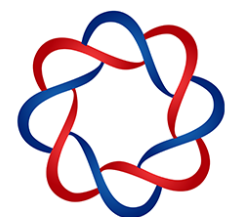


# NEIGHBORHOODS OF AMMAN

## POST COVID - 19



Friedrich Ebert Stiftung | AE Business Council | August 2020



Climate and Energy Project  
مشروع الطاقة والمناخ

**FRIEDRICH  
EBERT  
STIFTUNG**



منتدى الأعمال الهندسي  
A/E Business Council

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# NEIGHBORHOODS OF AMMAN

## POST COVID - 19

The Regional Energy and Climate of Project in the Middle East and North Africa (MENA) of Friedrich-Ebert-Stiftung has commissioned, edited, reviewed, and published this study.

Year 2020

### About FES Regional Climate & Energy Project MENA

The Regional Climate and Energy Project MENA advocates for an energy transition into renewable energy and energy efficiency. It continues to search for solutions for a just transition in the energy sector ensuring both, the protection of the planet and the people.

As the MENA region is one of the most affected areas by climate change, we contribute to policy advising, research, and advocacy in the areas of climate change policy, energy transition, and urban sustainability, with the support of research institutions, civil society organizations, and other partners in the region and in Europe.

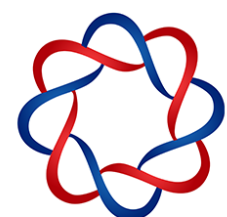
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/Amman (Jordan)/

يتحمل المؤلف كامل المسؤولية القانونية عن محتوى مصنفه ولا يعبر هذا المصنف عن رأي دائرة المكتبة الوطنية أو أي جهة حكومية أخرى.

### Prepared by

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## PREFACE

This study examines Jordan's reaction to Covid-19 and its impact on people by studying neighborhood mobility and services. Hence, it analyzes short term measures that were implemented to quickly deal with the crisis as well as envisioning long term strategies.

Showcasing several neighborhoods and the issues that were brought to light during the pandemic, the analysis focuses on possible short term and long term solutions that take into consideration the environmental impact among other pressing matters.

Furthermore, based on a thorough analysis of Amman's current situation, a set of possible components are suggested to create neighborhoods that are resilient and better equipped to deal with any future crisis.

The study is a result of a dynamic collaboration between multiple parties who collectively composted an intensive study of Amman's neighborhoods, and came up with the proposed solutions to address the pressing issue at hand.

### AE BUSINESS COUNCIL

The A/E Business Council is a membership and representational association offering professional services to architecture and engineering consulting companies based in the Hashemite Kingdom of Jordan. Its principal objectives are to promote quality, excellence and competitive standards in the sector, and to facilitate trade through best practices both in Jordan and in overseas export markets.

The A/E Business Council is a not-for-profit association that supports its members through networking, consultation with government agencies concerning professional and regulatory issues, information sourcing, business training and education and the promotion of international trading links.

The A/E Business Council is supported by and works closely with the Jordan Engineers Association (JEA), and the Engineering Offices Committee (EOC) through continuous dialogue and joint committees.

### FRIEDRICH EBERT STIFTUNG

FES is a German non-profit political foundation based on the principles of social democracy. It was founded in 1925 to promote international cooperation, education and research in Germany and abroad.

The activities of FES Amman focuses on promoting social democracy, sustainable economic growth, political participation, social justice and gender equality, as well as contributing to peace and security in the region and ecological sustainability through the Regional Climate & Energy Project. This project advocates for an energy transition into renewable energy by challenging fossil fuel driven economies of many of the MENA countries and encourage the exploration of the enormous economic potential of solar and wind energy. Not only businesses and investors should benefit of the energy transition, but also citizens, households and municipalities.

FES also promotes the concept of international and domestic climate justice by training their partners and civil society organizations in climate diplomacy and bring them together with governments.

In addition, they support research and policy advising in the energy and climate change sector and work on local solutions for adaptation and energy efficiency on the ground.

Therefor one of our main goals is to search for solutions for a just transition in the energy sector ensuring both, the protection of the planet and people.

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## 1. INTRODUCTION

## INTRODUCTION

COVID-19 caused the government of Jordan to follow the path of other countries in implementing unprecedented lock-down across the Kingdom. This in turn revealed the several weaknesses in the unsustainable planning of cities and neighborhoods in Jordan.

The neighborhood stores and groceries turned out to be far more effective than the malls that city planners had allowed to be built within the cities. With the lock-down in place, people have been encouraged to walk to their nearest groceries for their essentials. Clearly such demand needs to be maintained in the future and steps have to be taken to encourage such behavior change that promotes social justice and participates in creating a resilient and climate friendly city in the future.

For neighborhoods to be more resilient, planners and officials need to ensure lessons learned in this pandemic will be documented and implemented to make neighborhoods and cities ready for the coming climate crisis. This includes taking measures on

1. Planning and transportation levels
2. Socio-economic level

This study exams Jordan's reaction to Covid-19, it looks at short term measures that were implemented to quickly deal with the matter. It also showcases several neighborhood issues brought to light during the pandemic and possible short term and long term solutions for these problems that take into consideration the environmental impact.

Lastly it suggest components that should be included in every neighborhoods based on a thorough analysis of the current situation of Amman's existing neighborhoods.



**STAY HOME**



## 2. COVID IN JORDAN

## 2.1 MEASURES TAKEN TO ADDRESS THE ISSUE

When the “Stay Home” movement began as a drastic measure to slow the spread of COVID-19, people were forced to stay at home. Soon after the government enforced the nationwide lockdown, citizens were permitted to go out during certain hours of the day, by foot, to meet their basic needs and buy essentials from stores available in their neighborhoods.

This brought the realization that several basic necessities are not available within walking distance, an important aspect that was not considered before, since the majority of Amman’s citizens using vehicular transportation.

Once infection numbers started decreasing, the government eased the lockdown and implemented a curfew instead. Citizens were allowed to go out between 10 am and 6 pm to give business a chance to start recovering slowly as they were allowed to operate at 50% capacity.

However, the curfew created another problem where people struggled to purchase essentials due to the limited time available after work, combined with the scarcity of stores and an increased traffic at peak hours; right before the 6pm curfew. This resulted in the inability of many to get home on time or not going to stores all together to avoid the traffic and crowding. Thus, people could not receive basic services.

### BUYING ESSENTIALS

Another measure taken during lockdown was the complete closure of hypermarkets and limiting the purchase of essentials to neighborhood stores only.

This procedure also improved the socio-economic statues of neighborhoods as individuals ended up getting to know their neighbors and helping out the local store owners. Furthermore, traffic induced CO<sub>2</sub> and congestion was drastically reduced.





## 2.2 SHORT TERM IMPACT

### IMPACT ON HOUSEHOLDS

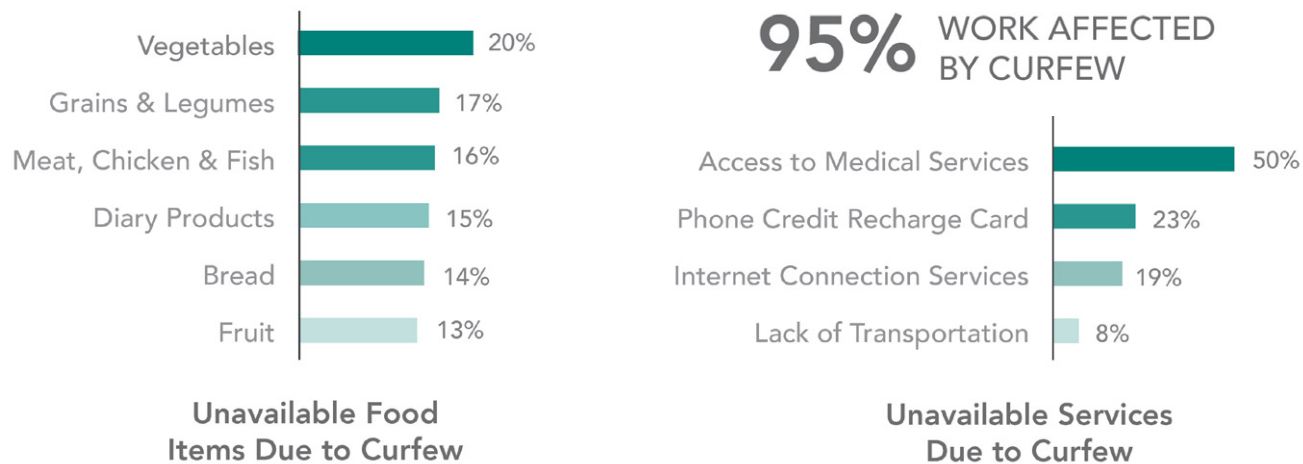
UNDP-Jordan implemented a brief study based on an online survey of 12,084 respondents to assess the impact COVID-19 has had on households and businesses and to highlight the effects of the lock-down on the livelihood of people. The general predictions are that some of the challenges will slowly ease away while others will have a long term impact.

As for the study findings, it was calculated that almost three-quarters (72.5%) of the surveyed individuals said that they are facing difficulties covering and obtaining basic needs (rent, food, heating & medicine) due to the implemented lock-down and that only (27.5%) have full access to basic needs.

Access to clean drinking water and basic health care were a big concern to many of the individuals (69.3%) as they reported challenges in their access to basic healthcare.



Another area of concern is access to the Internet that individuals need for work, education and e-commerce. As many reported the low availability of computers and tablets, all of which make it challenging to work or study from home. Lack of proper reach to community members also created a challenge mainly in the distribution of important information since, during the lock-down, the government used social media platforms to make many of its announcements.



Study Carried Out by CARE Jordan\*

### IMPACT ON THE ECONOMY

Before COVID-19, it was projected that Jordan's economic growth would reach 2.4% in 2020. The International Monetary fund (IMF) expected that the GDP growth rate would increase slowly over the next few years to reach 3% in 2024. Following COVID-19, international agencies now predict a shrinkage of 3.5% in 2020 as a result of reduced global and domestic economic activity.

Following the first COVID-19 infected individual that was reported on March 2, 2020, King Abdullah II ordered to activate the state of emergency and the defense law. This led the Prime Minister and his national response team to adopt strict measures, including the closure of airports, schools and universities, land border crossings, all private businesses and all non-essential public services. The shutdown of all economic activities has generated an adverse impact on individuals, public, and private entities.

The government declared it would not decrease the amount of public spending in its JOD 10 billion budget, emphasizing that it was still committed to paying off all foreign and local debts. This is despite the expected reduction in government revenues and increased expenditures due to the crisis.



## 2.3 CO2 EMISSIONS - AMMAN'S CLIMATE PLAN

### SUMMARY OF THE PLAN

In 2015, 195 nations adopted the Paris Agreement that aims to limit the average rise in global temperatures to well below 2 degrees Celsius. As a committed member of the C40, Amman set goal in 2018 to develop a plan that starts the city on a path to a Greenhouse Gases (GHG) emission neutral city by 2050.

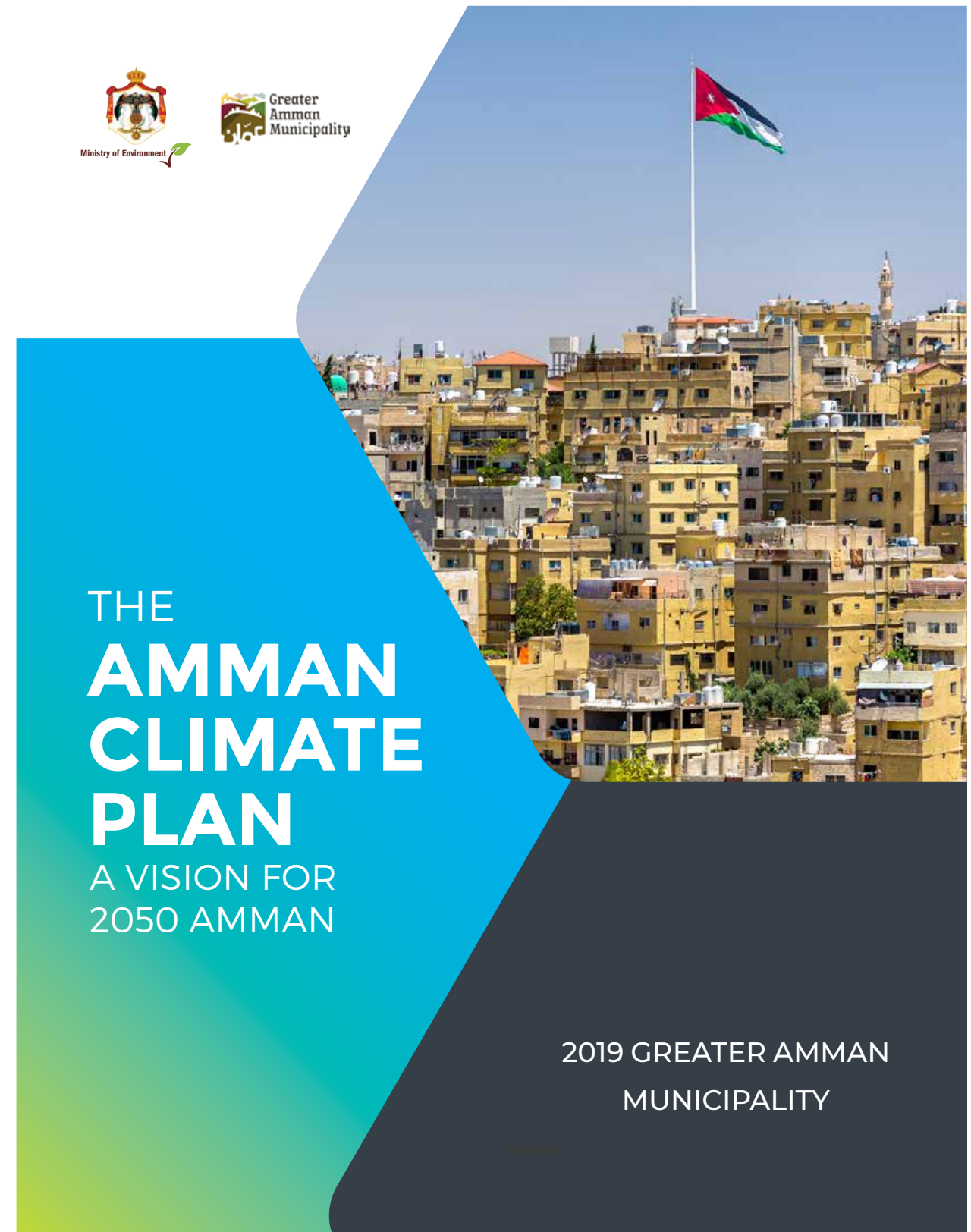
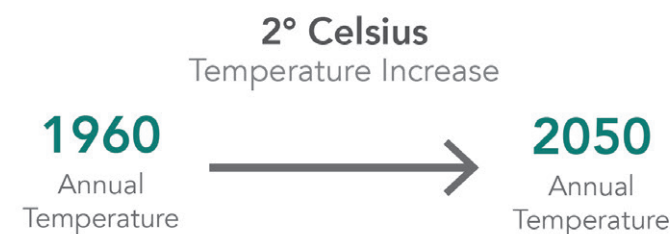
Since carbon neutrality is a long term goal that seems far away, the plan set an interim target of reaching a 40% reduction of greenhouse gas emissions by 2030, and this vision is shared among the government, private sector, development partners and residents of Amman.

The action plan itself consists of a set of pillars that go hand in hand with the goals of the "Amman Resilience Strategy" that was published in 2017.

### JORDAN'S CLIMATE

The climate in Amman is sub-tropical arid, and the city experiences hot dry summers and cold, wet winters. Amman has a varied topography and diverse climate, with extreme micro-climates in the city. The rainy season is in January and February when almost all of the rain for the year falls. The city is considered dry, with around 250 millimeters (mm) of rain a year.

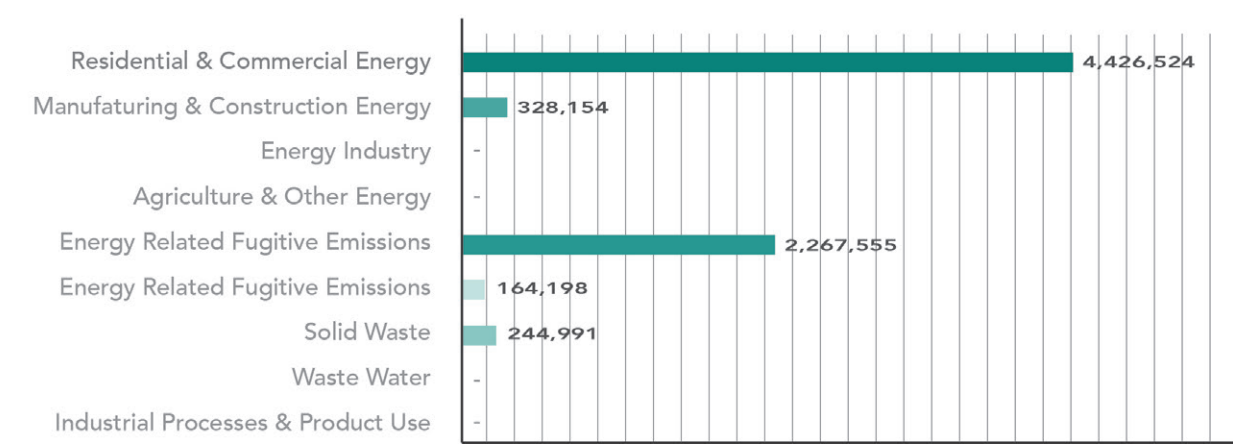
In accordance with historical changes and future projections, studies have concluded that Jordan's annual maximum temperature has increased by 0.3-1.8 °Celsius since the 1960s with more frequent heat waves and a predicted increase in temperature by 2 °Celsius by the year 2050. It is also expected that there will be an increase in intense precipitation even though the overall rainfall will somewhat decrease.





### AMMAN’S EMISSIONS

In 2014, Amman’s city emissions were measured at just above 7.4 million tons. This is similar to the emissions of cities such as Paris & Washington DC. It is also presumed that, if no action is taken, this number will double by 2030, and will most likely reach 40 million tons by 2050. Studies have also shown that the two largest producers of CO<sub>2</sub> emissions are stationary energy sources that mainly consist of residential and commercial buildings and the transportation sector in all its forms.



HIGHEST EMITTING SECTORS BASE ON 2014 GHG INVENTORY

### AMMAN’S ACTION PLAN

Amman plans on taking a set of actions in accordance with Amman’s Green Growth Program. The aim is to target specific sectors in that produce the most emission, thus achieving Amman’s 2050 vision. The targeted sectors are:

**TRANSPORTATION**

- BRT System
- Transportation & Mobility

**ENERGY EFFICIENCY**

- Enhance Street Lighting Efficiency (LED)
- Incentivize Green Building Using Green Building Density Bonus

**WASTE**

- Reduction
- Reuse
- Recycling
- Waste Management

### AMMAN’S RESILIENCE STRATEGY

Amman’s Action Plan builds on Amman’s Resilience Strategy that set out a vision for a resilient Amman as part of the “100 Resilient Cities Organization”. The strategy contains pillars, goals and actions, all of which aim to benefit the community, economy and environment in a multitude of ways. These benefits include:

 ENVIRONMENTAL BENEFITS	 SOCIAL/HEALTH BENEFITS	 ECONOMIC BENEFITS
Reduce air, land & water pollution	Protection against natural disasters (e.g flooding, storms, heat waves)	Increase jobs
Clean water	Improved health outcomes through reduced air pollution	Enhanced & expanded urban services (e.g public transportation)
Increase water supply	Better quality housing	Reduce utility bills
Protection of biodiversity for animals & plants	Imporved equitable access to urban services	Reduce operating costs
Increase green space	Enhance public open space & green space	Energy security
Reduce heat island effect	Increase community participation	Neighborhood revitalization

## TARGETED AREAS TO ACHIEVE GOALS

Achieving a deep decarbonization of Amman's economy and developing resilience against climate change requires a major transformational shift in major sectors.

### SUSTAINABLE MOBILITY

Improvement public transport, provide clean and efficient private vehicles and a more pedestrian friendly city center.

Possible Solutions

- Improve pedestrian & bicycling experiences and safety.
- Create an integrated public transport network that connects neighborhoods to the BRT.

### RENEWABLE ENERGY

Will be targeted at integrating photovoltaics (PVs) to increase production of renewable energy.

Possible Solutions

- Incentivize and promote residential & commercial Solar Rooftop Panels (PVs) to cover the majority of their energy needs.
- LED Street Lights
- Explore sites for municipal solar opportunities so that GAM can produce its own renewable energy.



[www.ecomena.org/solar-energy-jordan](http://www.ecomena.org/solar-energy-jordan)

### URBAN PLANNING AND LAND USE

Focus on the development of public spaces and transit-oriented corridors.

Possible Solutions

- Increase green open spaces by modifying existing regulations, enabling the GAM to zone and create more public open spaces in the city.
- Further develop transit-oriented policies to concentrate infill along the BRT lines being built.

### COMMUNITY ENGAGEMENT

One of GAM's ongoing efforts to achieve the city's Vision 2050 is a cross-cutting program that includes launching a city-wide awareness program about climate change and the benefits of the actions to be taken.

The main objective of the plan is to involve stakeholders in the different stages of the process that include design, development and implementation of actions. The involvement of stakeholders will increase local ownership thus improving the quality of the outcomes as they are directly affected by it and, in turn, will aim to achieve better quality results.

The participation of individuals and the change in their behavior is one of the core goals of this Plan. Therefore, their engagement in the implementation of the set of actions is one of the main targets GAM hopes to achieve.



Um Al Jamal community members participating in a community-wide meeting in the Governorate of Mafraq.



## 2.4 TRANSPORTATION

Transportation and mobility are largely dominated by the private vehicle in Amman. Over the past few decades, the city's transportation system grew to accommodate more vehicles—roads were expanded and multi-level intersections built across the city. Public transport, on the other hand, has witnessed little improvement.

A household mobility survey carried out in 2008 as part of the Amman Transport and Mobility Master Plan (TMMP) found that public transport mode share in the city was just under 14%. More recent statistics have indicated that car ownership is increasing in Jordan at a rate of 6.5% per year. Owning a car has not only become a status symbol but has also come to be viewed as a necessity to have access to employment and economic opportunities. It was also recorded that 47% percent of women have declined a job opportunity due to insufficient transportation. <sup>(1)</sup>

The heavy reliance on private cars has put significant pressure on household expenditure. A 2017-2018 report by the Department of Statistics found that transport constituted 25% of non-food expenses for Jordanian households. The toll is even heavier on the national economy, with almost half of the country's energy bill and about a fifth of greenhouse gas emissions are attributed to transport.

Nevertheless, more recently, there have been some positive developments. Public transportation has come to be viewed as a national priority, at least in the government's discourse. A bus rapid transit (BRT) system is under construction both within Amman and between Amman and neighboring Zarqa. There have also been efforts to organize and consolidate existing public transport operators and establishing a sustainable funding mechanism to ensure the provision of reliable, affordable services.

That said, non-motorized transport modes continue to lag behind. Despite the presence of small pockets for walking, Amman as a city is viewed as being not friendly to pedestrians. Sidewalks are often non-existent, too narrow, high, or filled with obstacles such as light poles, trees, and construction material.

Cycling is unsafe, and there is no dedicated infrastructure or road space for bicycles. Although there have been attempts on the regulatory side to set clear standards and specifications for sidewalks, those regulations are often not enforced.

The Covid-19 lockdown, has forced people to use non-motorized modes, specifically walking and cycling, since during lockdown the only allowable means of transportation was either by foot or bicycles.. This trend has highlighted variations among neighborhoods not only in the availability of services within walking (or biking) distance but also in terms of the pedestrian and transportation infrastructure, in general.

Hence, the demand on bicycles increased as many found them to be a very convenient means of transportation. It also proved that Amman is, in fact, a bicycle friendly city and that the major aspect in the way of cycling is the fact that the streets are largely created for and dominated by cars.

Therefore, the redesign of neighborhoods needs to take into consideration the possibility of downsizing roads to create bicycle lanes and proper sidewalks which, in turn, will decrease traffic; as many have the willingness to walk or ride a bike rather than drive whenever possible.



<sup>(1)</sup> SADAQA & FES 2019

## 2.5 NEIGHBORHOOD RESILIENCE

### WHAT IS A NEIGHBORHOOD

When trying to define a neighborhood, opinions have varied largely on its actual definition; some define it as an “important organ of urban life” where people are an interlinked organism living interdependently and are influenced by their socioeconomic surrounding. Others define it as a “combination of geographical boundaries, ethnic or cultural characteristics” of inhabitants that unifies them.

If we were to synthesize a collective notion that defines a neighborhood; it is a collection of people who “share services and some level of cohesion in a geographically bound place.”

However, since interest in neighborhood planning is growing exponentially, it is important to define an appropriate radius of work and matching research/ planning goals and tools before starting the actual work to be able to achieve the desired outcomes.

It is also worth noting that residents and local stakeholders are more inclined to participate in neighborhood-based planning as they can quickly see change and are directly affected by the results.

The first step towards achieving the intended outcomes is to understand what neighborhood resilience is as a whole, as the resilience of cities and the strength of its leadership largely depends on the resilience of its neighborhoods. In addition to that, understanding all the challenges and risks that the city might face and allocating preemptive measures helps reduce their impact and deal with them in case they arise.

**Therefore, we define neighborhood resilience as its ability to adapt and act in proactive ways that insures the lasting livelihood of a community and its ability to pivot in times of crisis.**

### Aspects of a Resilient Neighborhood & a Comprehensive Community

#### Attitudes & Values

Increase social cohesion and a positive perspective that is solution oriented

#### Infrastructure & Resources

Addressing any discrepancies or gaps in human, natural and built infrastructure & resources

#### Local Economy

Encourage local ownership and control of the economies

#### Leadership & Community Wide Planning

Engaging communities in neighborhood-based planning activities and actions to ensure that local needs are met

#### Sustainability

Encouraging community members to use passive energy sources and maintaining a balance between environment, economy and society.



## 2.6 CASE STUDIES

Many cities worldwide have taken COVID-19 outbreak as an opportunity to think of new ways to help people carry out their daily activities while maintaining social distancing. The worldwide mobility disruption has allowed communities to undergo several transformations paving the way for more resilient, more connected, and lower carbon future communities.

Streets transformations such as increasing the space for walking and cycling and reducing the use of cars not only help people move easier, but they create many benefits for climate change, public health, and the local economy.

Community changes and street transformation may not be too costly and complicated to implement, however, these simple small-scale, quick, and affordable changes can generate a significant impact on urban neighborhoods.

Examples of such changes include painting new pedestrian areas, installing low-cost street furniture, and creating parklets out of parking spaces.

### COMPLETE STREET PROJECTS ACROSS BRAZIL

In Brazil, tactical urbanism was considered during the pandemic facilitated with community engagement to allow people experience the new design changes before making them permanent.

A coalition between the national front mayors and the research institute WRI Brazil was done to choose a network of cities and implement complete street development. This coalition has led urban planners to exchange data and ideas, challenges, and previous experiences, to deliver better projects. Frequent communication either through in-person meetings or Whats-App groups was essential to keep people connected and motivated. Also, pilot projects and urban planning web-seminars promoted healthy competition among the cities chosen.

Many small-scale projects were implemented in Brazil using simple affordable methods. New pedestrian areas, sidewalks extensions, and posts for the safety of cyclists were painted using spray cans. Low-speed zone areas were established using painted car tires. These small adaptations proved to be very beneficial for the communities in which they were implemented, as they helped the city adapt faster and sustain revitalizing change.





## OTHER CITIES AROUND THE WORLD

### MILAN, ITALY

Milan has developed a city-wide plan to create new pedestrian and biking facilities on the streets. Paint and markings were used on some streets to widen sidewalks and add a parking-protected bike lane.

### AUCKLAND, NEW ZEALAND

Auckland created more space to allow for social distancing using asphalt ramps white safety posts, and paint to mark extended sidewalks.

### BRUSSELS, BELGIUM

Brussels officials were keen during the pandemic to create more open areas for pedestrians. A 20 km/h zone in the downtown core was created to provide pedestrians with the ability to walk more safely in the roadbed.

### DUNEDIN, NEW ZEALAND

Dunedin approved a plan that reduces speeds to 10 km/hr allowing for safer pedestrian movements. City businesses were allowed to open in streets, creating shared space for multiple of interaction.

### ALEXANDRIA, VA, USA

Temporary signage was used to indicate pick-up zones outside food restaurants allowing delivery drivers and customers to access businesses safely.

### KALAW, MYANMAR

Kalaw introduced spray painting cans to indicate the locations of vendor stalls to ensure proper distancing and allowing people to shop safely.



**MILAN, ITALY**

SOURCE: AMAT OFFICINA URBANA/COMUNE DI MILANO



**AUCKLAND, NEW ZEALAND**

SOURCE: AUCKLAND TRANSPORT



**BRUSSELS, BELGIUM**

SOURCE: EUROPEAN CYCLIST'S FEDERATION



**DUNEDIN, NEW ZEALAND**

SOURCE: NACTO-GDCI



**ALEXANDRIA, VA, USA**

SOURCE: CITY OF ALEXANDRIA



**KALAW, MYANMAR**

SOURCE: JAIN WERAPHONG

### **3. STUDY OF NEIGHBORHOODS**



## 3.1 MAJOR NEIGHBORHOODS

### 3.1.1 FIVE NEIGHBORHOODS SELECTION

The general issue at hand is the impact of Covid-19 on Amman's diverse neighborhoods and how a set of solutions can better equip them in the face of any future pandemics, in the aims of achieving more resilient, self-sufficient, walkable and socially diverse neighborhoods.

When studying neighborhoods of Amman during the lockdown period, it is crucial to narrow down the scale of work and to focus on a selected few that can be used as case studies to cover multiple factors and characteristics found within the larger boundaries of Amman. After studying multiple areas and scales of work, five neighborhoods are selected as a starting point since they are versatile enough to represent the majority of Amman's neighborhoods and thus can be used as reference.

The selection process focuses on the importance of covering Amman's complex diversity in terms of demographics, socioeconomic status, topography, density, etc. so as to be able to come up with a set of solutions that can be implemented on the majority of Amman's neighborhoods based on each of their unique characteristics.

These five selected neighborhoods are

- **Al Kuliye Al Islamiyeh**
- **Wadi Saqra**
- **Al Kursi**
- **Al Lweibdeh**
- **Hai Nazzal**

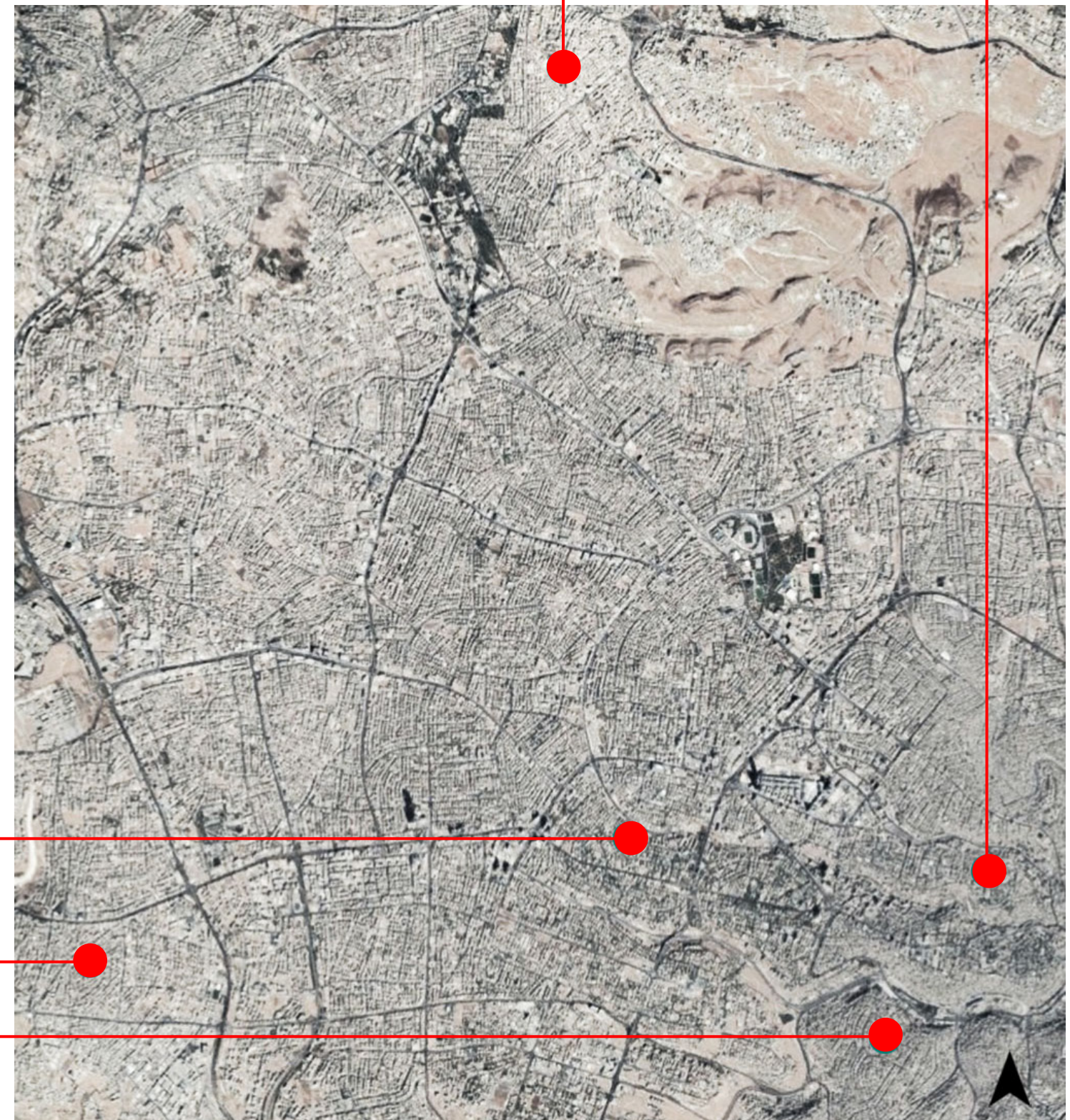
**WADI SAQRA**

**AL KURSI**

**HAI NAZZAL**

**AL KULIYEH AL ISLAMIYAH**

**AL LWEIBDEH**





## 3.2 FOCUS NEIGHBORHOODS

### 3.2.1 TWO FOCUS NEIGHBORHOODS SELECTION CRITERIA

After the selection of the five initial neighborhoods, the analysis narrowed down to two neighborhoods with a 300m radius. This results in a focused and comprehensive analysis.

The selection of the neighborhoods is based on the following criteria:

#### **Socio-economic Diversity**

Since Amman is home to a wide range of individual with different demographic backgrounds, it is crucial to include neighborhoods with a high socio-economic diversity. They should not be exclusive to one social class, race or ethnic background. This allows the analysis to be inclusive and address the needs of the greater majority rather than a selected few.

#### **Accessibility & Services Availability**

The selected neighborhoods take into consideration the availability of services within the set boundaries. It is important for the study that these neighborhoods are not on either extremities of containing an abundance of services that are easily accessible or areas that are isolated and lack any kind of service. Therefore, moderate availability of both elements is key.

#### **Personal Association**

Being familiar with the study neighborhoods creates a tremendous advantage especially if a team member lives in that area. This enables insight into the everyday life in that neighborhood specifically during the lock-down period. Thus, it saved the time and effort an outsider would need if they were to study the area for the first time.

#### **Problems Brought to Light During Lockdown**

Include neighborhoods where individuals discovered small scale issues that were not noticed before since all necessities could be obtained elsewhere by car. When neighborhoods and their services are limited to a walkable radius it brings to light that essentials are either missing or access to them is exceedingly difficult.

#### **General Building Classification**

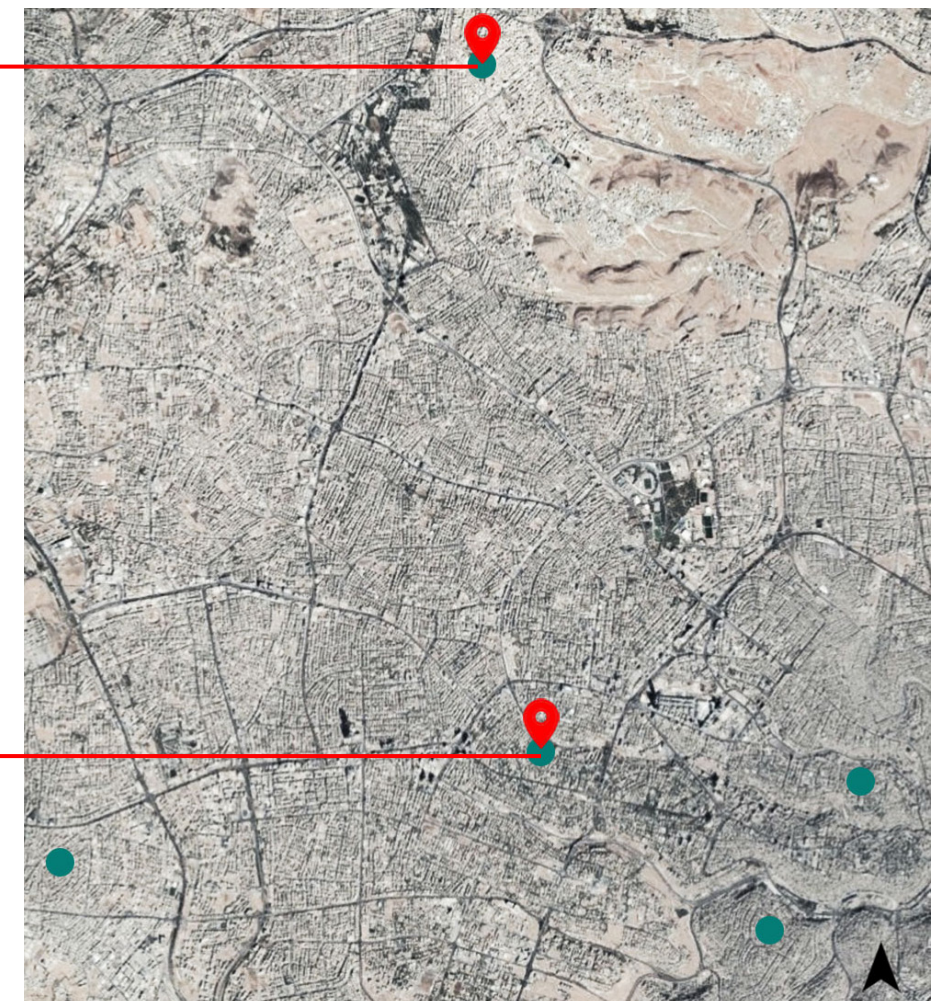
Studying neighborhoods that mainly include residential buildings since the main focus is how residents were affected during the lockdown period. Meanwhile commercially dominant areas were not as affected since they were empty during that period.

#### **Topography of the Selected Area**

Amman's terrain is typified by its mountains rather than flat stretches of land. Despite the fact that newer neighborhoods lie in flatter lands, there still remains areas with immensely steep slopes, therefor, selected areas need to take that into consideration and contain moderate slopes that represent the larger majority.

**AL KULIYEH  
AL ISLAMIYAH**

**WADI SAQRA**





### 3.2.2 FOCUS NEIGHBORHOODS ANALYSIS CRITERIA

Certain criteria are set for the analysis of the two focus neighborhoods so as to create a framework that can later be used in the fabrication of site specific solutions.

The criteria for the analysis of the neighborhoods are as follows:

#### **Solid & Void/ Vacancy**

Level of density within the residential area and the availability of open spaces or parks.

#### **Existing Land Use**

The distribution of land and services within the neighborhood - focus on the level of privacy for inhabitants and the amount of undesirable car traffic within dense residential areas.

#### **Road Networks & Road Hierarchy**

Analysis of road hierarchy as well as road accesses to all land plots within a neighborhood.

#### **Accessibility**

Ease of accessibility for residents to services and green open spaces, either using vehicles or on foot, and the level of safety and security of pedestrians accessing these services.

#### **Existing Services**

Essential public services and proper infrastructure insuring residents' access to all essential services resulting in an improved quality of life. Such services mainly include food, potable water and basic healthcare.

#### **Topography**

Study the topography of the land especially when laying out pathways and streets since Amman is typified by its mountains.

#### **Waste Sorting**

Study of the waste sorting system withing the neighborhood mainly in relation to the availability of a waste sorting system in place.

#### **Site Greenery & Services**

The availability of open public spaces and public sports fields with safe pedestrian access that encourages social interaction between inhabitants of the neighborhood.

#### **Neighborhood Quarantine Narrative - Strengths & Recommendations**

Issues brought to light and discoveries made, whether good or bad, during the lockdown period as people became more aware of the immediate surroundings outside the boundaries of their homes.





### 3.3 PILOT NEIGHBORHOOD A - WADI SAQRA

#### WADI SAQRA - OBSERVATION & ANALYSIS BASED ON "GENERAL PLANNING STANDARDS"

##### OVERVIEW | 3D

District	Zahran
Area	Wadi Saqra
Neighborhood	Al Radwan
Study Area	391,755 sqm



SITE LOCATION



WADI SAQRA - OBSERVATION & ANALYSIS BASED ON "GENERAL PLANNING STANDARDS"

CLUSTER CATCHMENT RADIUS  
VACANCY | SOLID & VOID



One Residential Cluster within Al- Radwan Neighborhood.  
A radius of 300m was taken as the ideal distance as it can be walked in five minutes at a normal pace.

Solid & Void represents the level of building density within the neighborhood where the shaded gray figures represent the buildings in the neighborhood while the white void is the area that does not contain any buildings.

This figure shows that the area is relatively dense as the majority of the neighborhood contains buildings.

EXISTING LAND USE

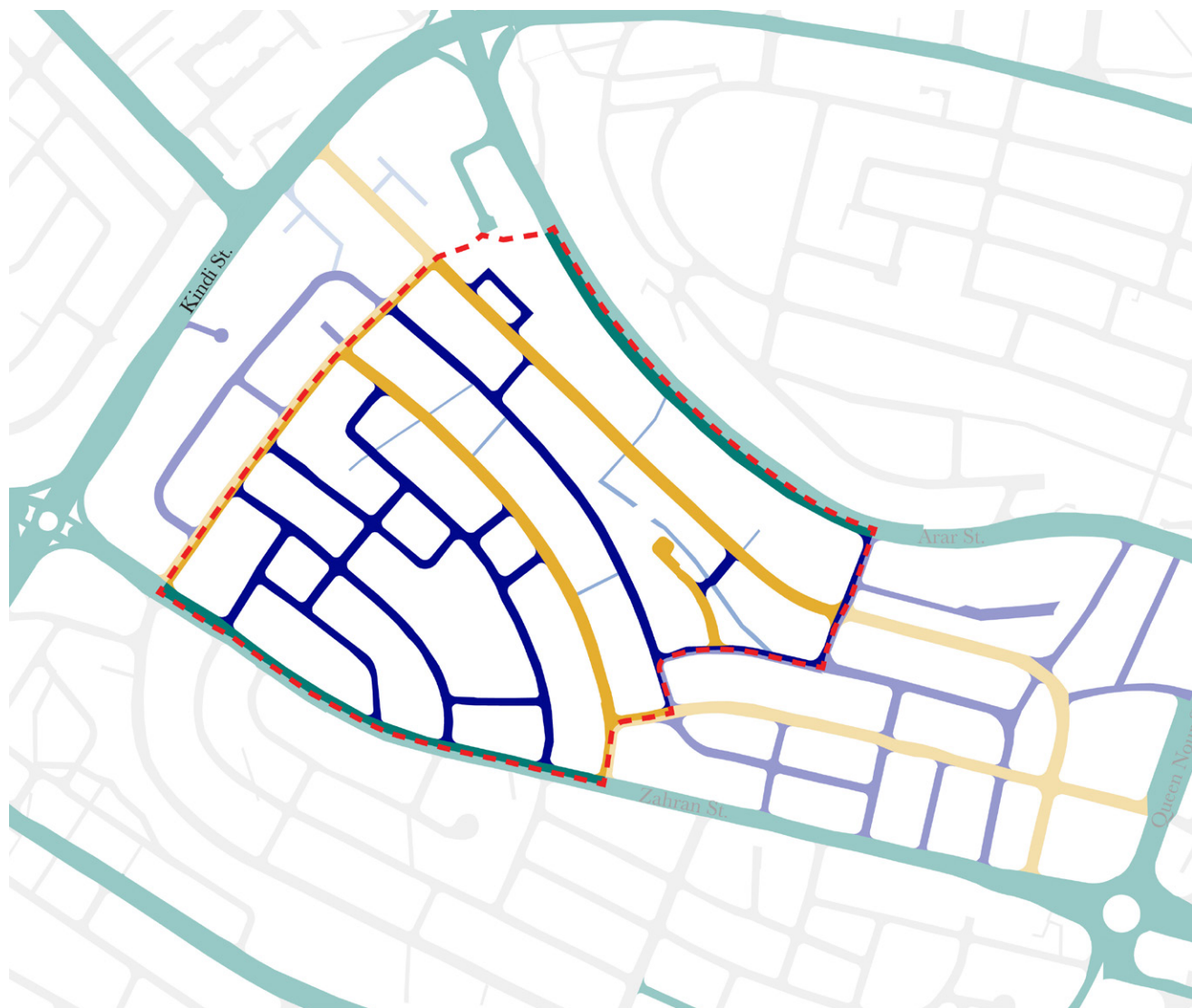


Total Number of Plots 223

- |             |           |
|-------------|-----------|
| Residential | Offices   |
| Commercial  | Park      |
| Hotel       | Religious |

WADI SAQRA - OBSERVATION & ANALYSIS BASED ON "GENERAL PLANNING STANDARDS"

ROAD HIERARCHY



- Arterial Road 22m | 30m
- Collector Road 16m
- Local Road 10m | 12m
- Pathway 3-4m

ACCESSIBILITY



The study area is located in one of the oldest parts of Amman.

The site is accessible through two main roads; Zahran Street to the south and Arar Street to the north. It has multiple entrances from Zahran St, and one entrance from Arar St.



WADI SAQRA - OBSERVATION & ANALYSIS BASED ON "GENERAL PLANNING STANDARDS"

EXISTING SERVICES

- Pharmacy
- Corner Shop
- Department Store | Cozmo
- Bank
- Hotel
- Restaurant
- Mosque
- Educational
- Gas Station

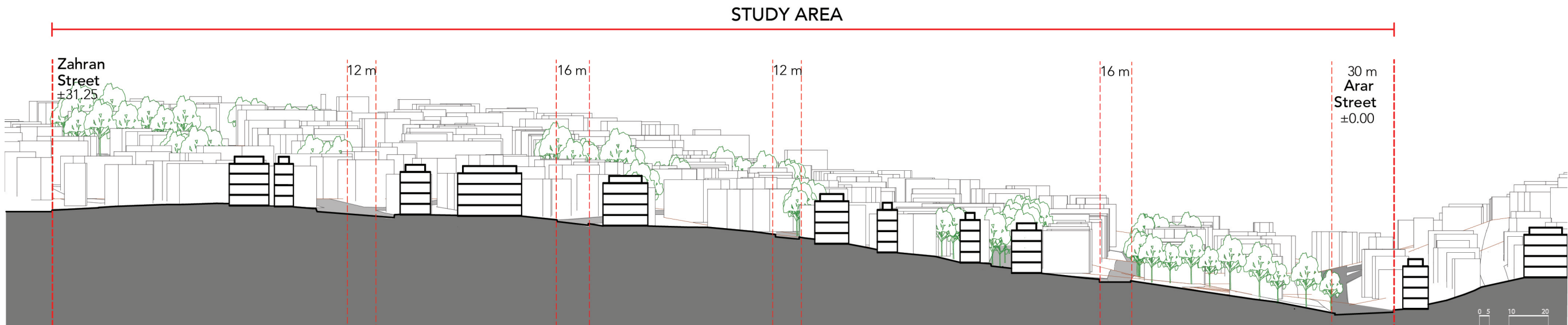




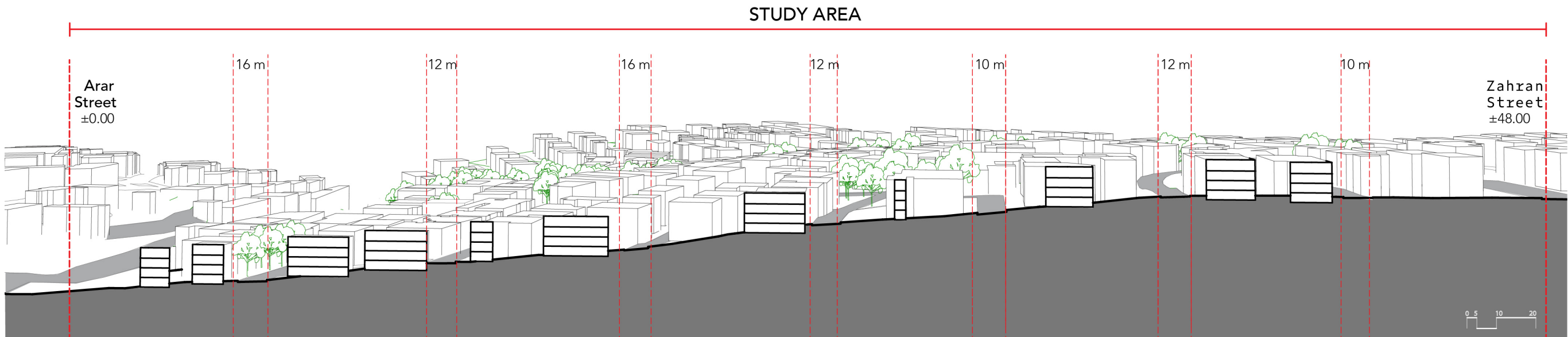
WADI SAQRA - OBSERVATION & ANALYSIS BASED ON "GENERAL PLANNING STANDARDS"

TOPOGRAPHY - SITE SECTIONS

Average Slope Between Arar Street & Zahran Street 8%



Section A-A





Section B-B

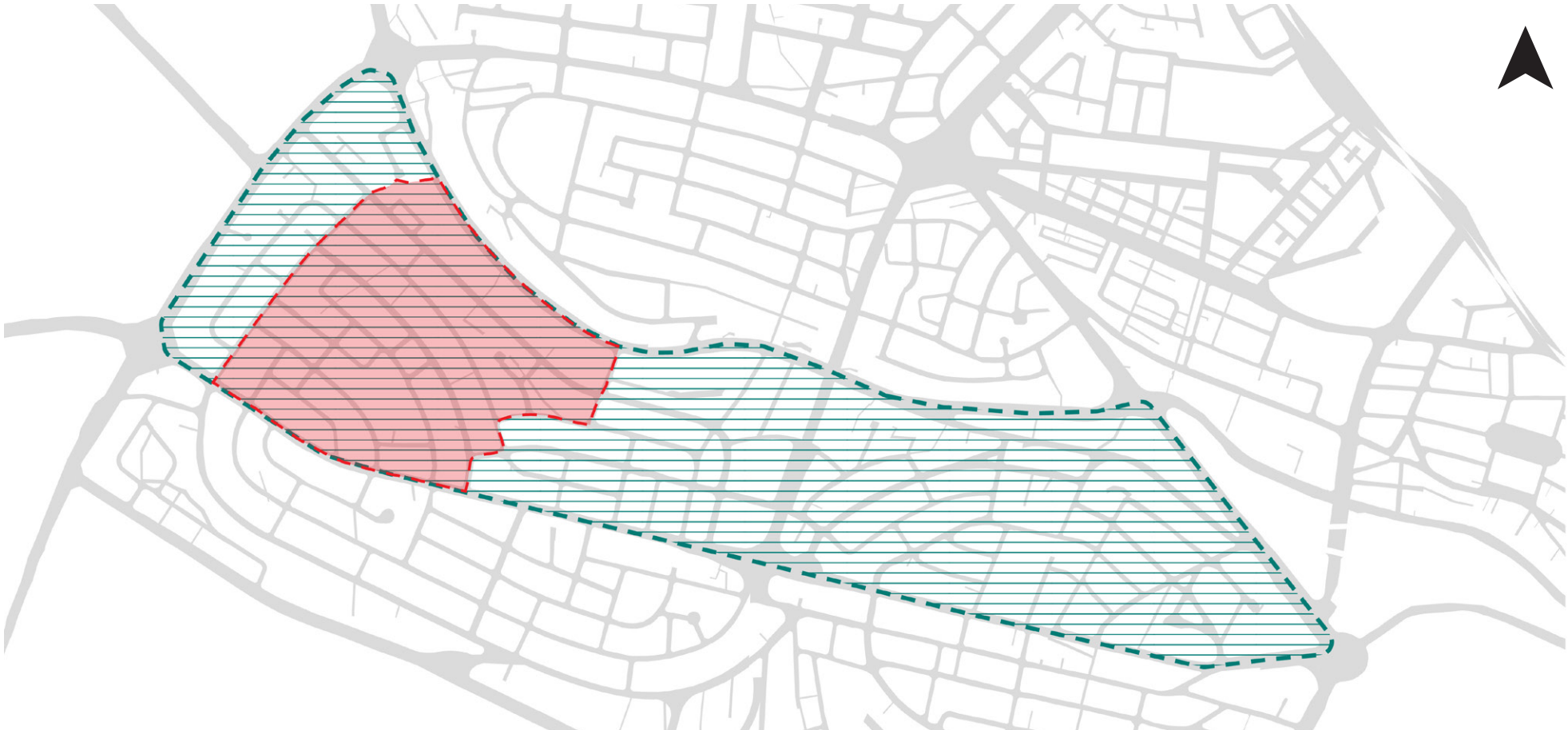


WADI SAQRA - OBSERVATION & ANALYSIS BASED ON "GENERAL PLANNING STANDARDS"

WASTE SORTING

The study area is located within the boundaries of a waste sorting pilot project initiated by GIZ and GAM.

-  Waste Sorting Pilot Project
-  Study Area





WADI SAQRA - OBSERVATION & ANALYSIS BASED ON "GENERAL PLANNING STANDARDS"

PHOTO DOCUMENTATION

SITE GREENERY



SITE SERVICES





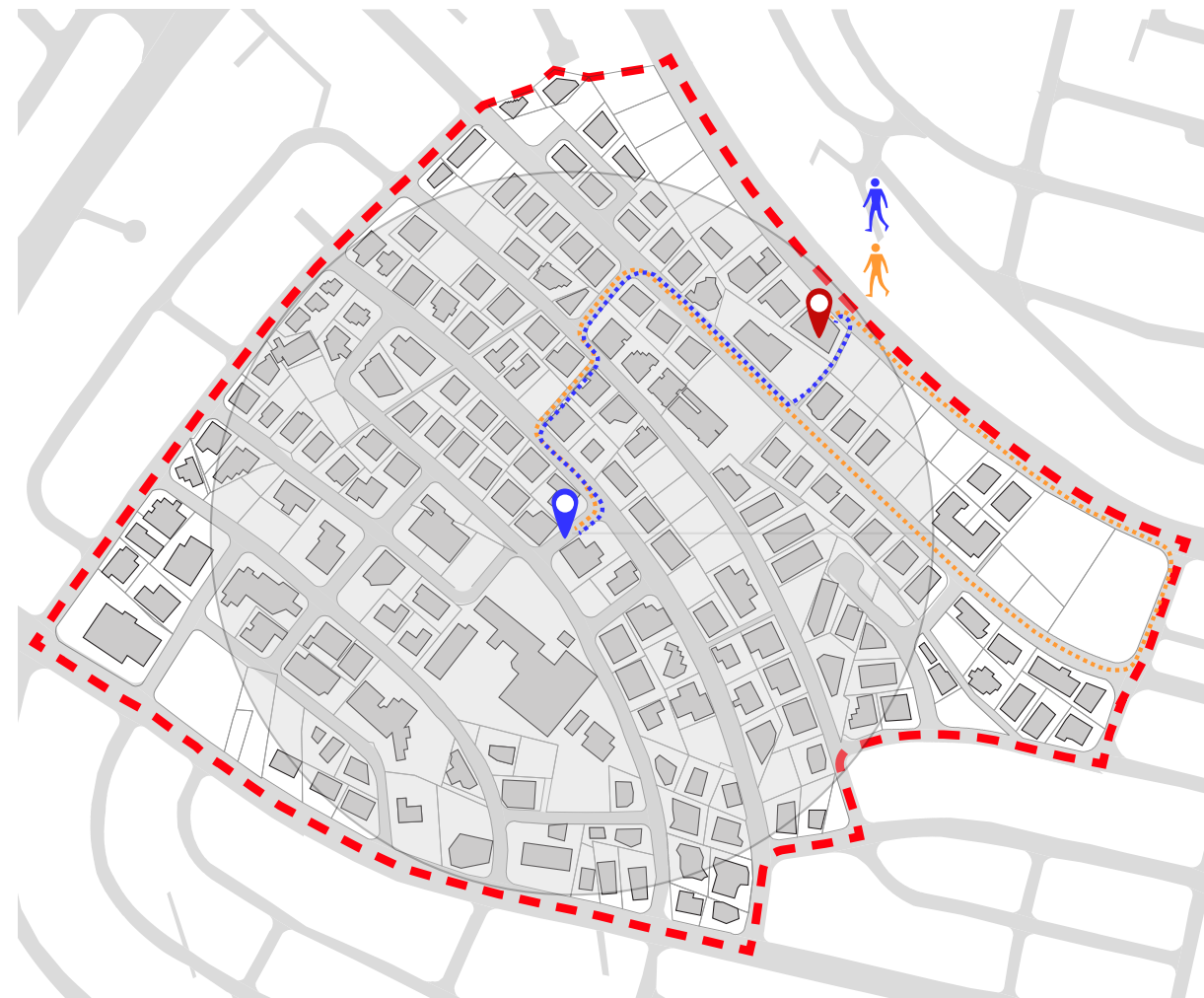
## NEIGHBORHOOD QUARANTINE NARRATIVE

Al Radwan neighborhood within Zahran district sits on a hilly land with an average slope of 8%. The area features small grocery shops which were found to be insufficient during lockdown.

Arar Street running in the valley to the North of the study area features services such as pharmacies and big department stores. This street serves both Zahran to the South and Shmeisani to the North.

One of the main features of this study area are the footpaths connecting terracing streets as shown in the figure below. These paths cut across the contour lines and make it easier to move between streets especially since the area is set on a very strong slope. The foot paths proved to be particularly useful during lockdown as most residents used them to get to Arar Street for grocery shopping.

The park highlighted in the maps also served as a connection point to the street below as its gate was kept open and people used it as a shortcut



## STRENGTHS & WEAKNESSES

### Strengths

In terms of walkability, the footpaths helped ease of movement towards the services on Arar Street.

The area in general is secure as it is well lit and hosts multiple embassies with 24/7 guard on duty.

In terms of services, the area proved to be sufficient only for pharmacies.

Fruits and vegetables shopping is available but had limited supply during lockdown.

### Weaknesses

In terms of walkability, accessibility to sidewalks and ease of movement are both very limited due to poor sidewalk conditions. However, during lockdown, people reverted to walking on streets as they were mostly empty.

In addition to that, the sidewalks proved to be inaccessible for people with special needs and those on wheelchairs. In terms of services, the area proved to lack some essential services; i.e. bakery, potable water supply.

## CONCLUSIONS BASED ON NEIGHBORHOOD ANALYSIS

Analysis focused on two core aspects of the neighborhood; walkability and availability of services.

Injection of services is needed especially to the south of the study area (closer to Zahran Street) as it was exceedingly difficult to carry grocery from Arar and walk up the incline.

Furthermore, wide and accessible sidewalks are needed. Rethinking typical street sections is key as existing street widths allow for increasingly human friendly sidewalks. Rethinking traffic direction within the study area further allows for a bicycle lane. Despite its topography, Amman proved to be a cycling friendly city during lockdown.

### 3.3 PILOT NEIGHBORHOOD B - AL KULIYAH AL ISLAMIYAH

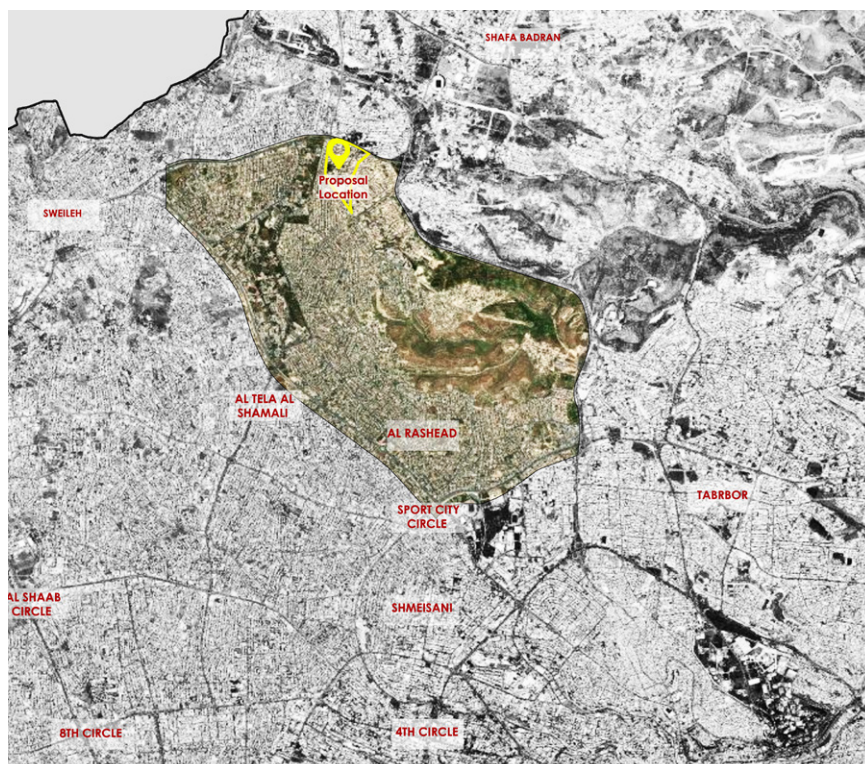
#### AL KULIYAH AL ISLAMIYAH - OBSERVATION & ANALYSIS BASED ON "GENERAL PLANNING STANDARDS"

##### OVERVIEW | 3D

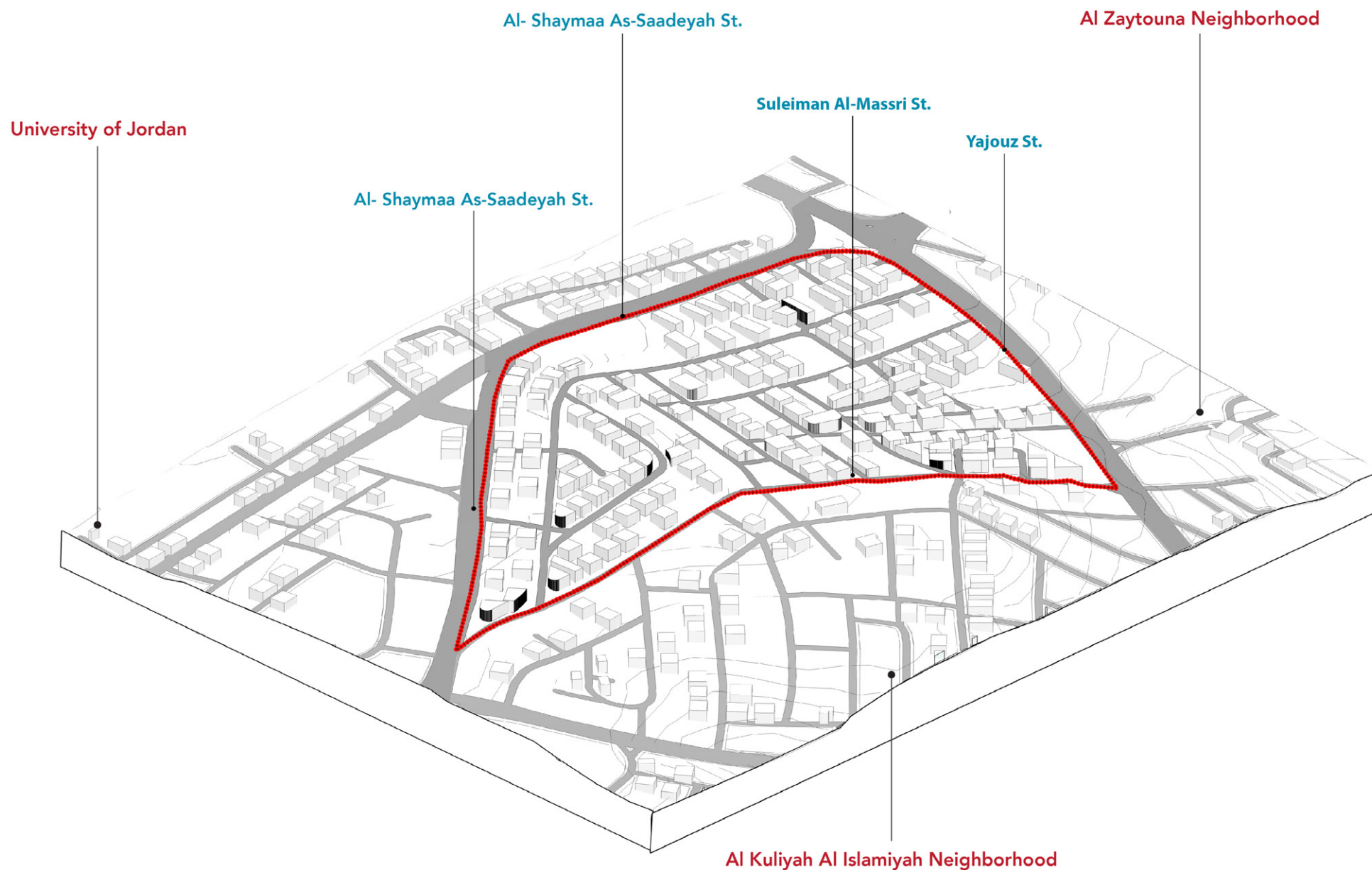
District Al Jubeiha  
Neighborhood Al Kuliya Al Islamiyah

Al-Jubeiha area consists of several neighborhoods, including the University neighborhood, Al-Rashid neighborhood, Qutna neighborhood, Al-Mansour neighborhood, Al-Zaytuna neighborhood and Al Koliyah Al-Islamiyah neighborhood.

The neighborhood itself is surrounded by Al Shaymaa As-Saadeyah main street from two sides that connects with Yajouz St. main street from one side and Suleiman Al-Massri secondary street from the other.



SITE LOCATION





AL KULIYAH AL ISLAMIYAH - OBSERVATION & ANALYSIS BASED ON "GENERAL PLANNING STANDARDS"

CLUSTER CATCHMENT RADIUS  
VACANCY | SOLID & VOID



The cluster is surrounded by three roads

- |                               |     |
|-------------------------------|-----|
| 1. Suleiman Al-Massri St.     | 20m |
| 2. Al-Shaymaa As-Saadeyah St. | 30m |
| 3. Yajouz St.                 | 40m |

EXISTING LAND USE



Total Number of Plots	225
Average Apartments per Plot	10
Residents per Family	4.8
Total Inhabitants	10,800

● Residential B



AL KULIYAH AL ISLAMIYAH - OBSERVATION & ANALYSIS BASED ON "GENERAL PLANNING STANDARDS"

ROAD HIERARCHY



- Arterial Road 22m | 30m
- Collector Road 16m
- Local Road 10m | 12m
- Pathway 3-4m

EXISTING SERVICES



The site has insufficient services concentrated in the northern half of the area. This includes one supermarket near the northern edge, one local mosque in the northern half of the site and one commercial shop for construction materials on the northwestern corner. The study area suffers a lack of services such as open areas, nurseries and commercial facilities.

- Supermarket
- Construction Shop
- Mosque

**AL KULIYAH AL ISLAMIYAH - OBSERVATION & ANALYSIS BASED ON "GENERAL PLANNING STANDARDS"**

**ACCESSIBILITY**

The neighborhood is mainly accessible from two sides; 2 entrances from Yajouz Street to the North and 3 entrances from Suleiman Al-Masri Street to the East.

The maps show the nearest basic services including bakery, vegetables shop, butchery... etc by walking distance from the study area center.



Nearest Market For Vegetables, Butchery, Etc



Nearest Bakery



## AL KULIYAH AL ISLAMIYAH - OBSERVATION & ANALYSIS BASED ON "GENERAL PLANNING STANDARDS"

### TOPOGRAPHY - SITE SECTIONS

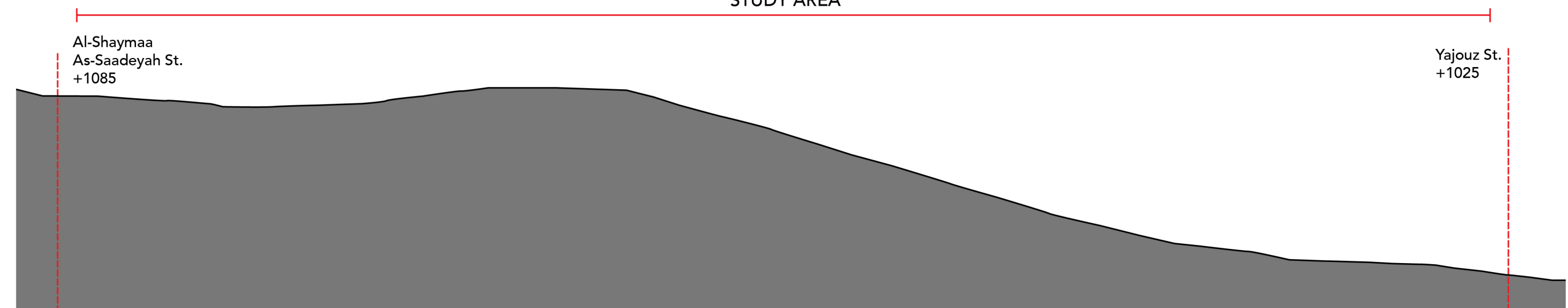
A topographic analysis with a 5 meter interval contour lines was created using a website called "Amman Explorer - Mostakshef Amman".

This neighborhood is characterized by a harsh topography in general in which land elevations descend from a high level of 1055m to a lower level of 975m above sea level with a difference in height of about 80m.

Higher areas are found in the Southern part of the site while the lowest areas are concentrated in the Northern part.



STUDY AREA



SECTION A-A



AL KULLIYAH AL ISLAMIYAH - OBSERVATION & ANALYSIS BASED ON "GENERAL PLANNING STANDARDS"

PHOTO DOCUMENTATION

NARROW STREETS/ WALKWAYS



LEFTOVER PLOTS





LEFTOVER PLOTS



ON STREET PARKING



GREENERY





## NEIGHBORHOOD QUARANTINE NARRATIVE

Al-Kulliyah Al-Islamiyah neighborhood within Al-Jubeiha district sits on a hilly land with a wide range of slopes that vary in steepness between 5% to 17%. These high slopes contain difficult footpaths cutting the steep slopes that are especially challenging for the elderly.

The area features one small grocery shop which was found to be insufficient during lockdown as the nearest fruits and vegetables shop, bakery and pharmacy are about 2.4 km, 2 km, and 1.1 km away from the center of the study area respectively. It was also brought to light that there is a lack of open spaces and gardens.

## STRENGTHS & WEAKNESSES

### Strengths

In terms of empty lands, the study area contains plenty; which gives the opportunity to cover the lack of services within the study area in terms of open spaces and green areas, local commercial shops, kindergarten and primary school.

### Weaknesses

In terms of walkability, accessibility and ease of movement, they are all limited due to poor sidewalk conditions. However, during lockdown, people reverted to walking on streets as they were mostly empty.

In addition to that, sidewalks proved to be inaccessible for people with special needs and those on wheelchairs.

In terms of services, the area proved to lack some essential services; i.e. bakery, potable water supply, fruits and vegetables, pharmacy.

## CONCLUSIONS BASED ON NEIGHBORHOOD ANALYSIS

Analysis focused on two core aspects of the neighborhood; walkability and availability of services. It was also concluded that the injection of services as well as wide and accessible sidewalks are needed.

Rethinking typical street sections is key as existing street widths allow for increasingly pedestrian friendly sidewalks.

Rethinking traffic direction within the study area further allows for a bicycle lane, where despite its topography, Amman proved to be a cycling friendly city during lockdown.



### 3.5.2 GENERAL OBSERVATIONS DURING LOCKDOWN PERIOD

#### Pedestrian Paths - Walkability

During the lockdown period, to avoid overcrowding inside stores, people were forced to queue outside. However, in certain areas they ended up queuing in the middle of the street due sidewalks being too narrow or a lack thereof.

Luckily though, the whole lockdown period happened during spring time thus people did not face any issues with standing out in the open without any shading. If this procedure had happened during winter time or in the middle of summer, people would have faced multiple difficulties having to stand out in the open without any shelter.

Therefore, the lack of proper pedestrian paths and street vegetation that can also act as shading elements are a few of the issues brought to light in various neighborhoods throughout Amman during this period.



Figure A - People queuing to buy bread from the bus.

#### Scarcity of Services

Another issue brought to light is the lack of services in many of the neighborhoods. This resulted in the government being forced to take certain measures to supply community members with basic necessities, such measures included using public transportation buses to supply various neighborhoods with bread; a basic necessity that the majority of community members highly depend on.

In many of the cases, stores were available in the neighborhood but in extremely low numbers. This resulted in exceedingly long queues, waiting periods of up to several hours, and diminishing access to goods in the markets due to low supply.

#### Coming Together

Another important observation during the lockdown period is the collaborative efforts by community members within neighborhoods. Many acts of kindness and neighborhood help could be observed, e.g. helping each other out with carrying groceries and delivering them to homes.

Others helped out their elderly neighbors living alone, unable to leave their homes for fear of catching the virus or simply because they could not make the trip. This sheds light on the ability of local communities to act as one interlocked (rephrase word) unit and provoke positive change.

Based on that, local stakeholders and members of the community must be invited and encouraged to participate/contribute to the change and the enhancement of the built environment around them.



Figure B - People queuing to buy essentials in one of Amman's neighborhoods

## 4. FINDINGS & SOLUTIONS



## 4.1 NEIGHBORHOODS PLANNING SOLUTIONS

### GENERAL OVERVIEW

After analyzing the two focus neighborhoods, it is crucial to propose a set of design and planning solutions.

Thus, the report presents a master plan of the two neighborhoods with planning solutions for each one as a whole. The proposed solutions are further developed to a set of components, each with its own design solution that are considered a necessity for the resilience of Amman's neighborhoods.

#### The addressed components are as follows:

1. Traffic Direction; one-way vs. two-way.
2. Pedestrian network; sidewalks & crossings.
3. Bike lanes & directions.
4. Services; existing vs. possible additions.
5. Green network; trees, planters, park, etc.
6. Typical street sections & plans enlargements.
7. Intersection enlargement.

The solutions take into consideration the following documents previously mentioned in the report:

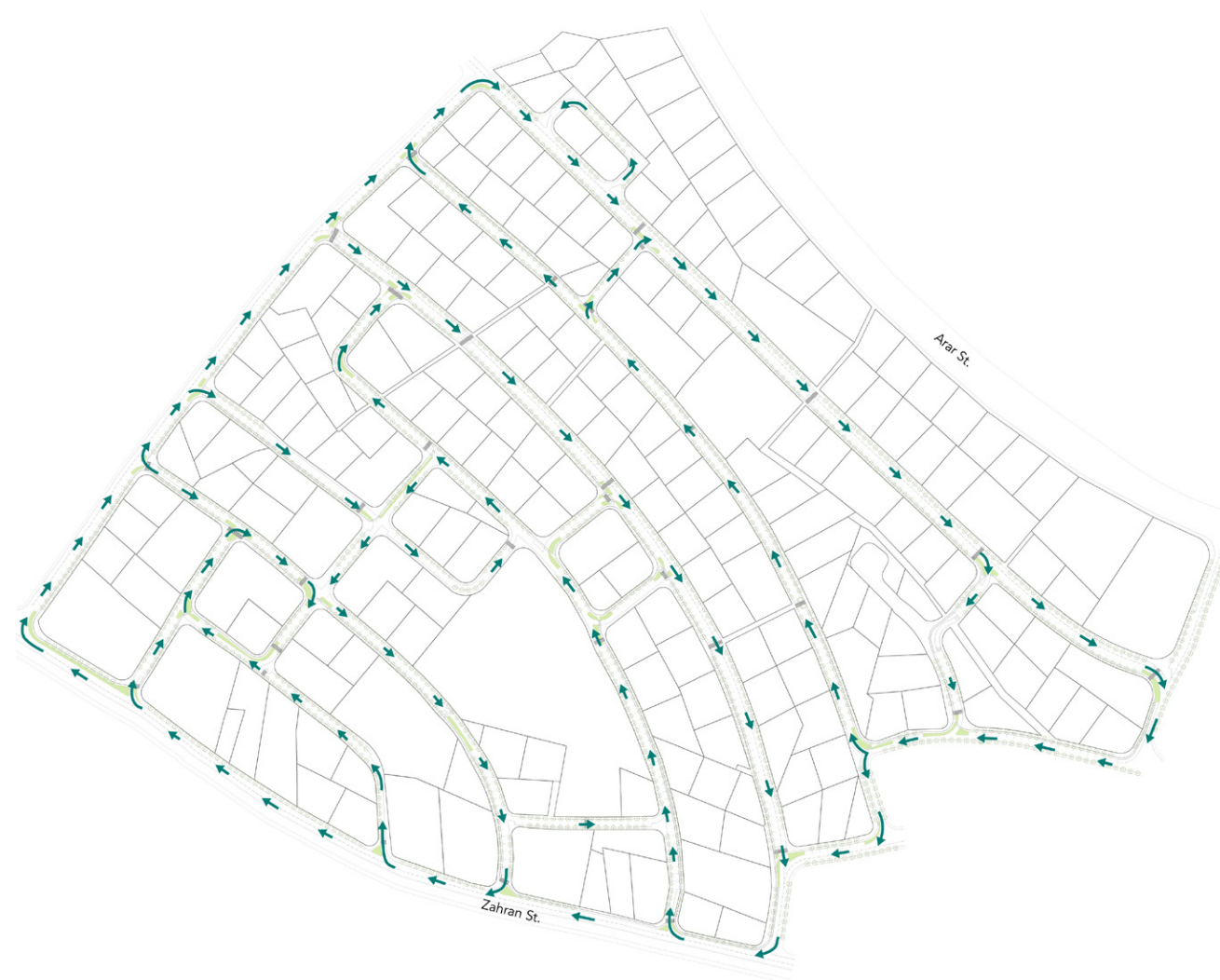
- Jordan National Green Growth Plan
- Amman Resilience Strategy
- Amman Climate Action Plan.



## 4.1.1 PILOT NEIGHBORHOOD A - WADI SAQRA

### WADI SAQRA - DESIGN & PLANNING SOLUTIONS

#### PROPOSED TRAFFIC DIRECTION



Traffic direction has been restudied and two-way streets have been replaced by one-way streets.

This measure helps reduce vehicular speed and provide improved conditions for non-motorized mobility; pedestrians and bicycles.

#### PROPOSED PEDESTRIAN NETWORK



The main feature in this neighborhood are the small footpaths connecting the terraced streets together.

Emphasizing this feature was the driving force of the design. Zebra crossings act as extensions to the existing pathways and connect sidewalks together.

An intertwined network of sidewalks, crossings, and pathways cover the design area.



WADI SAQRA - DESIGN & PLANNING SOLUTIONS

PROPOSED BIKE NETWORK



A one-way bike network is proposed.  
Raised bike lanes are vertically separated from motor vehicular traffic.  
A buffer zone separates the bike lane from the adjacent parking lane.  
The lanes are designed to be one-way and at the level of the adjacent sidewalk.  
At internal intersections, the lanes drop and merge onto the street, whereas at entrance/ exit intersections, lanes remain at the same level and streets rise to the sidewalk level.  
Raised sidewalks are safe and ensure exclusivity to bicycles.

PROPOSED SERVICES

● Proposed Mixed Use



As services are concentrated in the lower part of the study area and along Arar Street, a mixed use areas is proposed in the center of the study area that accommodates the needs of residents especially those residing closer to Zahran Street.

WADI SAQRA - DESIGN & PLANNING SOLUTIONS

PROPOSED GREEN NETWORK



Sidewalks are lined with canopy trees on both sides at intervals of 6m. At intersections, green takes the shape of low bushes and shrubs to maintain visual connection.

PROPOSED ON STREET PARKING

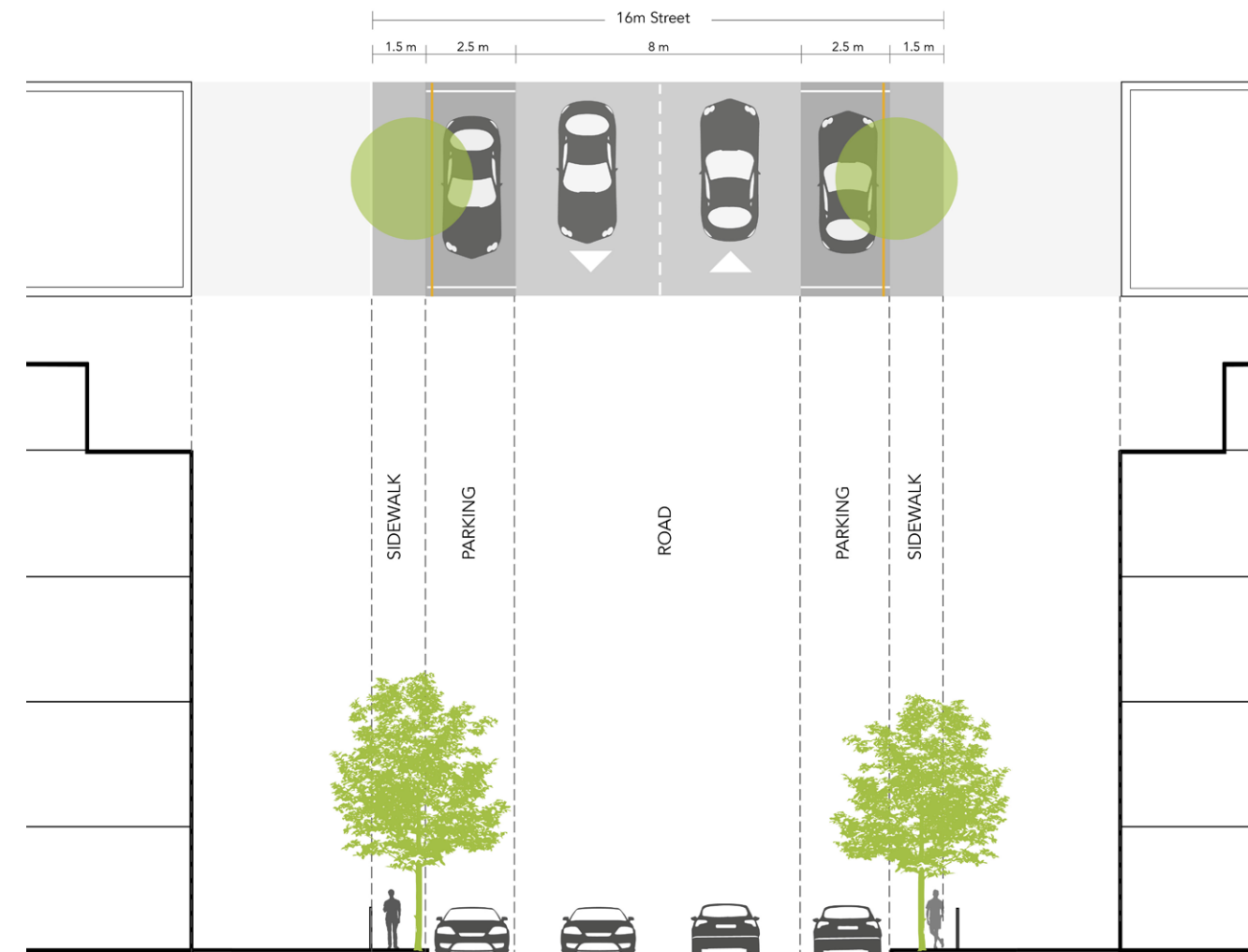




## WADI SAQRA - DESIGN & PLANNING SOLUTIONS

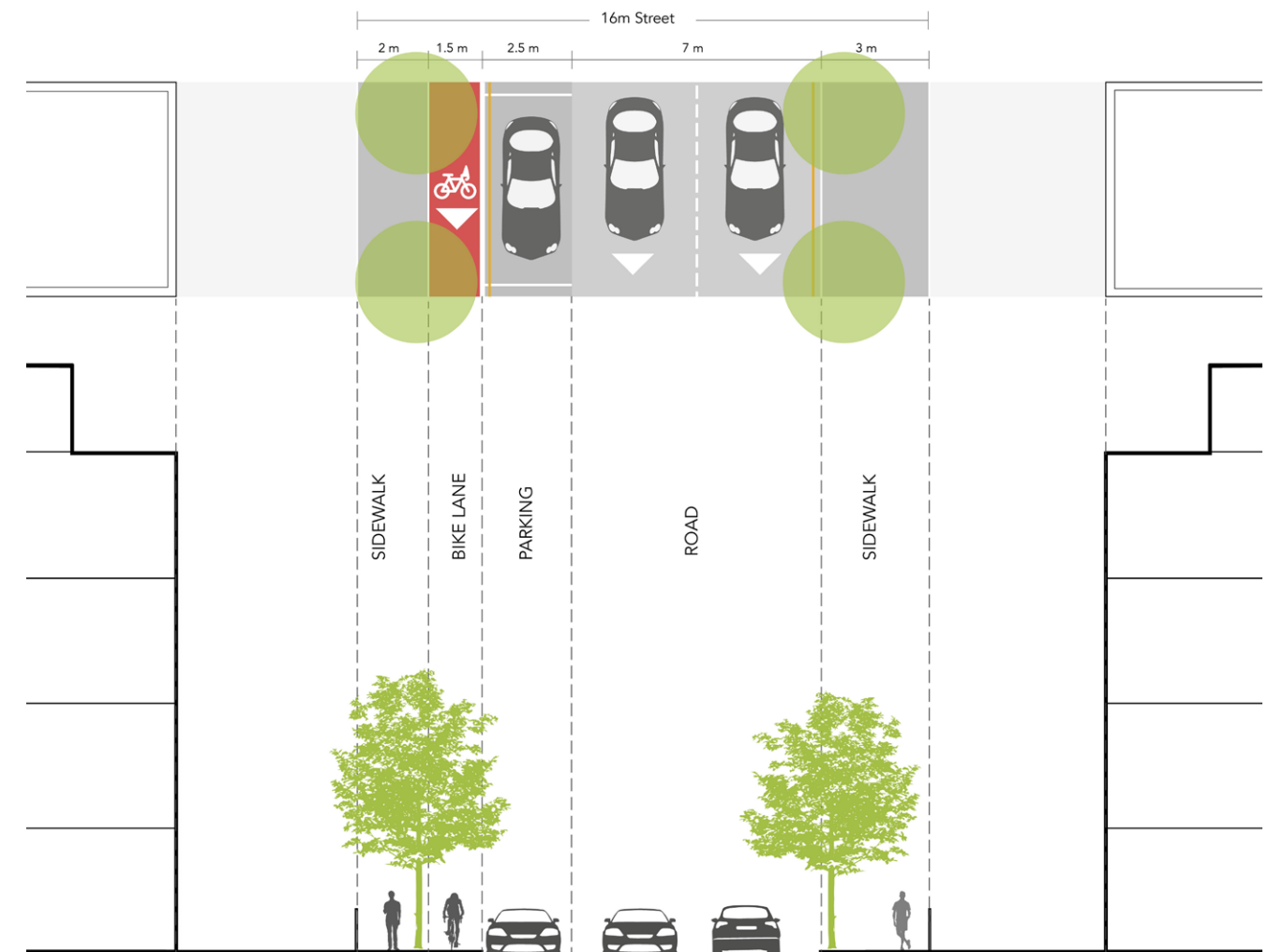
### PROPOSED STREET SECTIONS

#### 16M WIDTH STREET



#### EXISTING CONDITION

- Two-way traffic direction
- Parallel parking on both sides
- Narrow & obstructed sidewalks



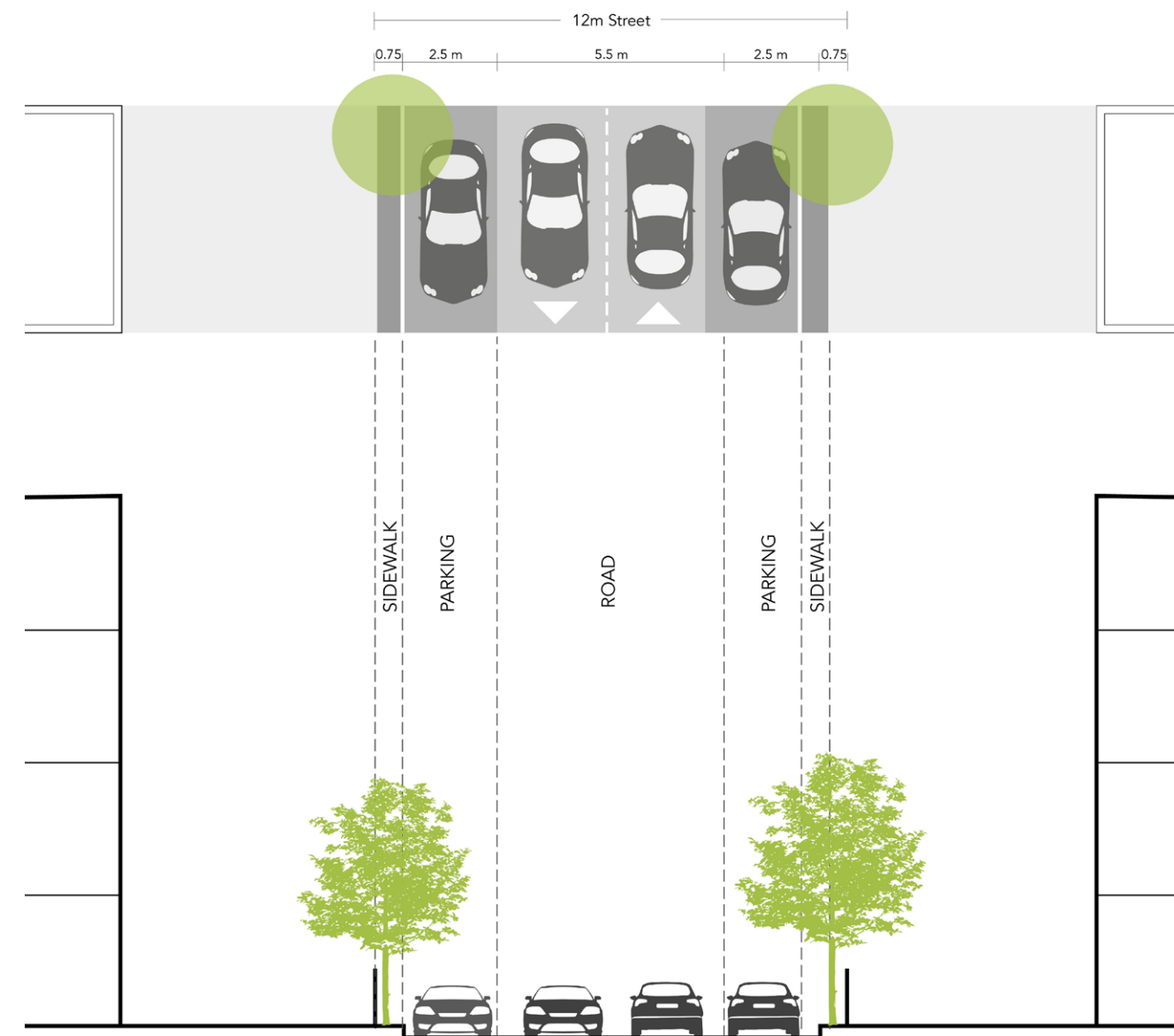
#### PROPOSED CONDITION

- One-way traffic direction - 2 lanes
- Parallel parking
- One way traffic raised bike lane
- Canopy trees at the edge of the sidewalk providing a clear width of 1.10m pedestrian walkway.

## WADI SAQRA - DESIGN & PLANNING SOLUTIONS

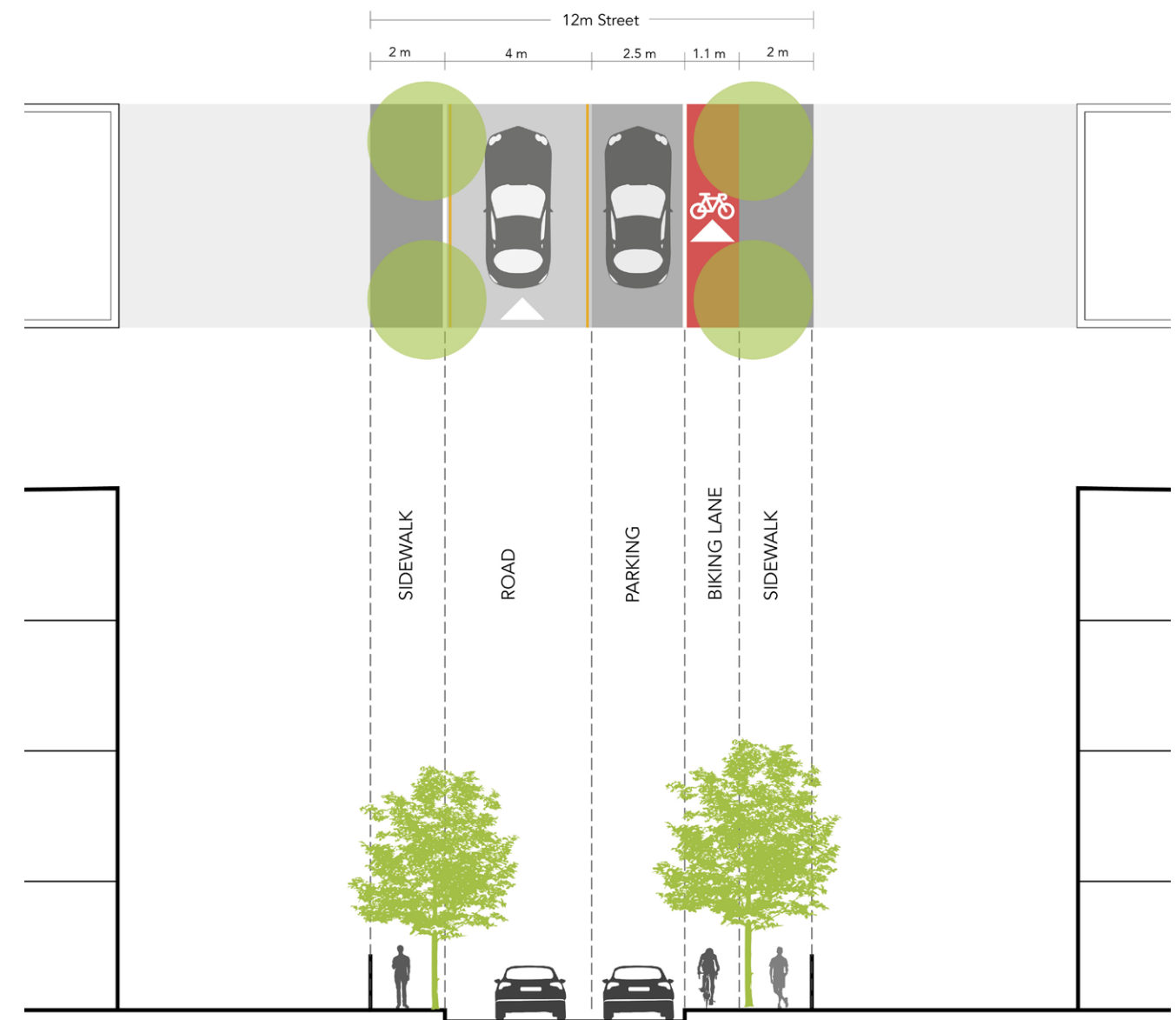
### PROPOSED STREET SECTIONS

#### 12M WIDTH STREET



#### EXISTING CONDITION

- Two-way traffic direction
- Parallel parking on both sides
- Narrow & obstructed sidewalks



#### PROPOSED CONDITION

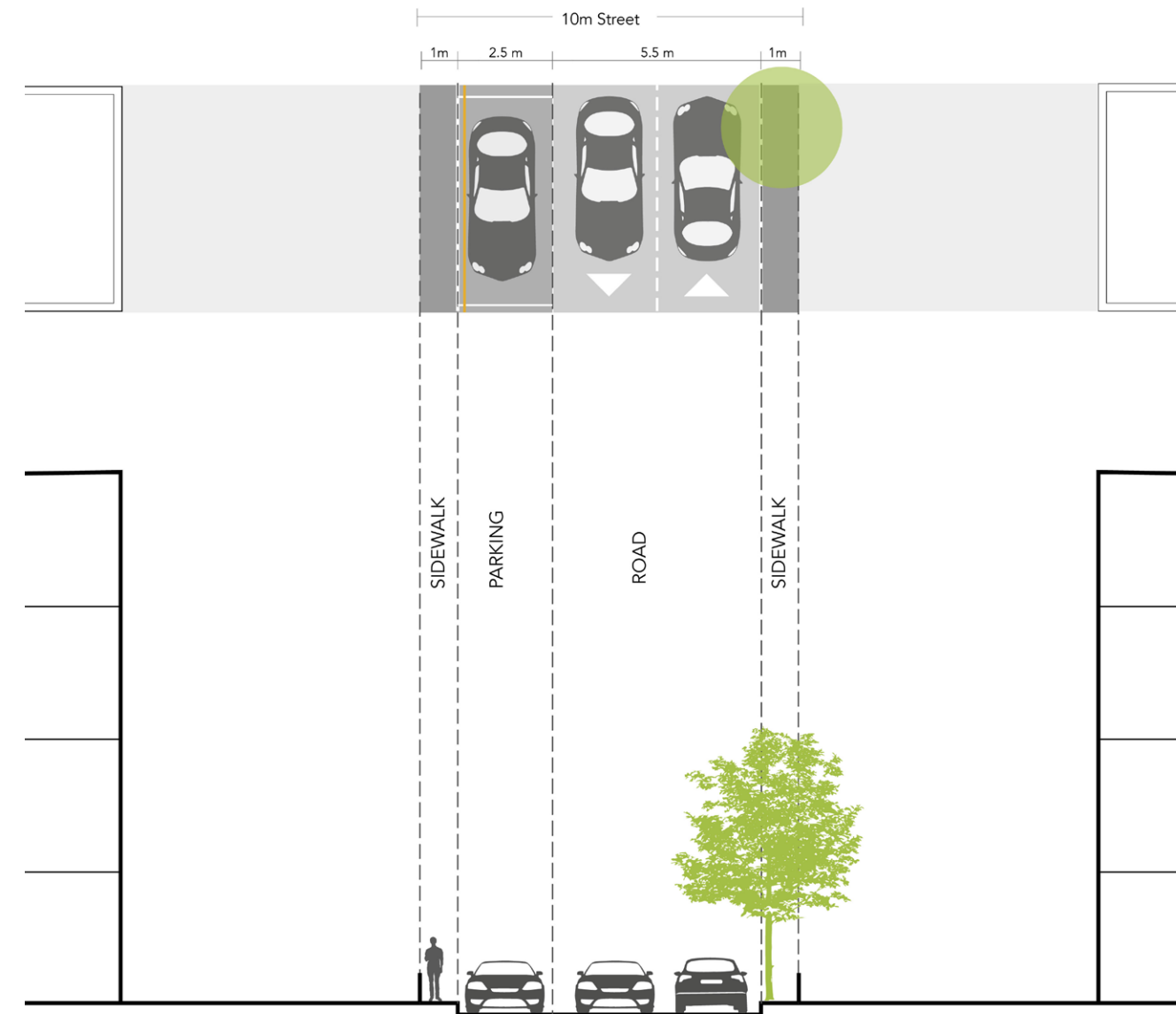
- One way traffic direction
- Parallel parking
- One way traffic raised bike lane
- Canopy trees at the edge of the sidewalk providing a clear width of 1.10m pedestrian walkway



## WADI SAQRA - DESIGN & PLANNING SOLUTIONS

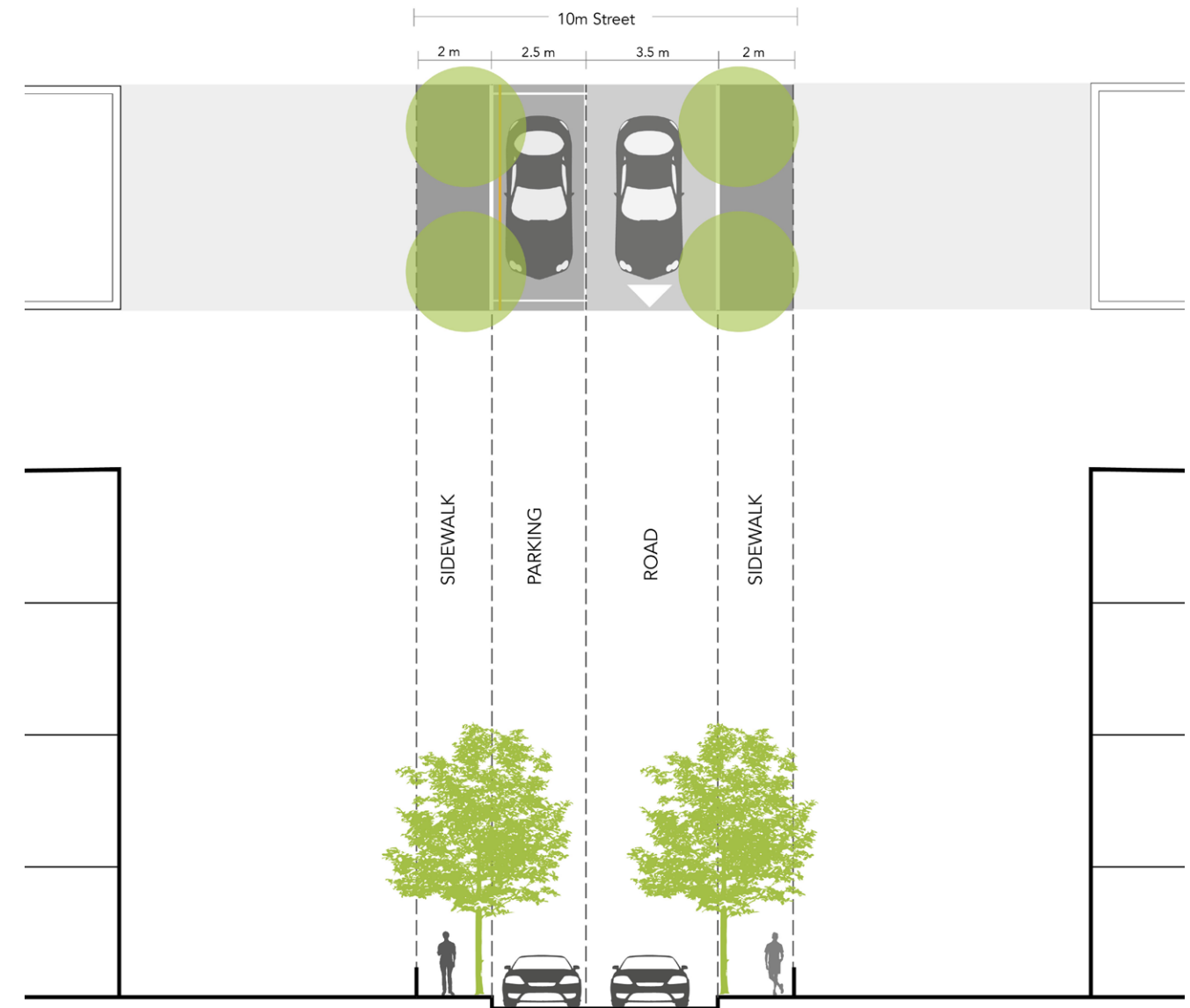
### PROPOSED STREET SECTIONS

10M WIDTH STREET



#### EXISTING CONDITION

- Two-way traffic direction
- Parallel parking
- Narrow & obstructed sidewalks



#### PROPOSED CONDITION

- One way traffic direction
- Parallel parking
- Canopy trees at the edge of the sidewalk providing a clear width of 1.10m pedestrian walkway

## WADI SAQRA - DESIGN & PLANNING SOLUTIONS

### INTERSECTION ENLARGEMENT 01

When choosing sidewalk trees, their shape and growth pattern should be considered; canopy trees with clear trunks provide shade and facilitate pedestrian movement. Tree trunks should have a minimum of 2m clear height so that people could walk easily beneath them, also, a trunk circumference should be considered with the sidewalk width so as not to be an obstacle.

Shrubs and bushes could be planted close to drainage trenches as in the case of rain gardens and swales<sup>(2)</sup> that perceive rainwater as resource rather than as waste.

Swales are best located at lowest points where rainwater would naturally flow, they feed ground water and reduce the pressure on existing infrastructure.

Permeable sidewalk pavement also reduces surface water runoff and feed ground water levels.

Such small interventions could improve the city's sidewalk conditions and mitigate flooding which Amman has been suffering from in the past couple of years.



swale <sup>(2)</sup>: it is a channel similar to a ditch but it's broad and shallow, and usually covered or lined with vegetation. The purpose is to slow and control the flow of water to prevent flooding, puddling, and erosion and/or avoid overwhelming the storm drain system.



## WADI SAQRA - DESIGN & PLANNING SOLUTIONS

### INTERSECTION ENLARGEMENT 02

Streets and sidewalks that are perceived as a network of green infrastructure are resilient and able to adapt to climate change.

When these green spaces are planned and intertwined through a network, the walkability and accessibility increases, public health and wellbeing improves, and as the amenity of spaces increases it reflects positively on social interaction.

Enhanced air quality and temperature, reduced flood risks and improved public health are a few of the environmental benefits of this network when applied to any built environment.





## 4.1.2 PILOT NEIGHBORHOOD B - AL KULIYAH AL ISLAMIYAH

### AL KULIYAH AL ISLAMIYAH - DESIGN & PLANNING SOLUTIONS

#### SUGGESTED TRAFFIC FLOW

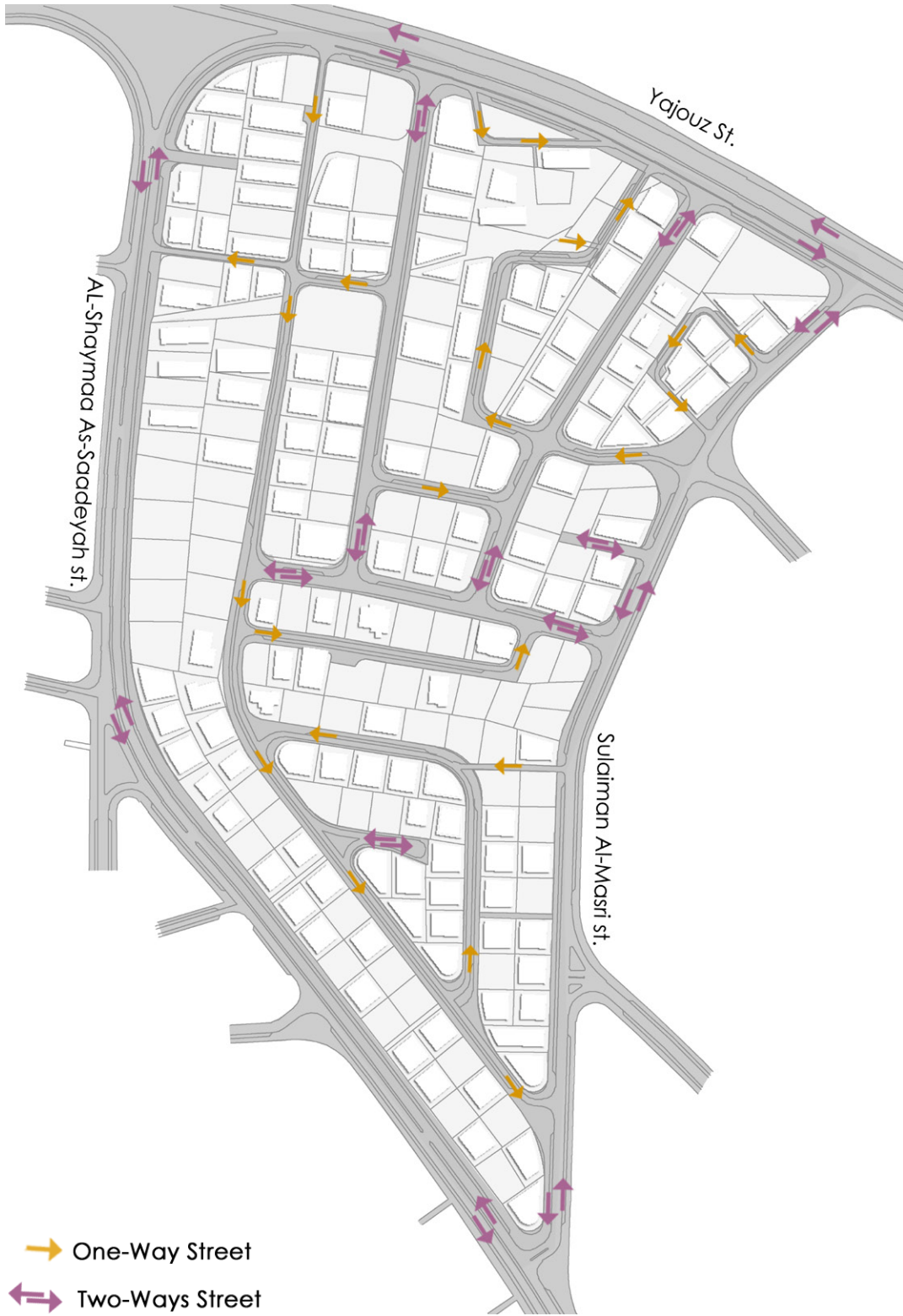
In order to give a space for street section design, it is suggested to change the existing traffic directions as shown in the diagram; this will increase the walkways width to create a pedestrian network.





AL KULIYAH AL ISLAMIYAH - DESIGN & PLANNING SOLUTIONS

PROPOSED STREET DIRECTION



PROPOSED PEDESTRIAN NETWORK





AL KULIYAH AL ISLAMIYAH - DESIGN & PLANNING SOLUTIONS

PROPOSED BIKE NETWORK



PROPOSED PLANTATION





**AL KULIYAH AL ISLAMIYAH - DESIGN & PLANNING SOLUTIONS**

**PROPOSED ON-STREET PARKING**

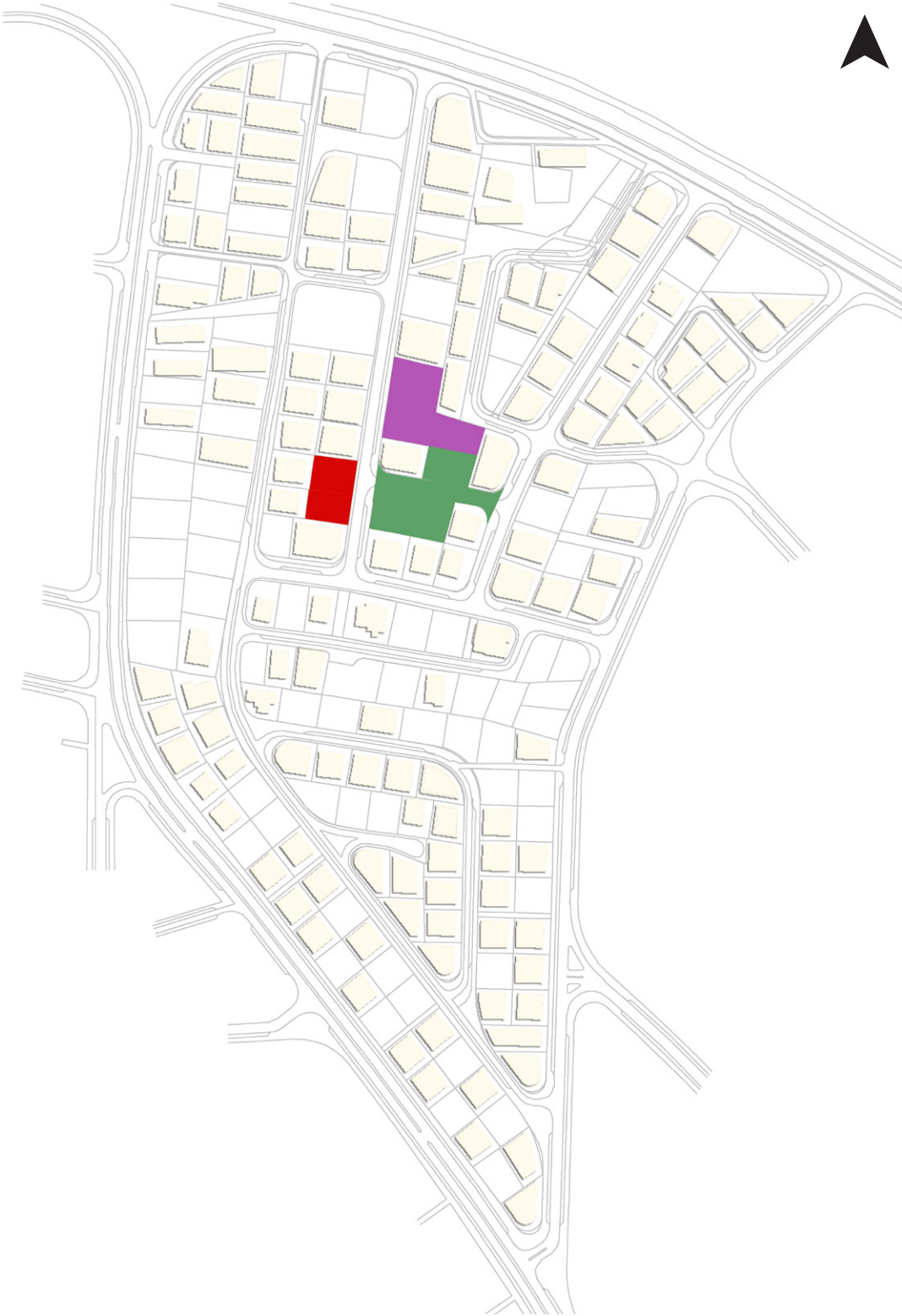


**PROPOSED STREET REHABILITATION**



# AL KULIYAH AL ISLAMIYAH - DESIGN & PLANNING SOLUTIONS

## NEEDED SERVICES



The proposed services were selected based on the analysis process and the level of necessity for these specific services in the Kuliyyah neighborhood.

A centralized location was chosen as the ideal location for the services as it is the most reachable by the majority of neighborhood members, thus achieving one Amman's Climate Action Plan goals in reducing the need for cars and becoming more dependent on pedestrian movement.

- Proposed Elementary School & Kg
- Proposed Garden
- Proposed Mixed Use
- Residential Buildings



AL KULIYAH AL ISLAMIYAH - DESIGN & PLANNING SOLUTIONS

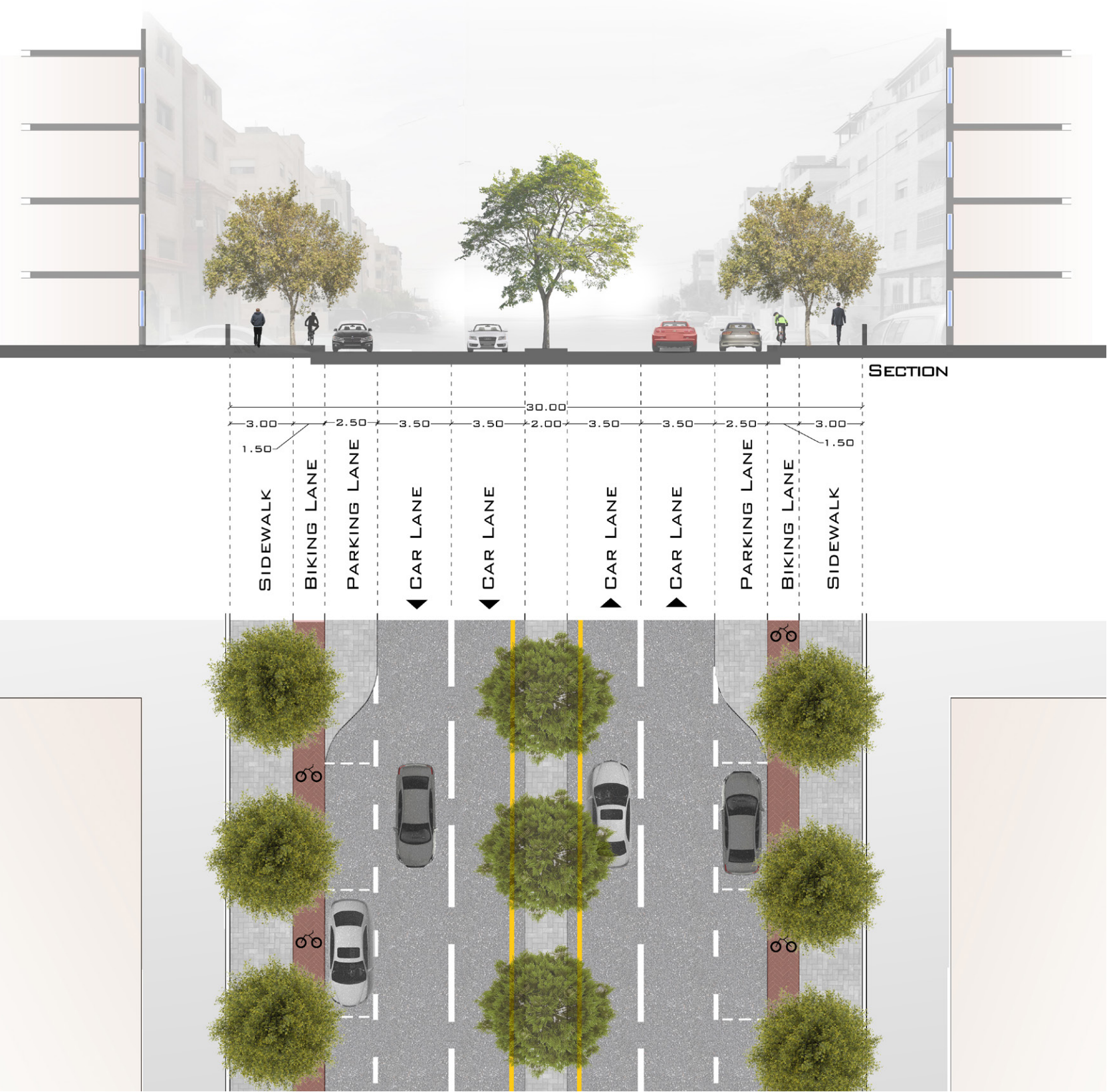
PROPOSED STREET SECTIONS

The following diagrams illustrate possible solutions for existing streets of various widths that can be implemented by simple adjustments.

The following diagram is for a 30m wide street where the design proposal includes adding cycling lanes, space for plantation and pedestrian paths.

The 20m street and 12m streets were taken as case studies to showcase the current situation and the proposed situation while also showcasing the percentage change that is proposed.

PROPOSED



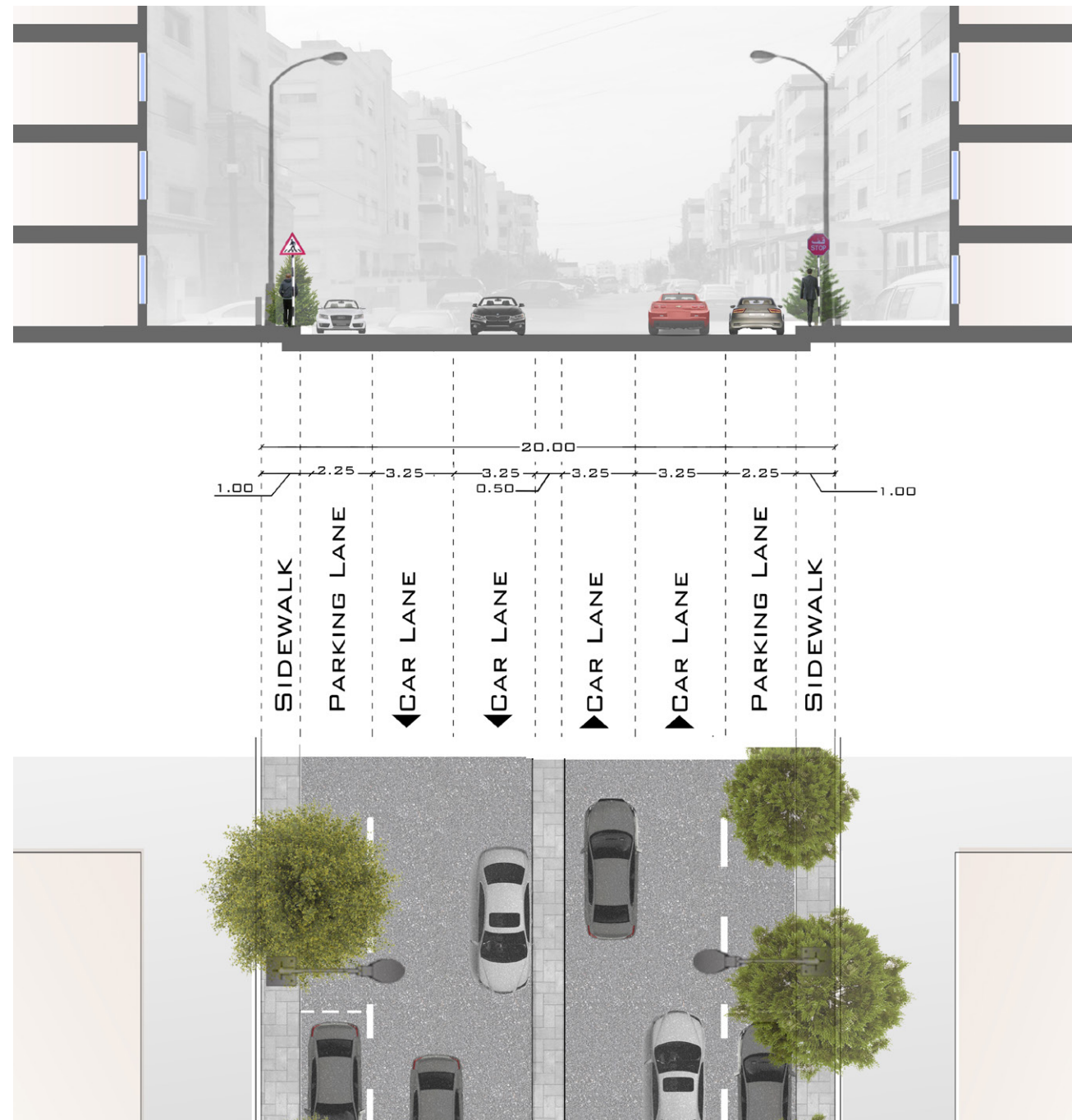
30m Width Street



## AL KULIYAH AL ISLAMIYAH - DESIGN & PLANNING SOLUTIONS

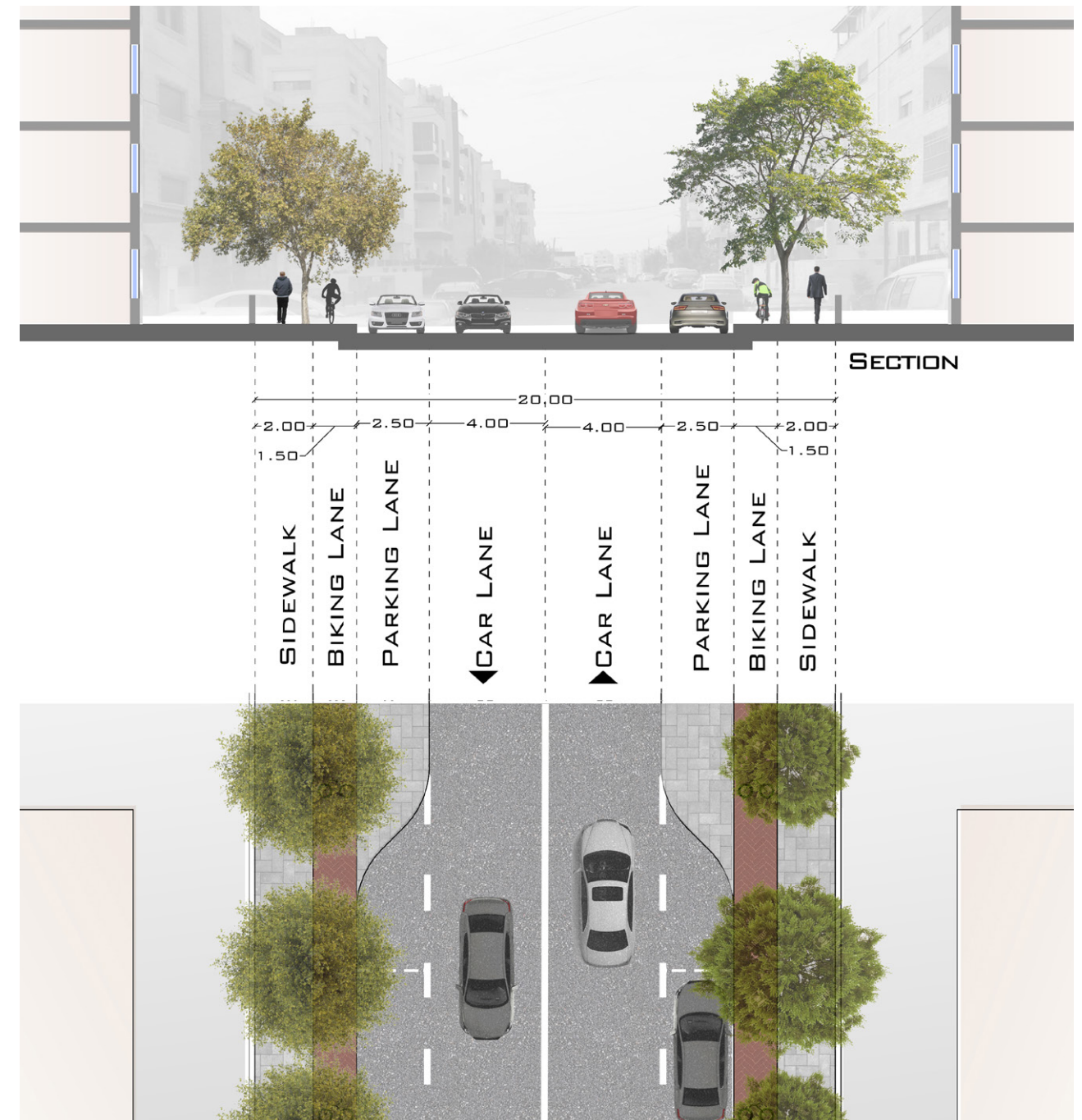
### 20m Width Street

#### CURRENT



The following figure shows the current situation for the 20m wide street, it has two lanes in each direction and parallel parking on both sides. Sidewalks are narrow and obstructed as trees are planted in the middle of the sidewalk, they are short and wide thus take up the majority of the sidewalk and leave very little room for pedestrian movement.

#### PROPOSED



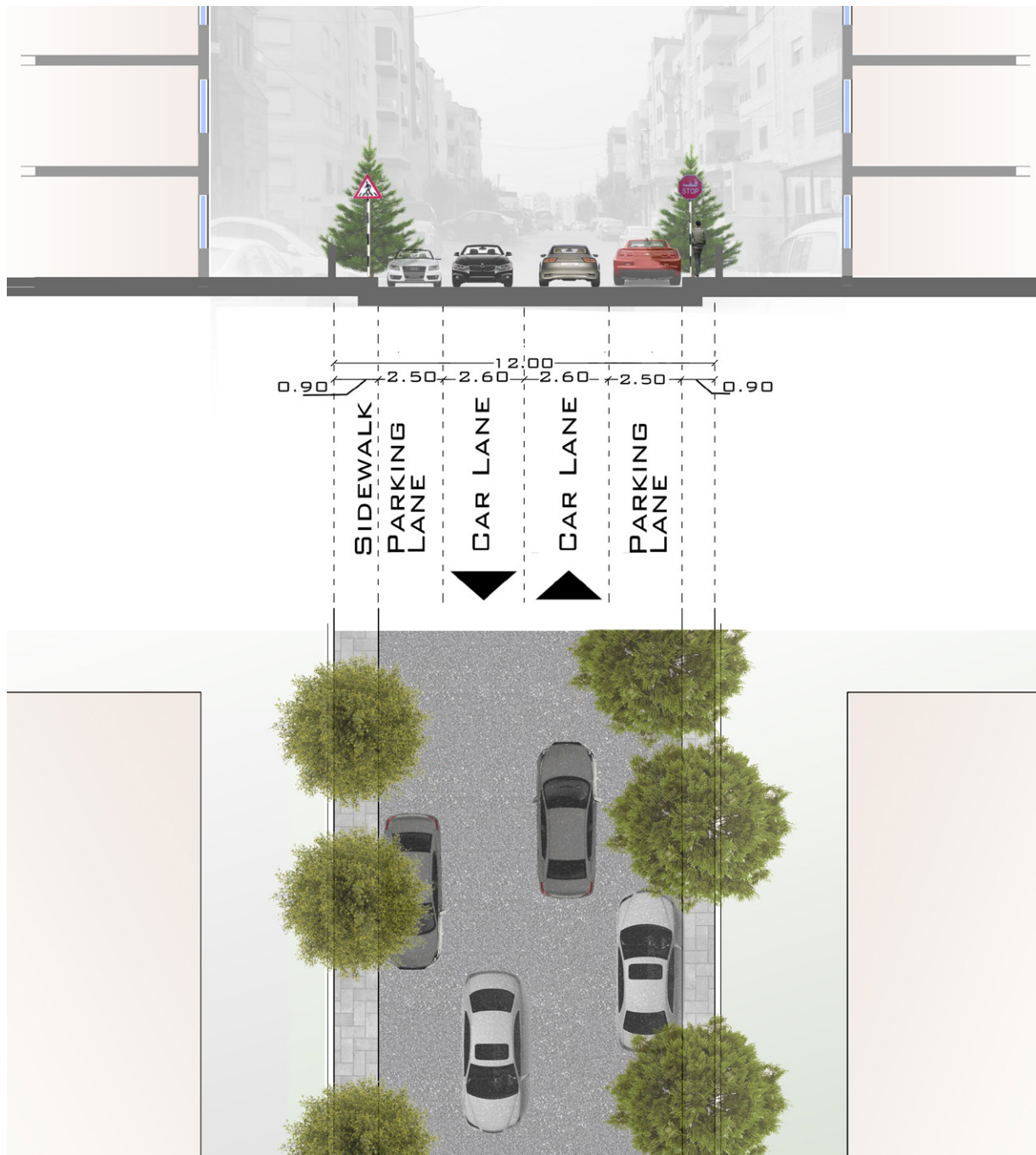
The proposed design suggests one traffic lane in each direction, a cycling lane on each side of the road and 2.0 m wide sidewalks. It is important to note that planted trees need to be long and slim, and planted on the edge of the pathway to create shade while allowing maintaining enough space for pedestrian movement. Planting trees with long stems that extend up to 2 m is preferred.



AL KULIYAH AL ISLAMIYAH - DESIGN & PLANNING SOLUTIONS

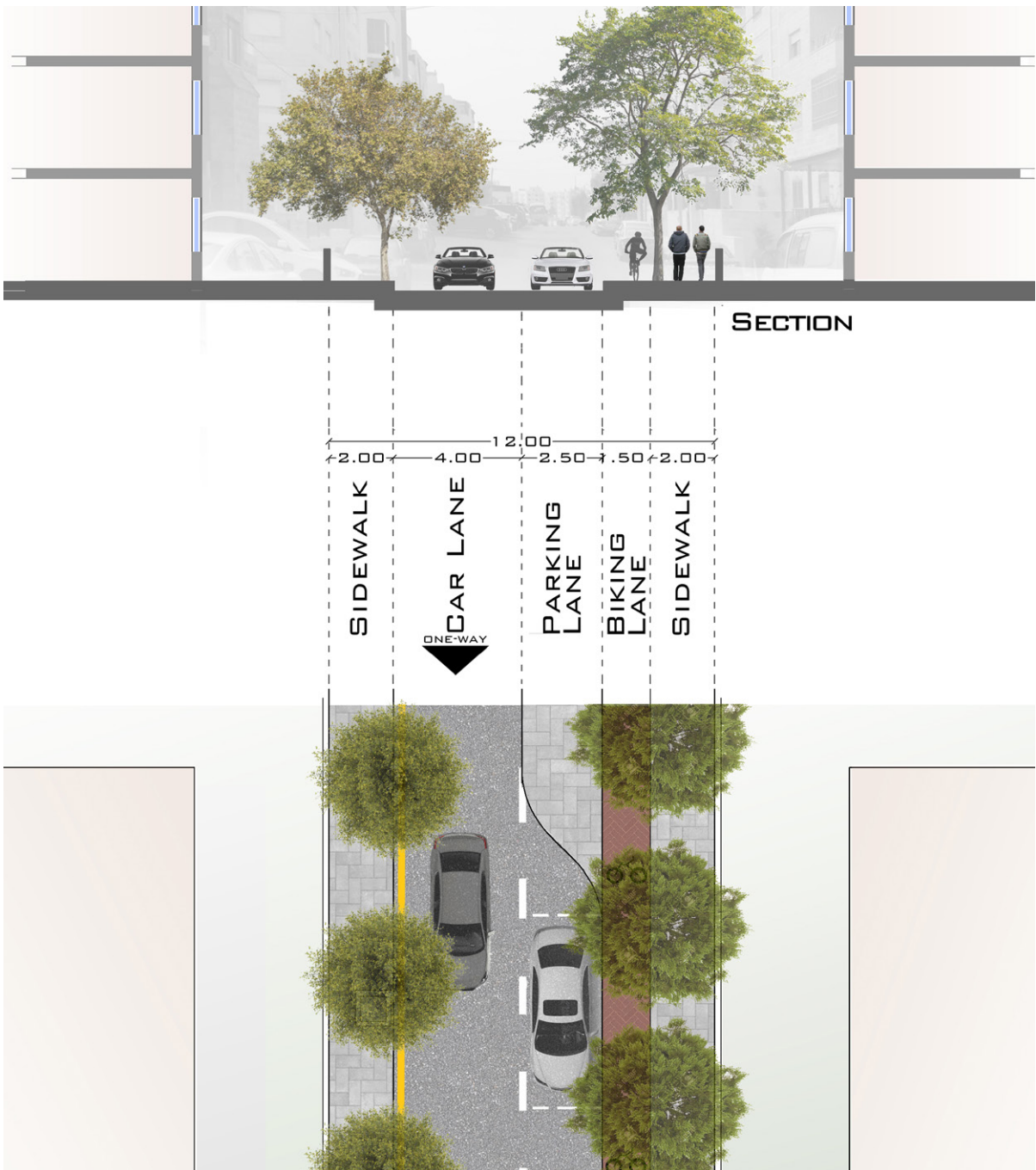
12m Width Street

CURRENT



The current street consists of two way traffic lanes and parking lanes on each side.  
Sidewalks are obstructed by trees.

PROPOSED

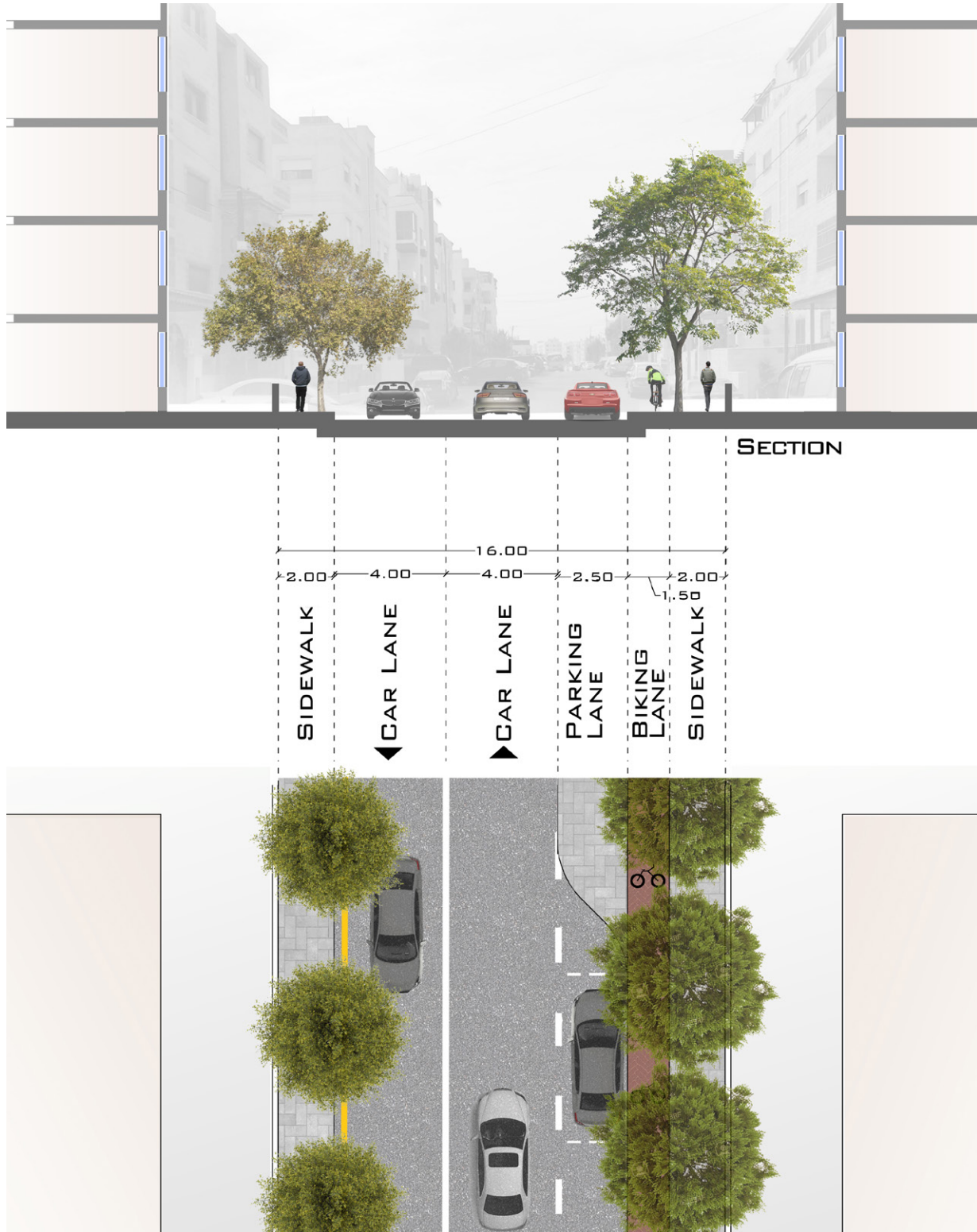


Proposed design reduces space for vehicular movement and creates space for pedestrian movement and bicycle lanes.  
This goes in accordance with Amman's climate plan to decrease greenhouse emissions as vehicular transportation is one of the main sources of CO<sub>2</sub> gas

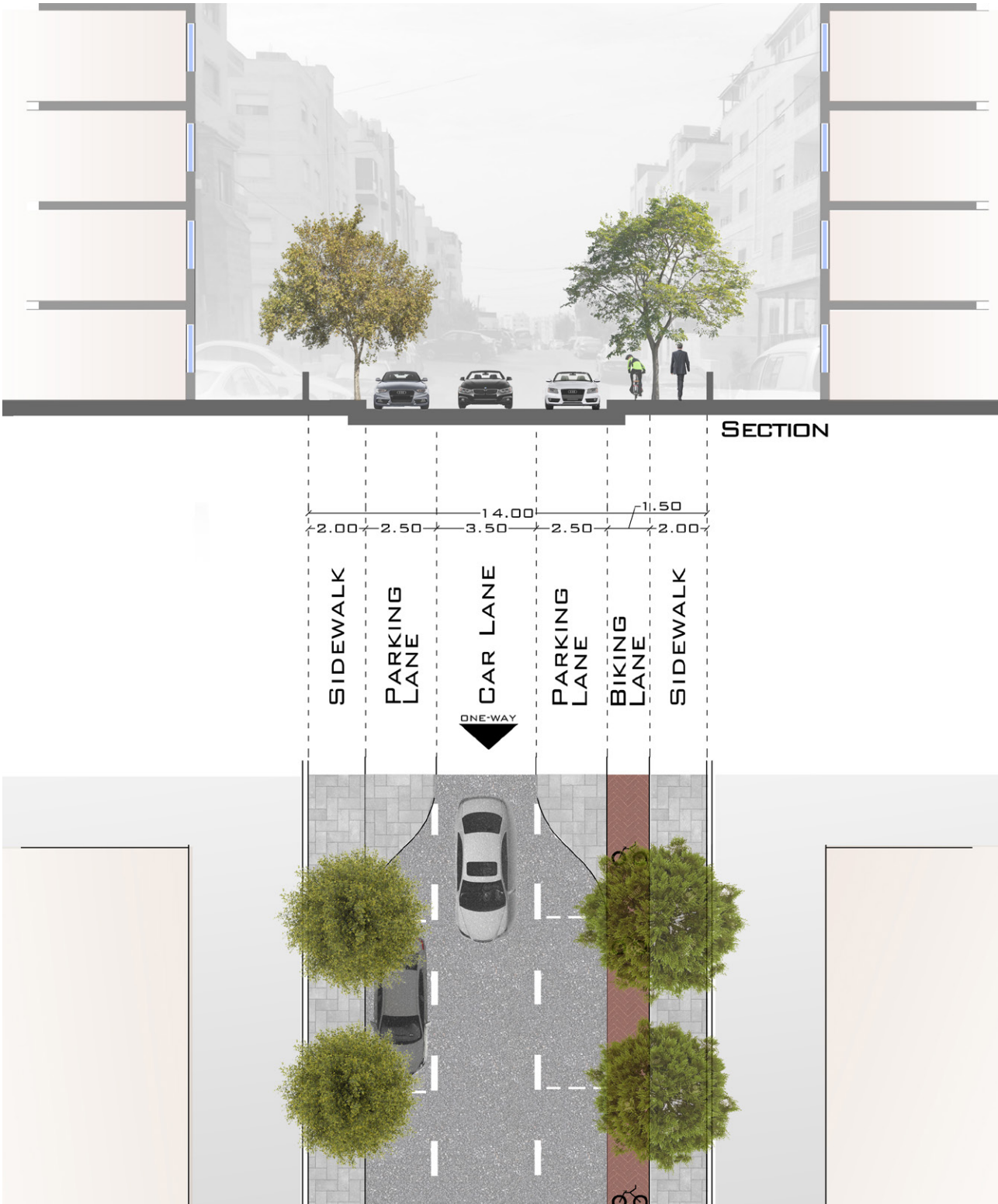


AL KULIYAH AL ISLAMIYAH - DESIGN & PLANNING SOLUTIONS

OTHER PROPOSED STREETS



16m Width Street

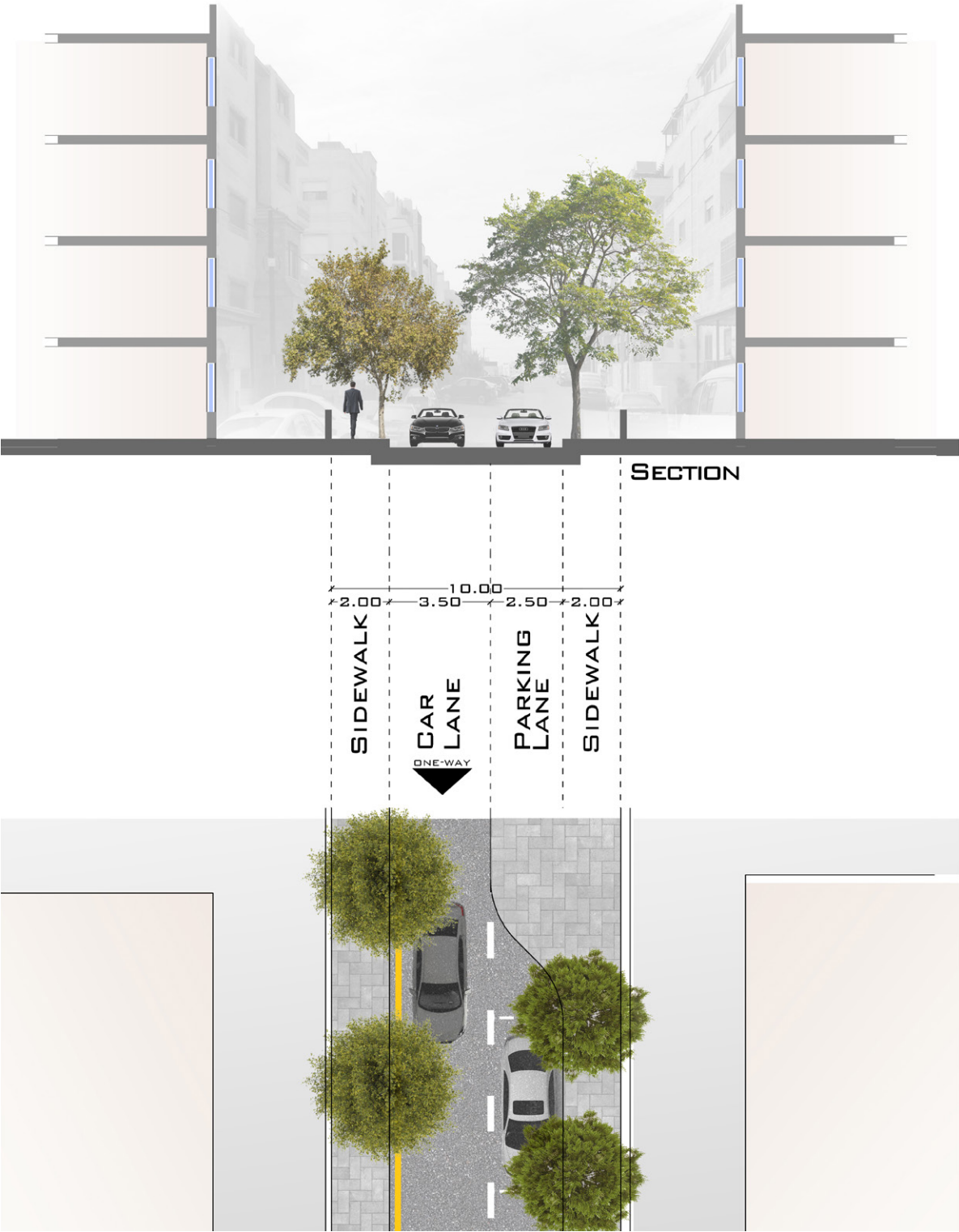


14m Width Street

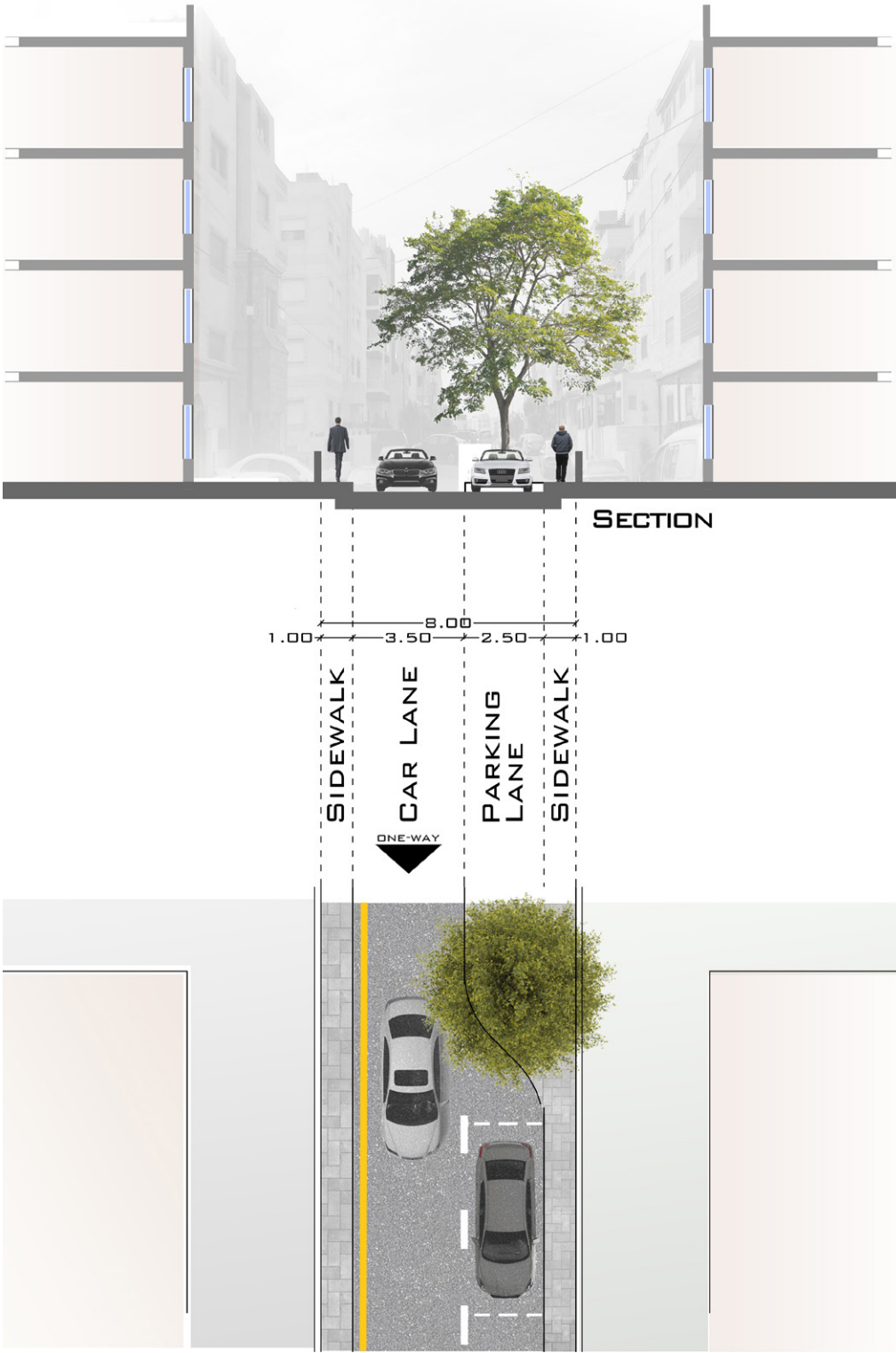


AL KULIYAH AL ISLAMIYAH - DESIGN & PLANNING SOLUTIONS

OTHER PROPOSED STREETS



10m Width Street



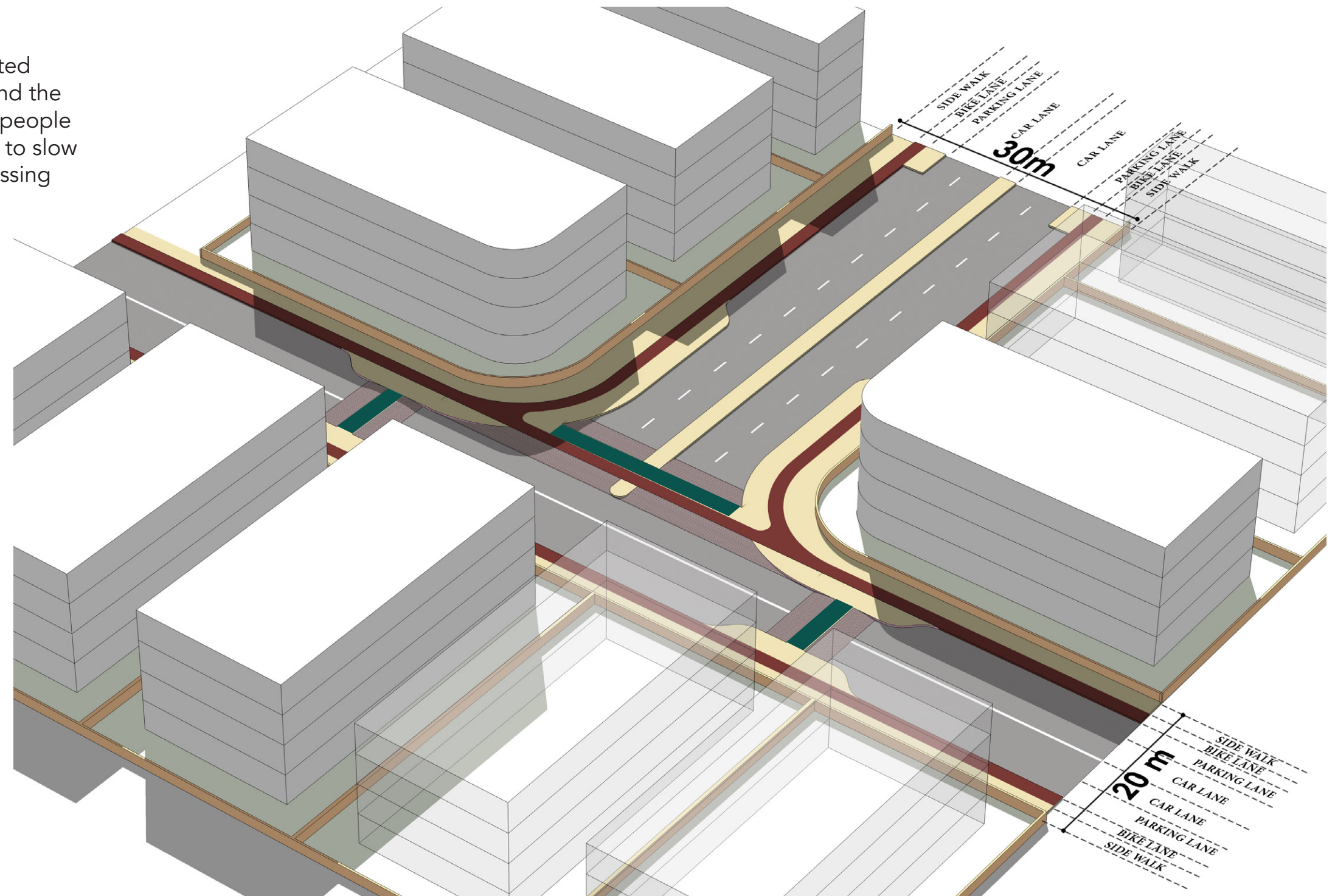
8m Width Street

### INTERSECTION ENLARGEMENT

The following diagrams illustrate possible solutions for existing streets of various widths that can be implemented by simple adjustments.

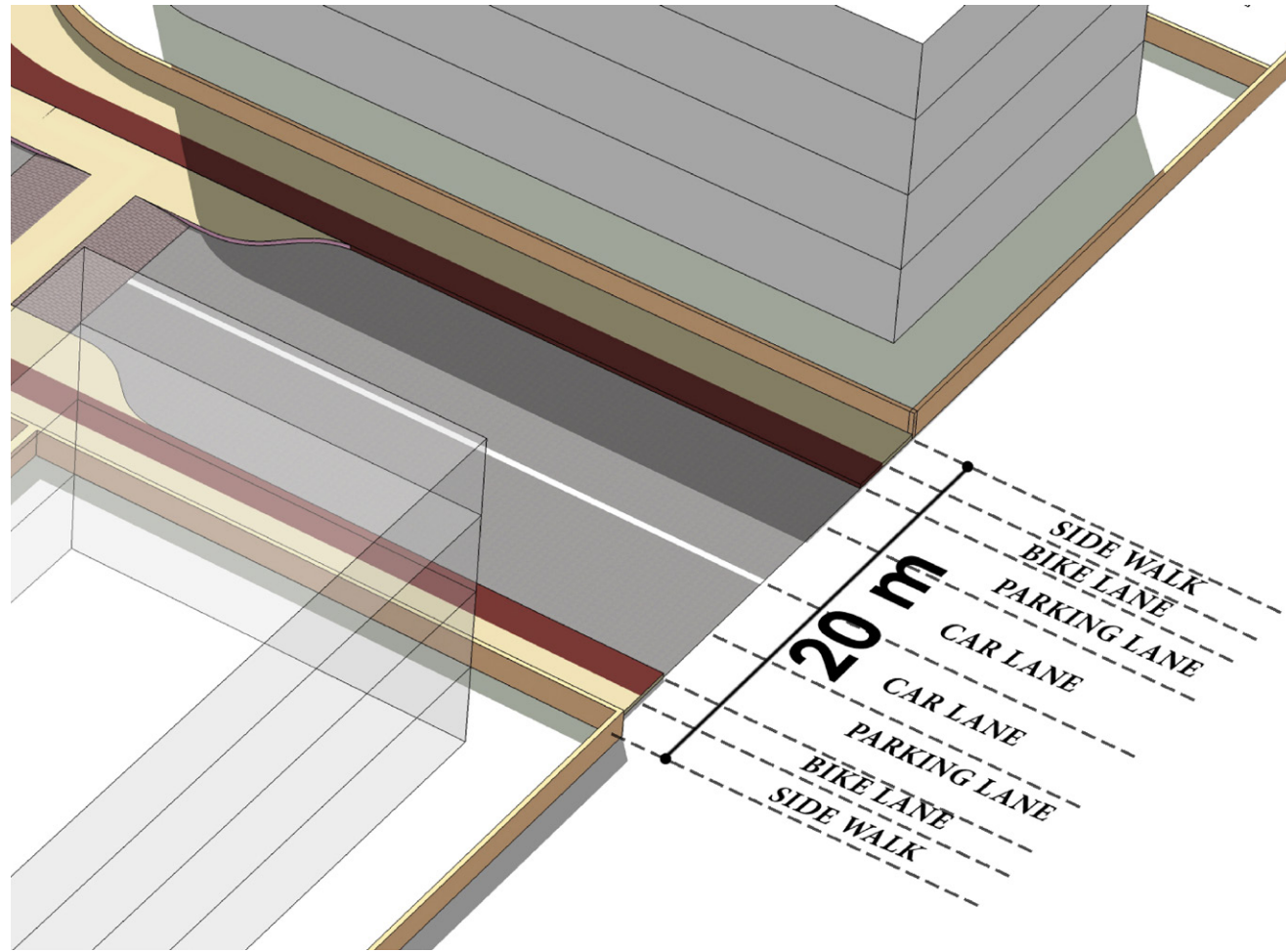
Street crossing is proposed in designated locations where the sidewalk widens and the street is raised so as to accommodate people with disabilities as well as force drivers to slow down and decrease risk for people crossing the street.

■ Designated Street Crossing Locations



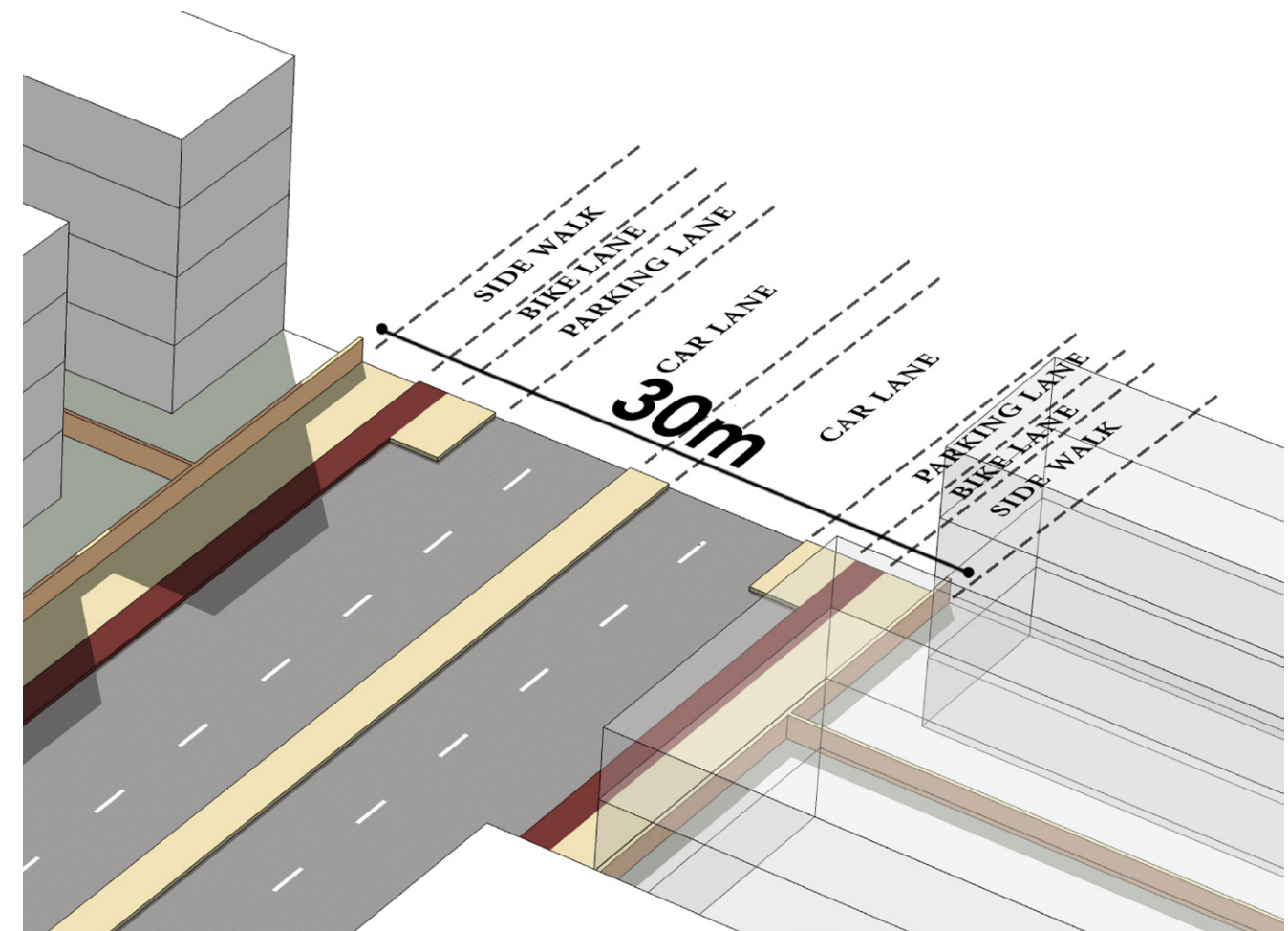


### INTERSECTION ENLARGEMENT



In the 20m existing street almost 80% of the width is for vehicular movement with only 20% given to sidewalks that are dominated by trees and thus leaving very little space for pedestrian movement.

The proposed street modification suggests a fairer ratio where almost 50% is given to vehicular movement including parking lanes, while the other 50% is given to bikers and sidewalks.

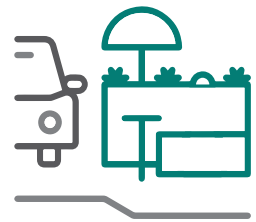


The same solution is proposed in the 30m streets where two lanes in each direction are proposed so as to accommodate the high traffic in main roads.

Sidewalks and biker lanes are also proposed with the addition of an island in the middle of the street that can also be planted with trees to create more greenery in the neighborhood.

## 4.2 FINDINGS & RECOMMENDATIONS

### STREET DESIGN PRINCIPLES



#### Streets are a Public Space

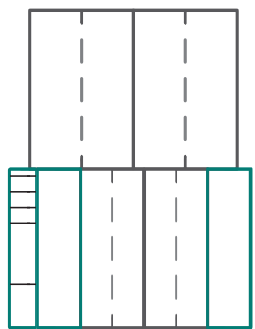
Streets are not only means to get from point A to point B, they play an integral part in the community's public life. Therefore, they should be utilized as public spaces and accordingly designed as such rather than only being channels of movement.



#### Better Streets Equal a Better Economy

Well-designed streets have been proven to result in a better economy as they make it easier for people to walk along sidewalks. More pedestrian friendly paths encourage passersby to stop and shop. This, in turn, will generate higher revenues for business owners and higher values for homeowners as increased window shopping will lead to more purchases.

Therefore, streets should be classified as an economic asset as much as they are a functional one.



#### Redesign Consideration

Basic reorganization of streets can have major impacts on their livelihood and traffic levels, such changes include moving curbs, changing alignments and redirecting traffic. This is mainly because many streets were built in a different time when the population was much lower. Therefore, they need to be reconfigured to meet new needs and accommodate a higher population number. Street spaces have also developed new purposes that may not have been socially needed before and need to be readapted for such activities.



#### Safety is a Major Design Element

Many of the street accidents are caused by faulty design of streets. Good road design can help decrease or even avoid such accidents by redesigning streets in which walking, parking, shopping, cycling and crossing paths can be done safely without any threats.



#### Green Areas & Emission Reduction

The transformation of the gray spaces to green spaces will have a direct positive impact on the city's environment. Introduction of PV panels, rain water collection (where possible), vegetation and bio-diversity will help mitigate climate variation throughout the year and reduce CO<sub>2</sub> emissions as passive measures are used to generate electricity fuel consumption will be reduced. Planting trees along the edge of sidewalks can also have a positive impact as that will create natural shading thus encouraging walkability.



## 4.3 ADDITIONAL CONSIDERATIONS

### COST & PRACTICALITY CHALLENGES

Urban neighborhood plans will differ from one another in terms of costs and practicality issues based on the complexity of each plan.

For construction works, costs of implementing neighborhood plans include the costs of community engagement activities, professional consultancy fees, and other unforeseen costs that might develop based on the outcome of the community engagement activities. These costs can be managed through financial support from specific neighborhood planning grants, local donations, and local businesses and authorities.

In this study, many cost and time challenges should be considered during the planning phase.

The following factors should be taken into consideration when studying the time and cost implications of the neighborhood plans:

- **Scope of Plan**

The level of detail and complexity of the plan and the nature of the neighborhood area can have a significant impact on the time and cost requirements of a neighborhood plan. The number of people and retail shops in the area can also affect time and cost. In other words, the higher the population, the more likely community costs will increase.

- **Skills & Qualities**

The skills and qualities of the staff depend on the scope and complexity of the plan. Since urban neighborhood planning involves leadership, project management, organization, communication, negotiation, analysis, and other skills, a team of various skills is essential to conduct the tasks associated with the plan.

- **Adequacy of Existing Policies**

The adequacy of existing policies can have an impact on the scope and the content of the plan. If policies are robust and relevant to the neighborhood area, then a simple neighborhood plan may be produced, which means less cost. Therefore, close coordination with GAM and other authorities is vital during neighborhood planning to ensure minimal costs.

- **Availability of Materials**

The availability of certain construction material may also impact a neighborhood plan. Special attention should be given during the detailed design to ensure the selected material can be sourced locally and at a relatively low cost. This also applies to the availability of local labor that is familiar with installing and maintaining the selected materials.

- **Obstructions to Daily Activity During Construction**

The implementation of complex plans may require obstructing daily life—such as limiting access to commercial facilities or obstructing traffic flow. Special attention should be given to these aspects to minimize the economic and social impacts during construction and ensure community buy-in.

## RECOMMENDATIONS & REGULATIONS

The neighborhood interventions proposed in this study may have a number of policy, regulatory, and governance pre-requisites and implications.

These include:

- Revisiting some zoning policies and regulations.
- Strongly enforcing sidewalk specifications identified by GAM, with high penalties for private developers who do not abide by the specifications and consistently maintain them.
- Increasing coordination among GAM departments;
  - The Traffic Operations Department, for example, needs to be involved to ensure adequate signage, road markings, and other elements are coordinated with any urban interventions.
  - The Public Transport Operations Department, on the other hand, needs to be consulted to ensure the proper placement of bus stops within neighborhoods.
- Coordinating between GAM and other departments, especially enforcement agencies. This is important for the enforcement of traffic laws, speed limits, and so on.

Furthermore, the interventions in this study can give way to new policies and regulations related to parking management.

Proper management of both on-street and off-street parking can be an effective policy tool to induce behavioral change—shifting people away from the private car into more sustainable modes, such as walking, cycling, or even carpooling.

Amongst the many parking management tools that can be utilized to reduce people’s reliance on private cars are parking pricing schemes. These are believed to be most effective when other transport alternatives are made available. where for example, instead of offering free on-street parking, imposing a fee can cause private cars to become less appealing.

Pricing schemes can be implemented dynamically in a way that takes into account the parking demand, time of day, and even the type of vehicle.

Hybrid or electric vehicles, for example, can be charged a lower fee.

Charging for on-street parking is common in urban areas around the world.

The table presents the cost for two hours of on-street parking in USD \$ for the top 10 cities, according to Parkopedia 2019 Global Parking Index.

Rank	Country	City	Average 2-hr (USD)
1	Netherlands	Amsterdam	14.61
2	United Kingdom	London	11.51
3	France	Paris	7.63
4	United Kingdom	Edinburgh	7.30
5	Netherlands	Utrecht	7.27
6	Norway	Trondheim	7.11
7	Australia	Sydney	7.01
8	Finland	Helsinki	6.99
9	USA	New York	6.90
10	Norway	Oslo	6.67

In the longer run, GAM may consider revising its minimum parking regulations for certain dense neighborhoods to impose maximum parking limits. Such regulations could truly induce a behavioral shift. This is only to be implemented, however, if these regulations are viable transport alternatives to the private car.



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