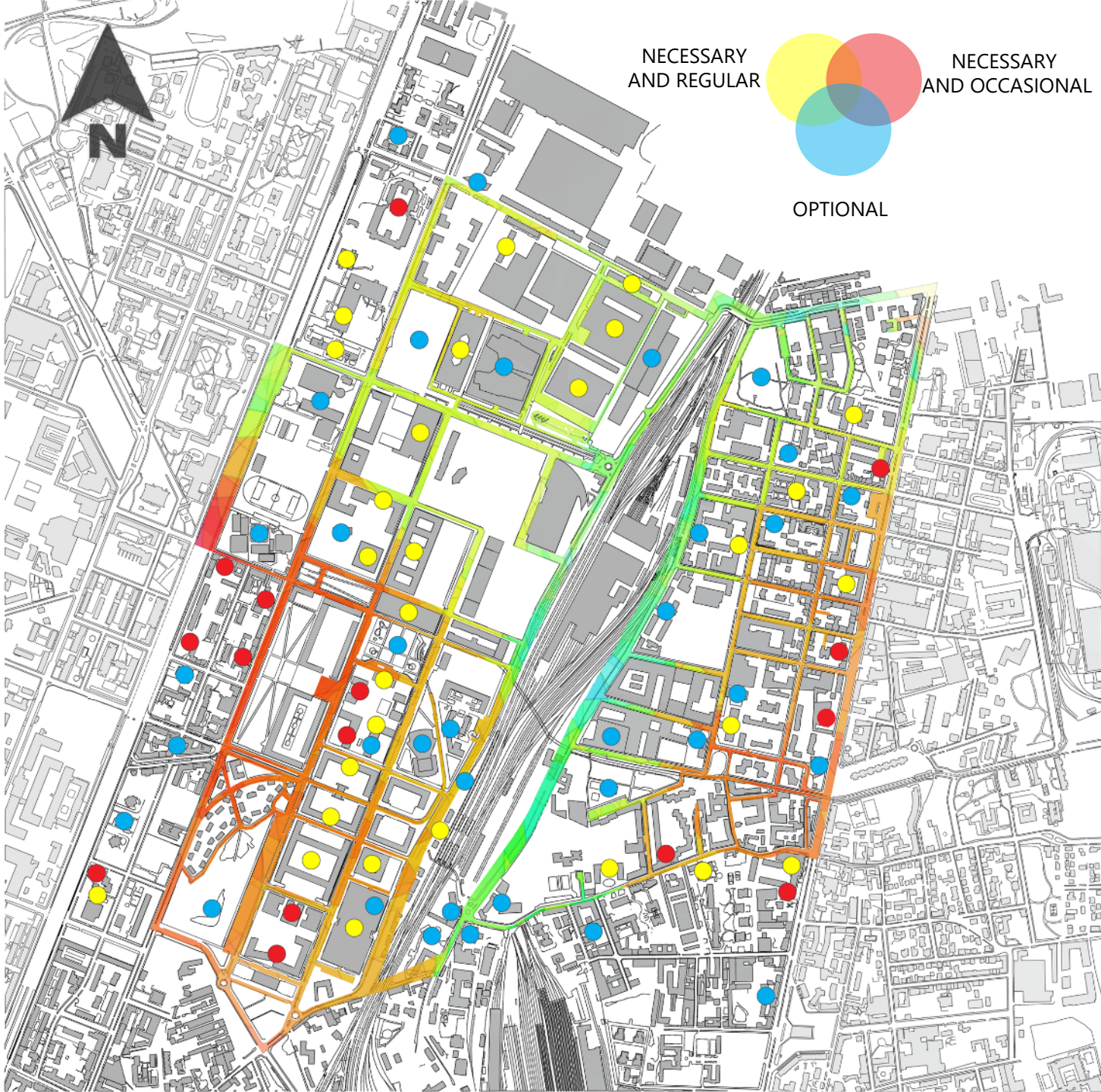
OPTIONAL ACTIVITIES



OPTIONAL

Park
Church
Restaurant and Bar
Hotels
Sport Facility
Cultural Facility

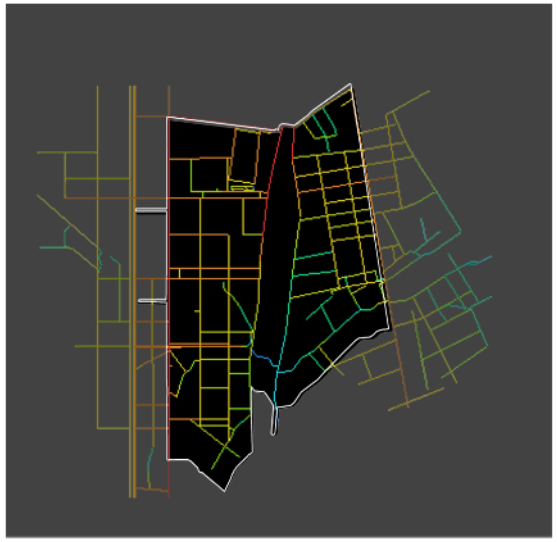
COMPLEXITY



INTERFACE

LINKS & VOIDS

COMPLEXITY



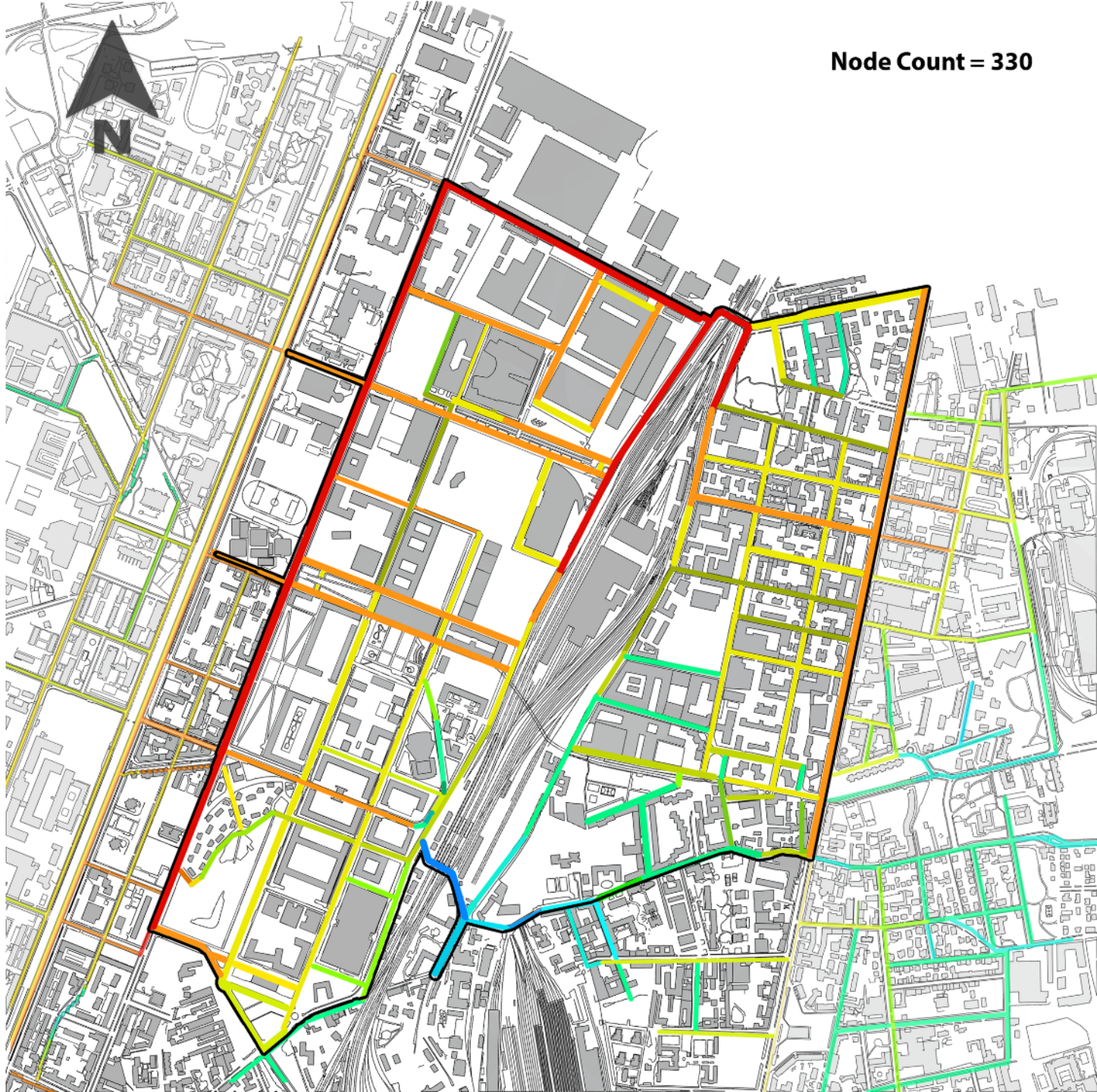
Maximum 0.62

High Integration

Average Integration (H-H) Value 0.44

High Segragation

Minimum 0.22



EFFECTIVENESS

TRANSPORTATION & VOLUME

CONNECTIVITY

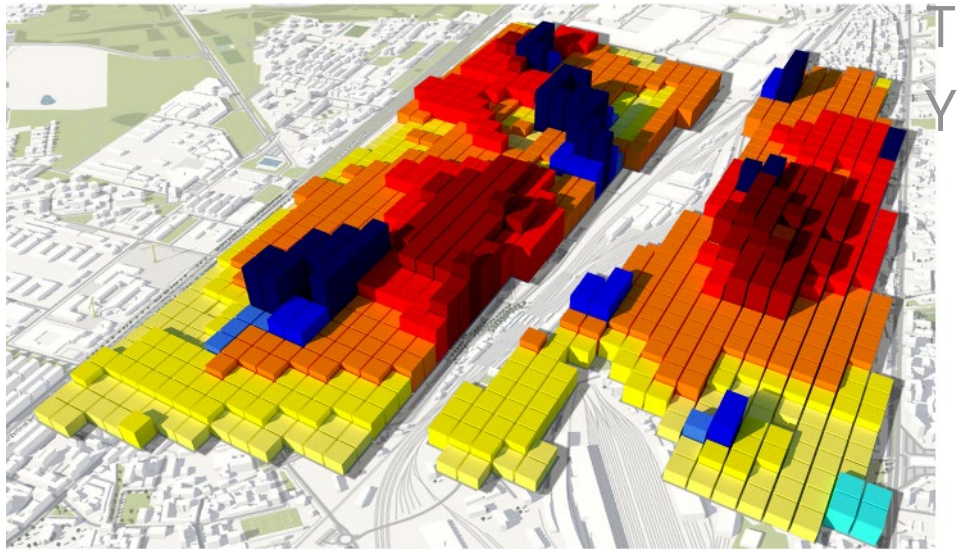
KEY FUNCTIONS

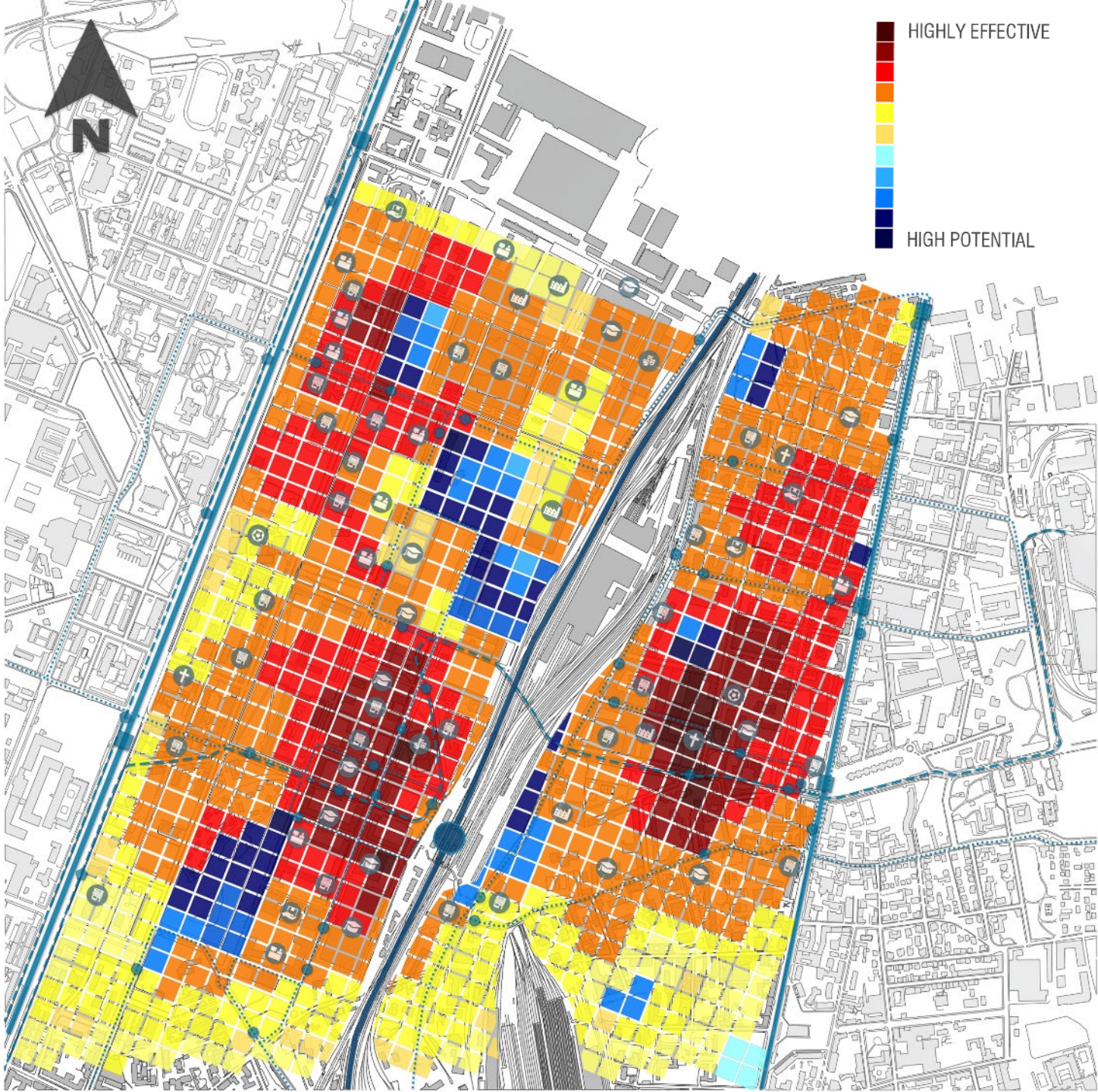
- EDUCATIONAL BUILDINGS
- COMMERCIAL BUILDINGS
- OFFICE BUILDINGS
- SPORT BUILDINGS
- PUBLIC SERVICE BUILDINGS
- INDUSTRIAL BUILDINGS
- CULTURAL BUILDINGS
- RELIGIOUS BUILDINGS

TRANSPORTATION LINES

- TRAIN LINE
- METRO LINE
- TRAM LINE
- BUS LINE

- TRAIN STATION
- METRO STOP
- TRAM STOP
- BUS STOP





ACCESSIBILITY
LINKS & FUNCTIONS

KEY FUNCTIONS

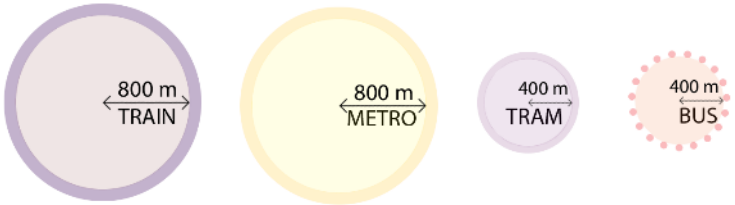
- EDUCATIONAL BUILDINGS
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- PUBLIC SERVICE BUILDINGS
- INDUSTRIAL BUILDINGS
- CULTURAL BUILDINGS
- RELIGIOUS BUILDINGS

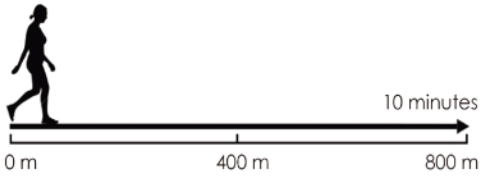
TRANSPORTATION LINES

- TRAIN LINE
- METRO LINE
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- TRAIN STATION
- METRO STOP
- TRAM STOP
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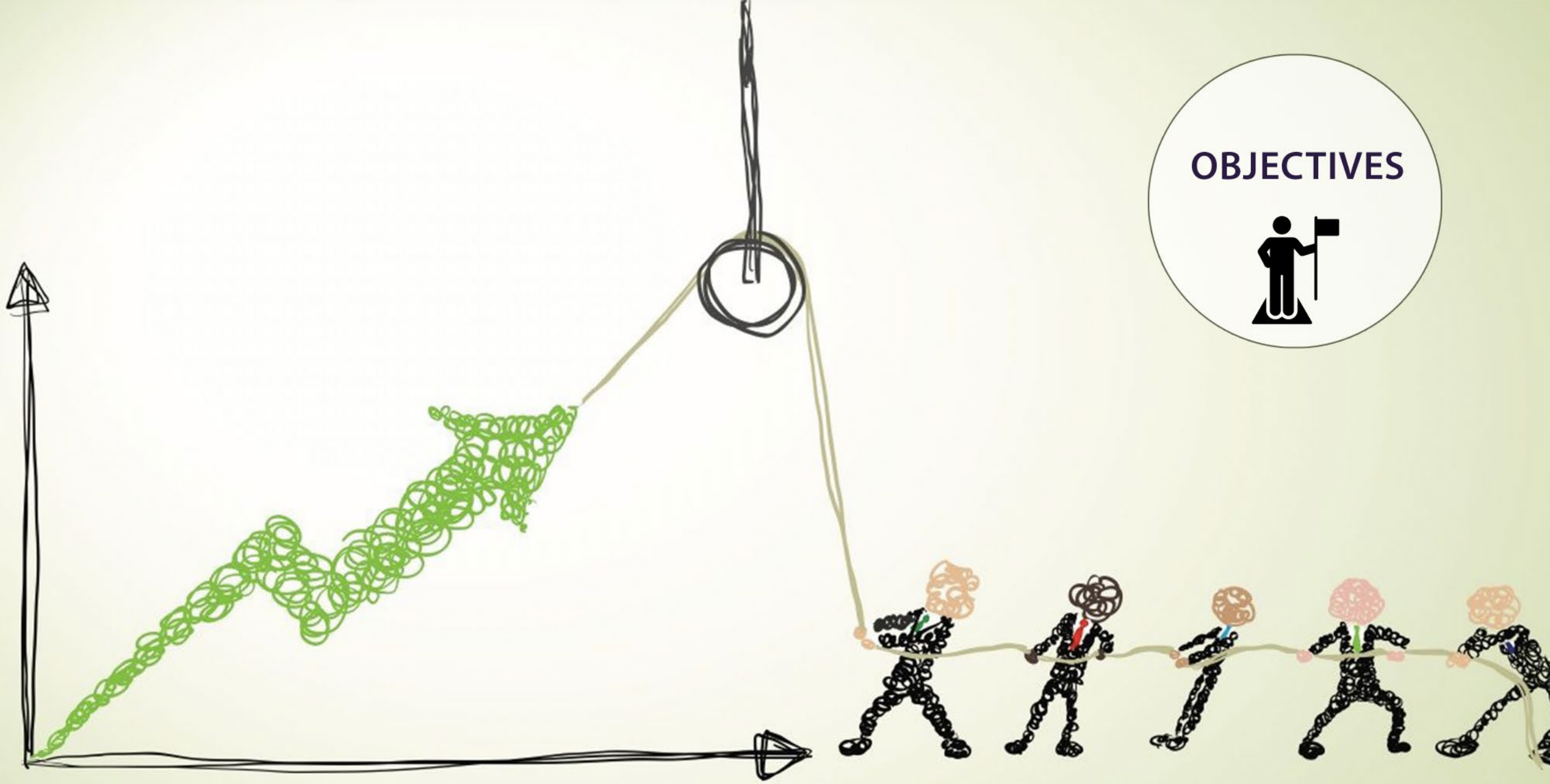
CATCHMENT AREA







OBJECTIVES



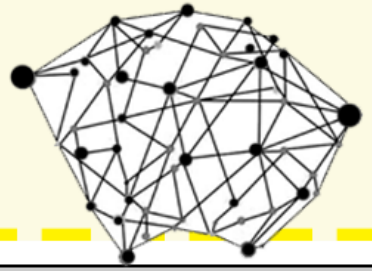
...FROM PROBLEMS TO SOLUTIONS...

"WHAT ARE THE PROBLEMS?"



OVERLAY OF ANALYSIS OF GRECO PIRELLI

IS THERE A RELATIONSHIP?



PROBLEM MATRIX

CATALYSTS SELECTION



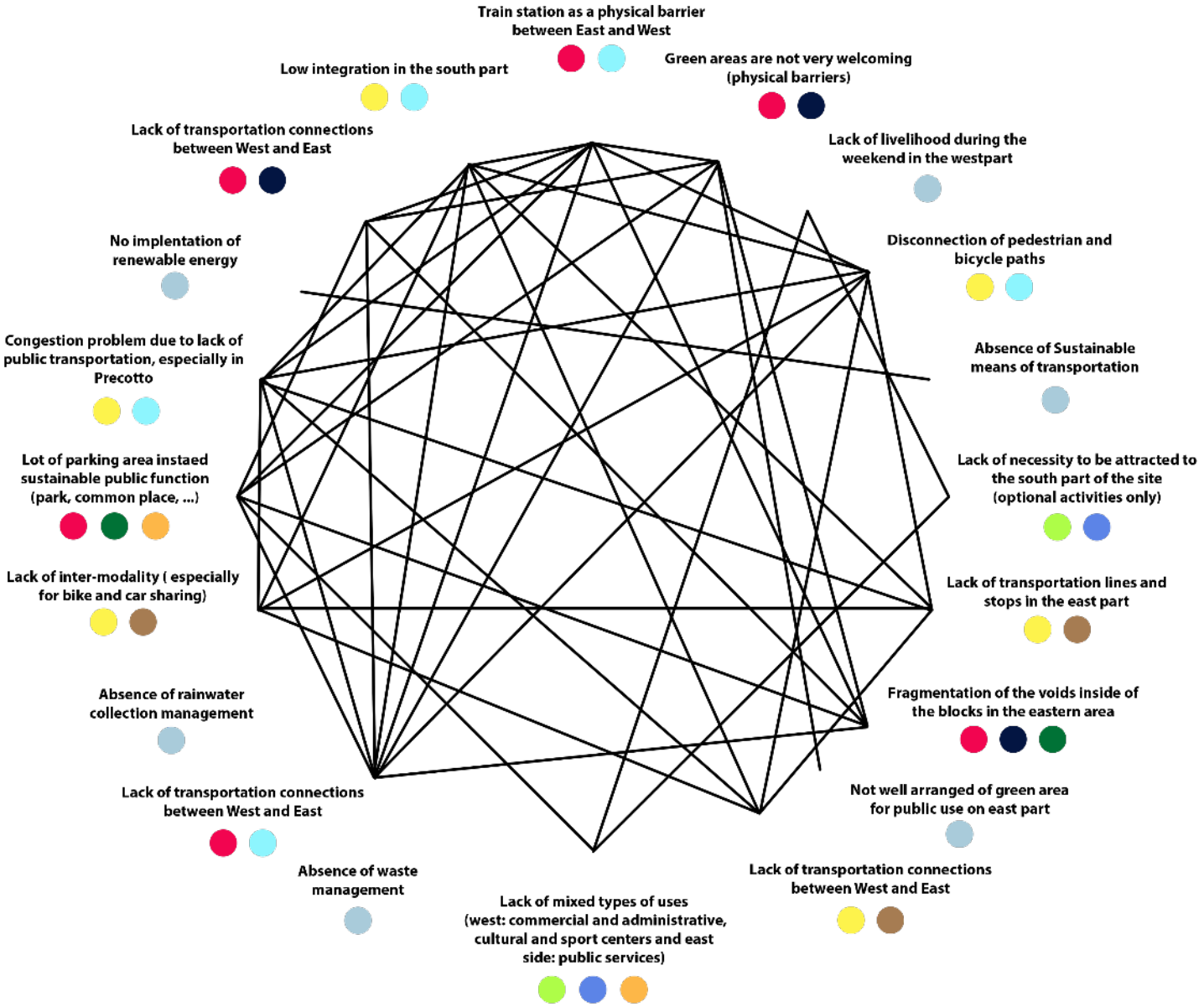
TWO CATALYSTS WITH HIGHEST CONNECTIONS

REFERENCE FOR SOLUTIONS

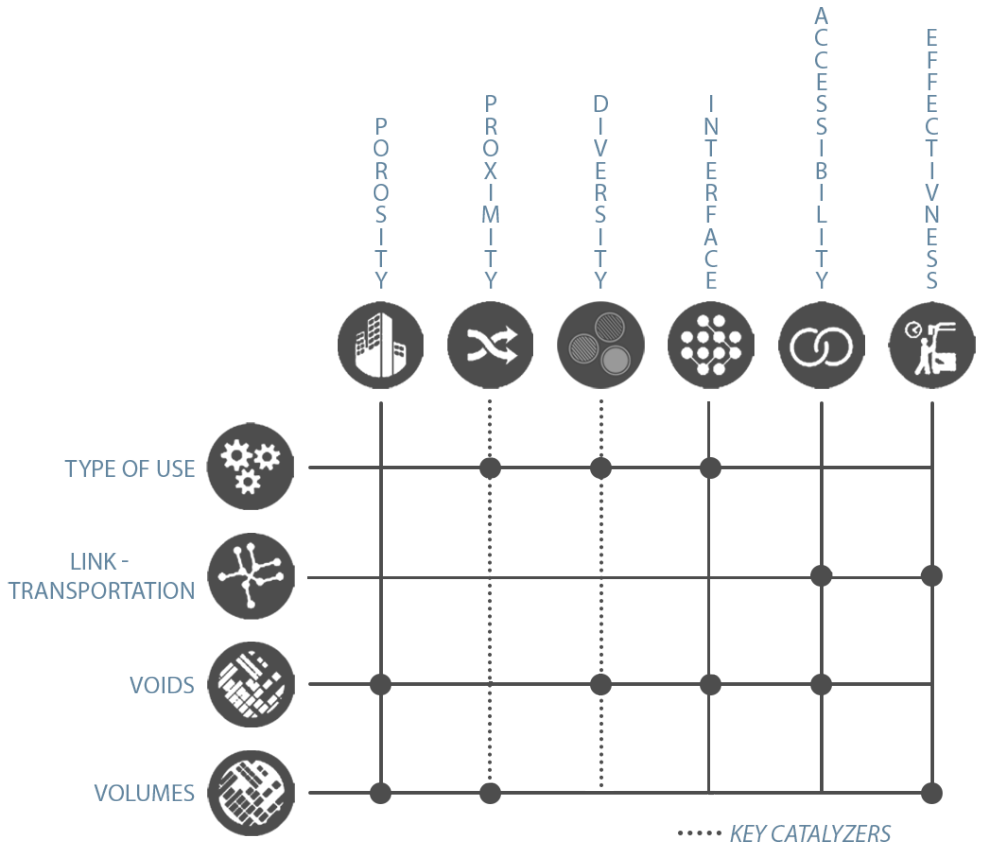


MASTER PLAN DESIGN AND INTERVENTION STRATEGY

PROBLEM MATRIX



OVERLAY OF ANALYSIES



TWO CATALYSTS WITH HIGHEST CONNECTION

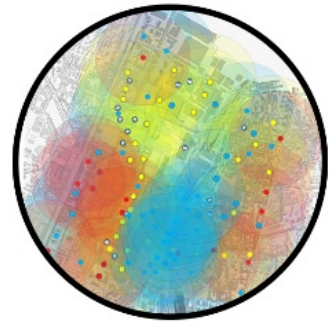
PROXIMITY + DIVERSITY



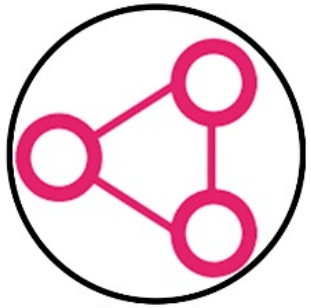
INTERFACE
Connected open space system.



LINKS & TRANSPORATIONS
Change from Mutli-Modality to inter-modality.
Urban Public Transporation.



DIVERSITY
Fostering mixed used spaces.



CONNECTIVITY
Bikability.
Promote walkability.



ENERGY COMPACTNESS
Fostering local energy consumption.
City as food producer.



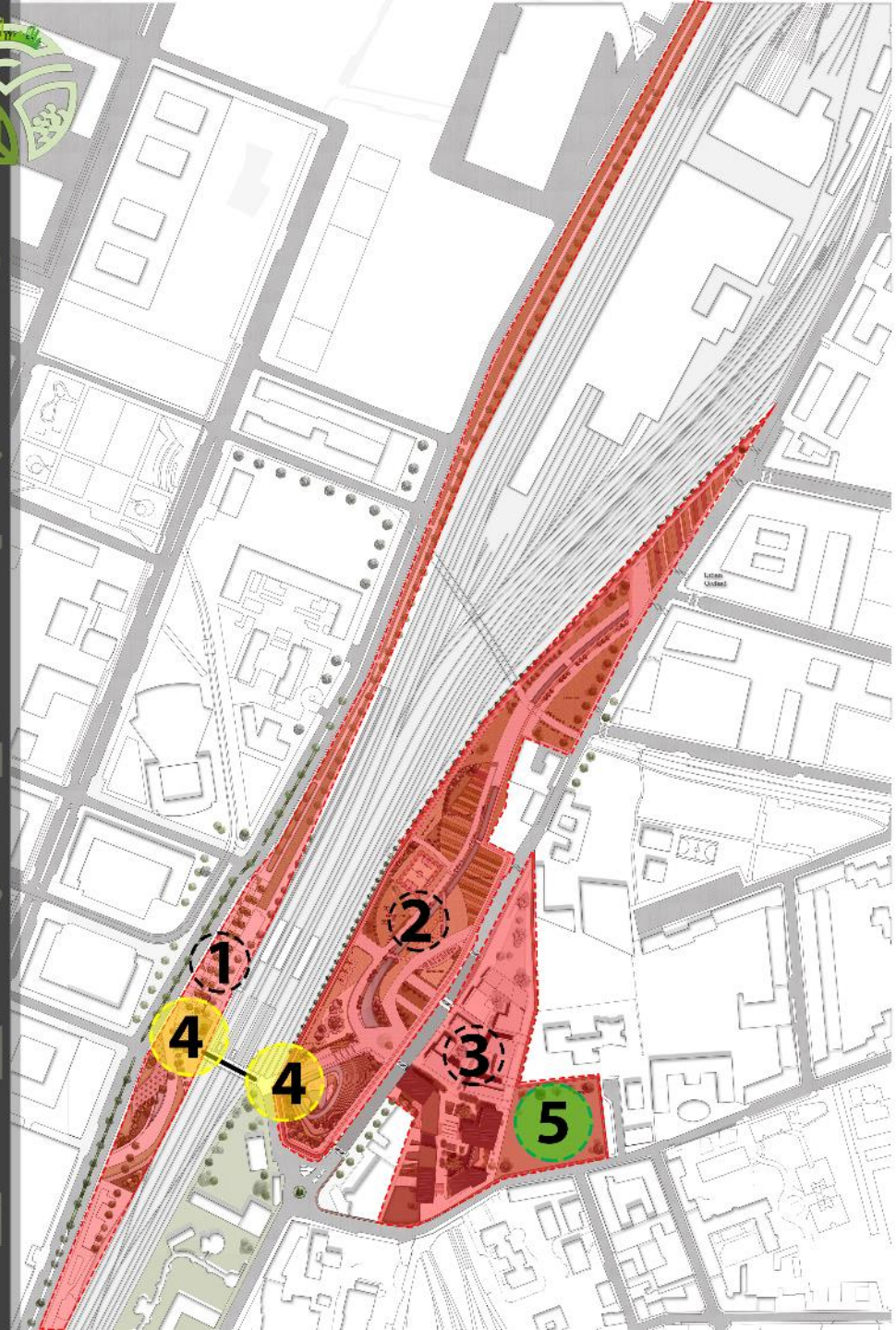
TECHNIQUES
Implement water management.
Prevent negative impact of waste.

CONNECTION The area is in part of the city which is divided by railway. The idea is to recall for the vitality in this part of the city by the more presence of people, reinforce the environmental friendly connections and the existing underpass which all are connected by considering more greenspaces depending on the two main catalysts of the analysis of the site Interface, Links and Transportation.

ENERGY Design an area based on the high integration in terms of infrastructure, energy, food, water and waste management which would help to the sustainability of the area.

FUNCTION Considering related functions to the existing ones of the area in the isolated divided part to reinforce the connection also in terms of function. Moreover, to balance more the proximity between both sides of the site to increase the presence of people. As well as designing of the linear park in the area and having functions and activities inside of it to attract people more to explore the site by walk or bike.

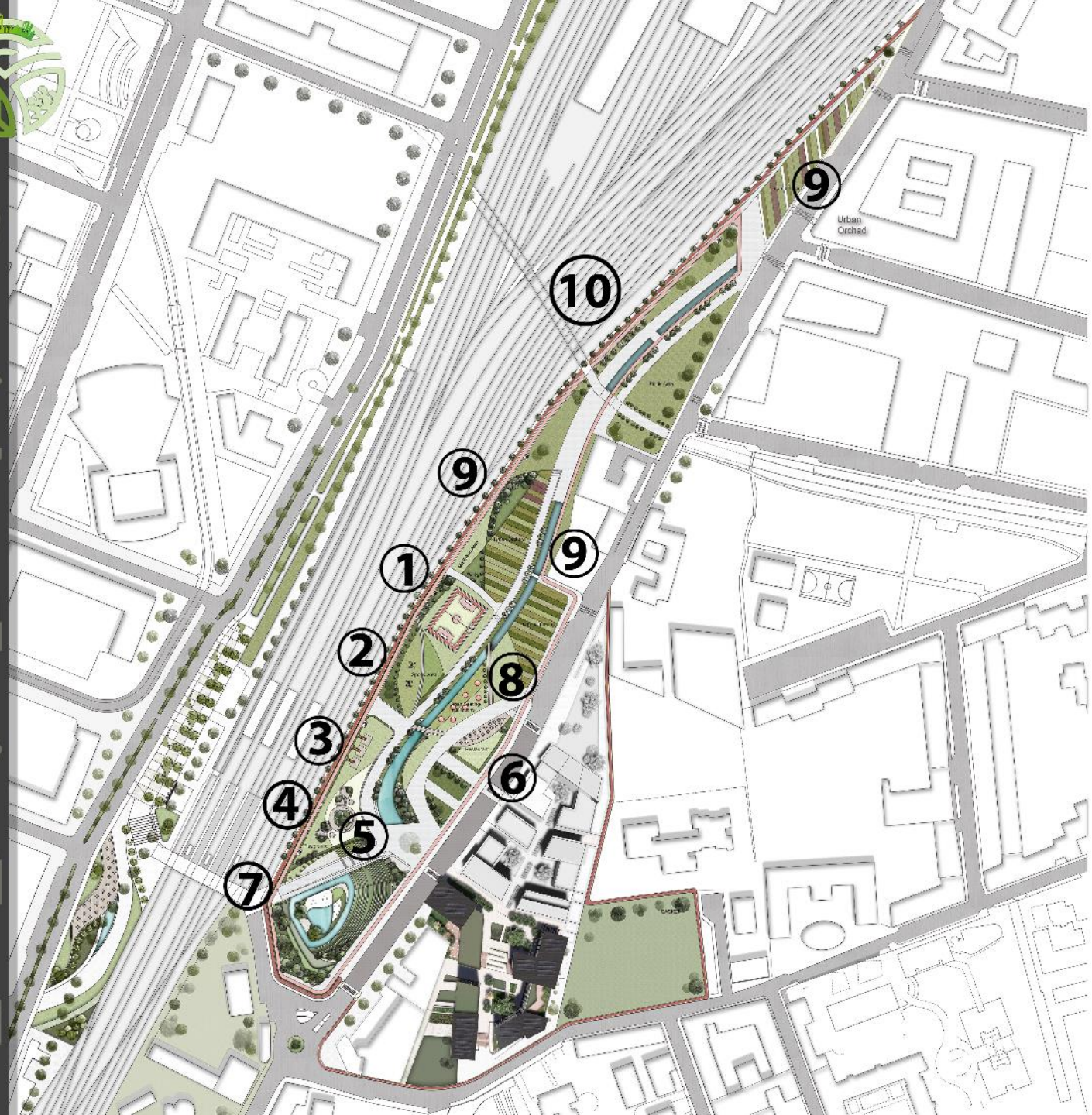




1 GREEN STRIPE WITH POTENTIAL
TUNNEL ENTRANCE IMPROVEMENT

2 URBAN PARK WITH
MULTI-FUNCTIONAL ACTIVITIES
SECOND TUNNEL ENTRANCE
IMPROVEMENT POTENTIAL

3 AFFORDABLE HOUSING PROJECT
(MIXED-USE)
GATEWAY TO PARK NODE 5

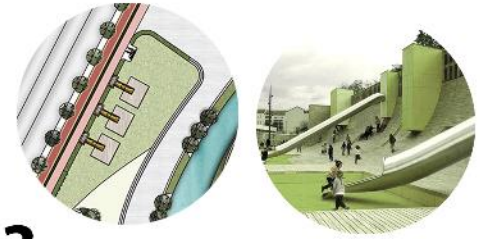




1 SOCIAL ACTIVITIES



2 OUTDOOR ACTIVITIES



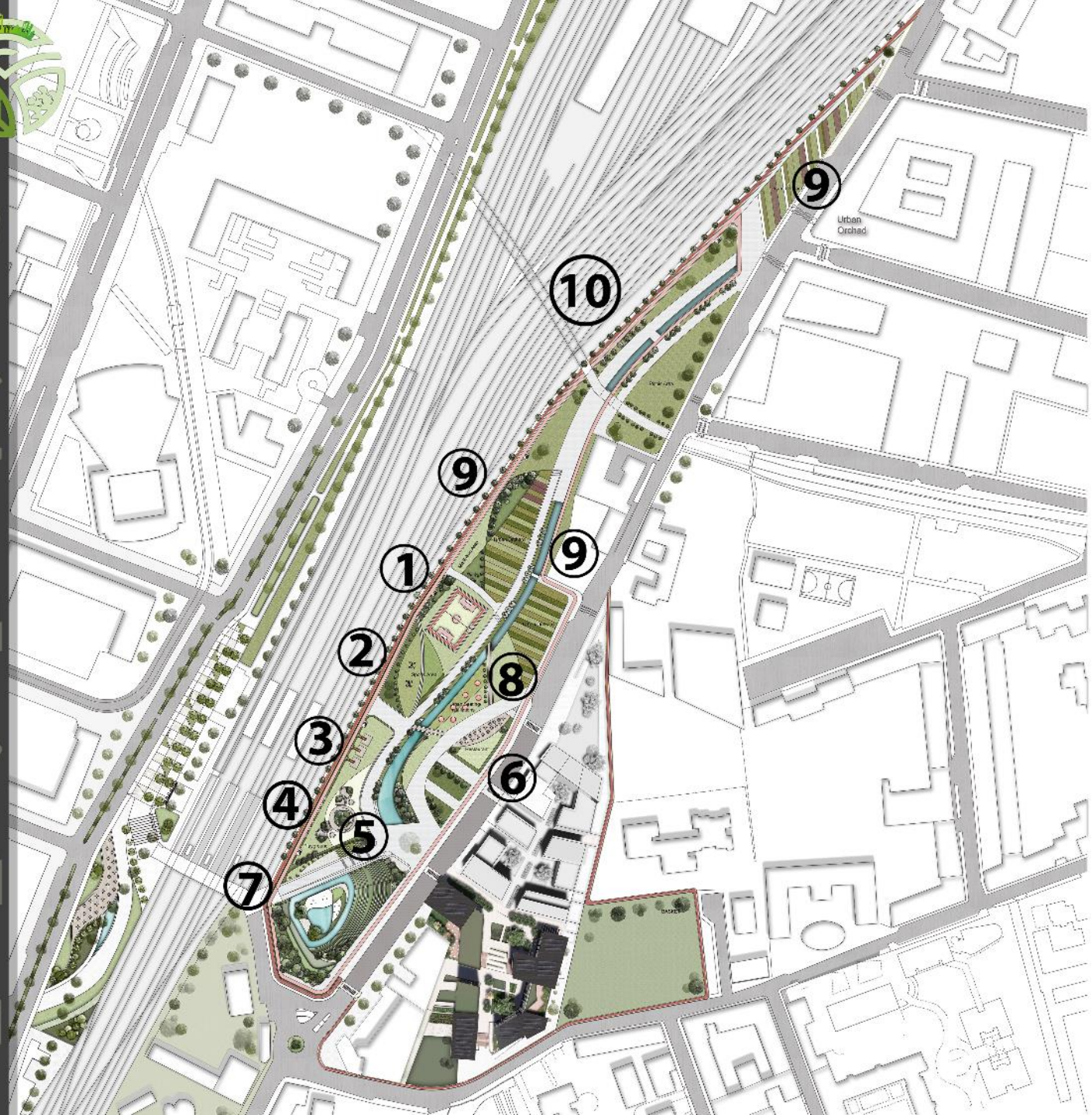
3 CHILDREN'S PLAYGROUND

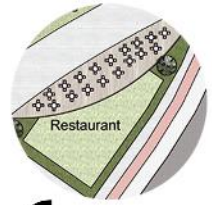


4 TRAIN OBSERVATION AREA



5 TREE HOUSE







6 RESTAURANT







7 TUNNEL GREEN PLATFORM



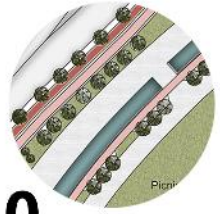


8 URBAN INSTALLATIONS





9 URBAN ORCHARD



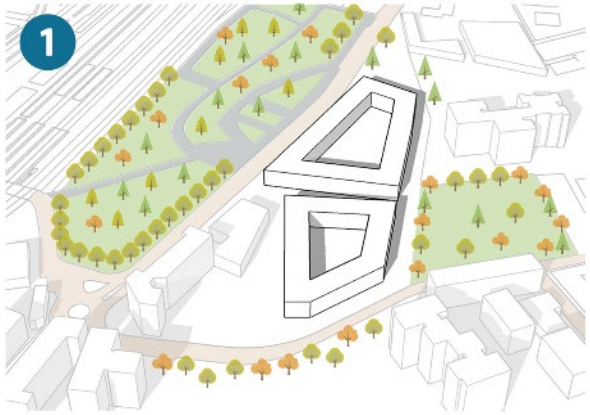


10 URBAN RUNNING & CYCLING TRACK AROUND MASTERPLAN

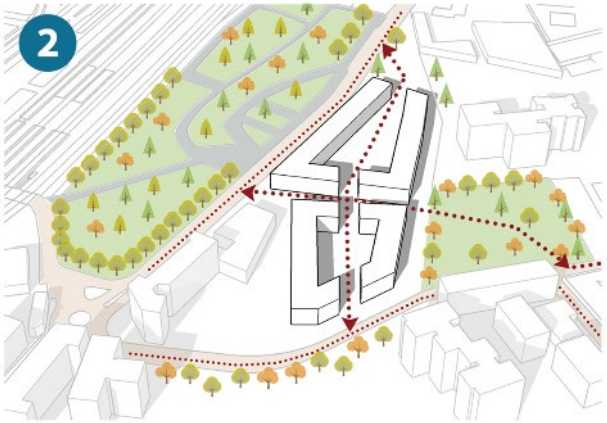
ARCHITECTURE DESIGN



FORM GENERATION



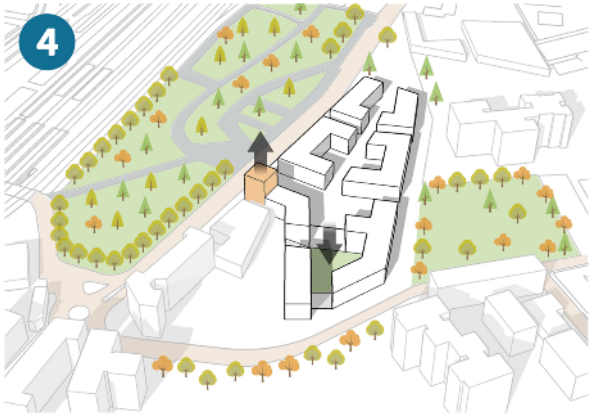
Buildings with internal courtyard in accordances with Milano's urban structure.



The two starting masses are cut in order to have a good permeability and create two main connection between the existing roads and the new eco-district.



The masses are cut again to allow secondary connections and creats semi-public spaces.



Creation of a tower on the northwest side of the student residence in order to increase the density. Addition of an internal courtyard below ground level in order to have a more private space for the students.



Cutting of the roofs to optimize irradiation and reduce the shadow on the surrounding buildings.



In the final result the flat roofs of the buildings are equipped with PV panels and walkable green areas.

N

FUNCTIONAL LAYOUT

BUILDING TYPES



FAMILY HOUSING



STUDENT HOUSING

N

FUNCTIONAL LAYOUT

LAYOUT PLANNING TYPES



TRADITIONAL COMPOSITION

- SOCIAL INTERACTION WITH LARGER RANGE OF STUDENTS.
- MORE MOTIVATIONAL POTENTIAL TO STUDY
- CHEAPER TO RENT FOR STUDENTS

SUITES COMPOSITION

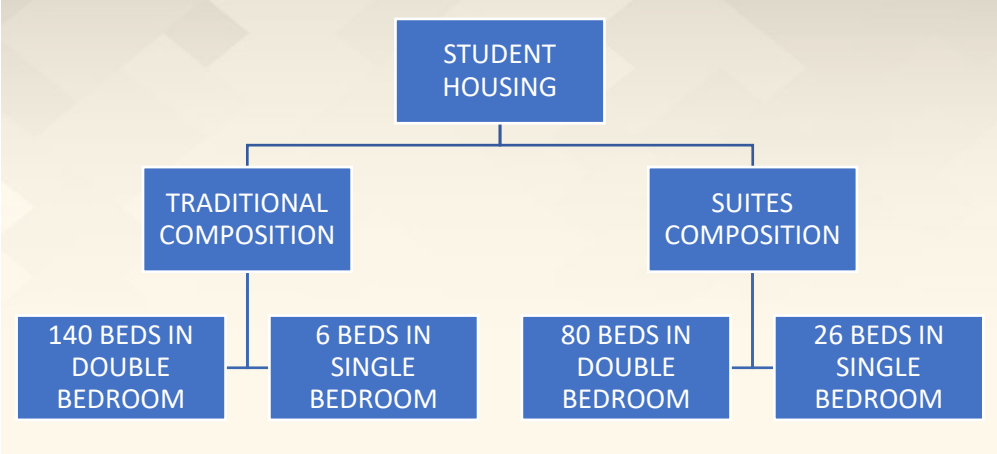
- MORE PRIVACY
- EASIER TO MANAGE ADL (ACTIVITIES OF DAILY LIFE)
- MORE PRIVATE SOCIAL INTERACTION POTENTIAL
- CHEAPER TO MAINTAIN

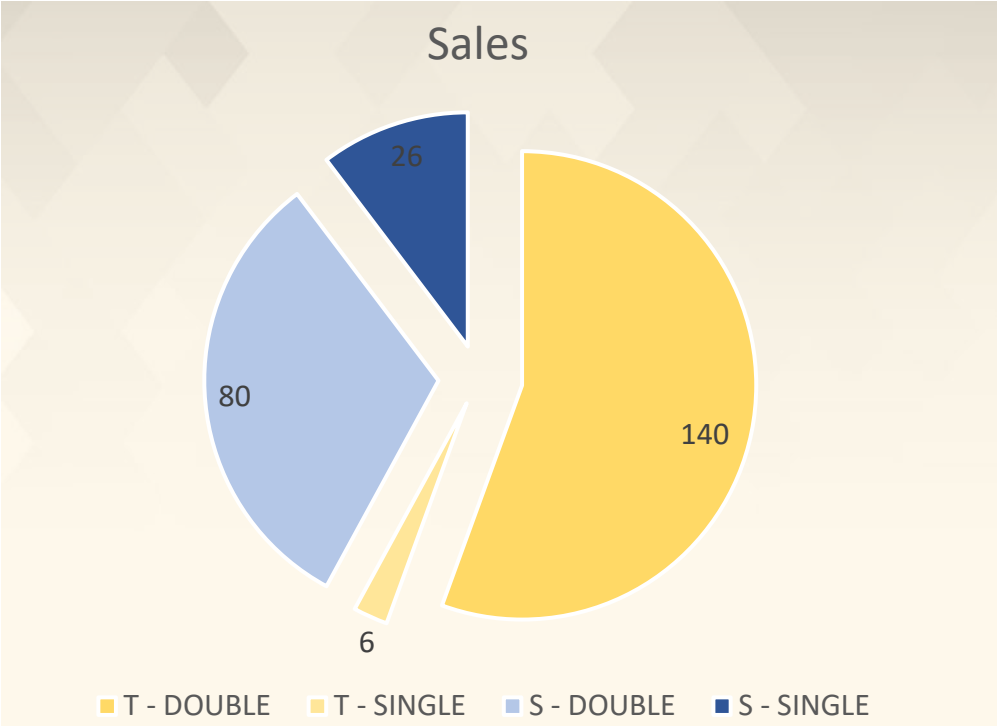




FUNCTIONAL LAYOUT

LAYOUT PLANNING TYPES



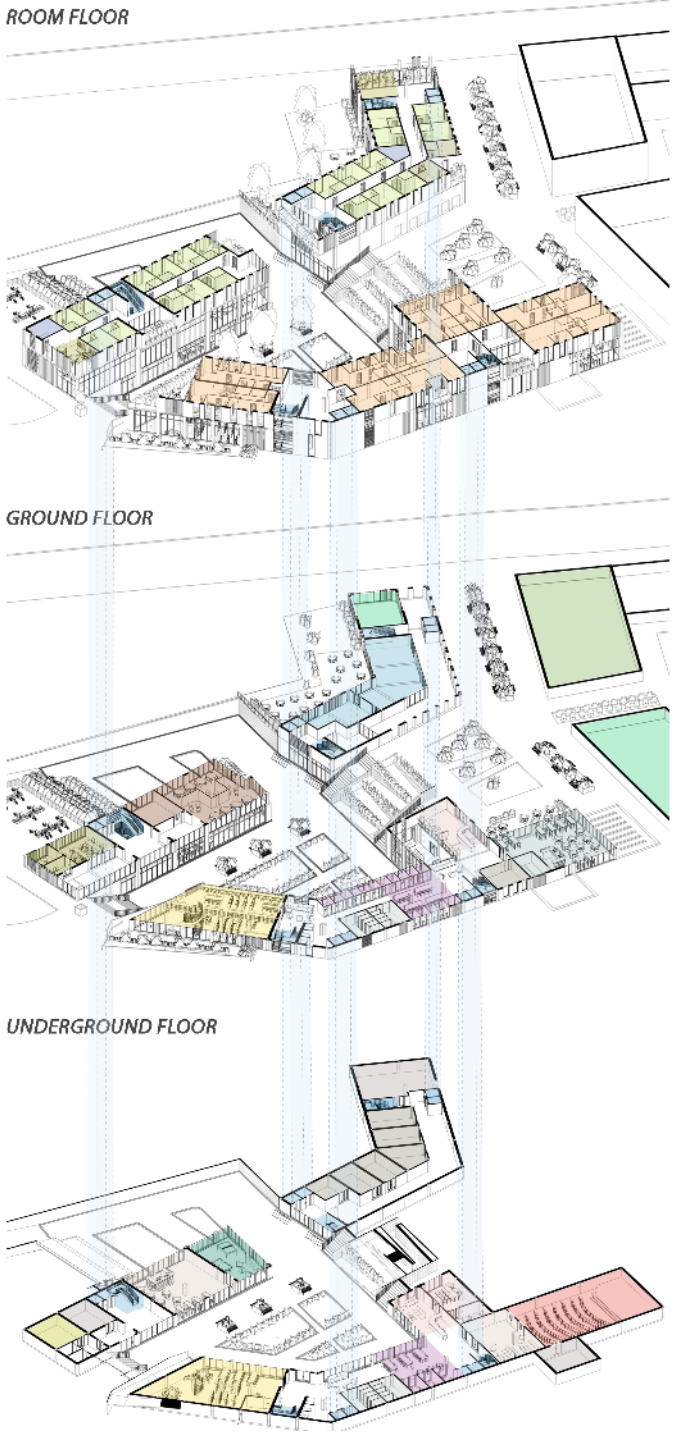




N

FUNCTIONAL LAYOUT

AXONOMETRIC PLANS



Residential
- Suite room
- Double room
- Single room

Cultural-Educational
- Library
- Study area
- Theater-Events hall
- Music room

Commercial
- Restaurant
- Shop
- Market

Management
- Office
- Reception

Recreational
- Game room
- Student lobby
- Bar

Support
- Laudry
- Bathroom
- Kitchen
- Storage
- Mechanical room

- Vertical connection
- Walkable green roof
- PV panels

N

FUNCTIONAL LAYOUT

UNDERGROUND FLOOR



Residential
- Suite room
- Double room
- Single room

Cultural-Educational
- Library
- Study area
- Theater-Events hall
- Music room

Commercial
- Restaurant
- Shop
- Market

Management
- Office
- Reception

Recreational
- Game room
- Student lobby
- Bar

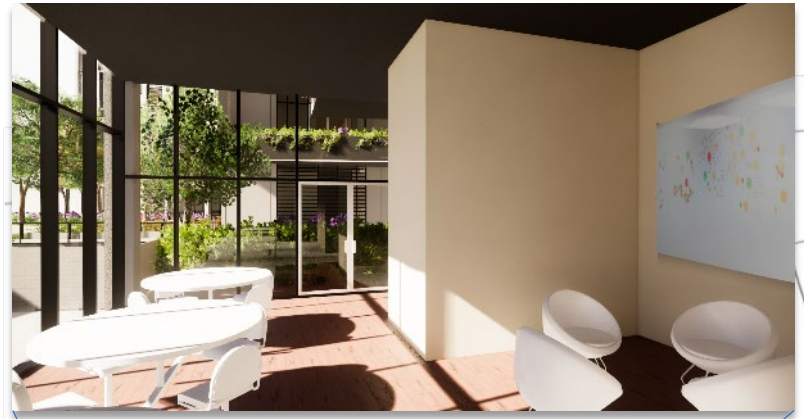
Support
- Laundry
- Bathroom
- Kitchen
- Storage
- Mechanical room

- Vertical connection
- Walkable green roof
- PV panels

N

FUNCTIONAL LAYOUT

GROUND FLOOR



Residential
- Suite room
- Double room
- Single room

Cultural-Educational
- Library
- Study area
- Theater-Events hall
- Music room

Commercial
- Restaurant
- Shop
- Market

Management
- Office
- Reception

Recreational
- Game room
- Student lobby
- Bar

Support
- Laundry
- Bathroom
- Kitchen
- Storage
- Mechanical room

- Vertical connection
- Walkable green roof
- PV panels

N

FUNCTIONAL LAYOUT

ROOMS FLOOR



Residential
- Suite room
- Double room
- Single room

Cultural-Educational
- Library
- Study area
- Theater-Events hall
- Music room

Commercial
- Restaurant
- Shop
- Market

Management
- Office
- Reception

Recreational
- Game room
- Student lobby
- Bar

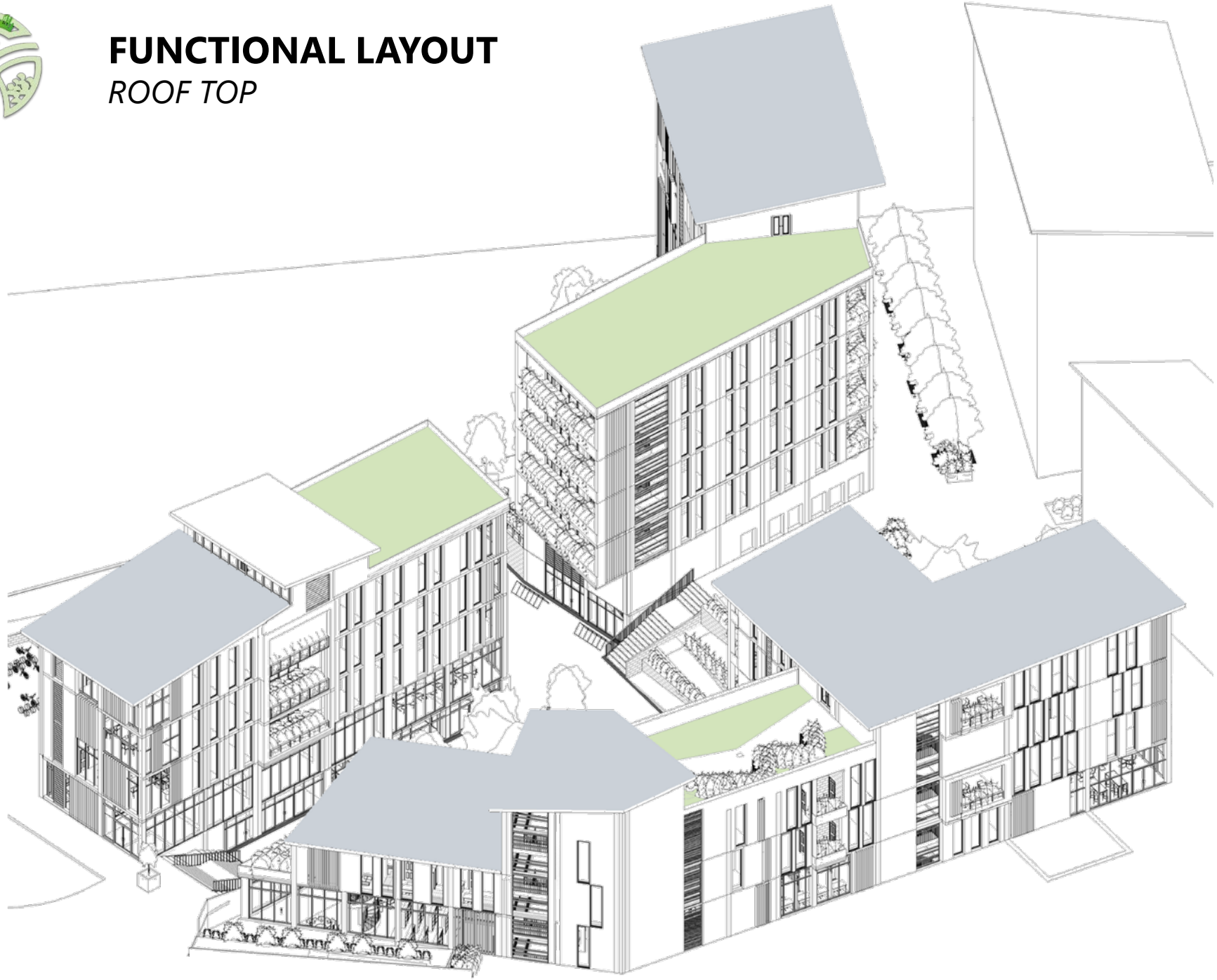
Support
- Laudry
- Bathroom
- Kitchen
- Storage
- Mechanical room

- Vertical connection
- Walkable green roof
- PV panels

N

FUNCTIONAL LAYOUT

ROOF TOP



Residential
- Suite room
- Double room
- Single room

Cultural-Educational
- Library
- Study area
- Theater-Events hall
- Music room

Commercial
- Restaurant
- Shop
- Market

Management
- Office
- Reception

Recreational
- Game room
- Student lobby
- Bar

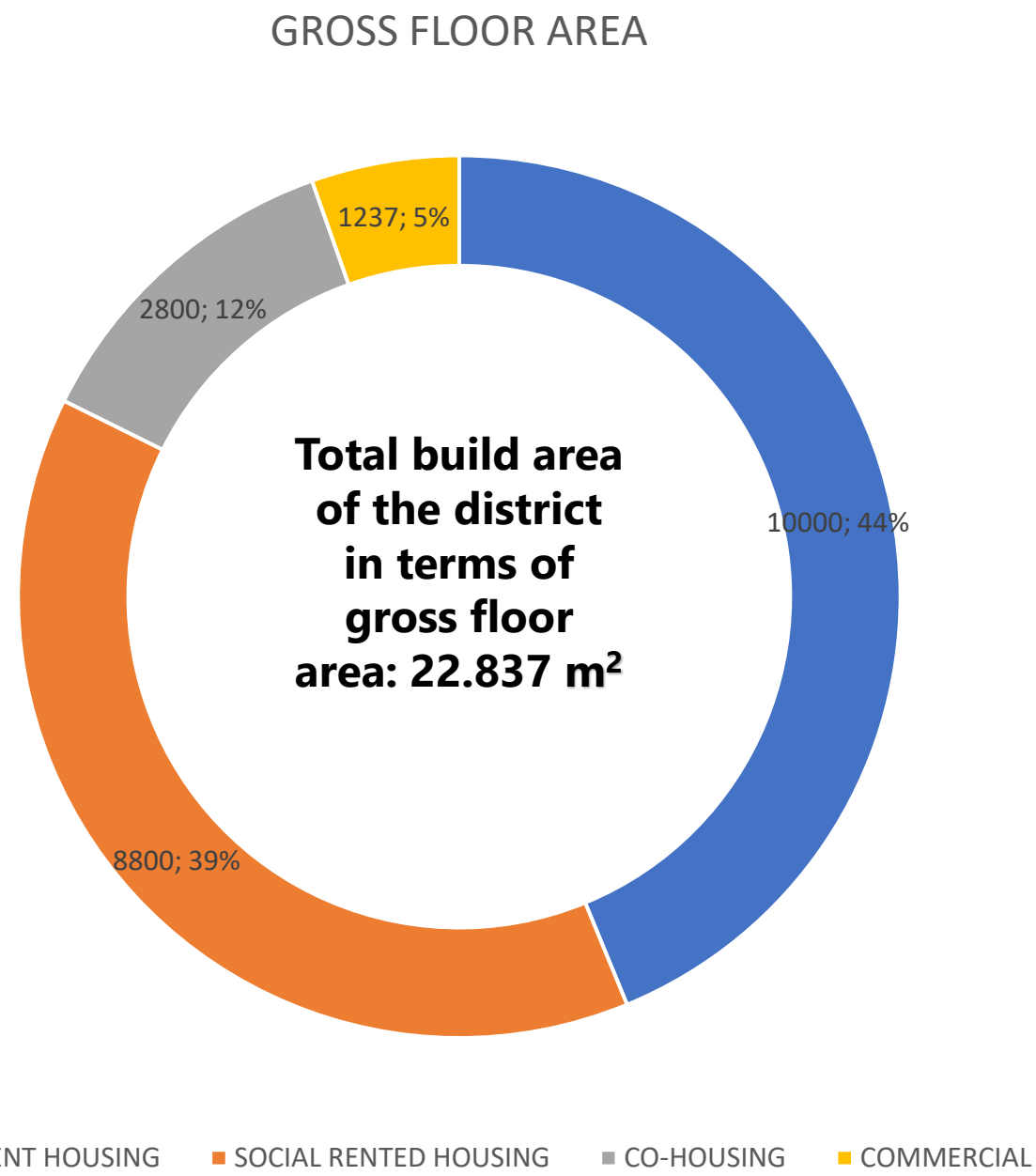
Support
- Laudry
- Bathroom
- Kitchen
- Storage
- Mechanical room

- Vertical connection
- Walkable green roof
- PV panels

N

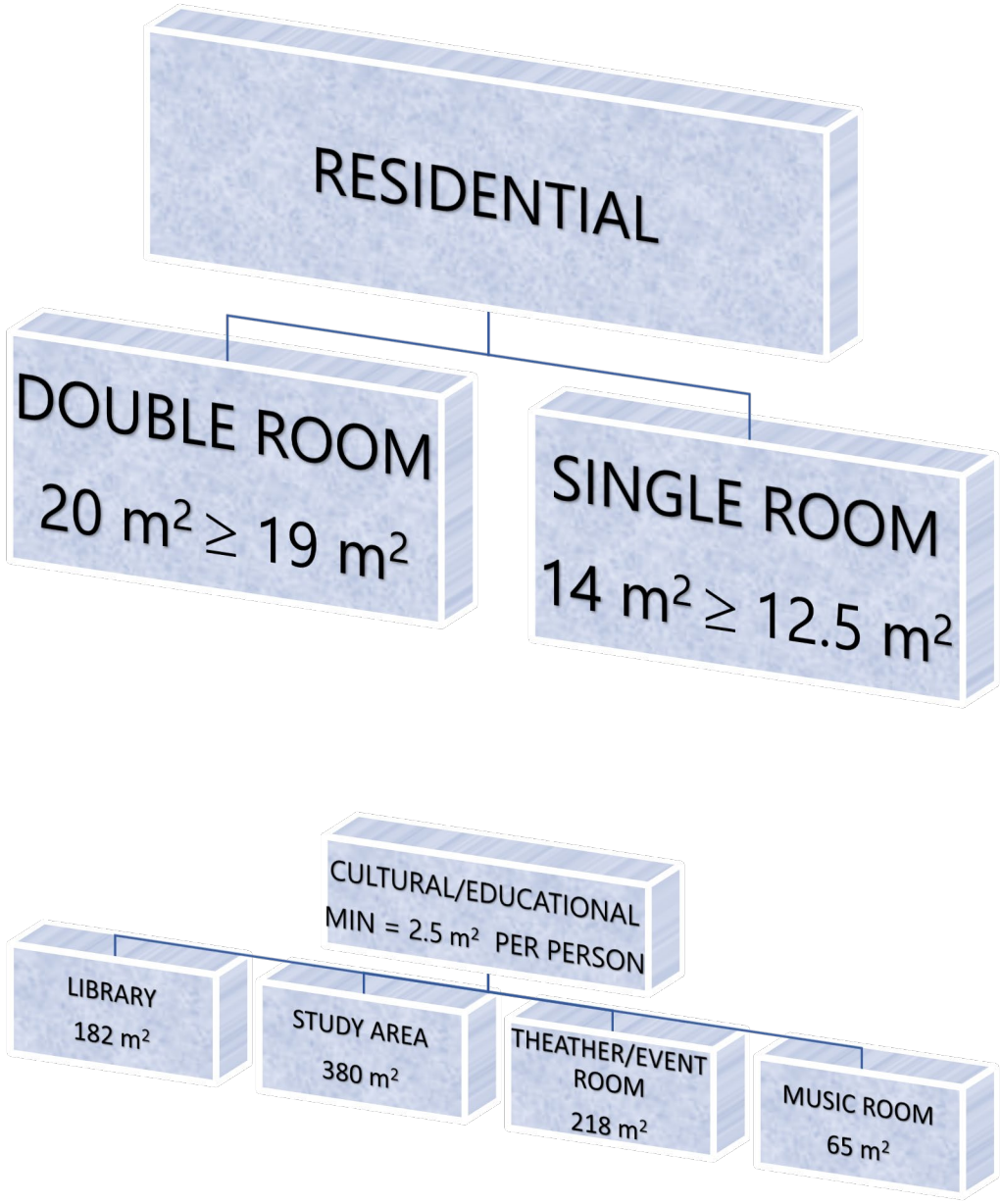
FUNCTIONAL LAYOUT

STATISTICS



FUNCTIONAL LAYOUT

STATISTICS



TOTAL: 845m² => 2.6 m²/PERSON

FUNCTIONAL LAYOUT

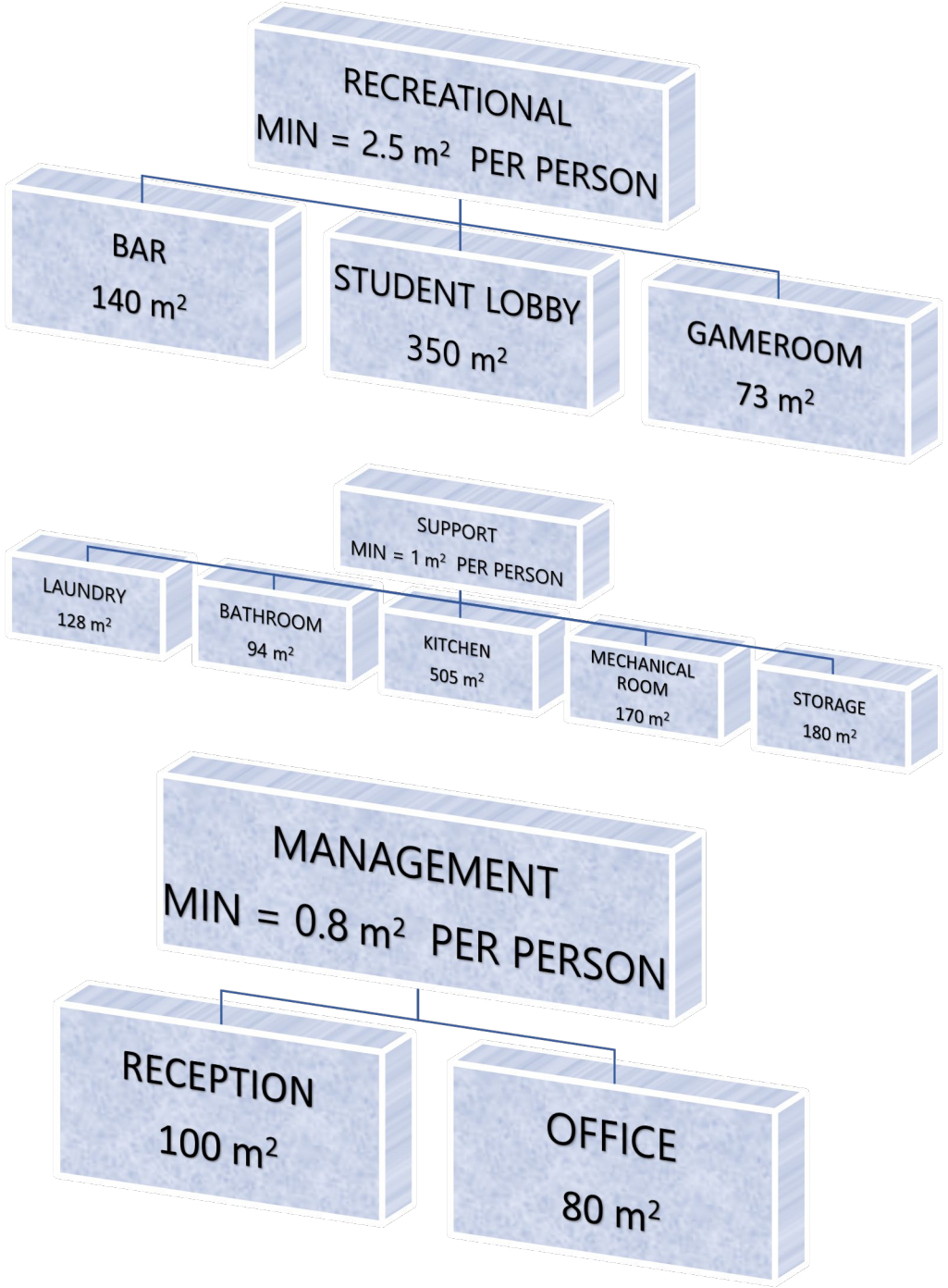
STATISTICS

TOTAL: 563 m^2 => 2.6 m^2/PERSON

TOTAL: 1,077m^2 => 5 m^2/PERSON

TOTAL: 180m^2 => 0.84 m^2/PERSON

SERVICES: 2485m^2 => 11.60 m^2/PERSON
MINIMUM=6.7m^2/PERSON



SECTIONS & ELEVATIONS

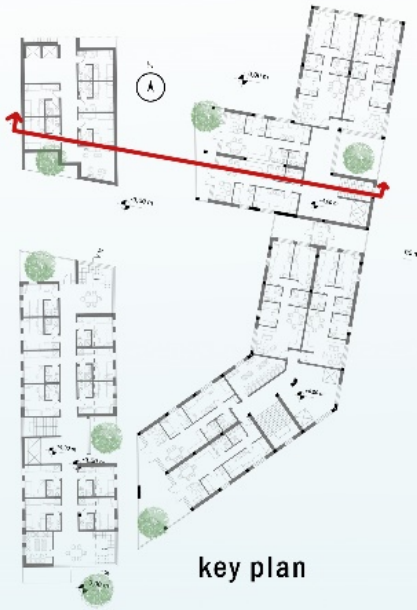


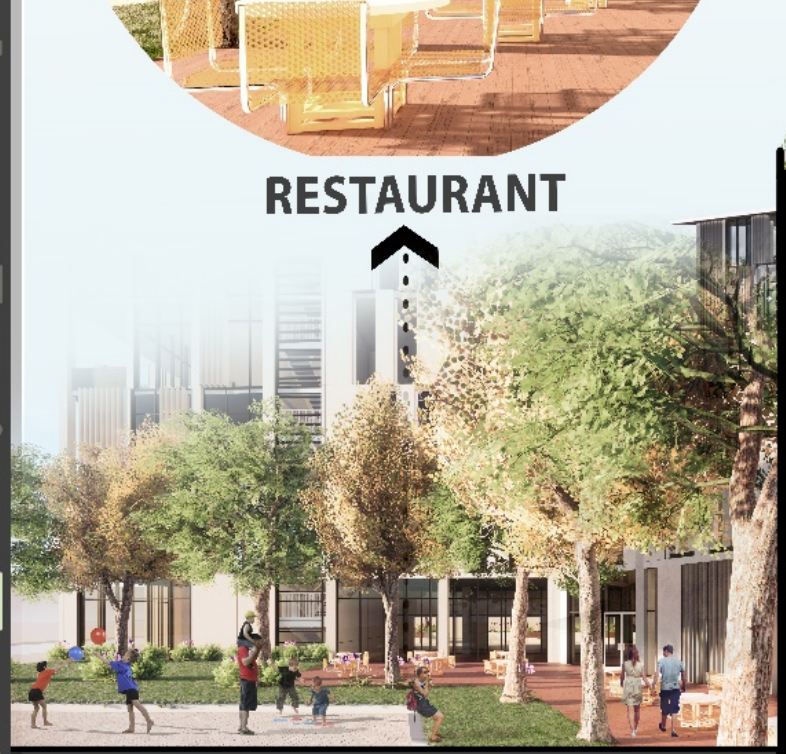


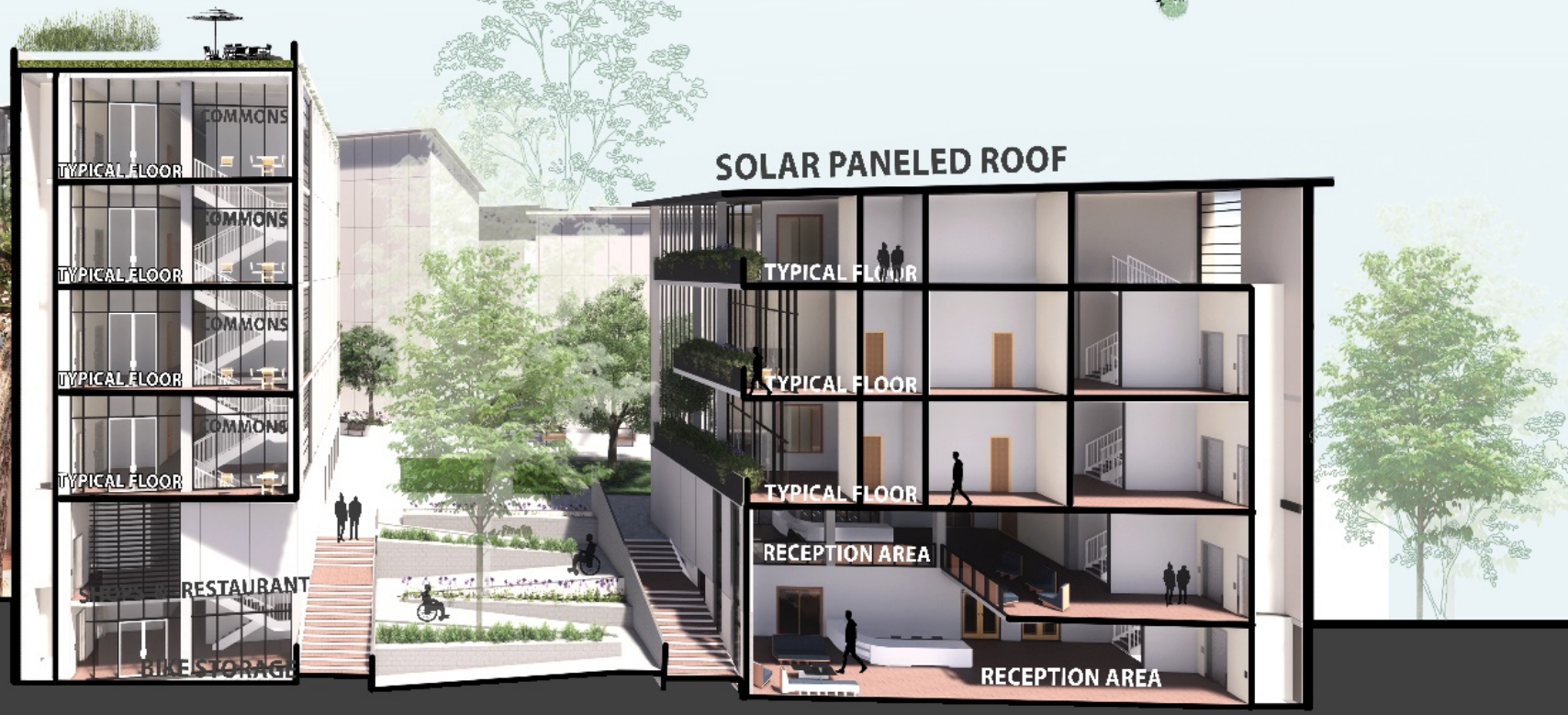
RESTAURANT

CONNECTIVITY

CONNECTING THE STREET WITH COMMERCIAL FUNCTIONS ACTING AS A LINK BETWEEN THE URBAN PARK AND THE HOUSING PROJECT







SECTION A-A
SCALE 1:200

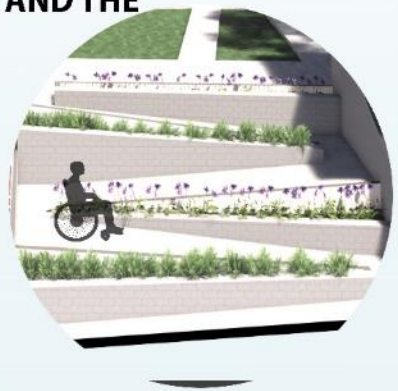


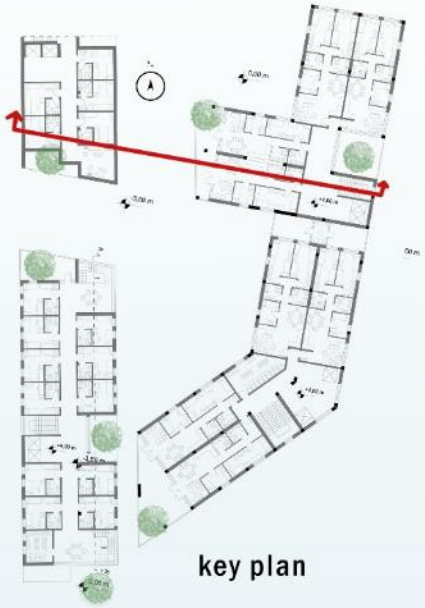
RESTAURANT

CONNECTIVITY

CONNECTING THE STREET WITH COMMERCIAL FUNCTIONS ACTING AS A LINK BETWEEN THE URBAN PARK AND THE HOUSING PROJECT

ADA ACCESSIBLE SITE





key plan

SOLAR PANELED ROOF



SECTION A-A
SCALE 1:200

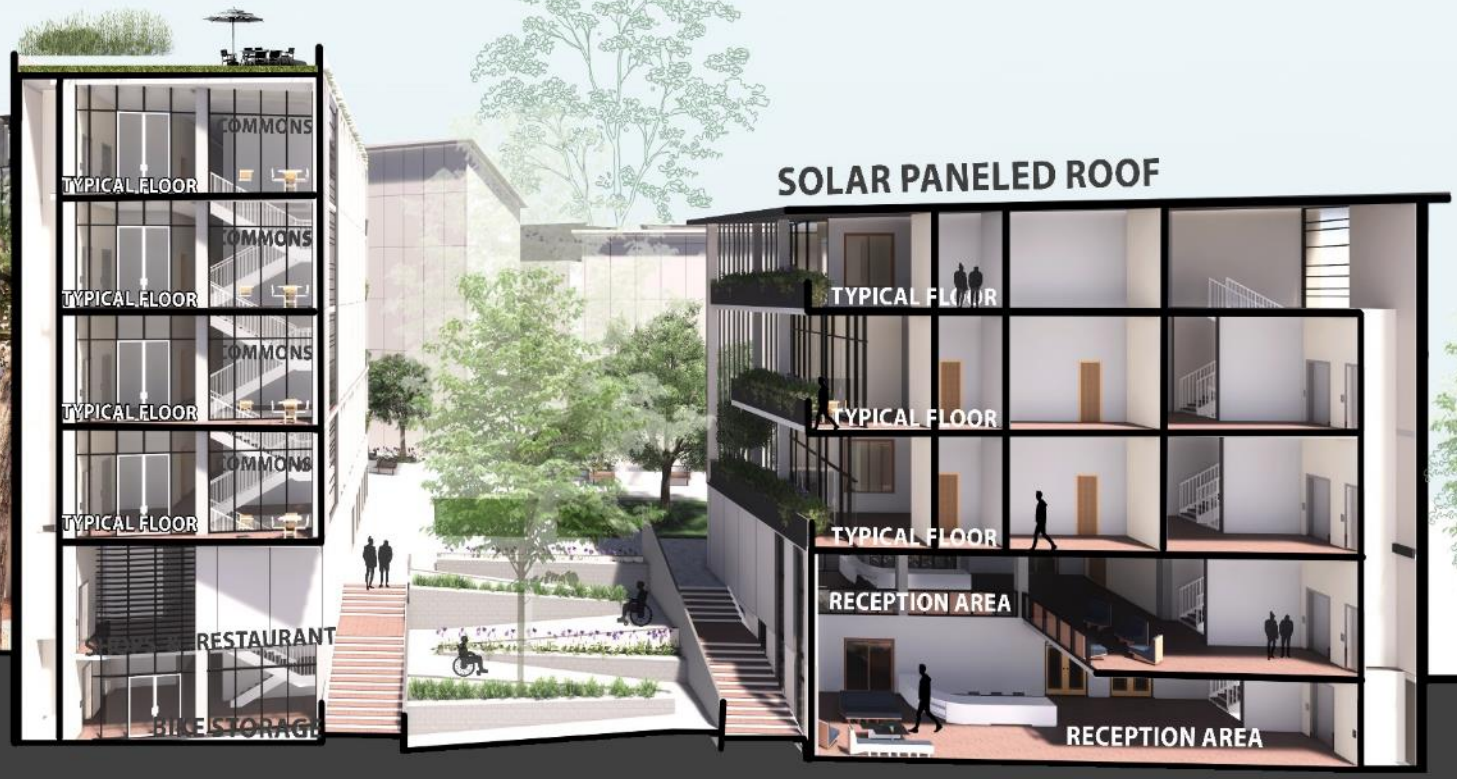


PRIVACY

SEPARATING THE STUDENT PLAZA FROM THE PUBLIC PLAZA TO MINIMIZE DISTURBANCE AND NOISE FROM THE COMMERCIAL AXIS

INTERNAL COURTYARD





SECTION A-A
SCALE 1:200



PRIVACY

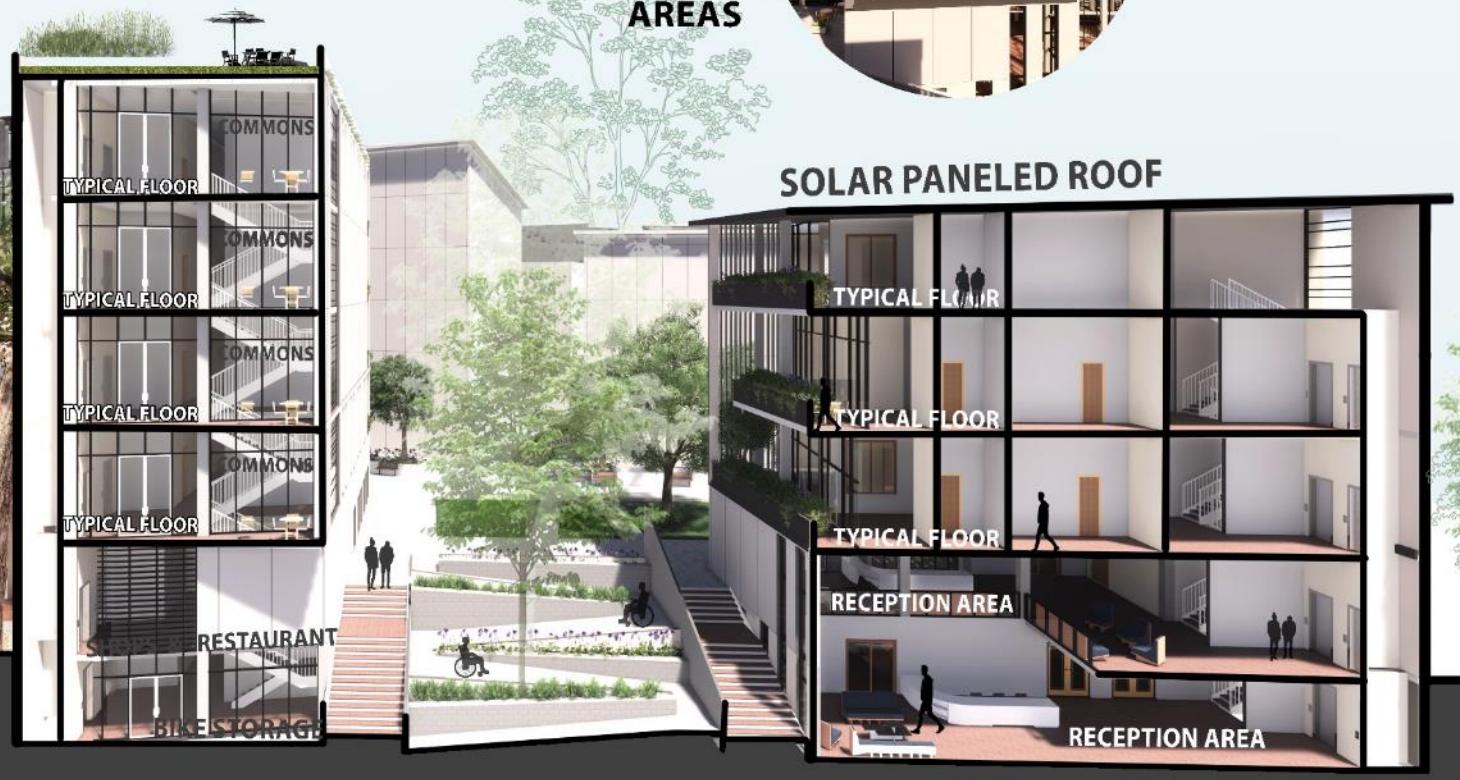
SEPARATING THE STUDENT PLAZA FROM THE PUBLIC PLAZA TO MINIMIZE DISTURBANCE AND NOISE FROM THE COMMERCIAL AXIS



MAXIMUM DAYLIGHT
VEGETATED FACADE
OPEN SPACE VERTICAL SOCIAL AREAS

INTERNAL COURTYARD







PRIVACY

SEPARATING THE STUDENT PLAZA FROM THE PUBLIC PLAZA TO MINIMIZE DISTURBANCE AND NOISE FROM THE COMMERCIAL AXIS

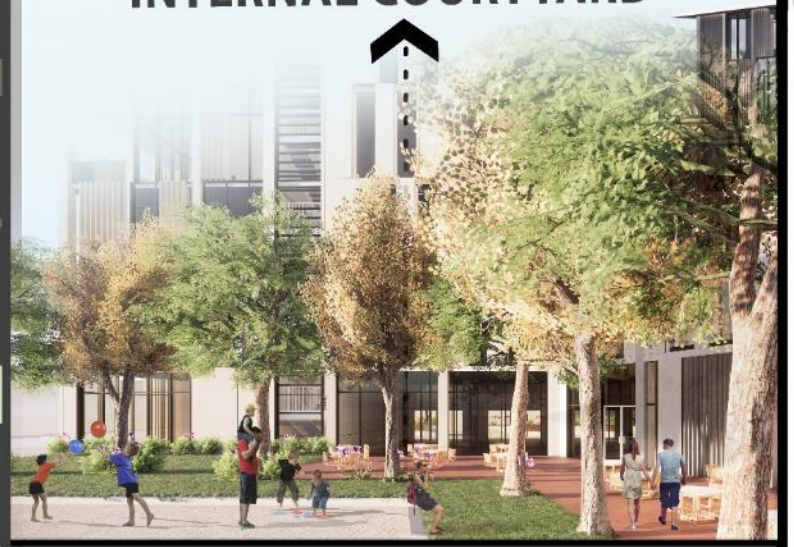


DOUBLE HEIGHT RECEPTION ACCESSIBLE FROM BOTH TOPOGRAPHIES



MAXIMUM DAYLIGHT
VEGETATED FACADE
OPEN SPACE VERTICAL SOCIAL AREAS

INTERNAL COURTYARD



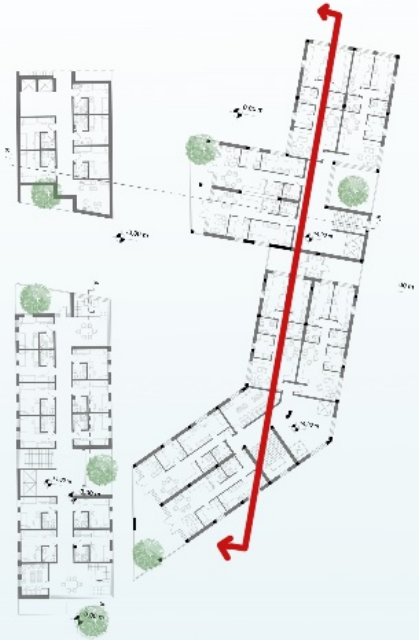




LIBRARY

MIXED-USE COMPLEX

COMBINING ALL THE NECESSARY FUNCTIONS NEEDED BY STUDENTS IN ONE PLACE AND INTEGRATING COMMUNAL NEEDS AND INTERACTIONS







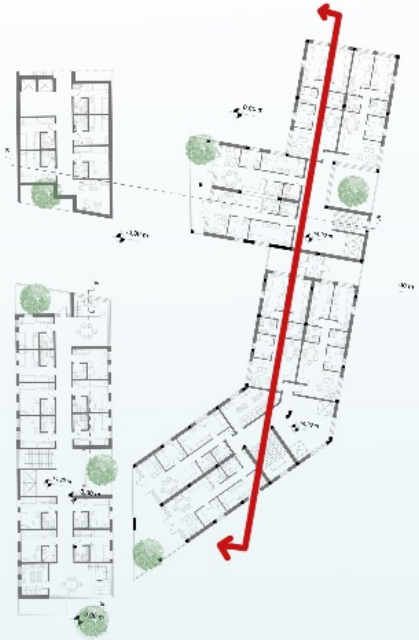
LIBRARY

MIXED-USE COMPLEX

COMBINING ALL THE NECESSARY FUNCTIONS NEEDED BY STUDENTS IN ONE PLACE AND INTEGRATING COMMUNAL NEEDS AND INTERACTIONS



STUDENTS BAR





ELEVATION CONCEPT

THE IDEA BEHIND THE LEVATION IS TO PROVIDE A MODERN CONTEXTUAL FACADE THAT RESPECTS THE AREA AND BUILDING TRADITION OF ITALIAN SOCIETY WHILE CATERING TO THE MODERN LIFE OF THE STUDENT RESIDENTS. TAKING THE PITCHED ROOF AS INSPIRATION



maximizing solar exposure



LONGITUDINAL RHYTHMIC WINDOWS
ROOMS PRIVACY + MAX DAYLIGHT



STRIPED SHADING
SEMI-PUBLIC SPACES/ COMMUNAL AREAS



VEGETATED FACADE
REGREENERATION



CURTAIN WALL
PUBLIC SPACES/ SOCIAL AREAS



WESTERN ELEVATION









SOUTH EASTERN ELEVATION

RE-GREENERATION HOUSING PROJECT





































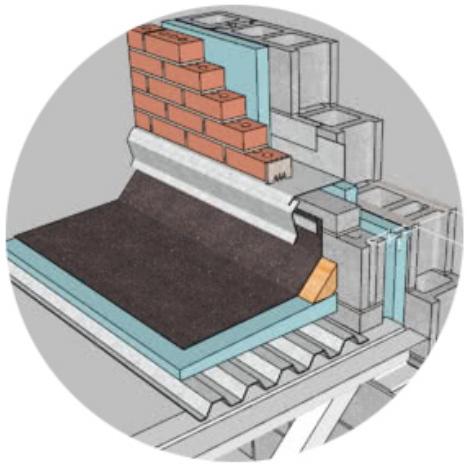




TECHNOLOGICAL DESIGN

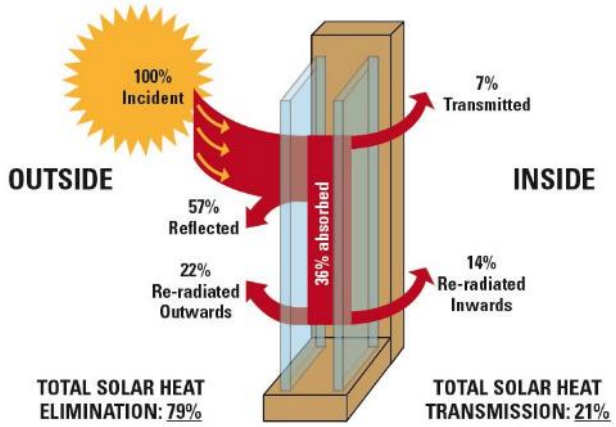


SECTION WALL



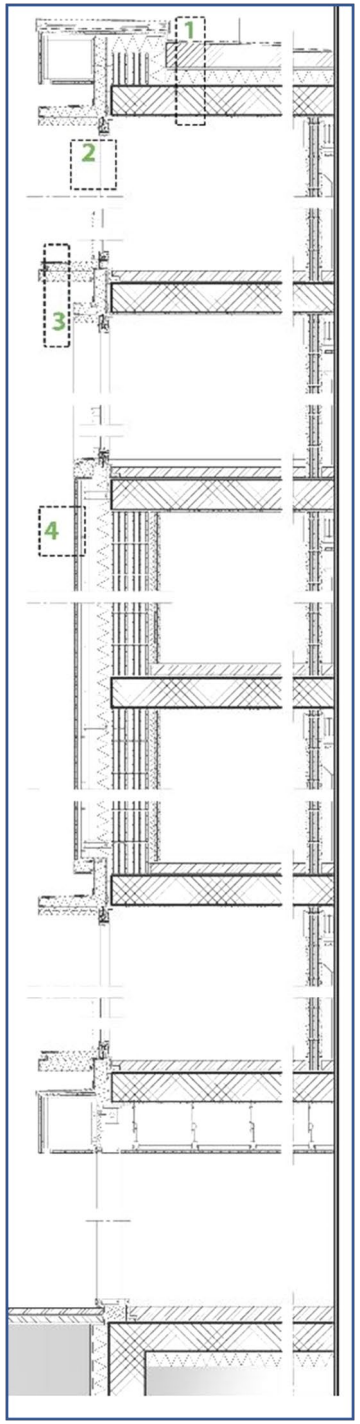
1. Roof:

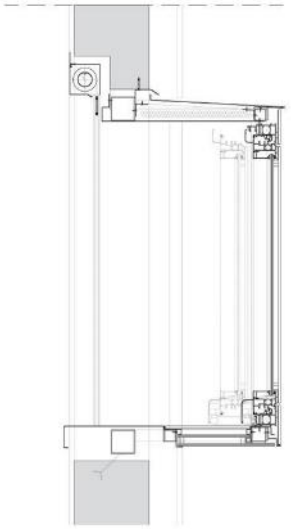
-Double bitumen sheathing reinforced with polyester
-Lightweight concrete for inclination (12 cm)
-Expanded polyurethane insulation (11 cm)
-Reinforced concrete slab (24 cm)
-Gypsum plaster (2 cm)



2. Transparent Vertical Enclosure:

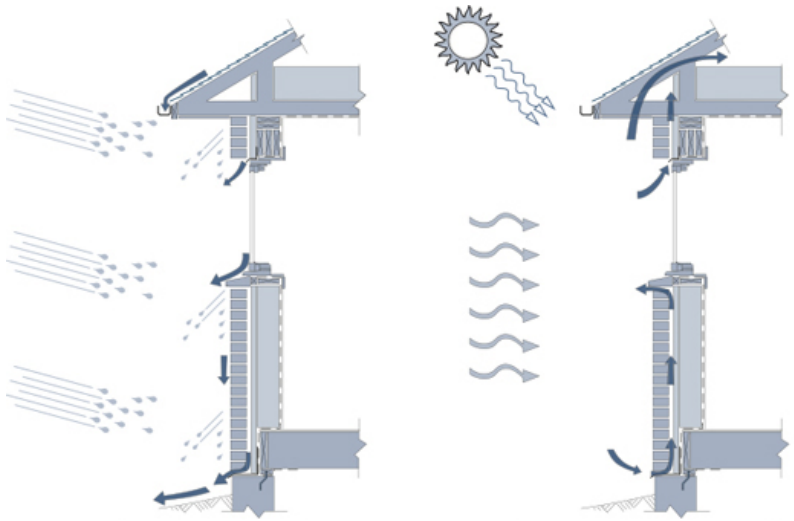
- Aluminum window frames composed of tubular profiles with thermal break
- Double glazing





3. Bow-Window:

- Pre-painted aluminum sheeting (10/15 mm)
- Galvanized steel structure



4. ventilated vertical enclosure:

- Aluminum panels (20/10 mm) on Aluminum structure
- Glass wool insulating panel (10 cm)
- Hollow brick block (25 cm)
- Glass wool insulating panel (4.5 cm)
- Double plasterboard panel (1.25 +1.25 cm)

Rainwater collection

Building

Street

Filteration → utilization for urban orchard

WASTE

Waste-to-energy

gray water collection



Sustainable
The PlasticRoad is a completely circular product that is made from recycled plastic. It has a significantly smaller carbon footprint than traditional road structures thanks to the longer lifespan and the reduction of transport movements involved in its construction

Prefabricated and modular
The PlasticRoad concept consists of a prefabricated, modular and hollow road structure made from (recycled) plastic. The prefabricated production, the light weight and the modular design of the PlasticRoad make construction and maintenance faster, simpler and more efficient compared to traditional road structures

Hollow design
The PlasticRoad has a hollow space that can be used to (temporarily) store water, thus preventing flooding during extreme precipitation



The municipal storm sewer system collects rainwater and surface water runoff from roads and parking lots into natural channels and catch basins (storm grates) and transports it to various points in Kempenfelt Bay. Water that enters a storm drain is NOT treated to remove pollutants; it is important not to dispose of any waste materials into any storm water collection point

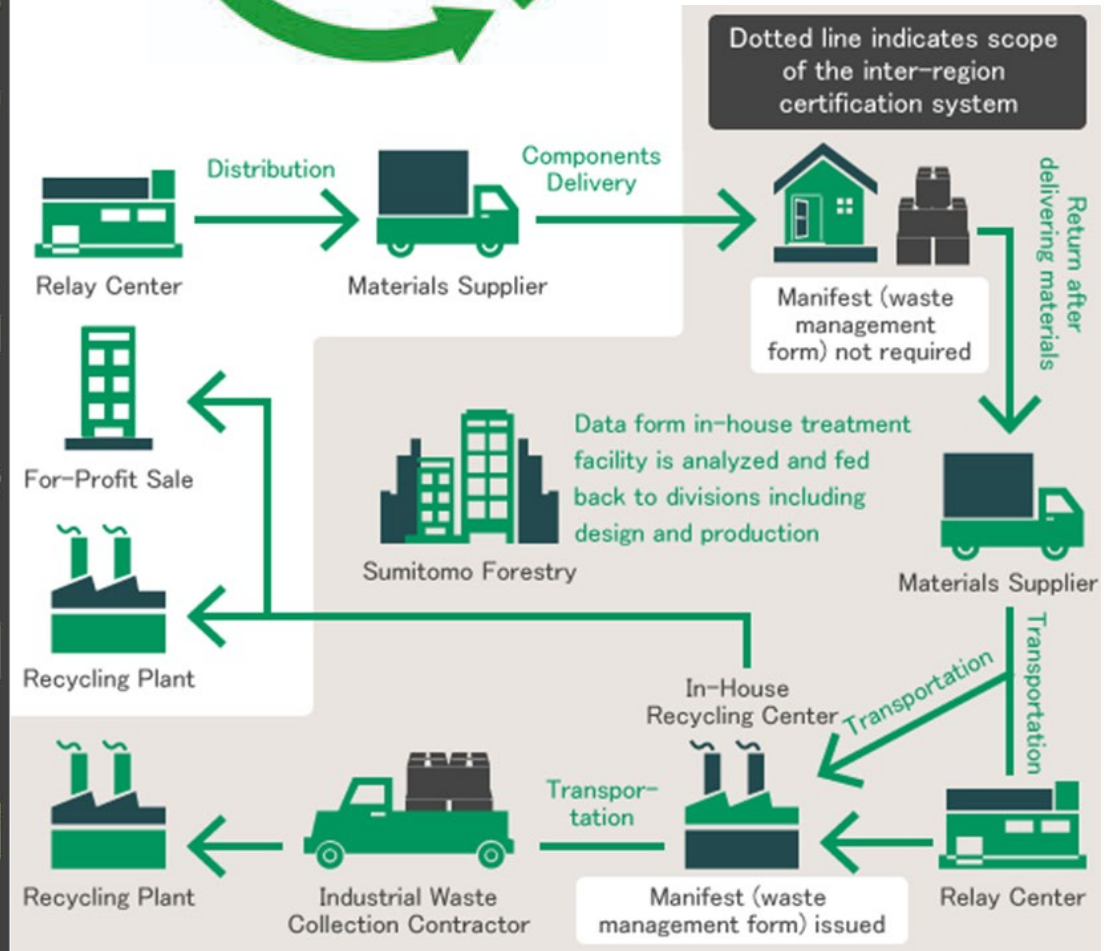
Pedestrian and bicycle oriented spaces are spaces in urban areas that are designed for use predominantly by pedestrians and bicycles, rather than automobiles. These spaces can be a sidewalk, bike lane, bike path, path, walking ·eet, or woonerf and are used for ·thering or transportation. Each these spaces are easily ·orporated into the urban fabric ·rough streetscape, greenway or ·eenbelt design

WATER MANAGEMENT









There are 5 types of waste

Liquid Waste. Liquid waste is commonly found both in households as well as in industries. ...
Solid Rubbish. Solid rubbish can include a variety of items found in your household along with commercial and industrial locations. ...
Organic Waste. Organic waste is another common household. ...
Recyclable Rubbish. ...
Hazardous Waste.

> The most important reason for waste collection is the protection of the environment and the health of the population.

FOOD PRODUCTION











RENT A PLOT

Users can rent a plot that they can be responsible for it and give the possibility to growht fruits and vegetables and sell their products in the public market.



ROOF-TOP PRODUCTION

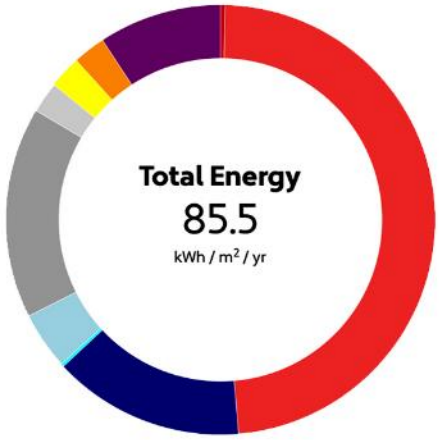
In addition to urban orchard, the students have the possibility to coltivate natural products like fruits and vegetable directly on the rooftop of the student's houses. The steps design for the roof help to have a good quantity of sun duing the whole year.





Annual Energy Use

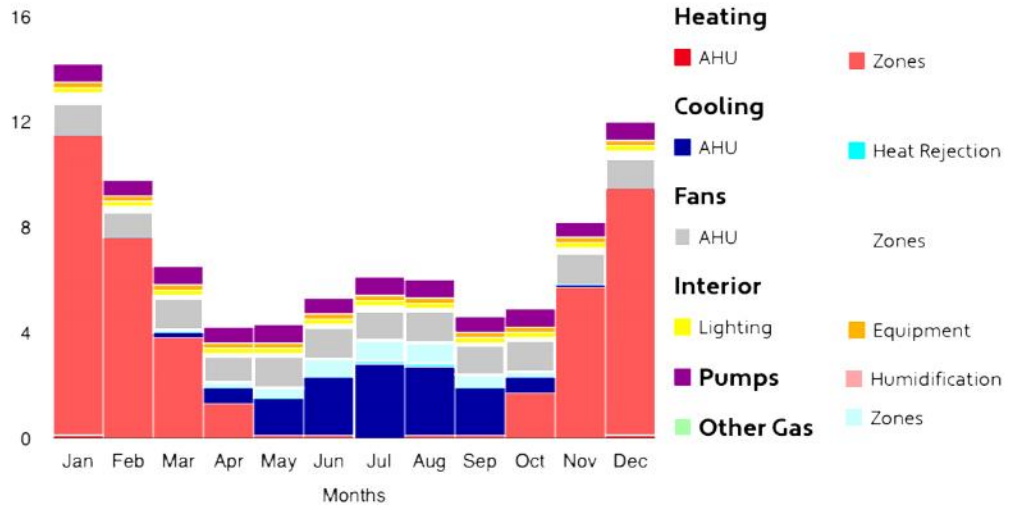
Annual



Segment	kWh / m² / yr	% of total use
Heating	**41.6**	**49 %**
AHU	0.3	0 %
Zones	41.3	48 %
Humidification	0.0	0 %
Cooling	**16.2**	**19 %**
AHU	12.3	14 %
Heat Rejection	0.2	0 %
Zones	3.7	4 %
Fans	**15.6**	**18 %**
AHU	13.6	16 %
Zones	2.0	2 %
Interior	**4.2**	**5 %**
Lighting	2.1	2 %
Equipment	2.1	2 %
Pumps	**7.9**	**9 %**

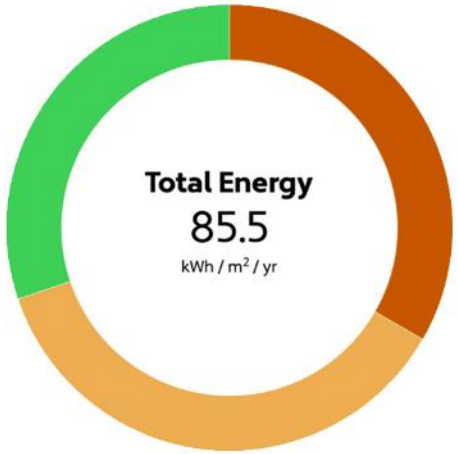
Monthly

Monthly Energy Use



Annual Energy Mix

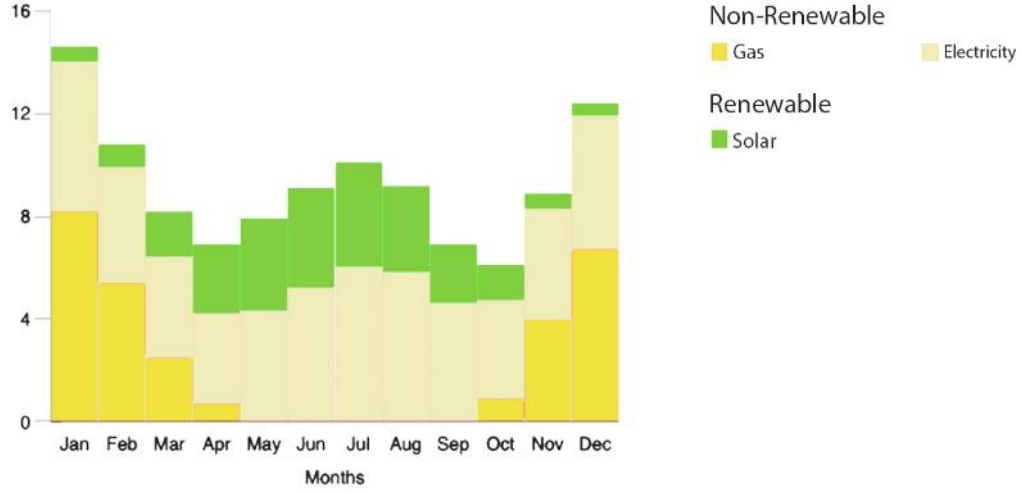
Annual



Segment	kWh / m² / yr	% of total use
Non-renewable	**59.7**	**70 %**
Gas	28.5	33 %
Electricity	31.2	36 %
Renewable	**25.8**	**30 %**
Solar	25.8	30 %

Monthly

Monthly Energy Mix

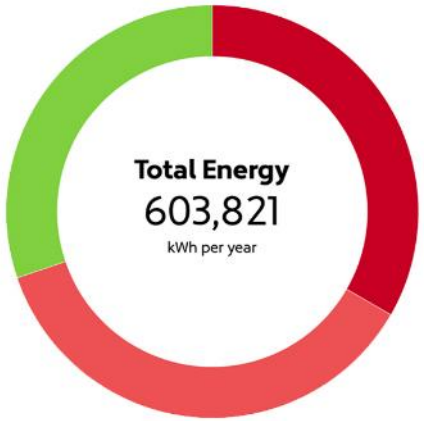


RESULT:

According to these charts 49% of energy consumption is for heating services, 19% is for cooling and to answer to that need of energy we provide 70% by non-renewable energies which are gas and electricity and 30% by renewable energy which is provided by solar energy.

Annual Energy Mix

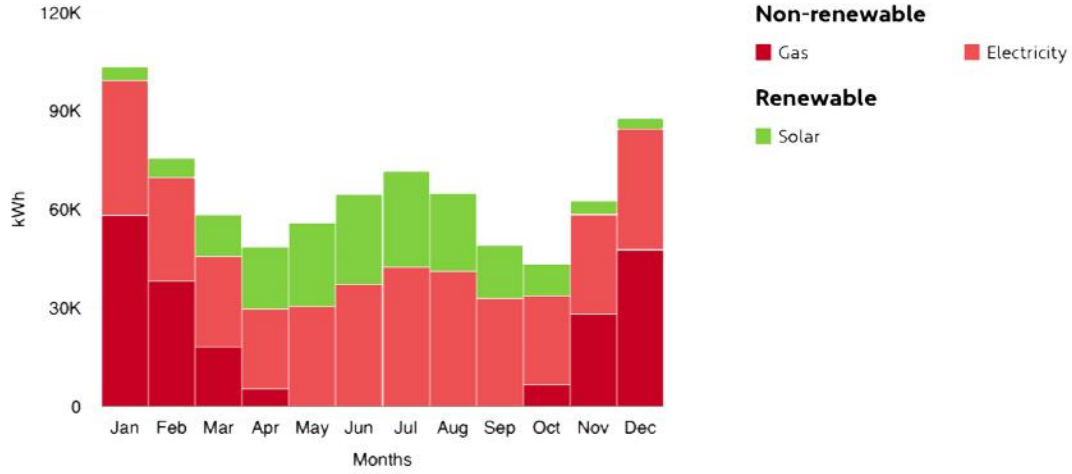
Annual



Segment	kWh per year	% of total use
Non-renewable	**421,392**	**70 %**
Gas	201,273	33 %
Electricity	220,119	36 %
Renewable	**182,429**	**30 %**
Solar	182,429	30 %

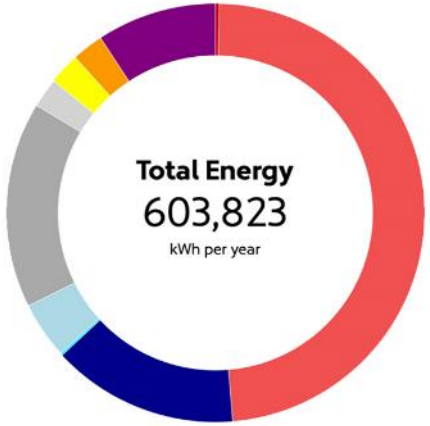
Monthly Energy Mix

Monthly



Annual Energy Use

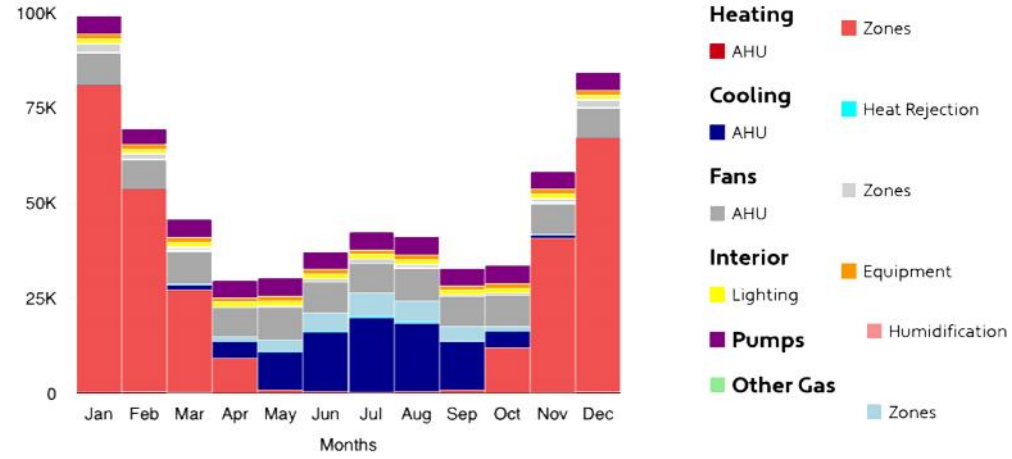
Annual



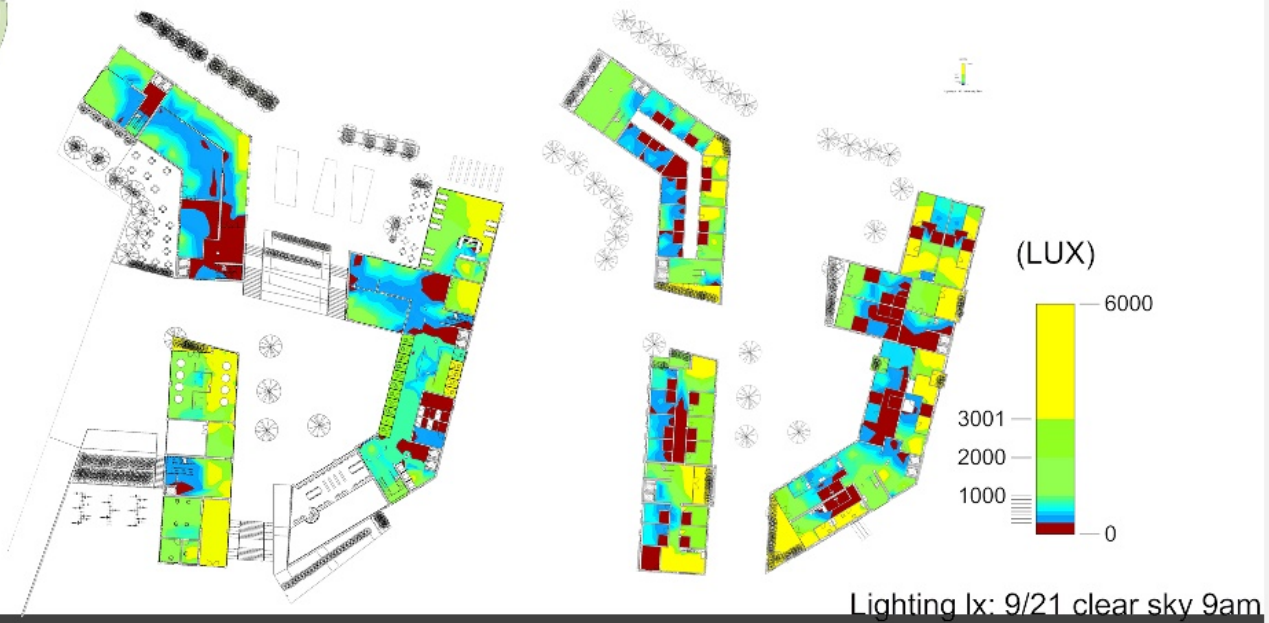
Segment	kWh per year	% of total use
Heating	**293,939**	**49 %**
AHU	1,798	0 %
Zones	292,141	48 %
Humidification	0	0 %
Cooling	**114,604**	**19 %**
AHU	87,033	14 %
Heat Rejection	1,101	0 %
Zones	26,470	4 %
Fans	**110,086**	**18 %**
AHU	96,278	16 %
Zones	13,808	2 %
Interior	**29,338**	**5 %**
Lighting	14,669	2 %
Equipment	14,669	2 %
Pumps	**55,856**	**9 %**

Monthly Energy Use

Monthly



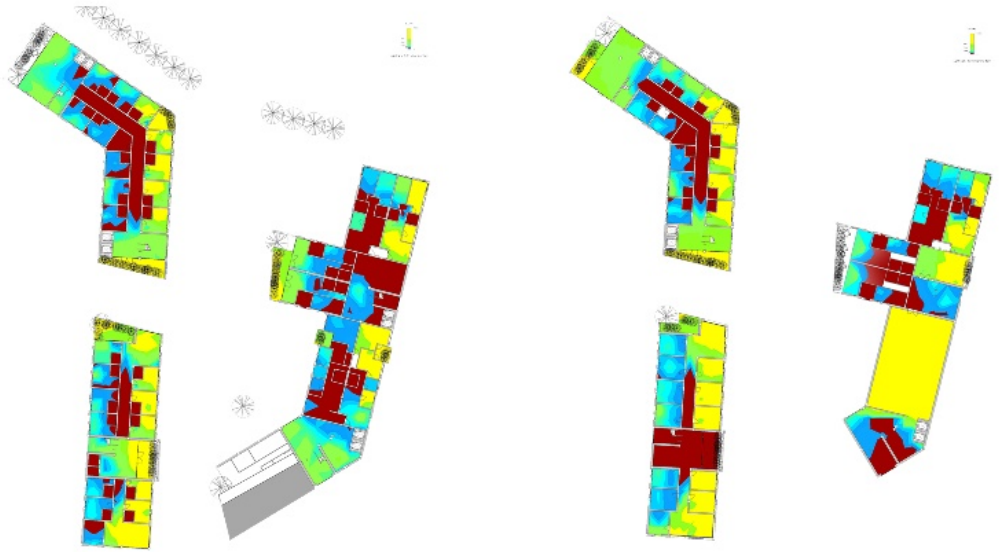
DAYLIGHT ANALYSIS



Lighting lx: 9/21 clear sky 9am

GROUND FLOOR

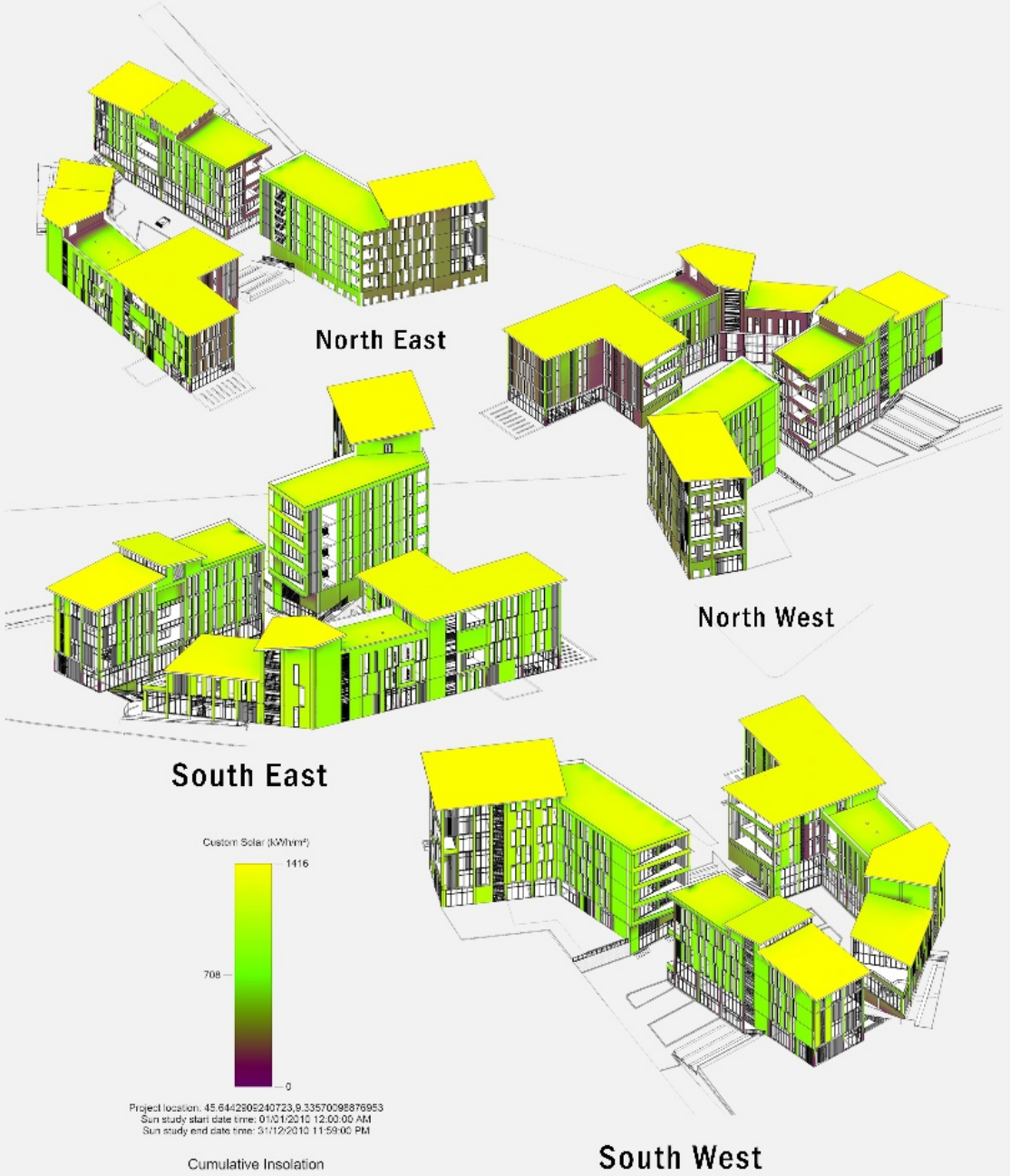
FIRST FLOOR



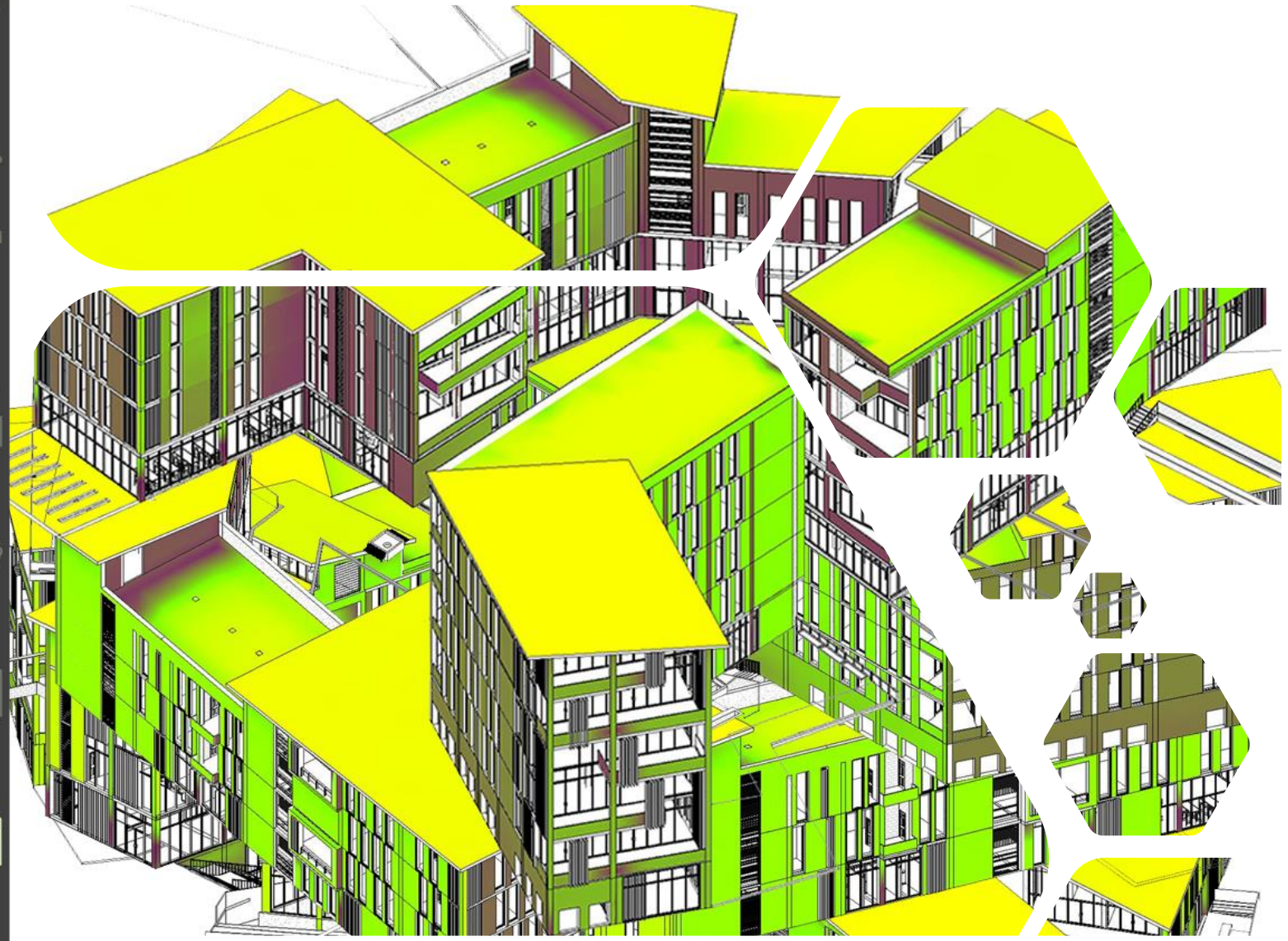
SECOND FLOOR

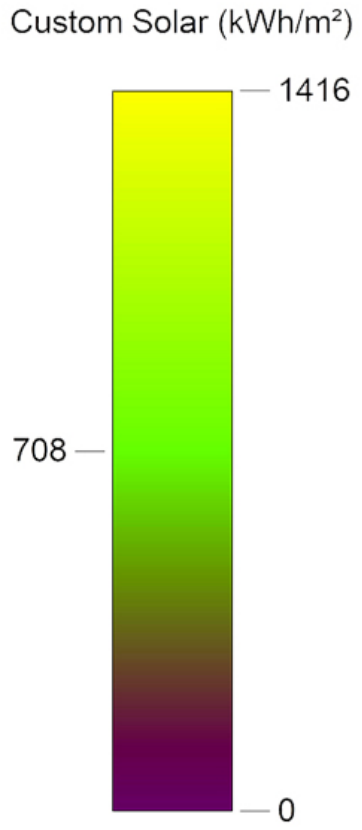
THIRD FLOOR

SOLAR ANALYSIS



Our roof surface let's us to have 180 m2 of PV Panel considering surface needed to access and maintenance.
As we calculated before we receive 1416 KWh per cube meter on our roof and we know pv panels have about 15% efficiency thus: 180m^2.1416KWh.15% efficiency = Energy gained by PV panels which is 30% of our energy need.





Project location: 45.6442909240723,9.33570098876953
Sun study start date time: 01/01/2010 12:00:00 AM
Sun study end date time: 31/12/2010 11:59:00 PM

Cumulative Insolation


RETROFITTING
IMM

PROXIMITY

BEFORE / AFTER

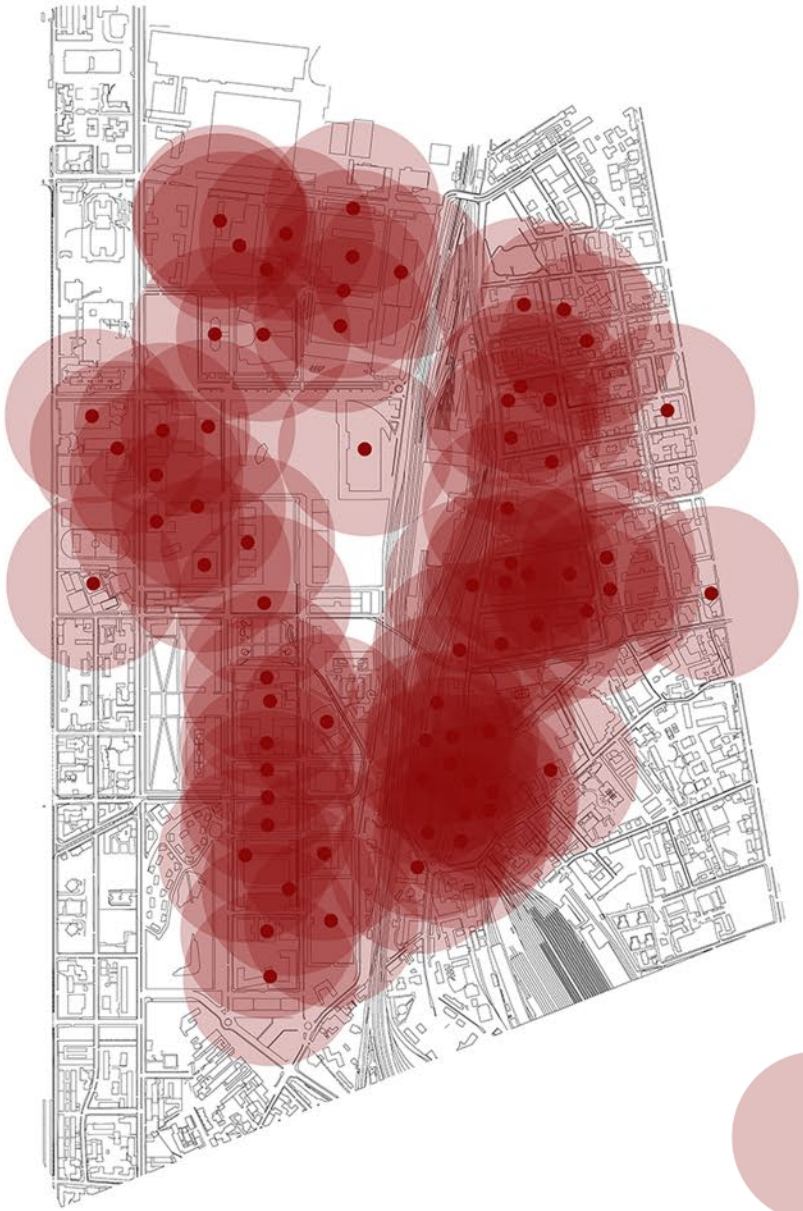
LEVEL OF PROXIMITY

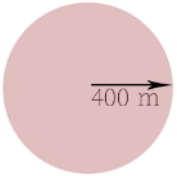
- High proximity
- Medium proximity
- Low proximity

KEY FUNCTIONS

- Educational
- Commercial
- Office
- Sport
- Public Services
- Industrial
- Cultural
- Religious
- University Residentials



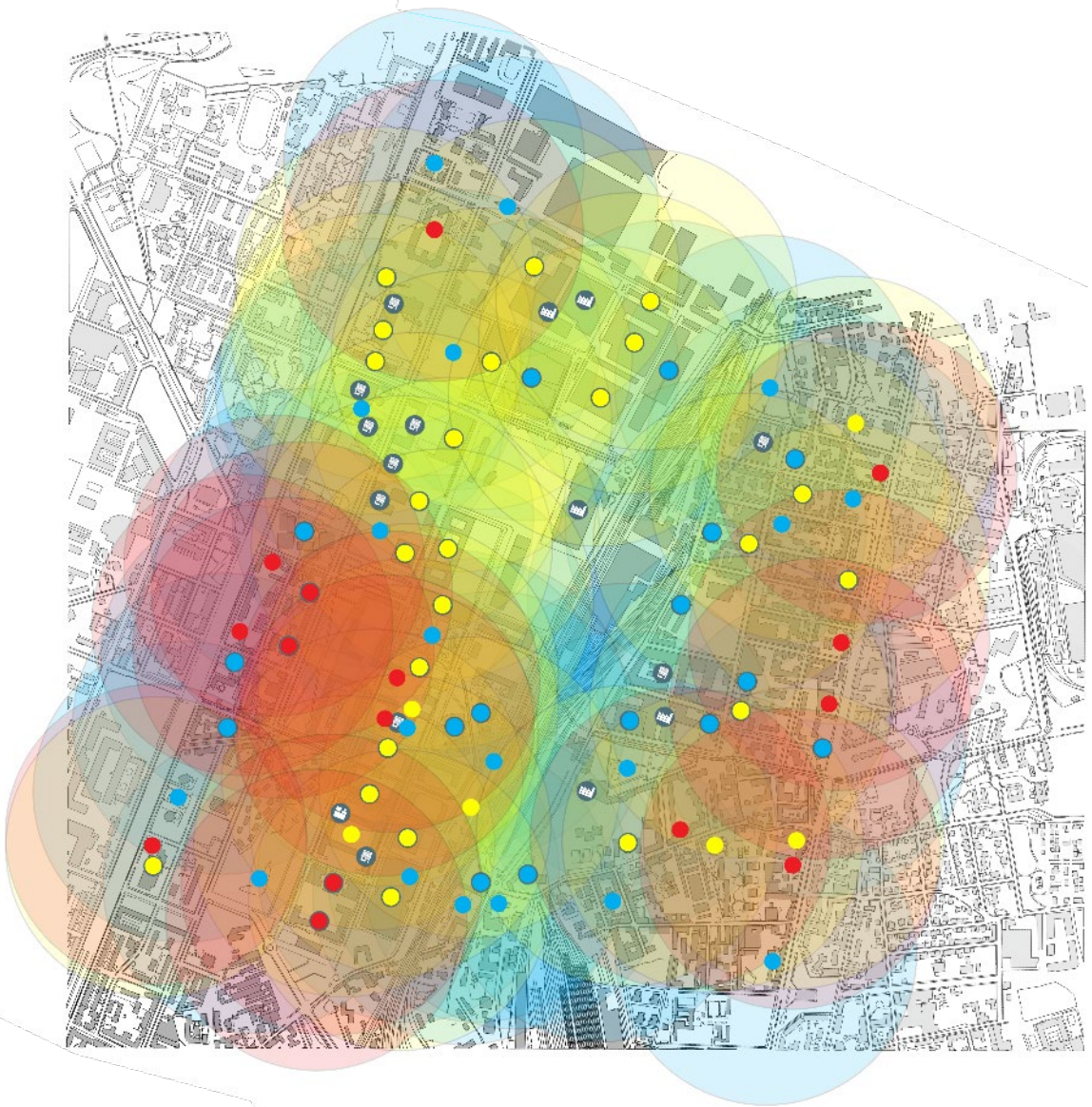


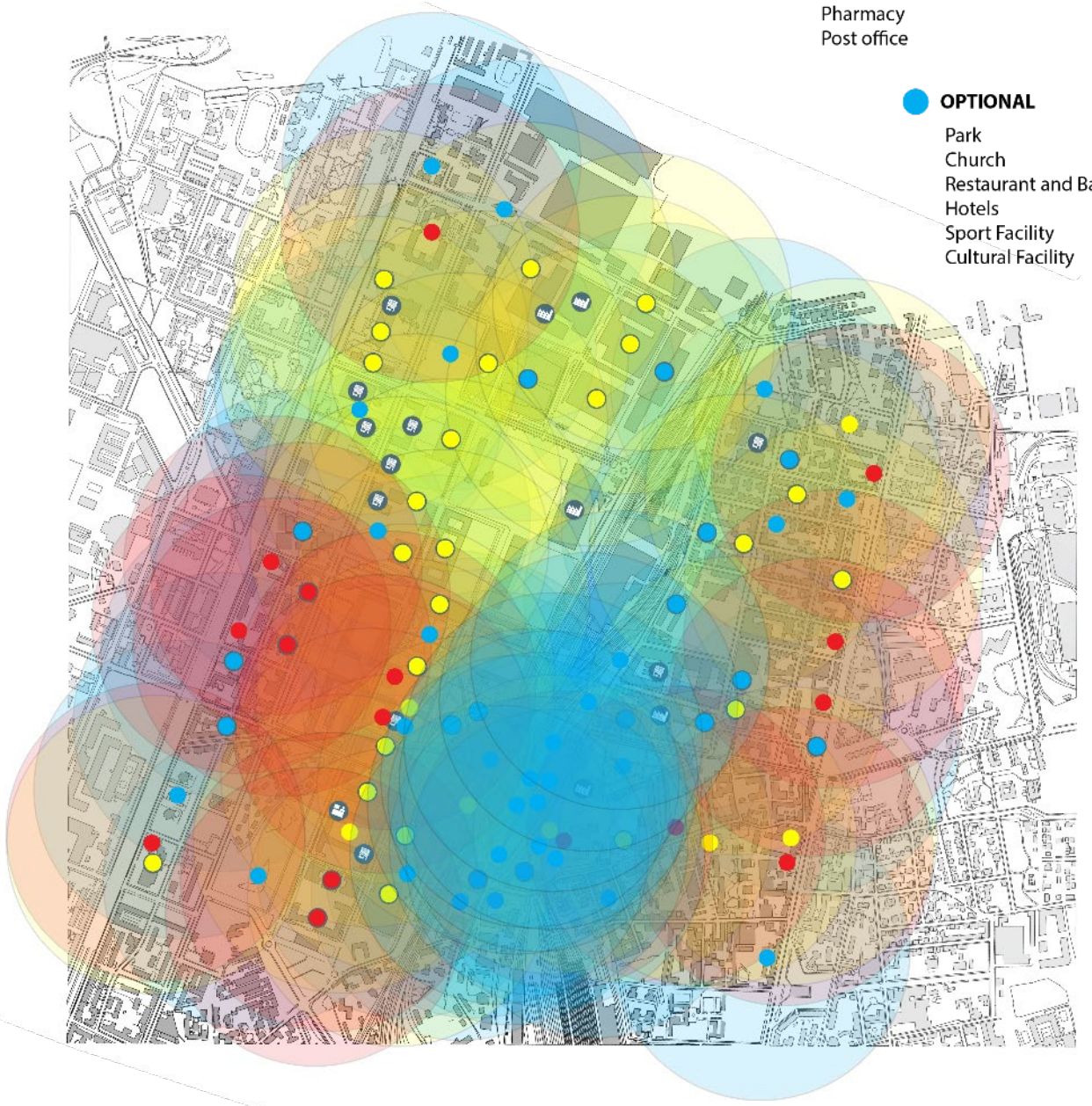


5-10 minutes walkable

DIVERSITY

BEFORE / AFTER





MAIN ACHEIVEMENTS

ARCHITECTURAL DESIGN

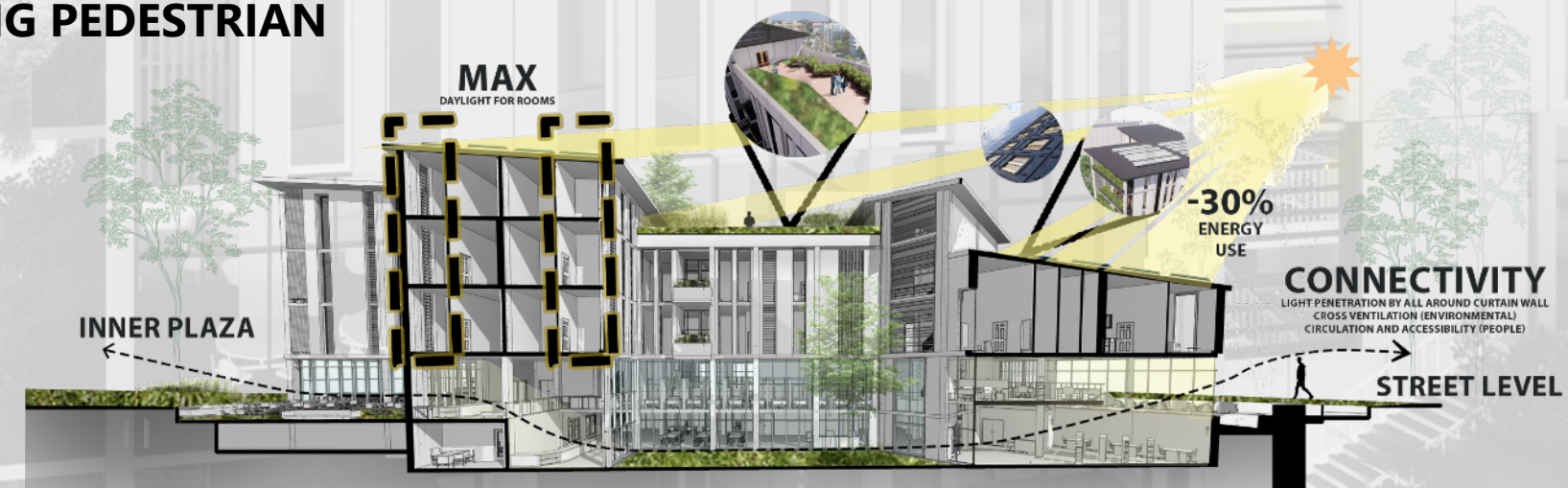
- SOCIAL INTERACTION GUARANTEED BY MIXED FUNCTIONS
- INTERNAL COURTYARD
- DIFFERENT LAYOUT COMPOSITIONS

URBAN DESIGN

- REDESIGN TUNNEL EXPERIENCE
- GREEN CONNECTION – LINEAR PARK
- FOOD PRODUCTION – URBAN ORCHARD
- NEW INTERMODALITY NODES
- RE-CONNECTION OF THE EXISTING PEDESTRIAN AND BIKE PATHS

TECHNOLOGICAL DESIGN

- ENERGY EFFICIENTY
- MAXIMUM DAYLIGHT
- WATER MANAGEMENT
- WASTE MANAGEMENT




THANKS FOR YOUR ATTENTION
GRAZIE PER L’ ATTENZIONE
از توجه شما متشکریم
شکراً لانتباهكم