Sustainable Mobility and Sustainable Urban Planning, As a Social and Environmental Project; Designing Living Streets

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structure

1. Istanbul Metropolitan City And Urbanization,
2. Urban Structure and Transportation in Old Istanbul,
3. Social Life in Neighborhood before Motorization,
4. Rapid Urbanization and Motorization Istanbul,
5. According motorization changing urban society, unsafe streets for pedestrian,
6. The negative externalities of motorization on environment,
7. Sustainable mobility, social and environment solution; Pedestrianization
8. Human scale social and spatial design and mobility: Living Street Project
9. Living street project implementation in Istanbul

The geographical location of Istanbul, Turkey

Istanbul Metropolitan Area

- Istanbul is the largest metropolitan city of Europe with it's big population and it is bigger than 23 country in Europe, the density of population is 20.116 person in the center of city

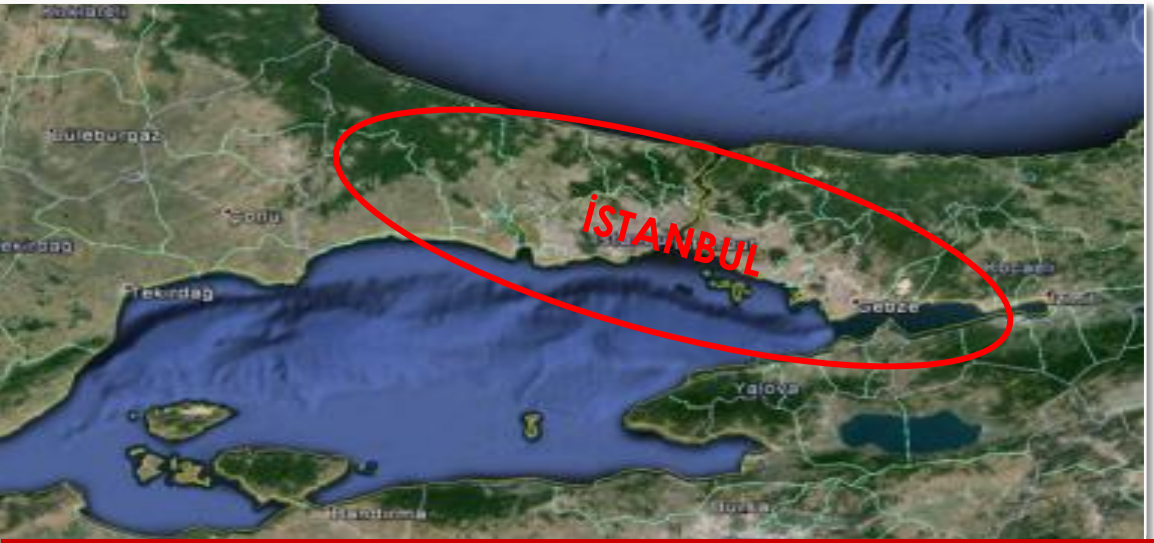
- Istanbul is a megapolis with approximately 15 million population and 39 district,

- Instead of rapid urbanization in Istanbul Metropolitan we need to create Sustainable Cities that have limited dimension and small area ,

- the concentration of population the public transportation system needs to improve with sustainable transportation and urban planning policies.

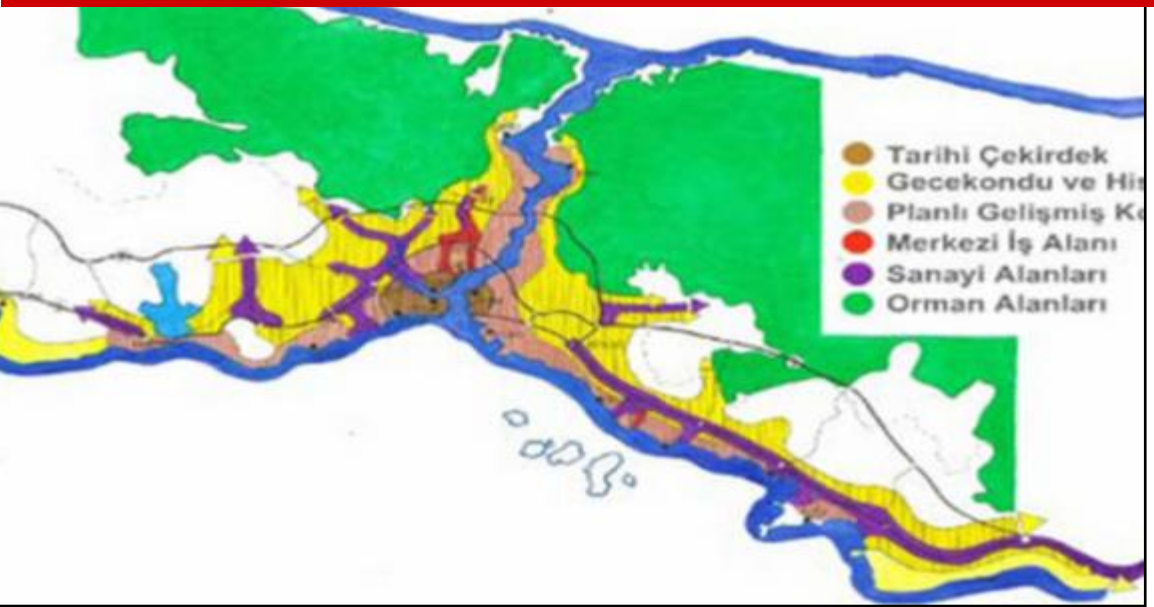
- The rapid population growth of the 1950s strained the historic nature of the urban fabric.

Urbanization Proses Of Istanbul



- Before urbanization: The history with its natural beauty and reputation of the geographical location
- has a special place among the metropolis of the world.
- The İstanbul City is in national and international trade and tourism center.
- At the that time industrialization began in İstanbul,
- Therefore many people have started to migrating Istanbul from small towns in Turkey after in 1950

Rapid urbanazation by the industrial growth (1950-1980)

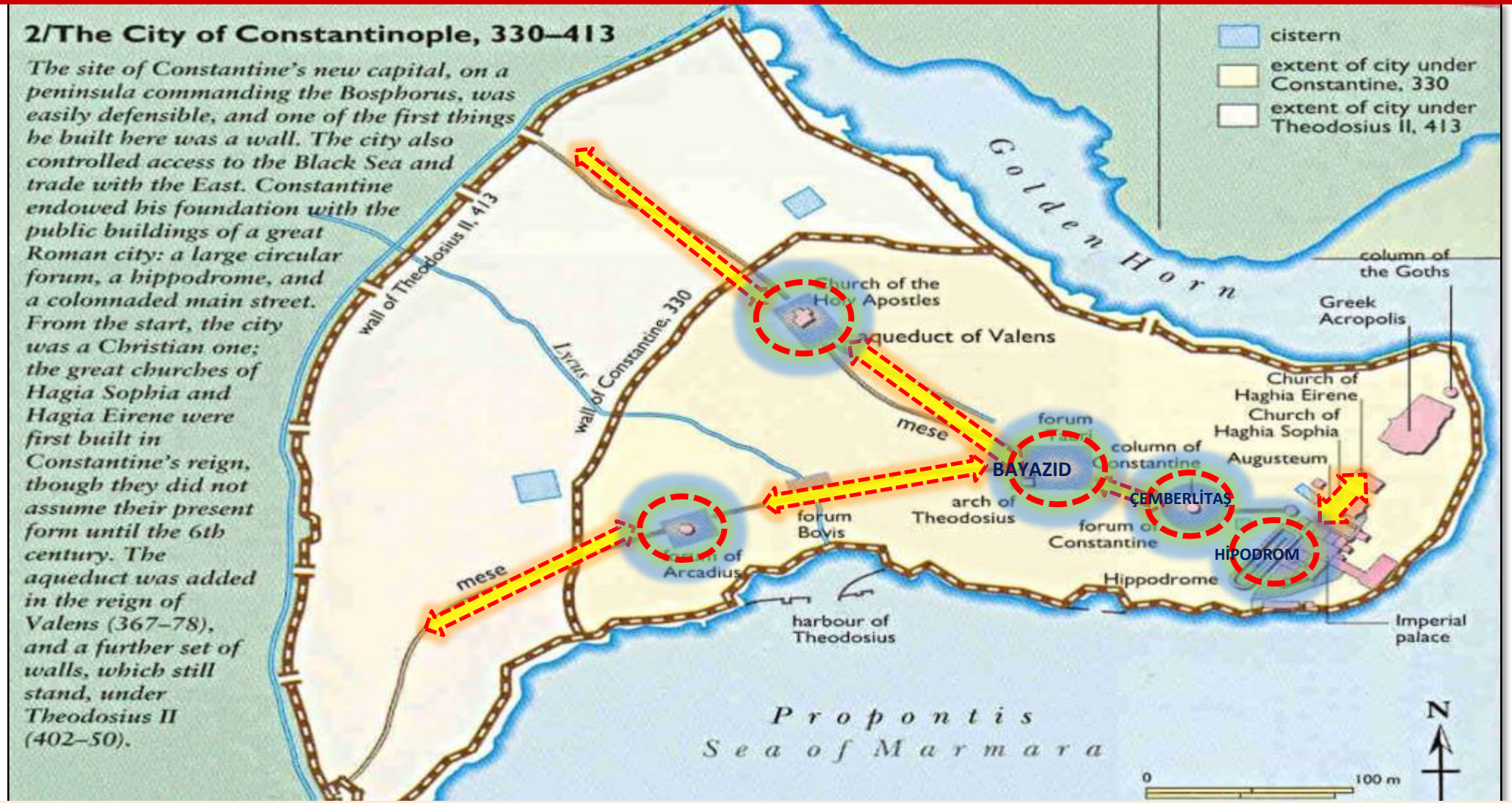


- unplanned and uncontrolled development has caused by rapid urbanization, it has been effected by the land use and transportation.
- migration of population concentration that comes with it has been an important part of the process.

Rapid Urbanization,Urban Development and Population Growth Of Istanbul

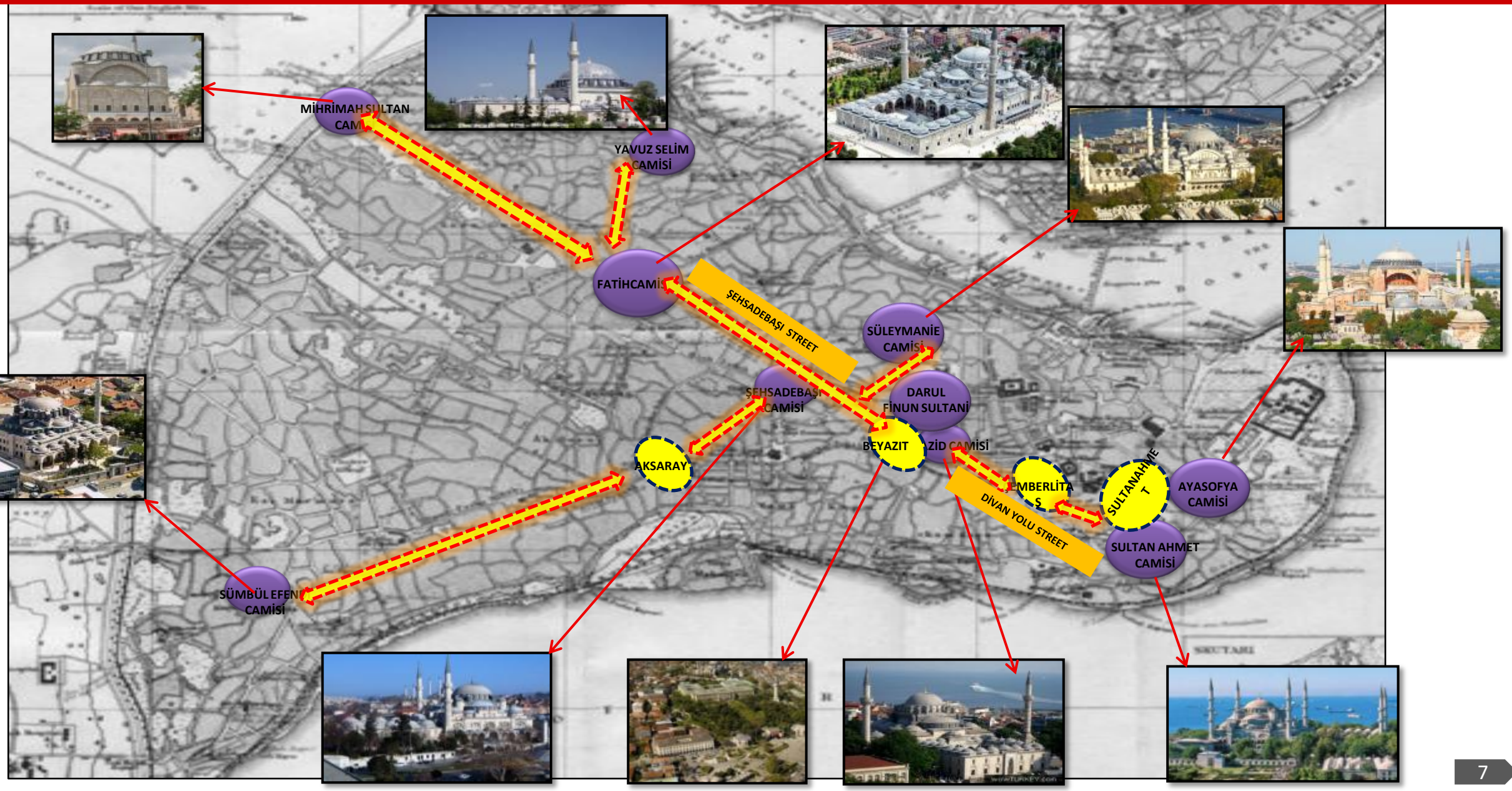
The most important factor which causes existing trend is MIGRATION!

Istanbul, Byzantion period (330-400), city squares and main pedestrian lines

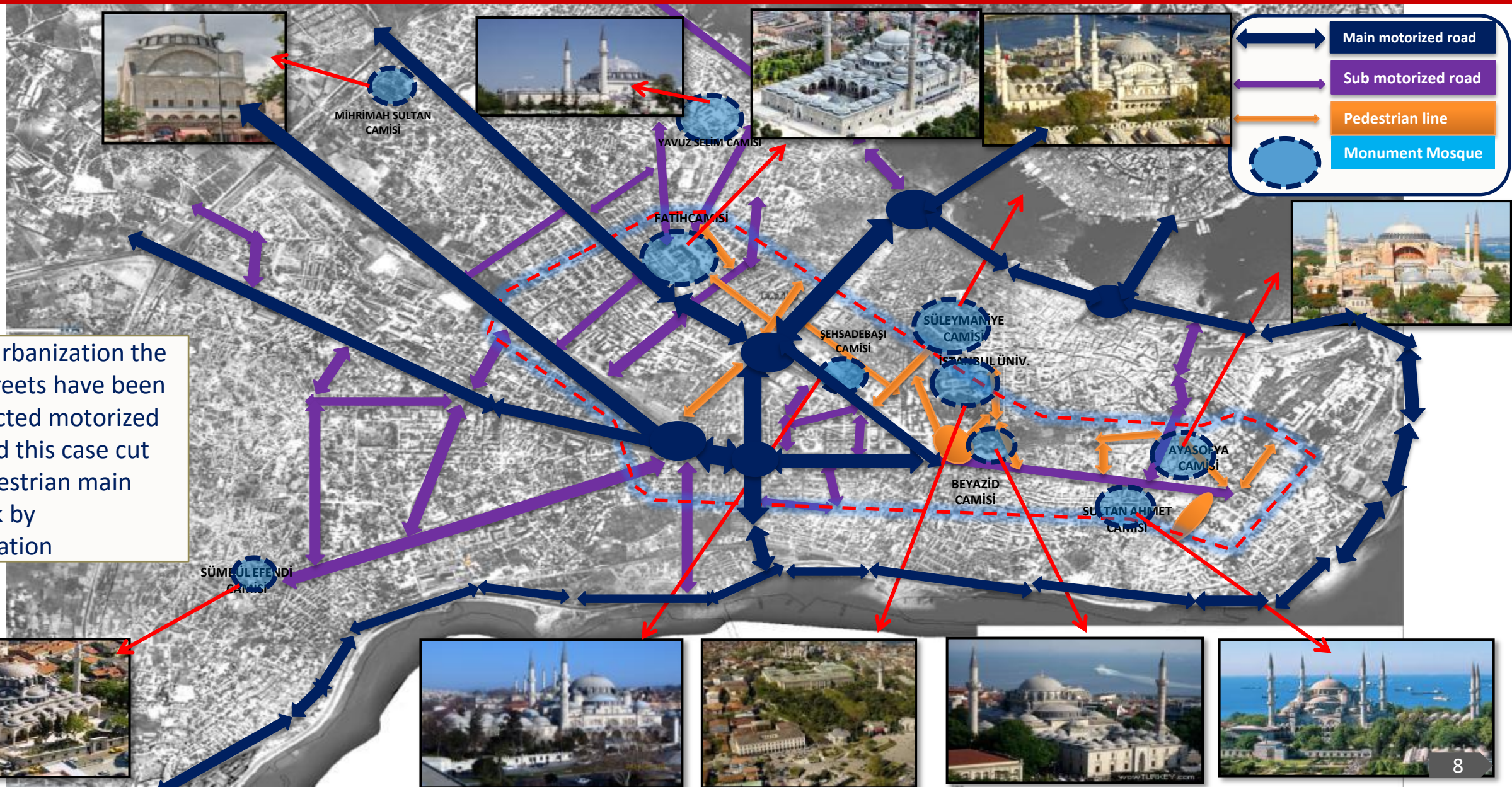


The old Istanbul city has been established around several monument mosques, such as, Fatih Mosque, Sultanahmet Mosque- Blue Mosque, Ayasofya Church and squares and there were a main pedestrian live between these squares to contact each squares with others.

Istanbul- Historical Peninsula, Ottoman Empire period (1453-1900), city squares and main pedestrian lines



Istanbul- Historical Peninsula, Rapid Urbanization and Motorization period (1950-1980), city squares and main pedestrian lines



By the urbanization the main streets have been constructed motorized road and this case cut the pedestrian main network by motorization

Social life in neighborhood before rapid urbanization

- Social life has been established at streets and around mosque at neighborhood scale in old Istanbul
- The streets are connected the mosque square and small green areas were majority free public places
- Community was having social relation around of the mosque square and at streets.
- squar is the living centers where are the collectors of streets, complementary and unifying element .

Square Oriented Living Center Project

What is Square?

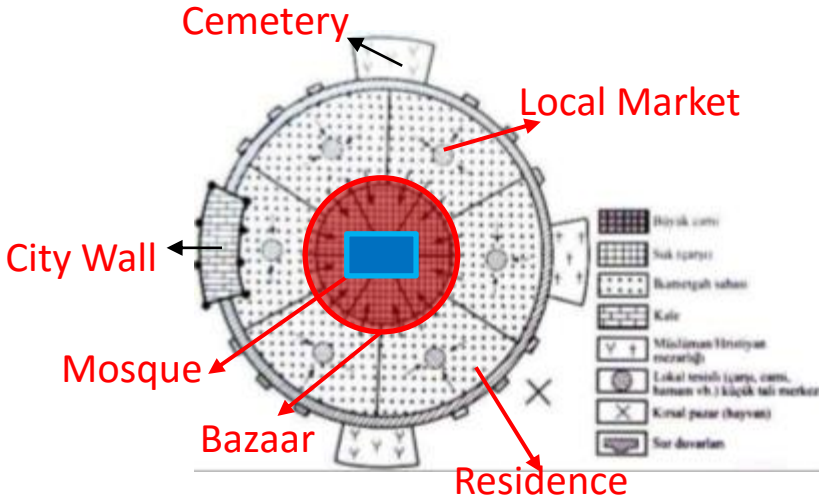
Based on intimacy in social life

- Occurred in community culture,
- square is not a tool for the detection of monumentality,
- it is social centers for meeting of the society,
- cohesion and developing activities such as making the trade.
- Square and streets were living spaces and safe zone for all different age groups, older, adult, younger and children age groups,
- Community is cooperating and helping each other with the spatial's well organized.
- free spaces form have been designed to create a strong social structure and community in neighborhood,

Sarajevo Square, Bosna Hersek

Old Istanbul square

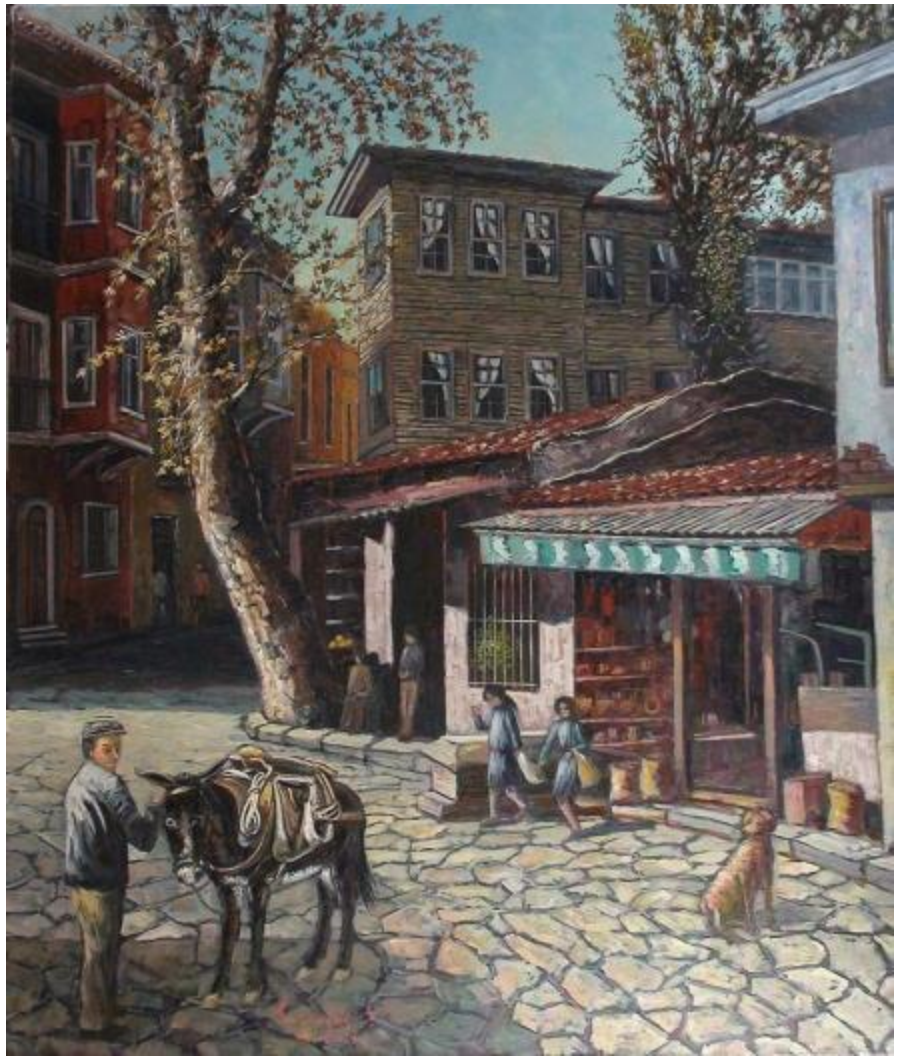
Relationship Between Market And Square



Market Neighborhood

"Mosques, bazaars and soup kitchens are the dominant elements of the Ottoman town planning. This area can be defined as the market neighborhood."

Faroqhi, 2004



- The past design should be well-analyzed to be inspired from the past.
- It was constructed a mosque first of all than it was constructed a the houses around of the mosque,
- Then new neighborhoods have grown outward from the center of the mosque by constructing housing piece by piece.

Inspiration from the Old Culture

Relating Oriented Living Center Square To The History And Past Culture

Public and Common Elements

MOSQUE

SCHOOL

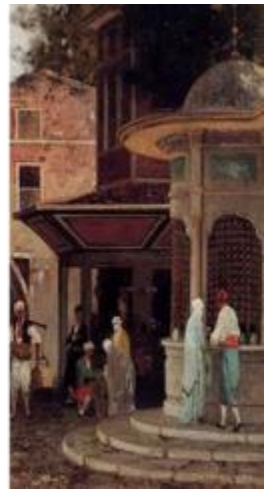
LIBRARY

EATING AND DRINKING PLACES

FOUNTAIN

BATH

SMALLER SQUARE



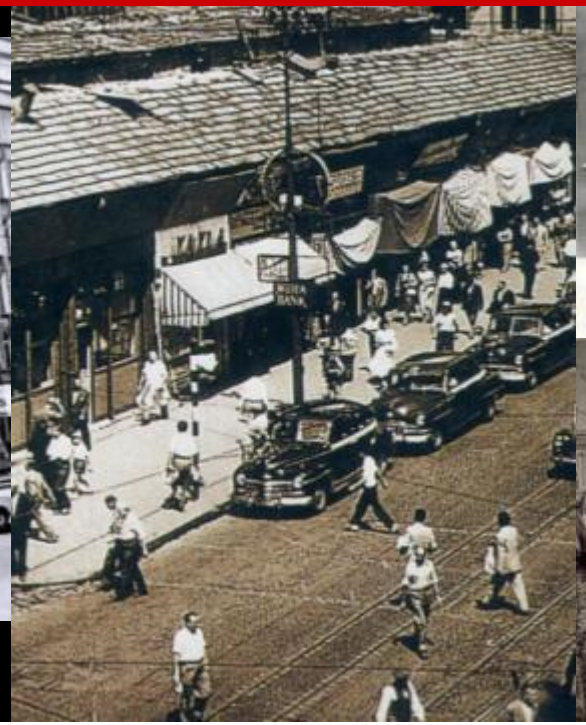
CAFE

- Each home would built absolutely respected “seniority rights" of the previous one about allowing its light and wind.
- The neighborhood widen size was usually between 1-5 hectares and population had changed between about 1000-2000 people.
- Neighborhood was ending with a dead-end street and every neighborhood had its own public and common elements.

Before The Car Social and Spatial Environment

- Before the car, vehicles were used in out of residential areas for different transport purpose such as for carrying goods and fora transport people between cities. Pedestrian-oriented transport was the most conmen in the cities.
- The city was shaped by the needs of the people. Streets, squares were safer and social life centers.

After the Car Changed the Social and Spatial Environment



- the car has become a part of our life-since the middle of 20th century,
- urban social life has been changed in order to using car in the city. The effects of the car on everyday life have been a subject of controversy,
- While the introduction of the mass-produced car represented a revolution in mobility and convenience,
- the modern consequences of heavy automotive use contribute to the use of non-renewable fuels,
- a dramatic increase in the rate of accidental death, social isolation, the disconnection of community, the rise in obesity, the generation of air and noise pollution, urban sprawl, and urban decay.

Rapid Urbanization and motorozation

- In recent 50's years during rapid urbanization, immigration and the population of cities were increased,
- high density urbanization in metropolitan area,
- the urbanization area getting bigger instead of high motorization and with a large population,
- the transport infrastructure has been insufficient.

- Before motorization term automobiles should be adapted with urban spaces,
- Motorization process causes to destroy the attendance of pedestrians in urban area.
- In rapidly urbanizing cities streets become exhibition space of the car because of parking,

After rapid urbanization and motorization, The effect of using cars on changing urban society life

Too complicated urban structure, no neighborhood structure

Crowded and separated community

Well design neighborhood model

- the spatial form and structure has been changed,
- the street network has been designed for high rate car usage and oriented cars,
- Limited the accessibility of pedestrians.
- The neighborhoods structure and forms have been destroyed
- The well designed spatial structure for communication and socializing, have changed with car oriented form.
- The neighborhoods have been transformed such as huge part of urban area
- neighborhoods have been divided by car oriented high speed roads.
- the human scale designed neighborhood structure was lost.

- The community has been separated according to economic groups, different age groups.
- the communication and socializing has decreased between communities
- The neighborhood units have divided by the form of urban area in city
- socializing and social cooperation has been decreased
- The community has been transformed such as individual crowded who do not know and do not trust each other.
- after motorization they have been transformed only for passing cars and car parking
- that never safe especially for pedestrian and children.

The streets Before the Cars

General Characteristics of the Street Before the Car

PART OF THE HOUSE

The streets are a continuation of the residential building and part of the house where house life intersect with bay window, balcony and the garden gate

SOCIAL AKTIVITIY

A place where women are sitting and chatting at fountains, communication and everyday life are provided

PLAYGROUND

A playground where children play

WALKABLE

A pedestrian path that pedestrians walk comfortably

SECURE

Safe and peaceful places

The former mayor of Bogota, Enrique Penalosa with the words;
“The great city is not the one that has highways, but one where a child on a tricycle or bicycle can go safely everywhere.”

The streets After the Car

General Characteristics of the Street After Car

BORDER OF THE HOUSE

The streets are where houses ends and limiting factors, rather than being a part of the housing

TRANSPORTATION

Use only for transport instead of socializing

WEAK NEIGHBORHOOD

Alienation between neighborhood

DEPENDENCE

The children are computer addicted and Asocial

UNSAFE

The streets are noisy, unsafe

In rapidly urbanizing cities like Istanbul, Streets become exhibition space of the car because of parking and ownership issues; especially in the last sixty years, streets has fewer children and more "gray" color.

The one is most necessary objective is whether the streets are safe or not for social community.

- the space safety and specifically the safety streets are related with designing spatial with human scale,
- the safety space is related being the place perceivable and controllable scale for human.

- the human feel safe when they were at the place where they can control it.
- The human feel unsafe and alone when they were in large crowds.

The effect of using cars on changing to urban society, safety of pedestrian?

- the car is that modern urban pedestrians must be more alert
- With the increasing of the car, a pedestrian has to anticipate safety risks of automobiles traveling at high speeds
- the loss of pedestrian-scale villages has also disconnected communities.
- Many people in developed countries have less contact with their neighbors and rarely walk unless they place a high value on exercise.
- rarely walk unless they place a high value on exercise.
- Use of cars for transportation creates barriers by reducing the landscape required for walking and cycling.

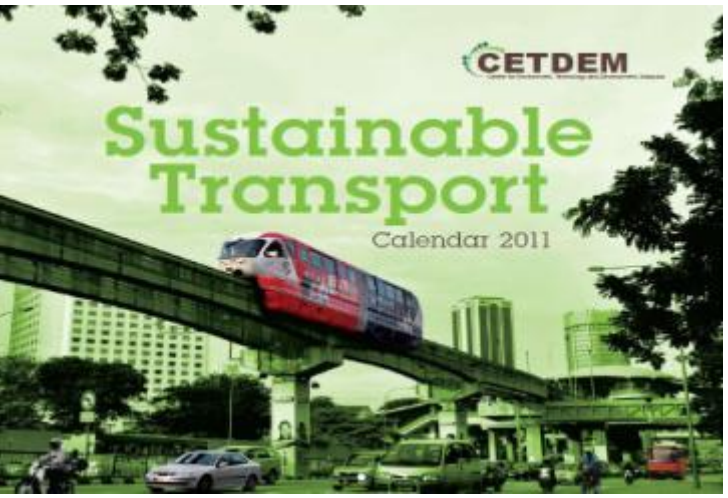
The negative externalities of using car on environment

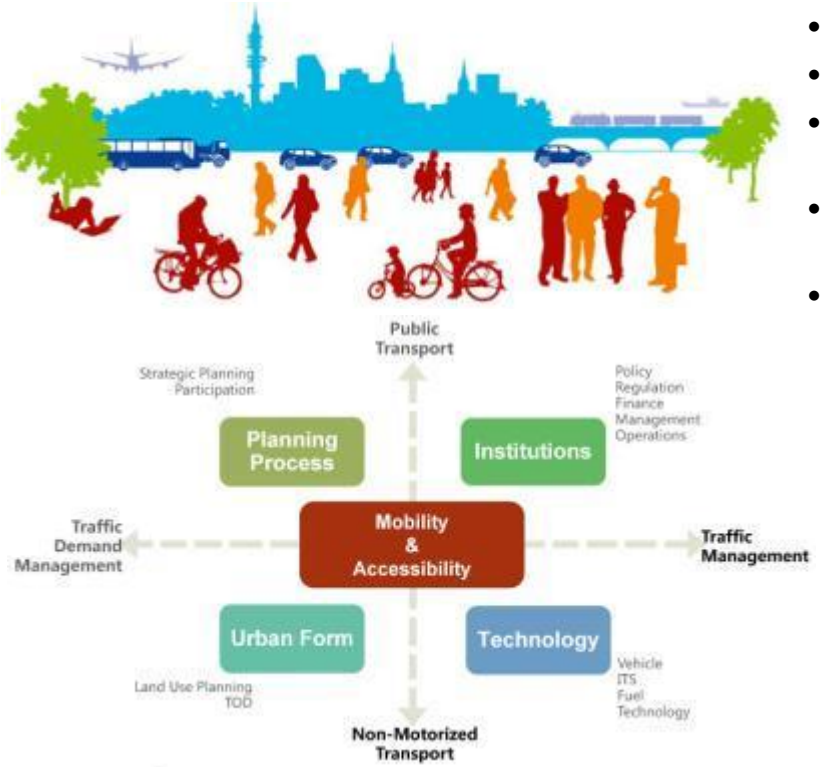
- The environmental impact of transport is significant because it is a major user of energy,
- creates air pollution, including nitrous oxides and particulates,
- a significant contributor to global warming through emission of carbon dioxide,
- road transport is the largest contributor to global warming.
- Cars contribute to pollution of air and water.
- Emissions of harmful gases like carbon monoxide, ozone, carbon dioxide,
- The emissions from cars cause disabilities, respiratory diseases, and ozone depletion.
- Transport systems include traffic congestion and automobile-oriented urban sprawl,
- Vehicles can consume natural habitat and agricultural lands.
- By reducing transportation emissions globally,
- The health impact of transport emissions is also of concern.

Grams emitted per passenger mile of travel	CO2	Carbon	NOx
Airplane	340	93	0.7
Car	200~298	55~81	0.3~0.95
Train	116	32	n/a
Bus	90	25	0.3

Sustainable mobility, social and environment solution; Pedestrianization

- Safe, attractive, and accessible spaces for community interaction are a vital component of sustainable, livable cities.





- **Pedestrianization**
- improves safety and accessibility for pedestrians,
- Brings larger social, environmental, and economic benefits for cities.
- improves public health by providing opportunities for physical activity through active transport,
- Curbs local air pollution, and improves traffic safety.

- The importance of pedestrianisation in developing countries
- increasing attendance of automobiles causes creating an unsafe, unpleasant and dangerous place for residents of that city.

- unpleasant and dangerous environment
- respecting pedestrian as a main user in urban web in urban designing.
- Creating a city by the Pedestrianisation

- Builds urban communities.
- consists combine to create cities that are livable and sustainable, improving quality of life for urban residents.

What are the aims of **LIVING STREETS** ?

SOCIAL

1. Make people **sense of belonging** to the area
2. **Reducing social crime rates** by increasing day and night use
3. **Improving dialogue** between neighbors
4. Creating **safe areas** for pedestrians
5. Creating **safe playgrounds** where children can play

ENVIRONMENTAL

1. Reduction of **noise,air and visiual pollution** levels
2. Making **physical image** stronger
3. İmproving **landscape elements**
4. Creating **ecological zones** in the city
5. Increasing **the diversity of flora and fauna** in the city

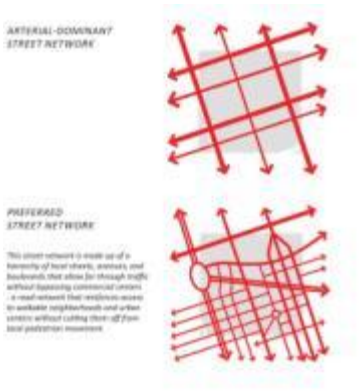
ECONOMIC

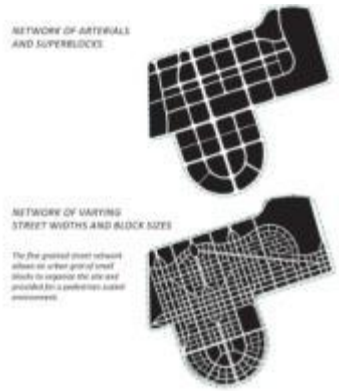
1. The revitalization of the **retail trade**
2. Make **continuous night life** as well as during the day
3. Creating n**ew and attractive investment area** except shopping malls
4. **Reducing the average annual cost** of maintenance and parking per vehicle of citizens
5. Supporting **brand value and tourism sector** of city

SPATIAL

1. Creating a network of **safe pedestrian circulation towards the city center**
2. The **development of public transportation and ensuring pedestrian / bicycle network with integration**
3. **Forbidding driving on** the living streets

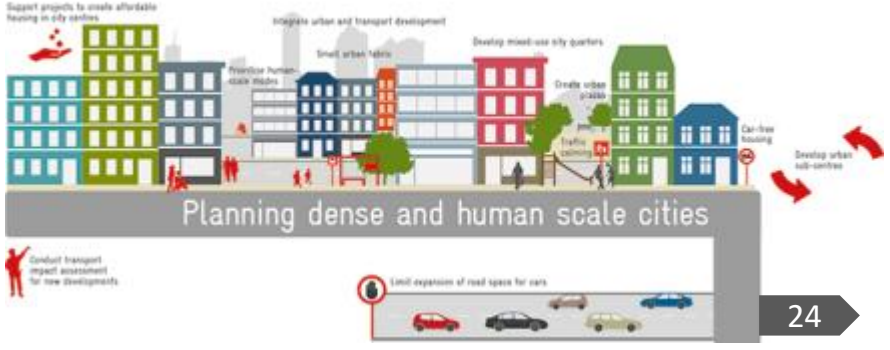
Pedestrian network planning and design Living Street



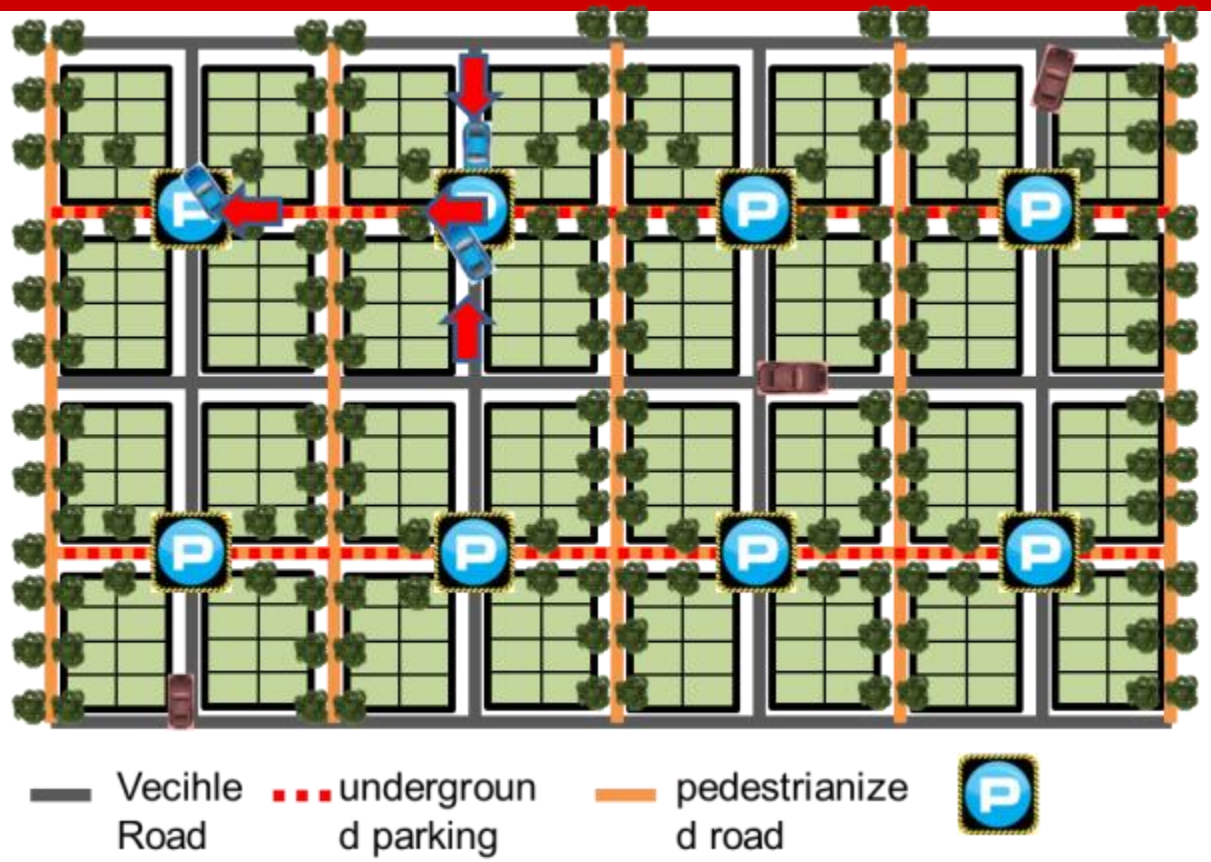


- "living street project" aims to design neighborhood units as non-motorized zone and pedestrianized streets
- to provide human scale spaces to increase the safety of unsafe streets to transformed to living quarters.
- The main proposal of this project design safe and social and people oriented spaces.
- changing the function of streets thereby changing the current usage to provide relation and communication between different social and economic groups

- to socializing community that they have been divided by creating relation one by one and face to face between individuals.
- Thereby designing the spaces for this aim it could be achieved for community happiness.
- In this respect the "Living Streets project" is
- a sustainable social, environment, urban planning and transport planning project
- designing the natural and artificial environment at human scale.



human scale design, social and spatial design, Living Street



- it is a health project in order to consider of pedestrian oriented and walkability for people.
- While the motorization the time to spending for walking getting shorter became a danger level for people health in community of city.
- walkability is most necessary subject for people health, because it aims to design the spatial in human scale based to provide to access and connect to open space for community by walking.

- providing to increase the usage of streets by the pedestrians and passing free by the pedestrianization
- organizing non-motorized and planning alternatives road network for cars in neighborhood units
- to transform streets to creating and designing free and open spaces for socializing,
- communication and enjoying for all different social groups, especially for children

Living Street Playground

Creating Secure Playgrounds

It is clear that there should be solution for the generation tend to be artists, athletes, happy and self-confidence people on the streets except growing internet addict generations. In international examples, the streets are forbidden to cars and provide the area to the children for playing games.

Which Phases Living Streets Project consist ?

Living Streets Project Phases

Living street project has steps due to traffic purification by reducing the use of personal cars with encouraging the public transport system, improving bicycle system, completion of the modular parking infrastructure respectively.

1| PUBLIC TRANSPORT

encouraging the public transport system

2| BICYCLE

The promotion of bicycle use in each area

3| CAR PARK

Creating Modular storey or underground car park

4| ZONING

Creating defined neighborhood zones

5| DESIGN

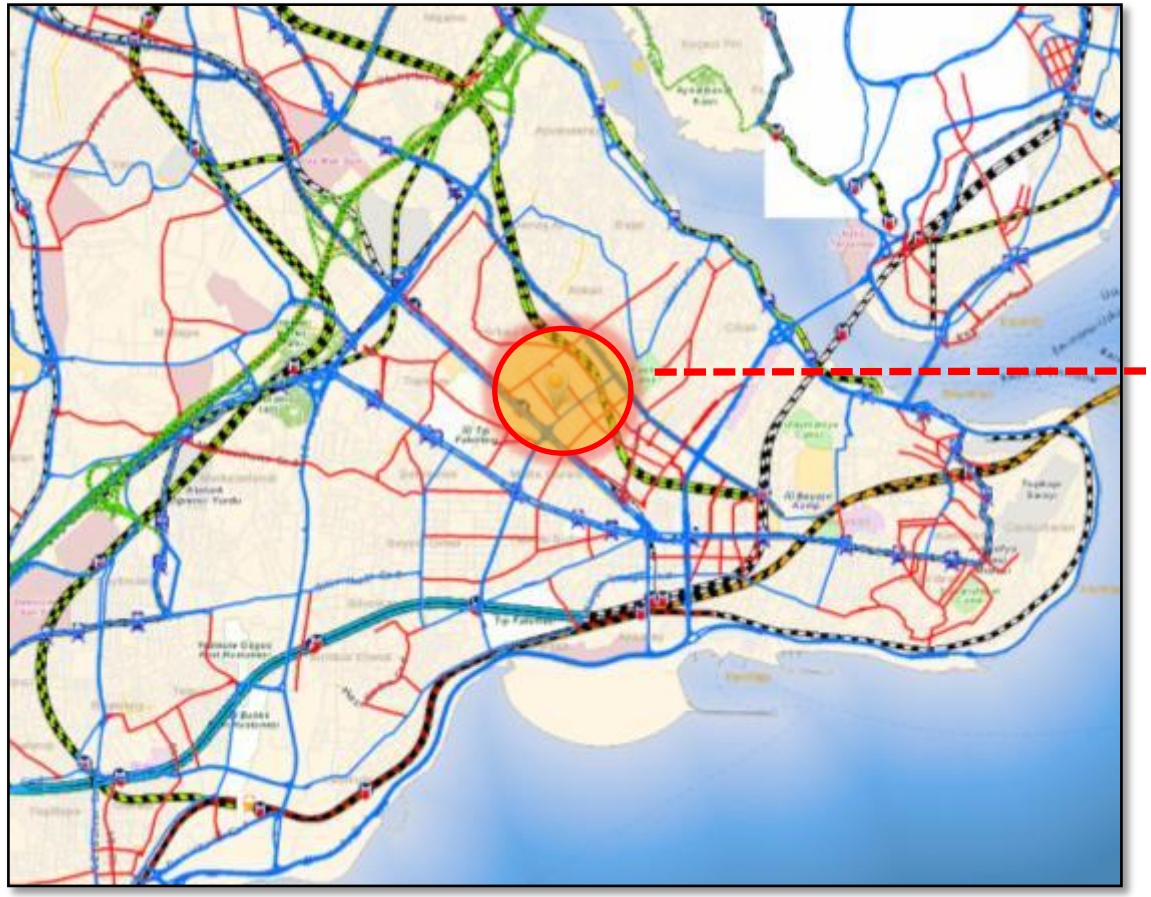
Designing safe areas

6| DETAIL

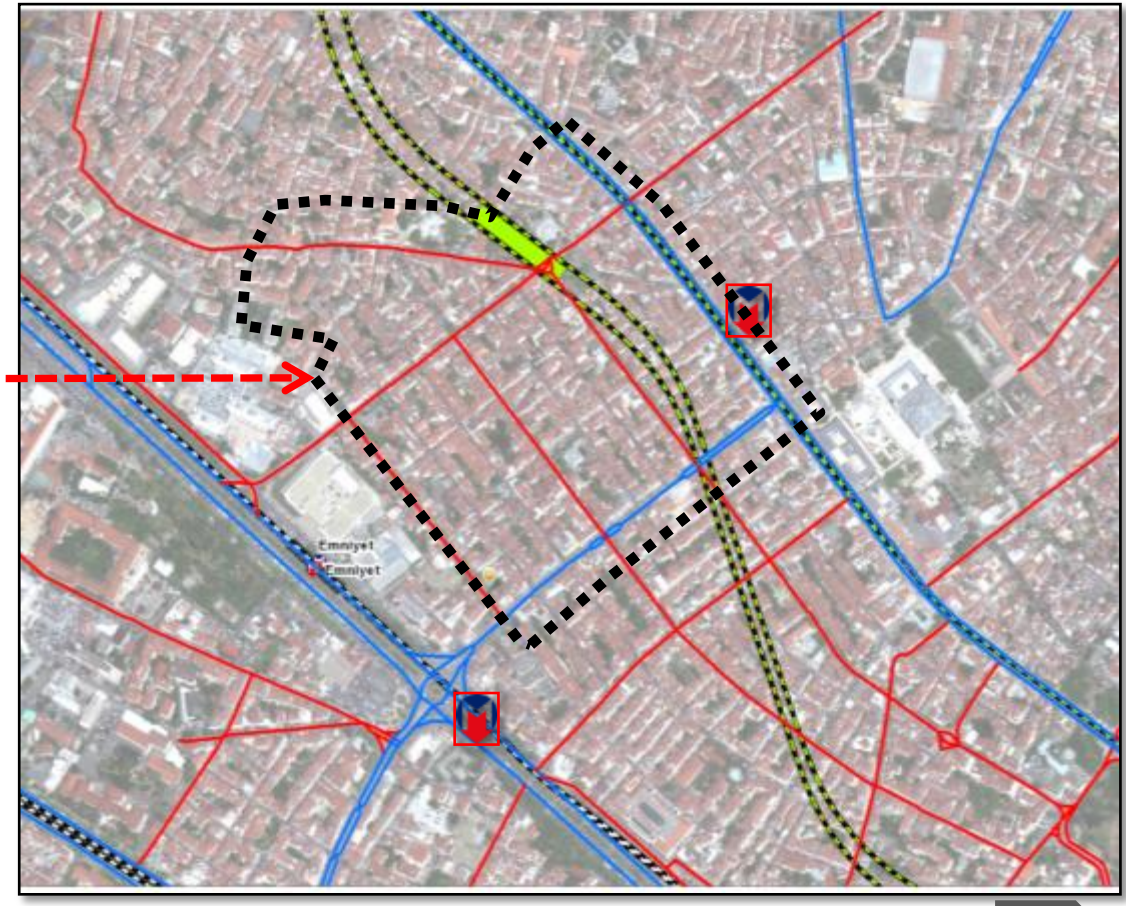
Locational Solutions

LIVING STREET PROJECT IMPLEMANTION IN
Hirkai Serif Neighborhood in Historical Peninsula, Istanbul

The Historical Peninsula (Fatih District) -Main road and street network, subway network schema

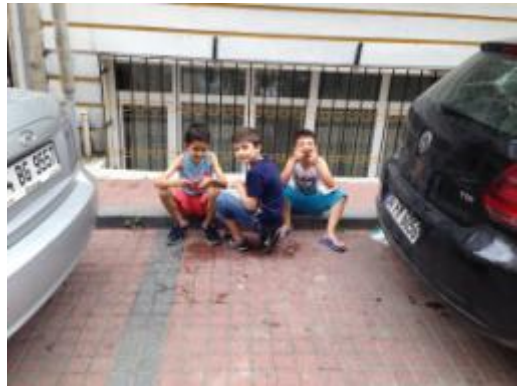


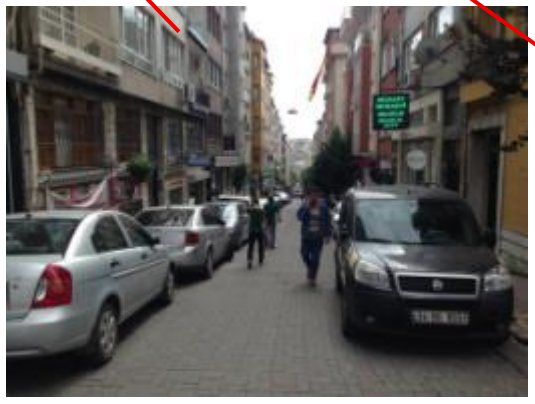
Hirkai Serif Neighborhood- Main road and street network, subway network schema



Hirkai Serif Neighborhood land use and urban plan map

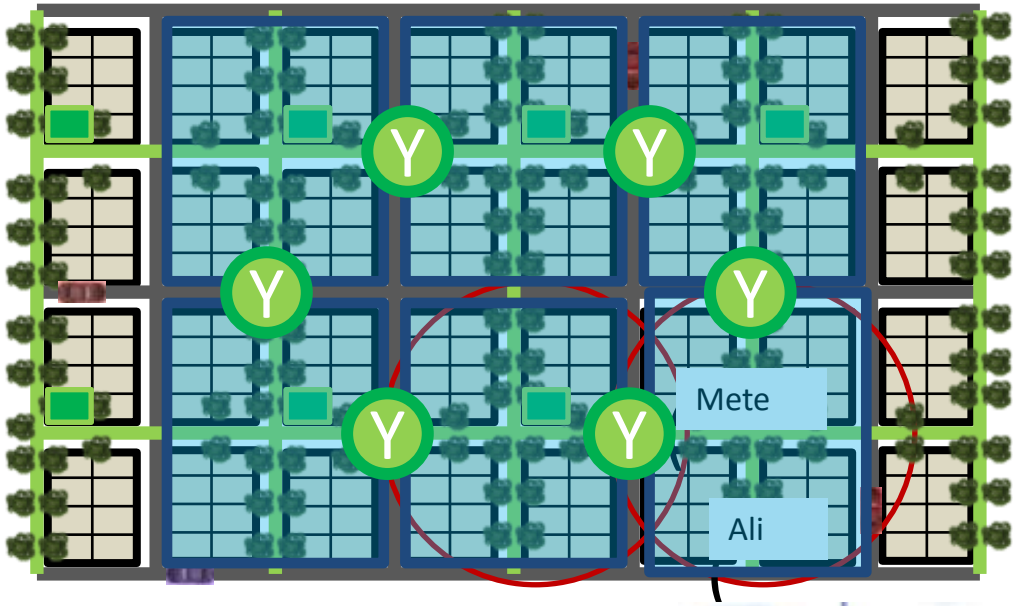
Pedestrians and kids are helpless at streets because of many cars





Living Street, Safe Areas And Continuous Pedestrian streets

Planning Non-motorized pedestrian zones: Most pedestrian-only areas are created by restricting traffic access or closing roads to traffic.



Level Crossing (Vehicle weighted road and LPS), In these nodes "the Green Dome" project will be implemented.

Safe Area
(Game Interaction Areaı)

The Green Dome
Green dome project has been developed for protecting continuity of the pedestrian and bicycle route and allowing vehicles to enter to parking lot

Definition of the Issue

Today the area is faced with serious problems that increasing car use, migration, population growth and rapid urbanization by apartment buildings.

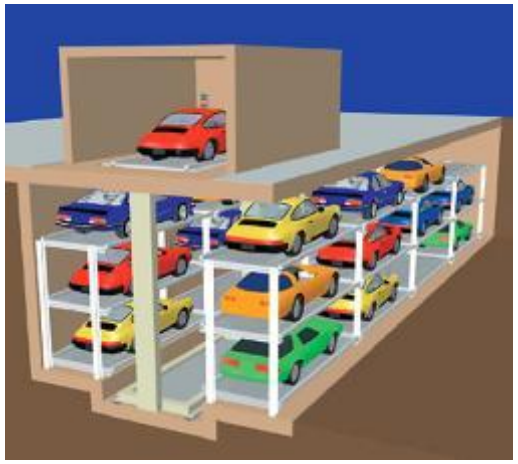
In the area there is a serious lack of parking spaces because of high rates of car ownership, dense building area and high population density.

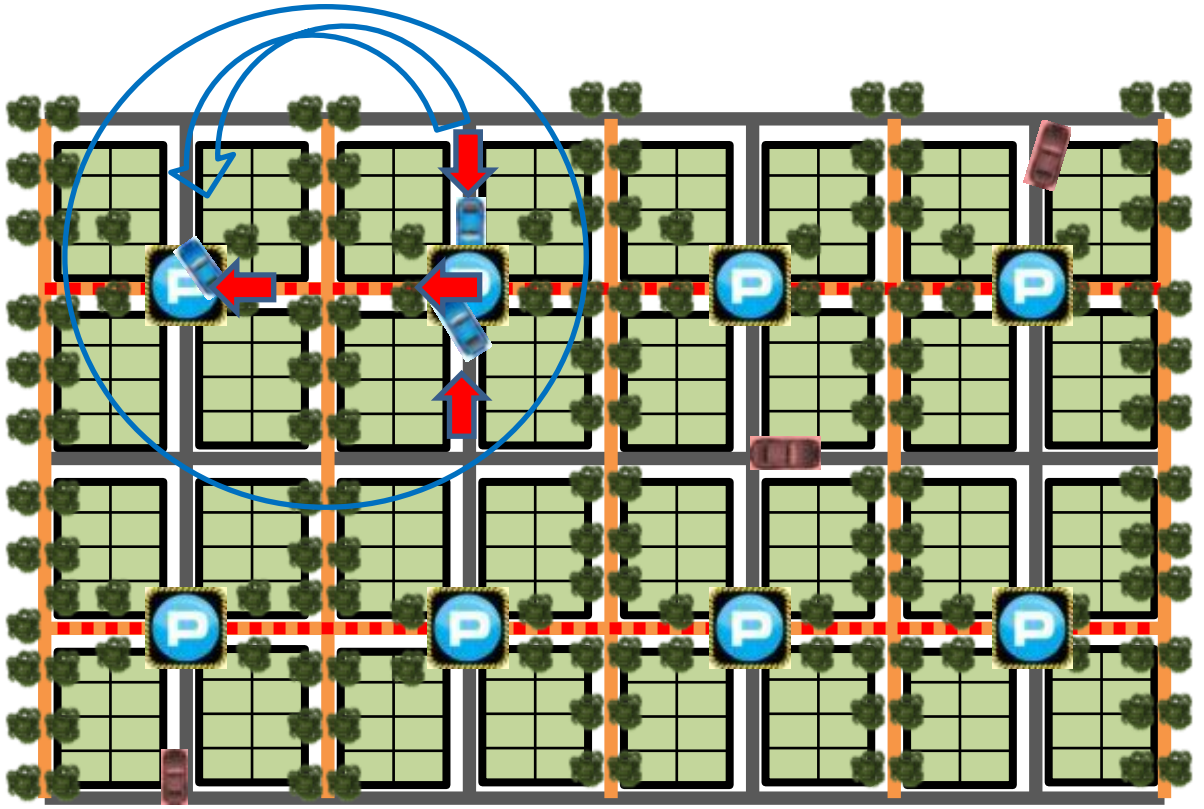
According to Fatih's historic mission, the problems should analyze precisely and seek solutions which will bring old tolerant Fatih back by Living Street Project

Living Street Parking System

LIVING STREETS

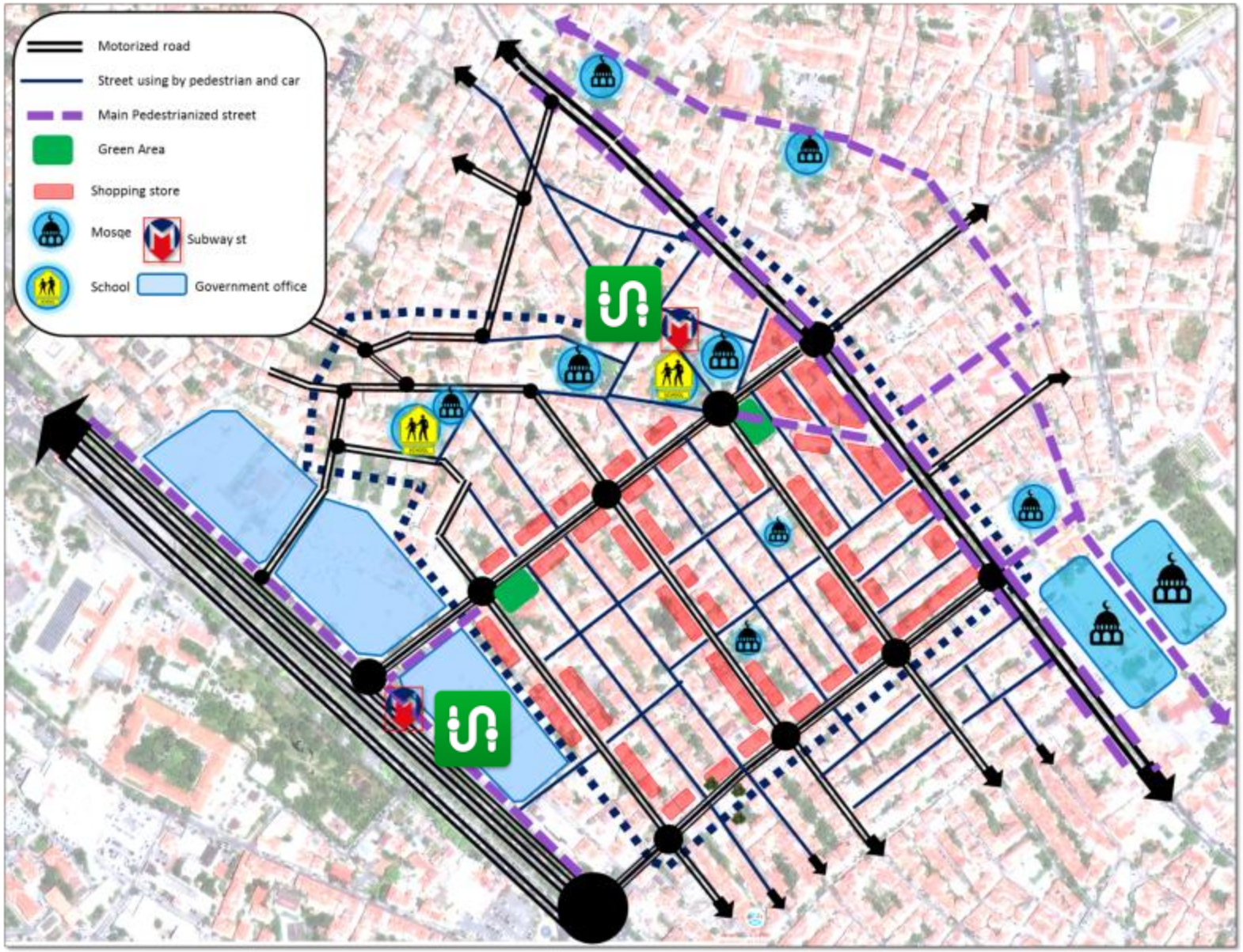
underground parkingc





underground parking will be designed under pedestrianized streets. Each underground parking will planned for 4-6 blocks with considering amount of population, ownership of vehicles and parking spots for guests. There will be services like providing online subscription and learning capacity.

Current transportation case in Hirkai Serif Neighborhood



Living Streets Project Step by Step

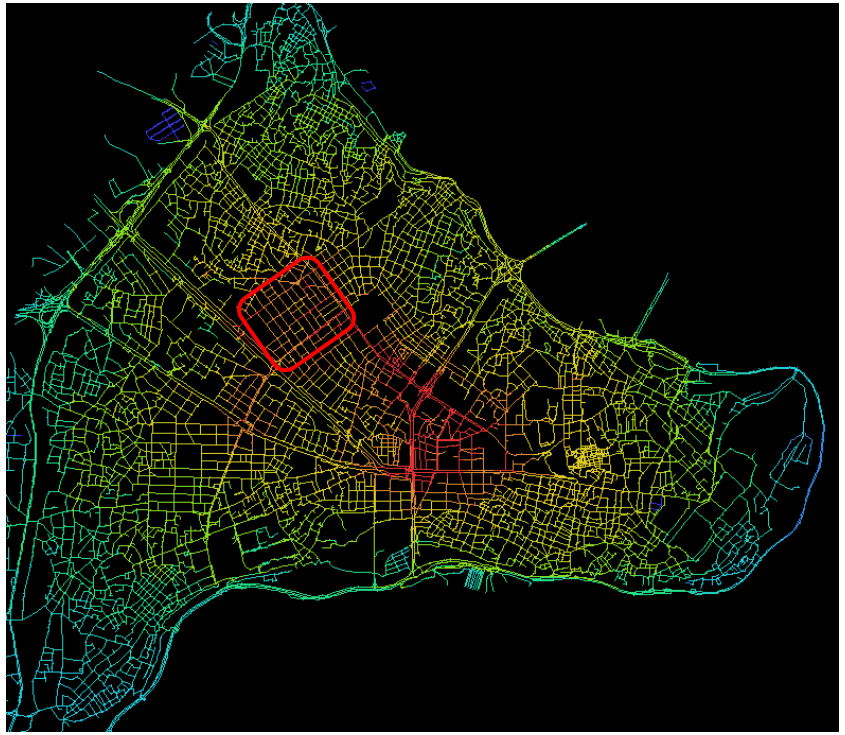
Mass Transit system must be improved.

Metro should be prioritized in Fevzipaşa Street where Fatih Complex and lots of Public infrastructure located and Integration should be ensured with Metro station in Vatan street. Metro System should be designed suitable for bikers according to **Bicycle Plan**.

- **Designing living streets concept**
- The concept of ‘living streets’ recognizes that, as a priority,
- streets should be designed with living and community interaction .
- While cars are not excluded, they are designed so drivers are aware
- they are in an area where pedestrian and other users are important.
- A living street aims to balance the needs of residents, businesses, pedestrians
- cyclists with cars, and thereby encourage a better quality of life and a greater range of community and street activity.

Using GIS data to examine movement patterns by using Spatial network analysis

Fatih District,Total Connectivity, R:2000



- **Walkability** components of proximity and connectivity can be readily utilized using GIS methods.
- This methodology is used the measures of segment-based connectivity measures implemented on a GIS platform using GIS street network representations.
- various research fields in transportation, architecture and urban planning.
- With in this scope it has run the **DepthmapX** GIS software.
- DepthmapX is a multi-platform software platform to perform a set of spatial network analyses designed to understand social processes within the built environment.

Fatih District,Total Node Count, R:2000

- **Connectivity Patterns:**
- To assess the street connectivity patterns, the entire street network of Istanbul Metropolitan area was analyzed used the Streetmap of 2015.
- In this research freeways were excluded since they do not factor in pedestrian movement.
- Connectivity was computed for two level and first level used for Fatih District
- (1-Total Connectivity, 2-Total Node Count, 3-Total İntegration for radius: 2000 m.)

Fatih District,Total Integretion, R:2000

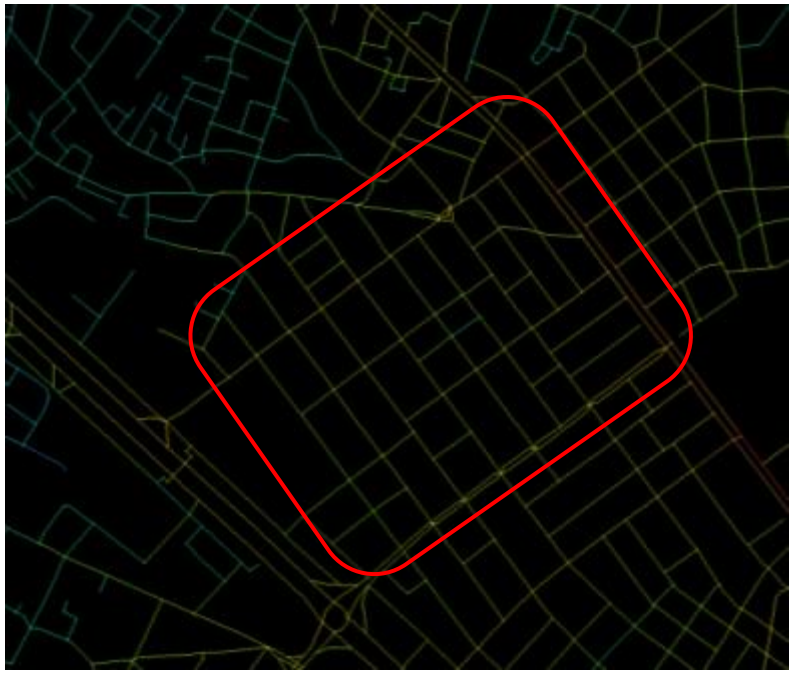
- The objective of the analysis is to derive variables which may have social or experiential significance. It has been used DepthmapX by 1-Total connectivity analysis, 2-Node Count analysis 3-Integration analysis.
- **Total connectivity analysis:** The number of lines which each line intersects
- **Node Count analysis:** The number of nodes within a “cookie cut” Radius
- **Integration analysis**: Show how each street is connected to all others in a whole city in terms of the maximum possible direction changes.

Using GIS data to examine movement patterns by using Spatial network analysis

Hirkai Serif Neighberhood-Total Connectivity, R:2000

Hirkai Serif Neighberhood- Node Count, R:2000

Hirkai Serif Neighberhood-Total Integretion, R:2000



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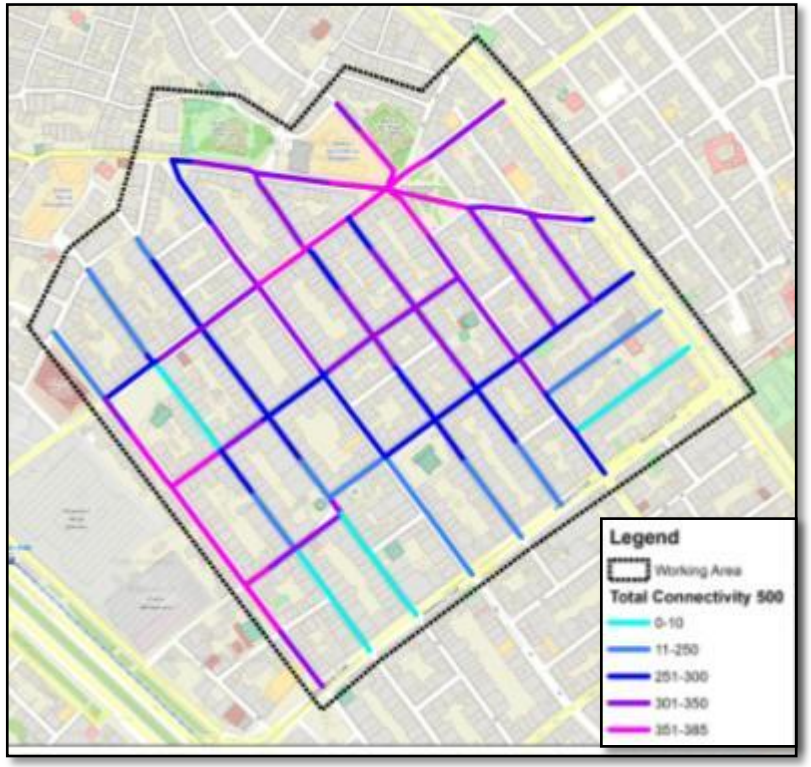
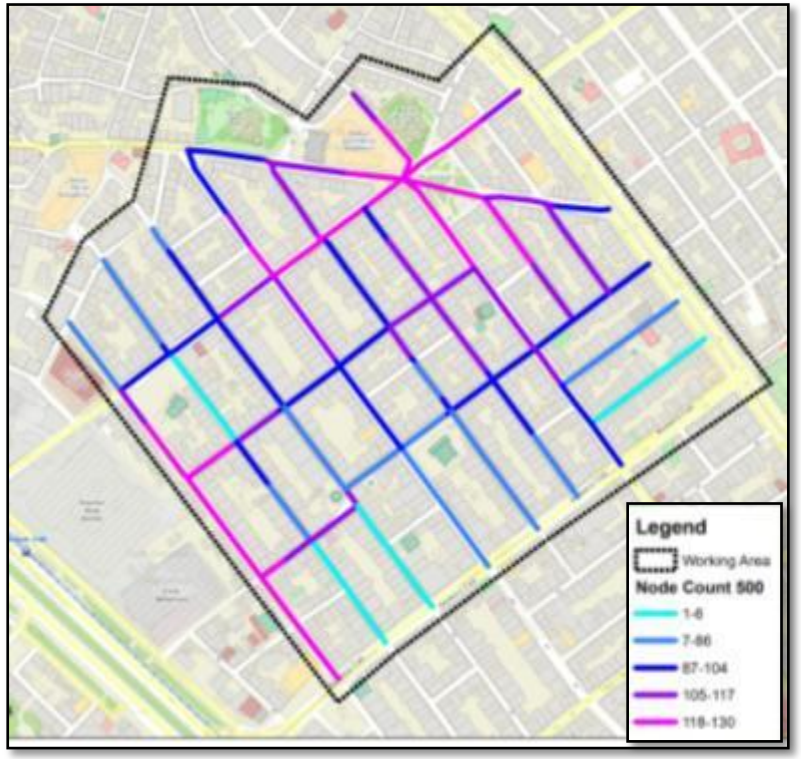
- Each level is considered by the regional scale that when running
- 1-Total Connectivity, for radius: 2000 m,
- 2-Total Node Count, for radius: 2000 m,
- 3-Total İntegration for radius: 2000 m,

Using DepthmapX Spatial network analysis for Hirkai Serif Neighborhood

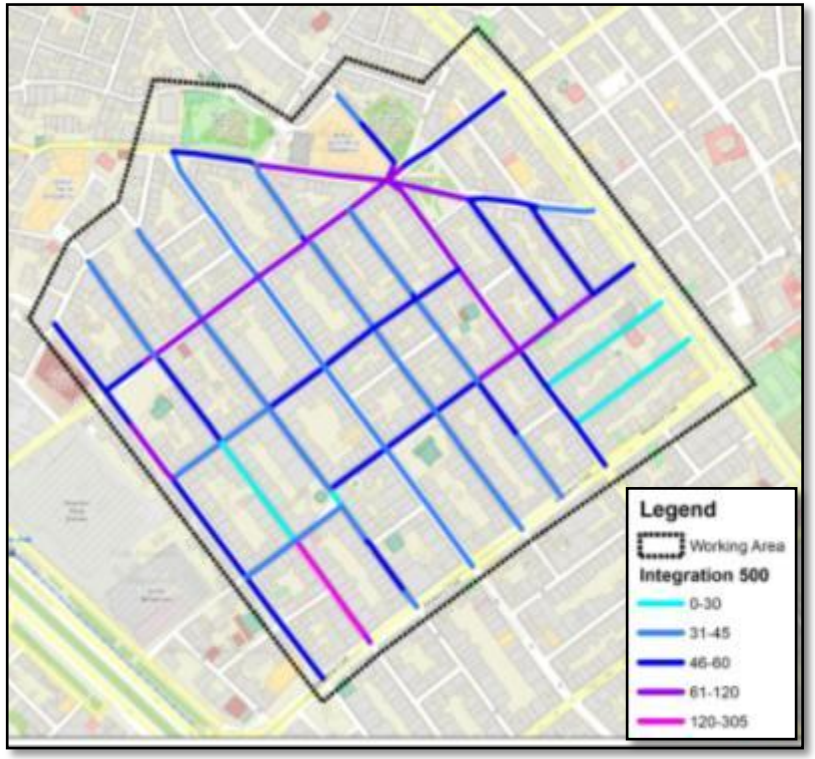
Total Connectivity, R:500



Node Count, R:500



Integretion, R:500

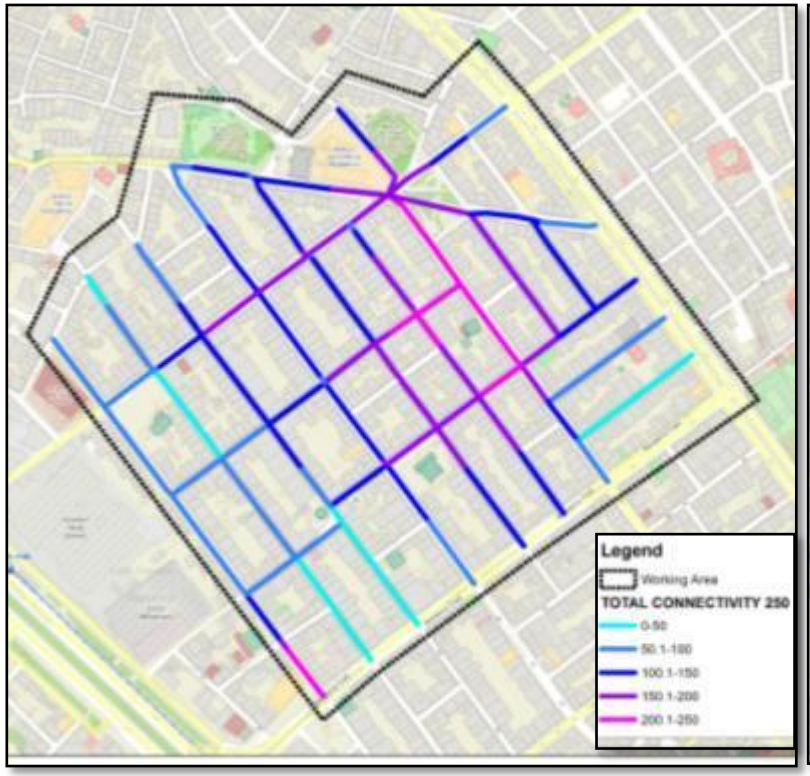


Hirkai Serif Neighborhood

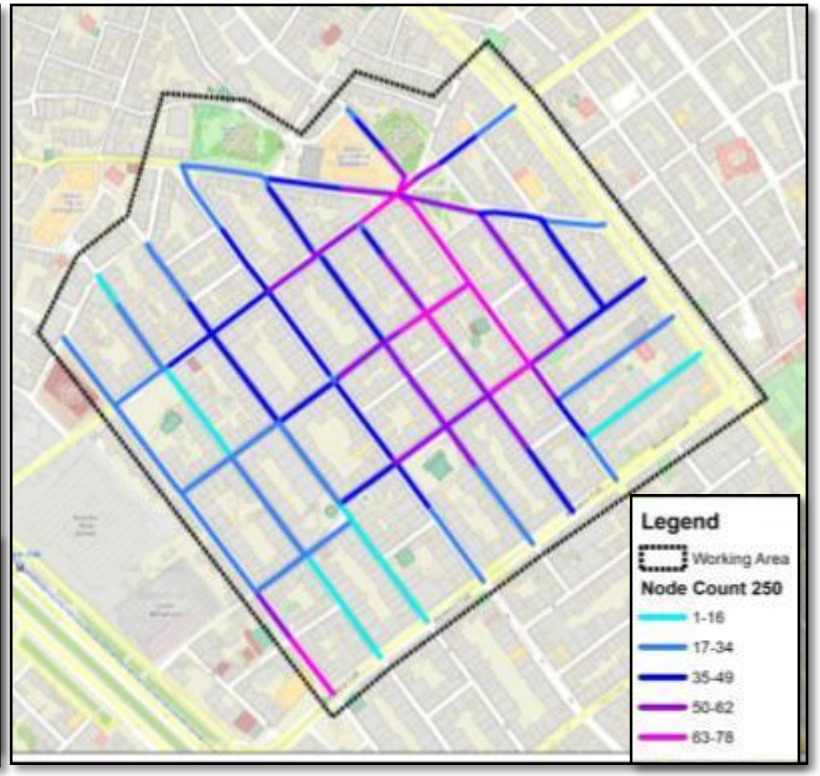
- 1-Total Connectivity, for radius: 500m
- 2-Total Node Count, for radius: 500m
- 3-Total İntegration, for radius: 500m

Using DepthmapX Spatial network analysis for Hirkai Serif Neighborhood

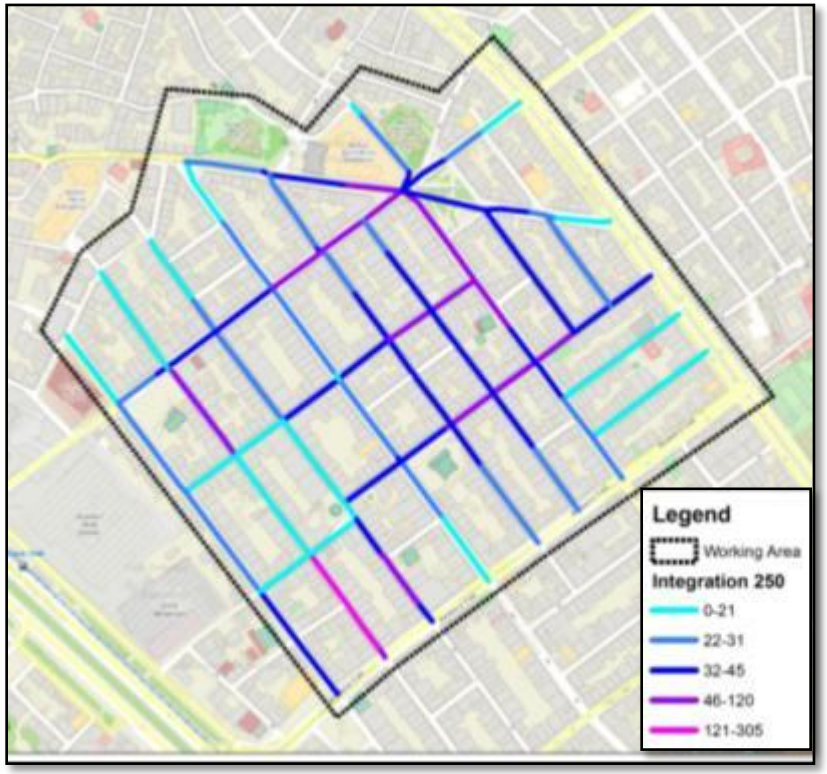
Total Connectivity, R:250



Node Count, R:250



Integretion, R:250

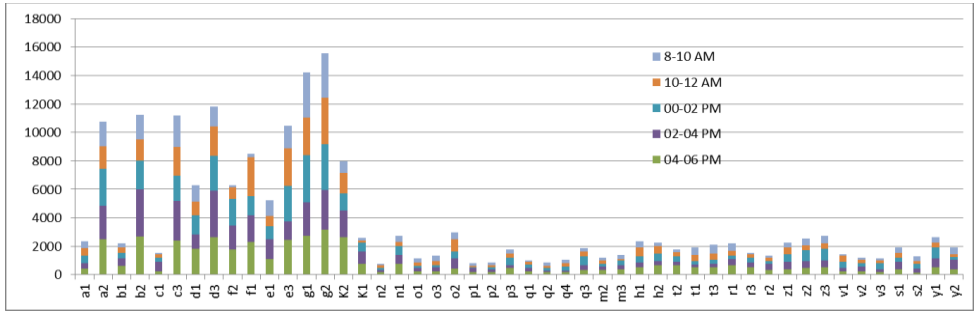


Hirkai Serif Neighborhood

- 1-Total Connectivity, for radius: 250 m.
- 2-Total Node Count, for radius: 250 m.
- 3-Total İntegration, for radius: 250 m.

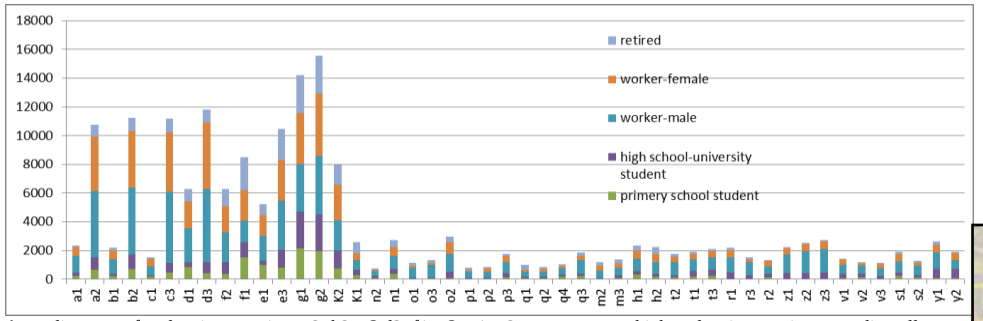
The analysis of data collecting: pedestrian passing and usage streets for Hirkai Serif Neighborhood

Table 1: According to time- pedestrian passing



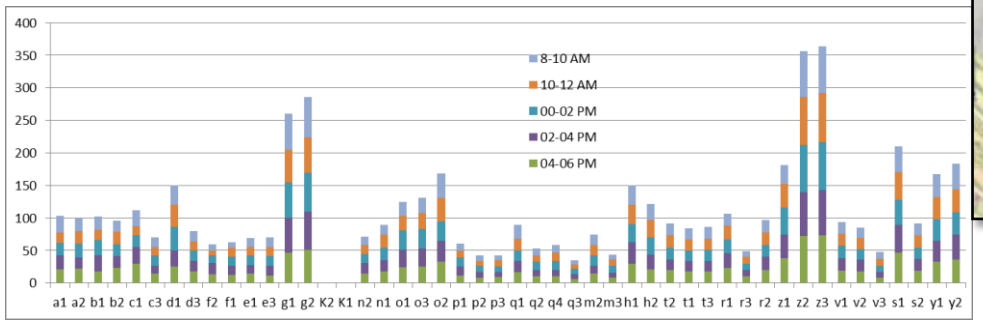
According to time- pedestrian passing: a2, b2, c3,d3, e3, g1, g2 streets are too high pedestrian passing volume according the each different time period, Table 1

Table 2: According sort of pedestrian- passing



According sort of pedestrian- passing: a2, b2, c3,d2, f1, e3, g1, g2 streets are too high pedestrian passing according all sort of pedestrian passing volume. Table 2

Table 3: According to time on-street parking occupancy

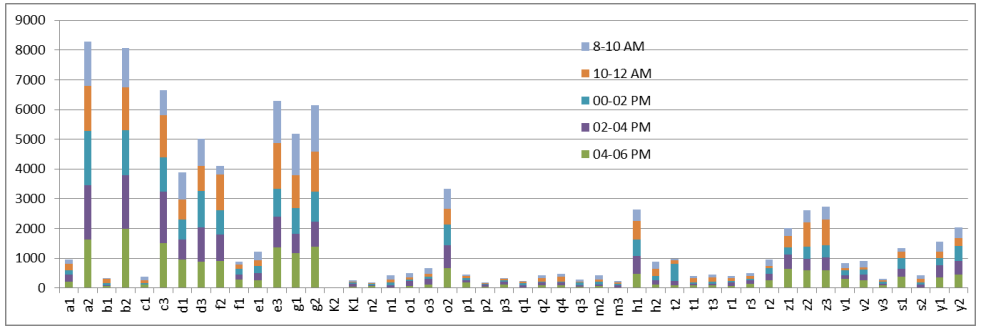


According to time on-street parking occupancy:, g1, g2, o2, z2, z3, s1, y1, y2, streets are too high on-street parking occupancy. Table 3

Pedestrian count data were systematically collected in the areas for 50 streets during June 2015. Pedestrian and vehicle are counted for 5 different time period

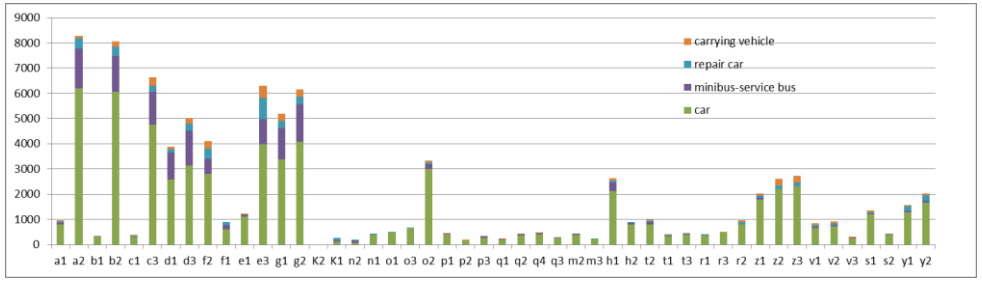
1:8.00-10.00 AM,
2:10.00 AM-12.00 NON, 3:12.00-2.00 PM,
4:2.00-4.00 PM,
5:4.00-6.00 PM)

Table 1: According to time-vehicle passing



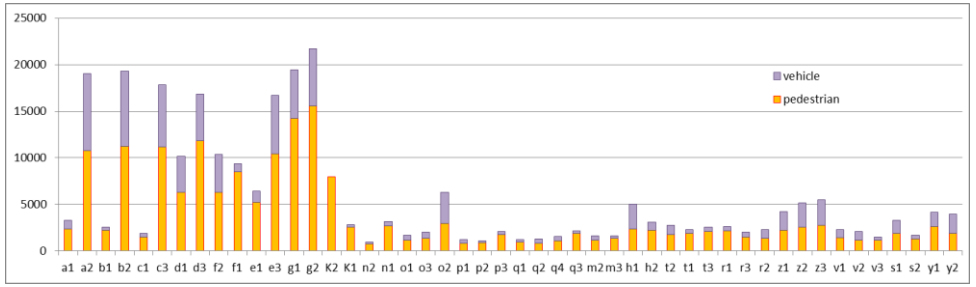
According to time-vehicle passing: a2, b2, c3, d1, d3, f2, e3, g1, g2, o2, streets are too high vehicle passing volume. Table 4

Table 2: According to sort of vehicle- vehicle passing



According to sort of vehicle- vehicle passing: a2, b2, c3, d1, d3, f2, g1, g2, o1, h1, z2, z3 streets are too high vehicle passing volume. Table 5

Table 3:Total pedestrian and vehicle passing



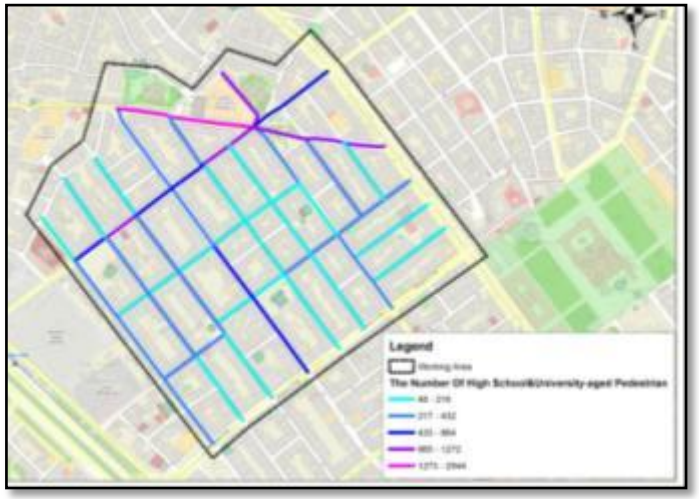
Total pedestrian and vehicle passing: a2, b2 c3, d3, e3, g1, g2 streets pedestrian volume higher than vehicle volume, generally the pedestrian volume higher than vehicle volume at most of streets Table 6

The analysis of data collecting: pedestrian passing and usage streets for Hirkai Serif Neighborhood

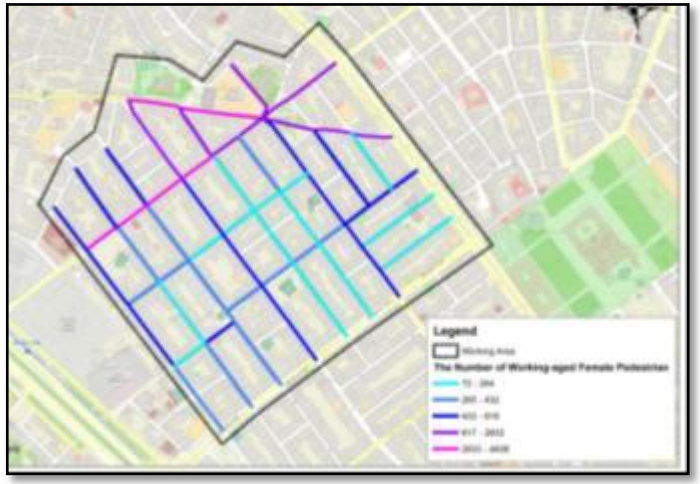
Count Points For Pedestrian And Vehicle Passing

Primary school student pedestrian passing

high school-university student pedestrian passing

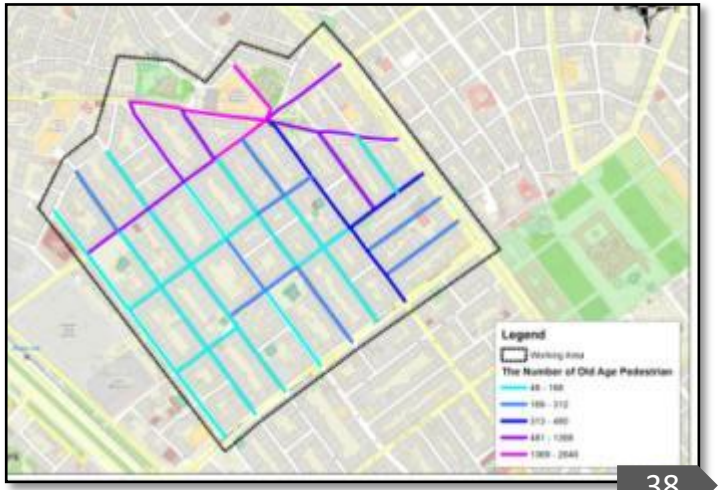


worker-female pedestrian passing



worker-male pedestrian passing

Retired pedestrian passing



The analysis of data collecting: pedestrian passing and usage streets for Hirkai Serif Neighborhood

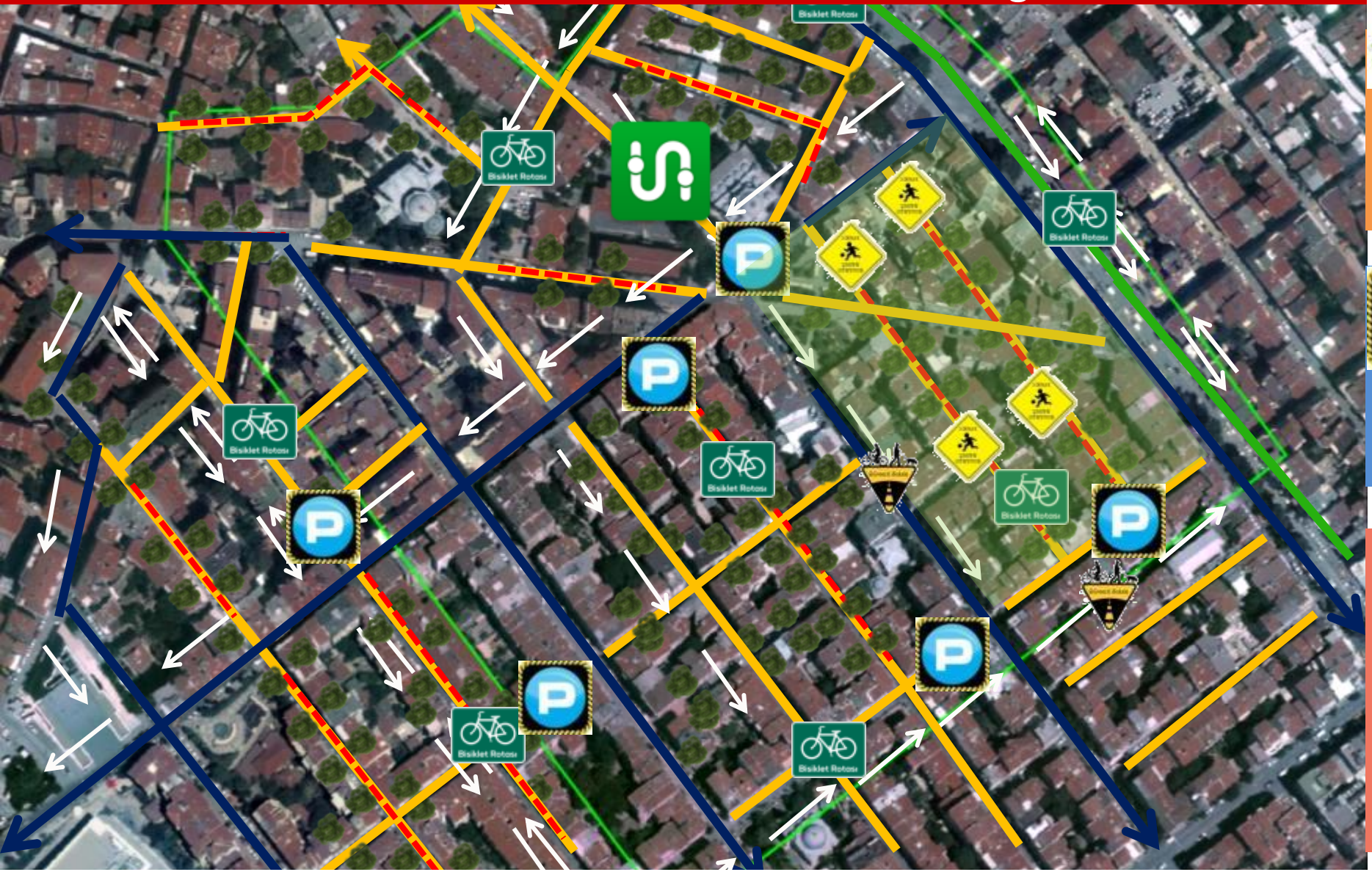
Roadside parking is prohibited in the entire project area.

Fevzipaşa street additional subway connection (additional underground to Yenikapı-Hacıosman metro line, Connection to Aksaray-Airport metro and funicular)

Bisiklet Rotası

The vacated areas where no roadside parking will be evaluated as a continuous bike path.

The analysis of data collecting: pedestrian passing and usage streets for Hirkai Serif Neighborhood

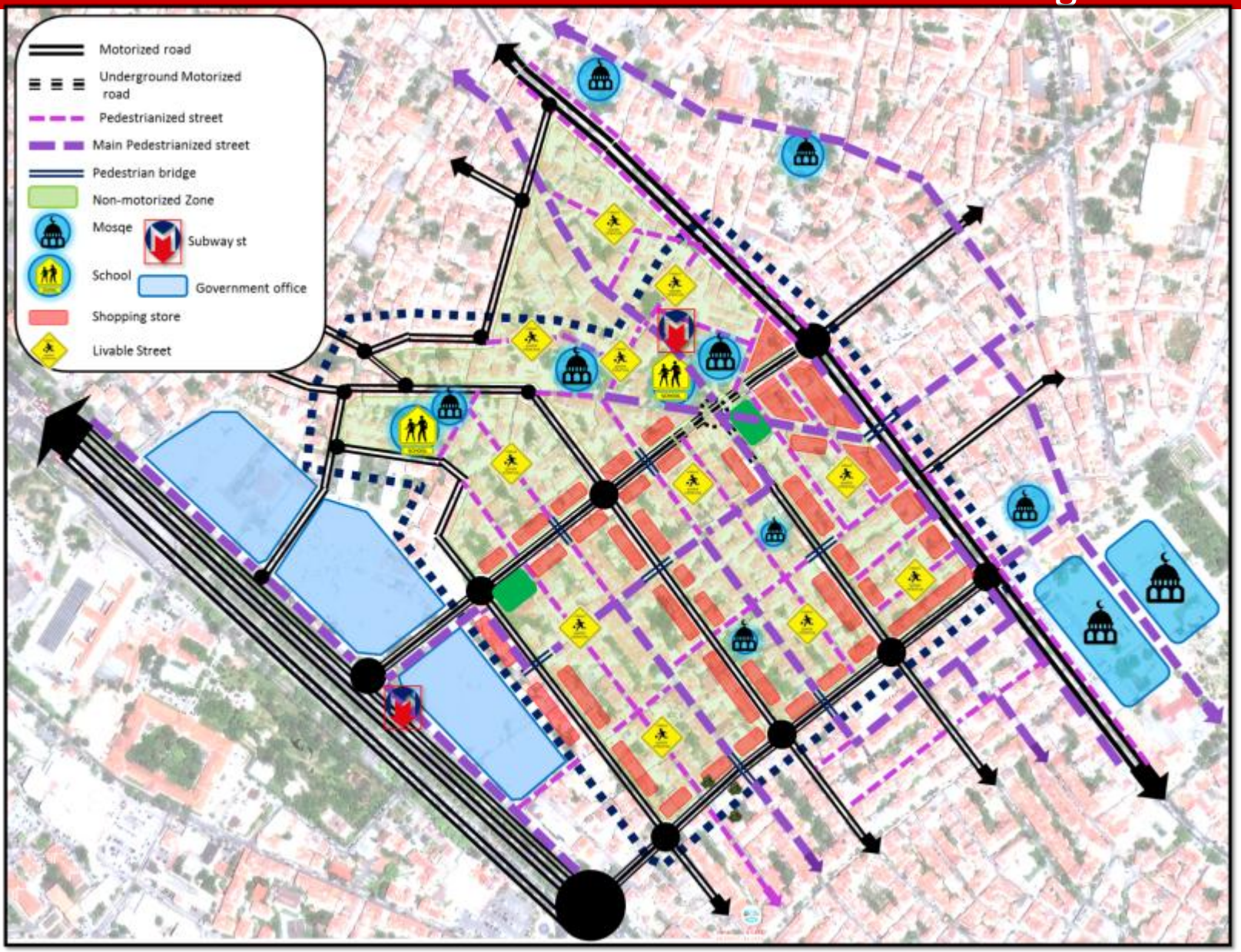


Safe neighborhood regions have been designed by zoning analysis

Parking lots are located in intersection of vehicle roads and pedestrianized street and also integrated with bicycle and pedestrian networks.

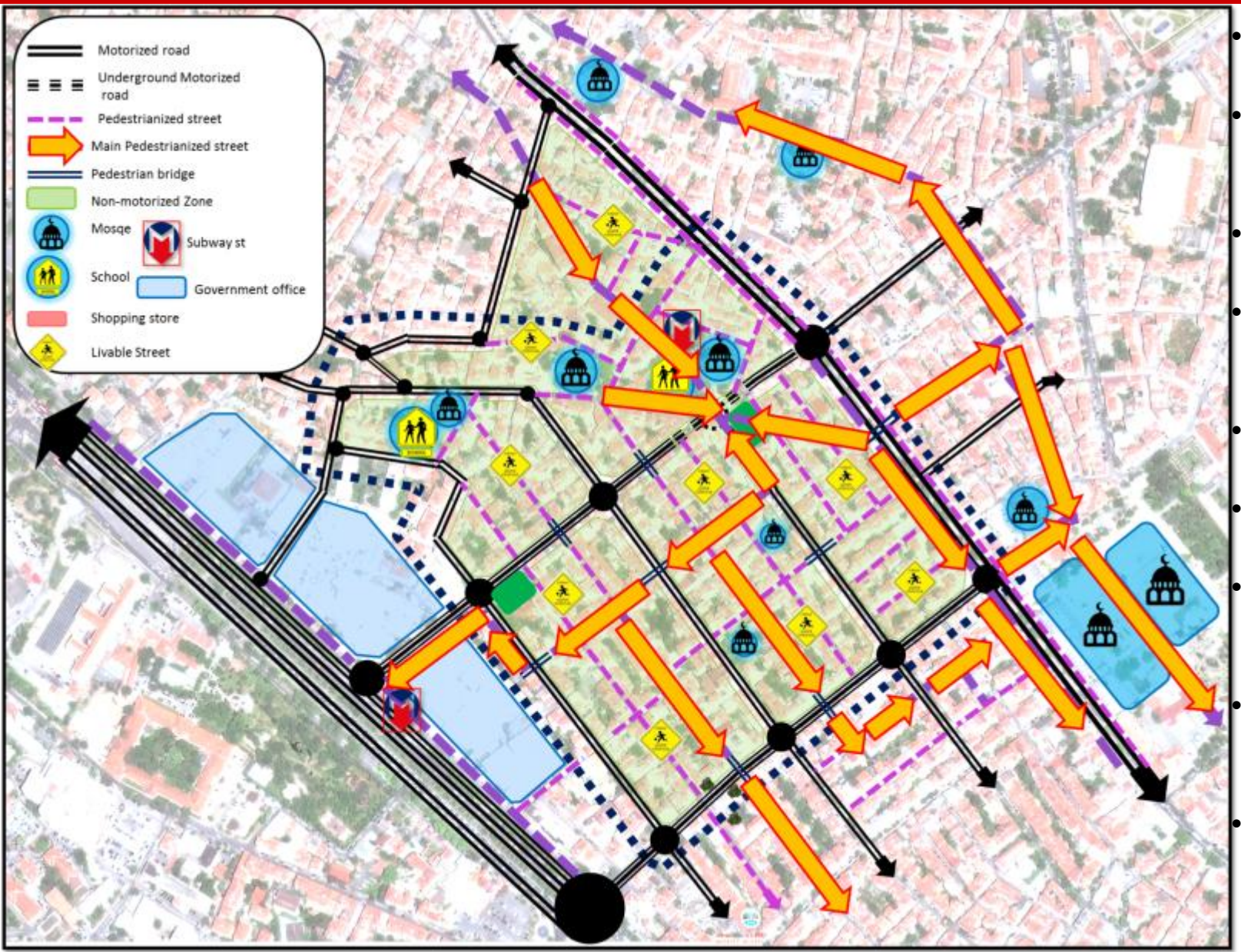
Safe streets and game streets are well-defined and locational solutions that have been developed.

Planning Living Streets Project Step by Step
for Hirkai Serif Neighborhood



Mass Transit system must be improved. **Metro** should be prioritized in Fevzipaşa Street where Fatih Complex and lots of Public infrastructure located and Integration should be ensured with Metro station in Vatan street. Metro System should be designed suitable for bikers according to **Bicycle Plan/**

The design Living Street Project for Hirkai Serif Neighborhood



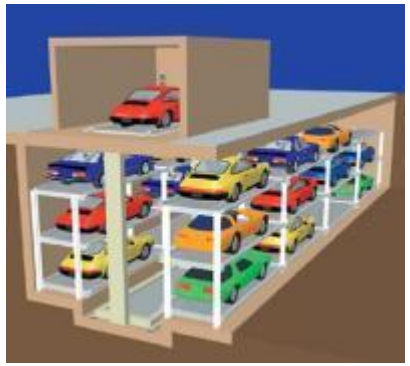
- while design this project it has been considered pedestrian movement data,
- pedestrian passing and usage data, it was used GIS data movement patterns by using spatial network analysis,
- it was applied GIS Connectivity analysis model to assessment of network planning,
- it was evaluated the analysis GIS Movement pattern pedestrian and car movement for Hirkai Serif Neighborhood.
- All analysis are evaluated to design non-motorized zones and playground zones
- and determined pedestrian network and main pedestrian network,
- pedestrianization streets by considering school, mosque, green area, shopping stores and public transport stations pedestrian ways.
- With these scope providing the free step possibility for pedestrians between non-motorized zones by the designing pedestrian bridges.
- The designing square is the main part of “Living Streets Project “with pedestrian network and pedestrianization.

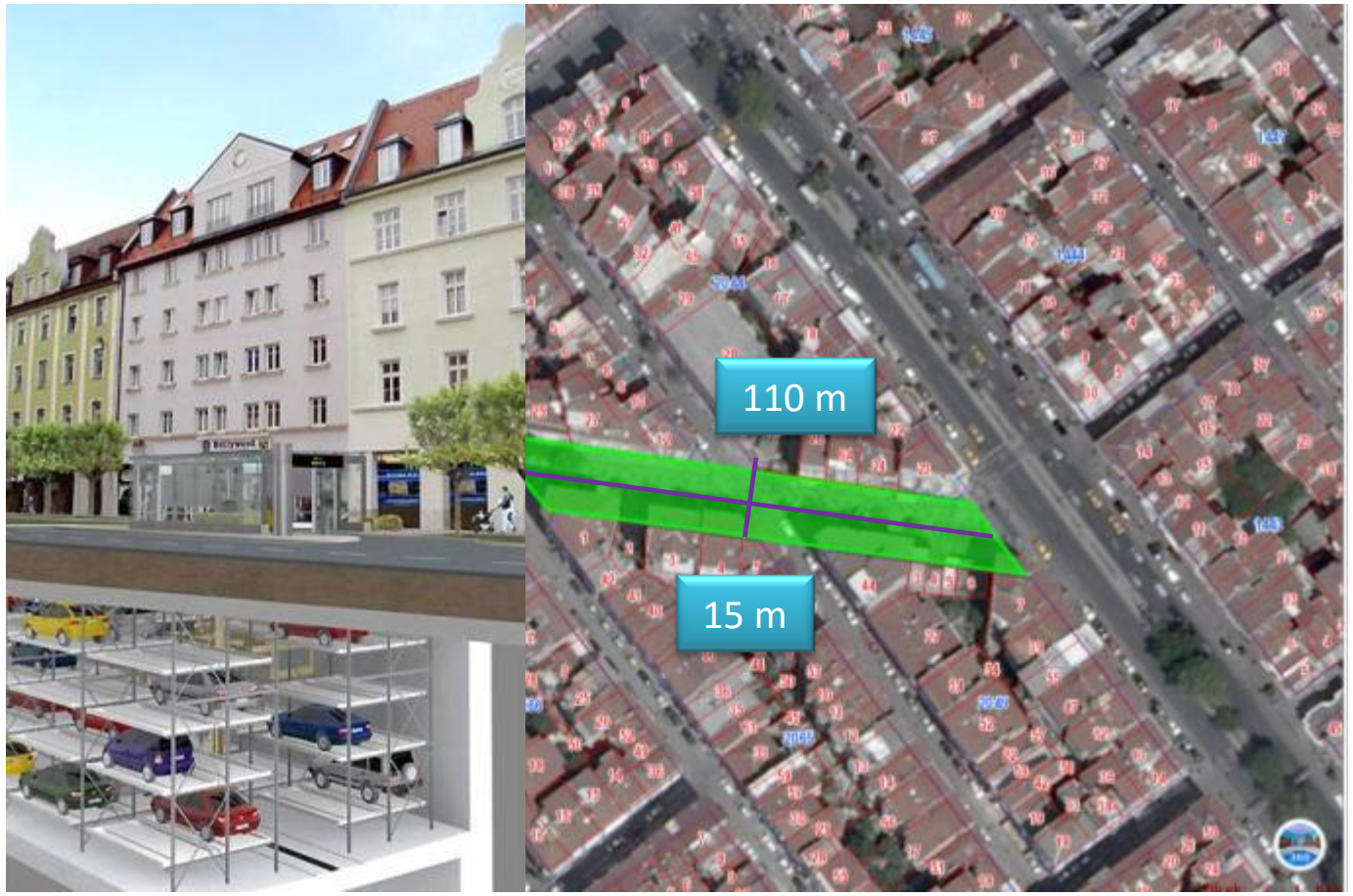
Pilot AUCS Project Area for Hirkai Serif Neighborhood

Hırka-i Şerif Street

Automatic underground car storage

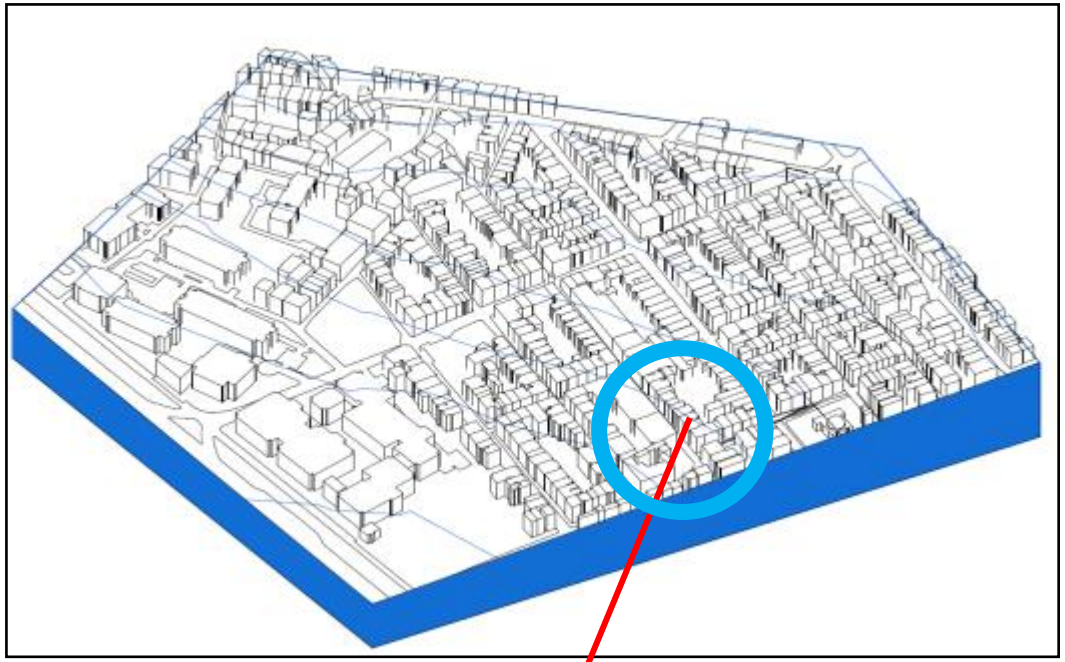
- Automatic under floor Storey Car Park
- 22 Sequence parking area with the elevator shaft in the middle and two available side for the car parking. Thus each floor has 44 car parking area (22X2)
- If the building has 3 floors, there will be 132 car-capacity with automatic underground technology.

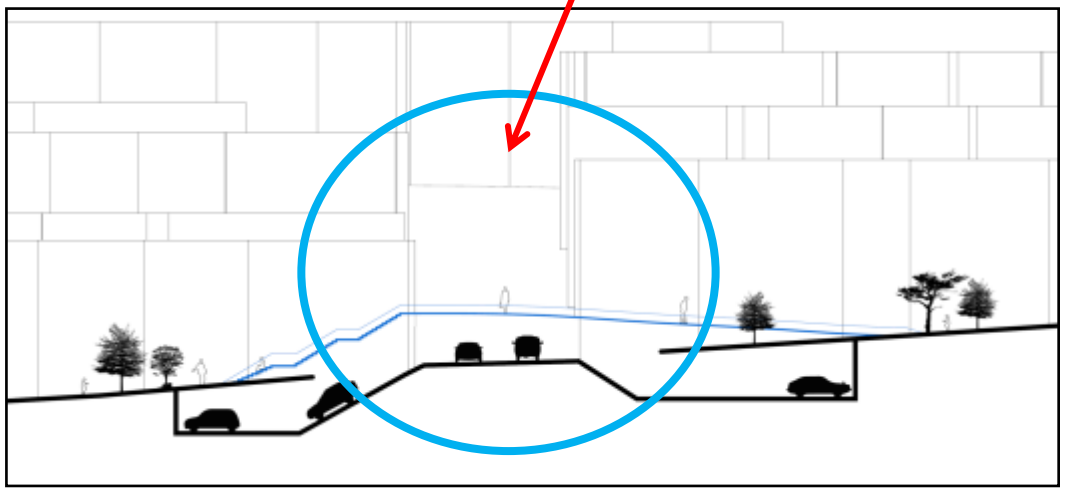




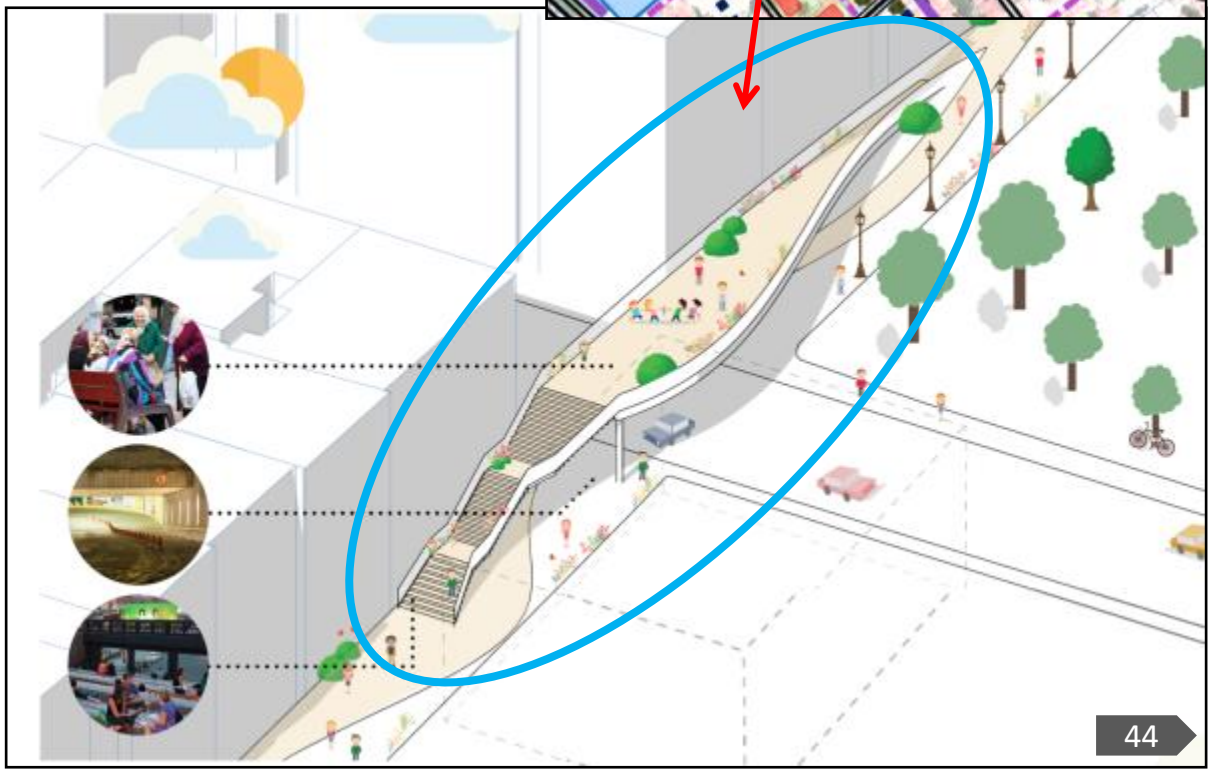
designing pedestrian bridges

free step possibility for pedestrians between non-motorized





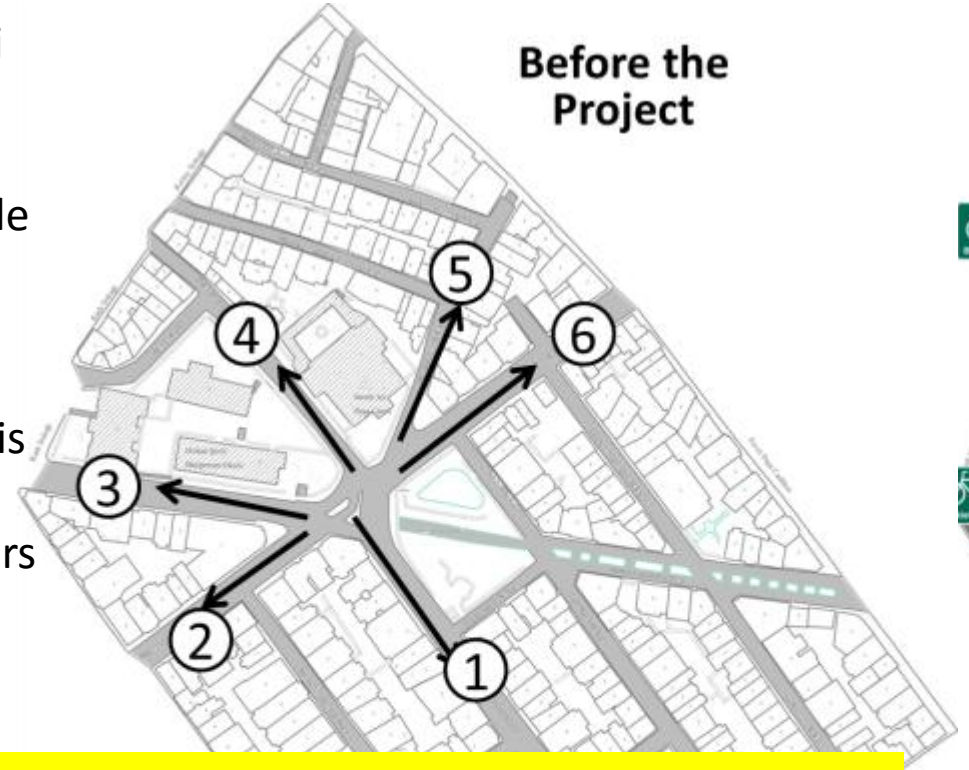
With these living streets project scope providing the free step possibility for pedestrians between non-motorized zones by the designing pedestrian bridges



As a main part of Living Street Project: Square Oriented Living Center Project

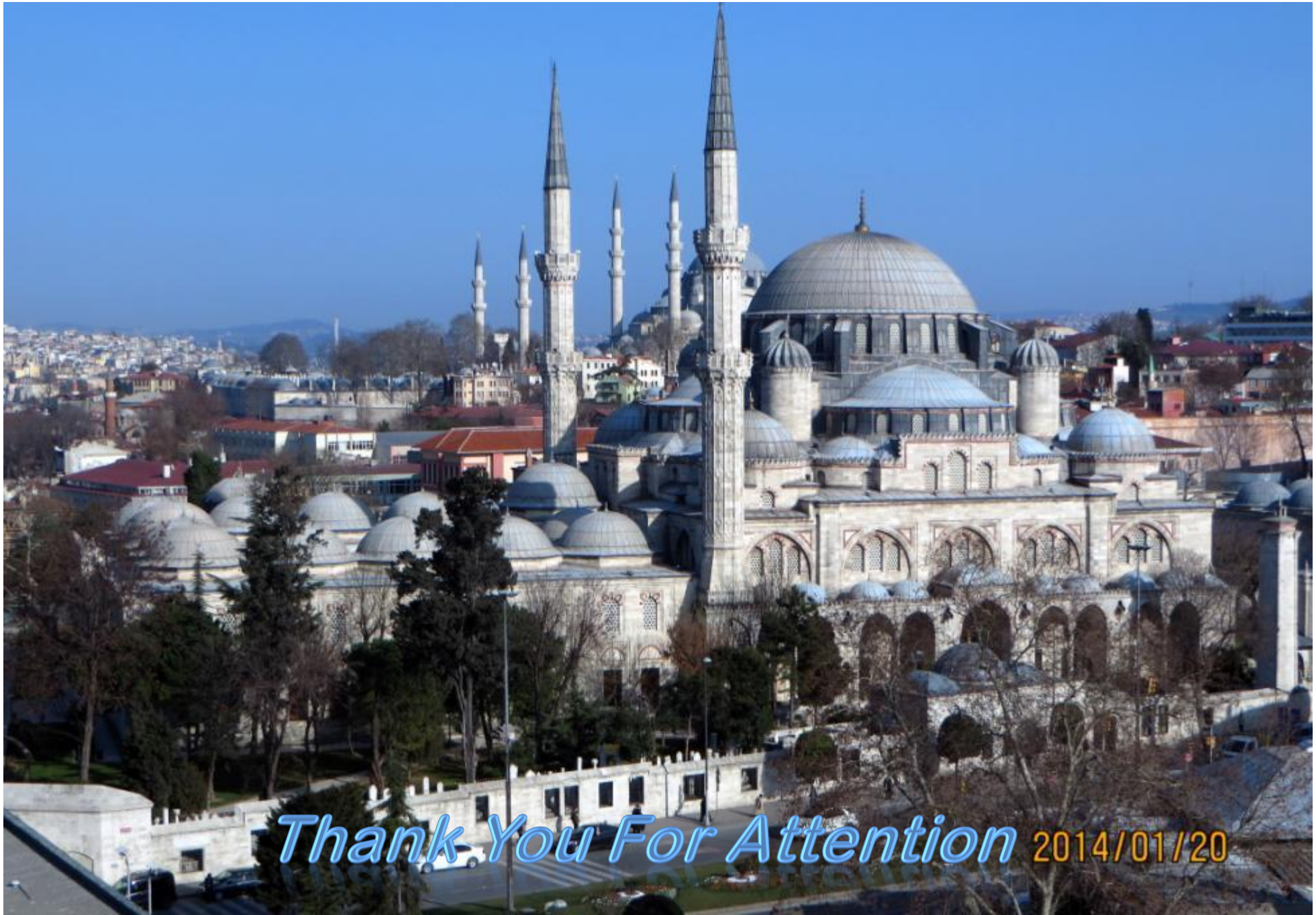
Definition of the Problem Hırka-i Şerif And Akşemsettin Streets: There is no defined square but there is roadside parking in whole area and streets are not suitable for pedestrian use.

Occurred in our culture, square is not a tool for the detection of monumentality, it is social centers for meeting of the society, cohesion and developing activities such as making the



Project's Outcomes

A strong relationship between the school and the mosque,
A strong relationship between mosque and squares,
A strong Fatih Bazaar (2nd stage market) and Hırka-i Şerif Market Relations (local market),
A strong school, major-pedestrian artery and commercial relations,
A strong relationship between green spaces and square,
Underground parking lots in the whole area,
Connected with livable pedestrianized street secure,
Commercial, cultural and tourist activities,
Metro connections and a tight relationship between different transportation modes


Thank You For Attention
2014/01/20