

Tel Aviv-Yafo

# Climate Adaptation Action Plan

2020

*Summary English version*

1910

1930

1950

1970

1990

2010

## A Message from the Mayor

Tel Aviv-Yafo is presently coping with the COVID-19 crisis, recovery processes and preparations for “the day after”. The impact on the city and its residents is considerable, but we are doing our best to maintain the quality of life of our residents as well as their health.

Along with the current crisis, we continue to address the climate crisis and we are launching the **Climate Adaptation Action Plan**.

Tel Aviv-Yafo has a long-standing tradition of adapting to hot and extreme climate. The green and shaded boulevards of the “White City” are vertical to the beachfront, and the pleasant sea breezes ventilate the depth of the city. Today more than ever, we are committed to continue enhancing a qualitative and shaded public sphere, adapted to the changing climate.

Two years ago, Tel Aviv-Yafo joined C40 Cities, a network of the world’s largest and most important cities that came together to affect and prepare for the climate crisis. Our membership in the network connects us with partners from around the world, for mutual learning and exchange of knowledge concerning adaptation to climate change.

In the framework of C40’s **Deadline 2020** initiative, we committed to develop and adopt ambitious municipal plans and targets, by the end of 2020. Tel Aviv-Yafo, like many cities in Israel and the region, is already experiencing climate change.

Accordingly, I instructed the professional teams to prepare an action plan for adaptation to the increase in temperatures, changes in the precipitation regime and intensity, and sea level rise.

In affinity with the City Vision document, updated in 2017, the Climate Adaptation Action Plan defines four guiding principles for action: using nature-based solutions to strengthen the ecosystem; tending, first and foremost, to vulnerable populations in the city; promoting a healthy and sustainable lifestyle for all residents throughout the city; and making connections between the Tel Aviv’s innovation and entrepreneurship with the challenges of climate change.



The Climate Adaptation Action Plan presents an opportunity to improve the quality of life of Tel Aviv-Yafo residents as well as all those operating within its boundaries. The plan reflects our ambition to ensure a qualitative and healthy future for our children in the near – and farther – future.

I take this opportunity to express my appreciation to Anne Hidalgo, Mayor of Paris, who led C40 Cities to achieve common goals of protecting the world and making it a better place. My thanks go to the present Chair Eric Garcetti, Mayor of Los Angeles, who continues to pioneer environmental and social justice at the beginning of a critical decade; and to all my colleagues, the mayors, our partners in the challenge of climate protection. Special thanks to C40 Cities’ Executive Director Mark Watts, who facilitates the extensive professional support provided to Tel Aviv-Yafo’s through the numerous working groups.

I thank all those involved in this work within the municipality: the Deputy Director General who leads urban sustainability; the city’s Environmental and Sustainability Authority, for compiling and coordinating the Action Plan; the City Architect’s Office; the Construction and Infrastructure Administration, the Strategic Planning Unit and all our partners in and around the city.

We are on our way!

Ron Huldai,  
Mayor of Tel Aviv-Yafo

## A Message from the C40

On behalf of the entire C40 family, I would like to congratulate Mayor Ron Huldai and the city of Tel Aviv-Yafo on the publication of the city's first Climate Adaptation Plan. This marks a major milestone for Tel Aviv-Yafo and its partnership with C40, less than 3 years after the city joined our global leading cities network.

It gives me great pleasure that the city developed this Plan by utilising all the benefits of C40 membership including access to expertise from the world's leading cities in adaptation. The participation of city officials in the Adaptation Academy hosted by the City of Rotterdam, the Cloudburst Management/Urban Flooding study tour organised in Copenhagen and the activities of the C40 Cool Cities Network were just some of the ways Tel Aviv-Yafo was able to make the most of international best practice sharing. We are delighted this helped deliver such an ambitious and robust Adaptation Plan in line with C40's Deadline 2020 Climate Action Planning Framework.

It is noteworthy to highlight that the assessment of climate hazards, the list of priority actions and the targets and indicators described in this document were developed in consultation with key partners and organisations in the city – and will be implemented in collaboration with them. Raising environmental awareness and engaging the public is the only way forward to ensure the achievement of your goals. Most importantly, this is a Plan with a clear objective to address the severe climate change



challenges in an equitable, just and beneficial way for all. Mayor Huldai's pledge and priority to protect the most vulnerable residents in his city are strongly reflected in the Adaptation Plan.

We are extremely proud to have Tel Aviv-Yafo as a C40 member. Its work on climate adaptation will inspire other cities, across our network of the most powerful and influential cities of the world and beyond. We now look forward to supporting the implementation of the Climate Adaptation Plan on the basis of inclusivity for all communities, laying the ground for a sustainable and resilient future for Tel Aviv-Yafo and its residents.

Mark Watts  
Executive Director,  
C40 Cities Climate Leadership Group



# 1

## INTRODUCTION



Photo: Guy Yechieli



The **Tel Aviv-Yafo Climate Adaptation Action Plan** was launched in August 2020. It is a comprehensive citywide plan that presents an analysis of the threats and vulnerabilities of the city in light of

the changing climate. The plan includes databases for evaluation, work packages, implementation indicators and a comprehensive framework<sup>1</sup>.

## Tel Aviv-Yafo Climate Adaptation Action Plan

Recent years have brought about the recognition that climate change is already here, and that cities must prepare, adapt and address various climate hazards. Tel Aviv-Yafo is the first city in Israel to start preparing adaptation measures and to examine the municipal resilience accordingly.

In January 2018, Tel Aviv-Yafo was accepted to the C40 Cities network, an organization of 96 leading global member cities, committed to the Paris Climate Agreement. As a C40 member, Tel Aviv-Yafo is committed to adopt ambitious greenhouse gas (GHG) mitigation targets and to develop a climate adaptation plan.

As early as 2008, the Mayor of Tel Aviv-Yafo instigated the signing of the Cities Convention for Climate Protection by Israel's Forum 15 Cities.<sup>2</sup> The cities have adopted a GHG reduction target of 20% by 2020, and compiled GHG inventories and mitigation plans. In continuation of the mitigation plans, green building was promoted in Tel Aviv-Yafo, and in 2011 the Forum's cities adopted the Israeli Green Building Standard as binding.

Progress in Tel Aviv Yafo, is already noticeable in many pertinent areas, 40% of the city's waste has been diverged from landfills. In transportation, Tel Aviv-Yafo aims to turn the pyramid of transportation users, prioritizing pedestrians, cycling and public transportation over private vehicles. As of early 2020, the city has approximately 140 km of bike lanes and some 16% of city residents already commute by cycling. At the end of November 2019, the Mayor announced Tel Aviv Yafo's GHG targets for 2030, creating a guiding principle for the city's mitigation plan, to be prepared in 2021.

This **Climate Adaptation Action Plan** provides the municipality with a compilation of actions intended to ensure that by the end of the third decade of the 21st century, the present day quality of life in Tel Aviv-Yafo will prevail and even improve, reaching all city residents and creating good and pleasant living conditions, in an environment that is transforming due to climate change.

1 This is a summary of the plan; the full text is [available](#) in Hebrew.

2 Forum 15 is an association of Israel's fifteen self-government cities, whose municipalities are fiscally autonomous and not dependent on national balancing or development grants. In 2008, Forum 15 cities together with Jerusalem, Ashkelon and Bat-Yam, inaugurated The **Climate Convention**, a local version of ICLEI's international convention for climate protection. See <http://www.forum15.org.il/en/Content.aspx?id=224>

# Major Trends Toward 2030

## The Climate is Changing | Getting Warmer and More Extreme

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Changes in weather patterns are already evident in Israel. The second decade of the 21st century started off with a number of extreme events: in December 2010, a great fire erupted on Mount Carmel. The fire was extinguished after four days, during which 44 people were killed, some 17,000 residents were evacuated, and much property was damaged. The decade ended with heavy storms across the country, flooding of coastal cities; two

victims of flooding in Tel Aviv-Yafo and one victim in Nahariya.

2016 was the hottest year on record, followed by 2019. Much like global trends, Israel is becoming hotter and stormier. Alongside the temperature escalation, a rise in evaporation is expected, as well as a moderate decrease in precipitation.

## The City is Developing

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In the city's Strategic Plan, updated during 2017, the future development of Tel Aviv-Yafo was evaluated through four lenses (or key values): prosperity and growth, equality, inclusion, environmental sustainability and resilience. An analysis of the current status and future projections for 2030 presented a developing and growing city in all aspects – population, economics, building and centrality.

Over the course of this next decade, most areas of the city will undergo construction, development and regeneration processes, during which some 100,000 residents and 600,000 built-up square meters will be added to the city. City residents will consume about 40% more electricity, with at least a quarter generated by solar energy. The light railway

will begin operating, supplemented by sustainable infrastructure to encourage walkability, cycling, public and shared transportation. The share of private cars is expected to decrease to less than 30%. On the Tel Aviv-Yafo shoreline new bathing beaches and beach services will be developed, due to an increase in the number of users and density. Open spaces will decrease, but ecological systems will be preserved and nurtured. Awareness of nature and sustainability will be on the rise around the city, and the public space will be more walkable and accessible. Innovation and culture will be maintained as the city's growth engines; and since climate policies will be improved globally and nationally, the Clean Tech sector is likely to expand.

## The Ecosystem is Being Eroded

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The challenges of climate change and urban growth impose burdens on the natural environment, as it loses its capacity for regulating pollution and offsetting weather hazards. As the natural system erodes, it directly affects the city's ecological services, as well as recreation activities and potential health benefits.

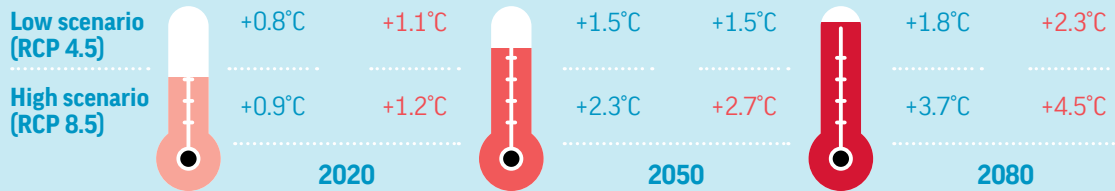
As fauna habitats narrow, the friction between

animals and humans increases, as does the risk of morbidity.

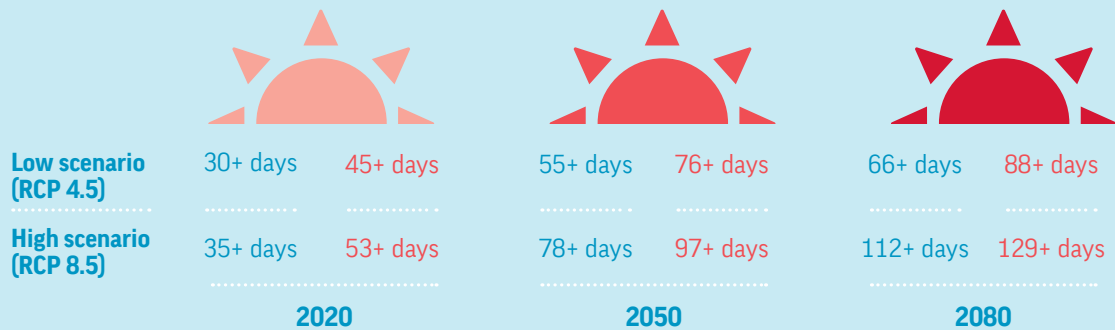
During the past decade, Tel Aviv-Yafo has done much to preserve, regenerate and improve the natural ecosystem within the city boundaries; nature sites were instated, green areas expanded, and currently the city is developing a strategy for preserving and managing of the urban forest.

# Tel Aviv-Yafo

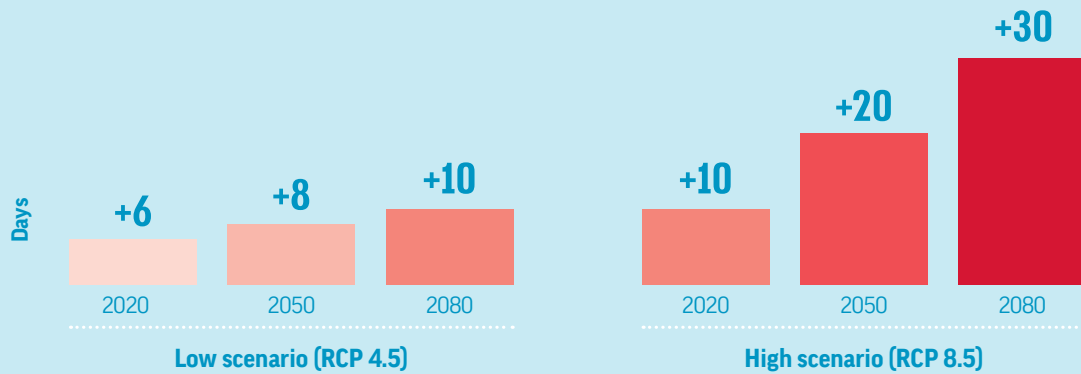
## The Rise in the Average Temperature in Tel Aviv-Yafo<sup>1</sup>



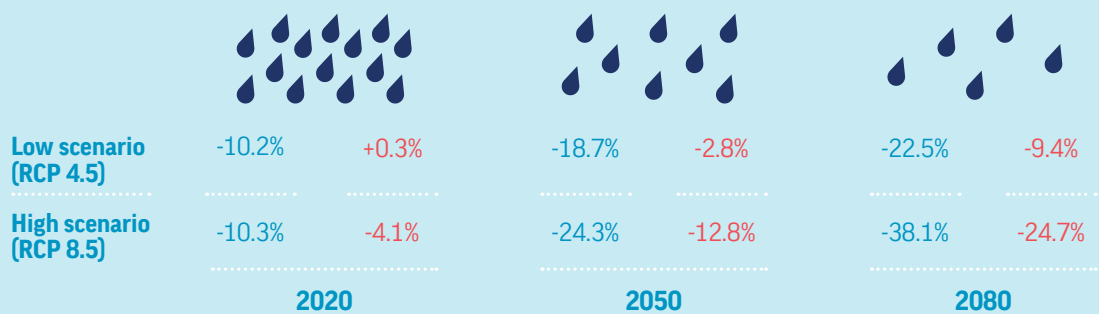
## The Number of Days in Tel Aviv-Yafo with Temperatures Exceeding 33°C



## Incremental Increase in Heatwave Duration



## Precipitation Changes



■ Low assessment ■ High assessment

<sup>1</sup> Projected Average Heat Wave Duration, Center for Climate Systems Research, Columbia University, NASA Goddard Institute for Space Studies, 2019

## Outline of the Action Plan

The **Climate Adaptation Action Plan** is inspired and guided by the Strategic Plan for Tel Aviv-Yafo; the UN Sustainable Development Goals (SDGs), specifically: Goal 13 – Climate Action and Goal 11 – Make cities inclusive, safe, resilient and sustainable; and the Deadline 2020 action framework developed by C40 Cities, aiming to attain net zero GHG emissions by 2050.

Much like the city’s Strategic Plan, the **Climate Adaptation Action Plan** is based on assessing the current situation, identifying future scenarios and consequently formulating policy measures to ensure the desired future. The Plan will be absorbed within the municipality’s work plan framework, to be updated annually, in accordance with the concurrent knowledge and the Plan’s state of execution.

### Broad Partnerships

The impacts of climate change are not confined to the city’s boundaries or its residents, therefore adaptation to climate change necessitates the establishment of a network of cross-boundary and cross-sectoral collaborations. The process of planning and implementation of the **Climate Adaptation Action Plan** is augmented, throughout, by a variety of measures to broaden the discussion and extend the involvement of multiple stakeholders.

Cooperation begins within the municipality itself. Thematic teams from numerous municipal units formulated the action plan. In the process of forming the Plan, the municipal Sustainability Forum held two designated sessions, in order to map urban vulnerabilities and suggest modes of action. The Plan was presented to professional stakeholders by

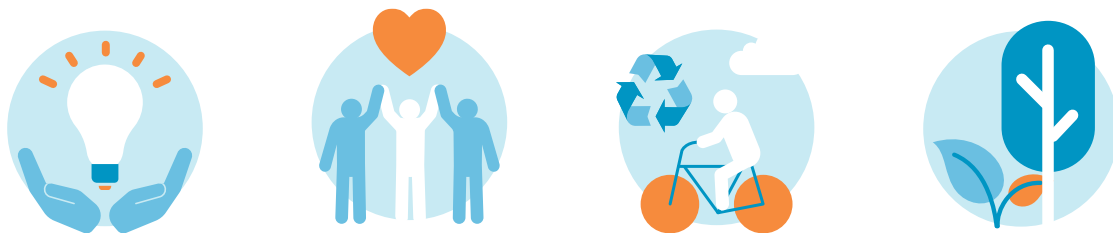
the municipal Environmental Committee; and will be presented to the public in a series of meetings and activities, intent to introduce and explain the issues, and encourage the public to take action.

Additional partners, outside the municipality, include: Forum 15, representing all Israeli independent local authorities, neighboring cities, government ministries and the Inter-ministerial Administration for Climate Change Adaptation, the Water, Energy, Transportation and Rivers Authorities and Tel Aviv University.

The Plan was compiled in partnership with C40, and the 100 Resilient Cities Initiative, of the Rockefeller Foundation, specifically through the Resilience Accelerator, collaboration with Columbia University and NASA.

Tel Aviv-Yafo	Dan Region (Gush Dan)	Israel	International Level
Municipality	Cities of the Metropolitan area	Government ministries and the Administration for Climate Change Adaptation	C40
Residents	Regional governmental factors	Forum 15 and the Federation of Local Authorities in Israel	UNEP IPCC
Environmental and Social NGOs	Town Associations	Academia	European Union
Business	Rivers and drainage authorities	Water, Energy and Transportation Authorities	100 Resilient Cities network





## Principles of Action

The Tel Aviv-Yafo Climate Adaptation Action Plan adopts the sustainability approach as its framework of action: nurturing local resources; advocating environmental justice, equity and collaboration

together with nature preservation; to produce an adapted and improved climate preparedness.

These are the four guiding principles of the plan:

### Nature-based actions

The Climate Adaptation Action Plan will strive, first and foremost, to restore and strengthen ecological infrastructure, by means of nature-based solutions to minimize the damages and, at the same time, improve the system.

### Promoting a sustainable lifestyle

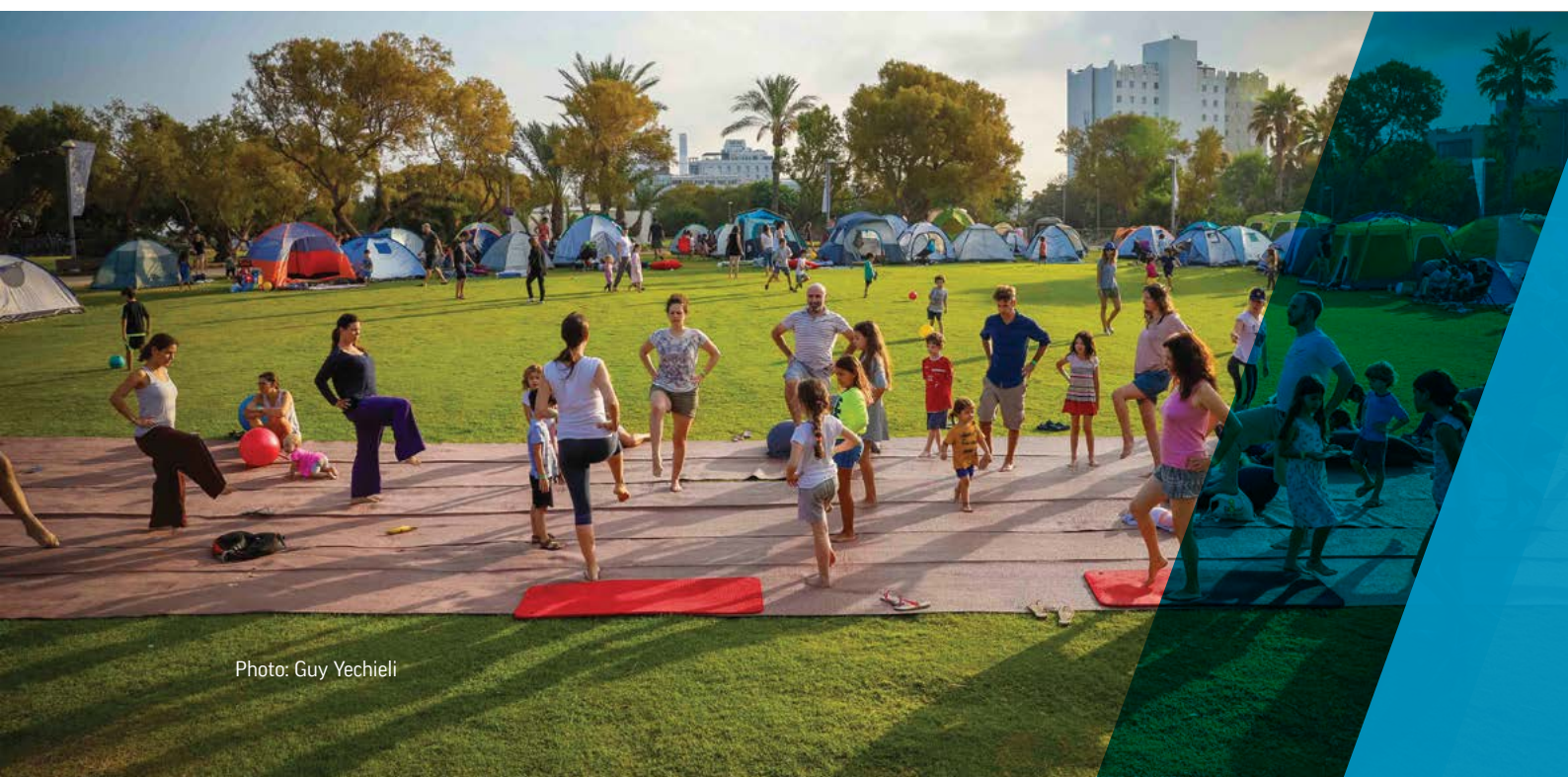
Adaptation to climate change will require residents to take responsibility for their consumption and behavior patterns, both in the private and public spheres. Local adaptation is developed gradually, by promoting awareness, public participation and partnerships.

### Leave no one behind

The city's populations are not equally exposed to the effects of climate change. Provisions must be made to address the vulnerable populations to ensure, in the spirit of the sustainable development goals, that no one is "left behind".

### Innovation serving climate adaptation

Integrating innovation and technology to create synergies between GHG mitigation measures and adaptation measures to promote prosperity and quality of life.





# 2

## HOT AND STORMY



Photo: Guy Yechieli & Barak Brinker

# What to Expect?

## Analysis of Threats and Vulnerabilities

**The city's resilience is a product of the analyses of threats, urban vulnerabilities and adaptation capabilities. Together they lead to the city's strategy of adaptation to climate.**

The analysis of anticipated climate changes was based on the Israel Meteorological Service's<sup>3</sup> research and data, including the contingency scenario published in November 2019, and findings collected and processed by a joint team of the Municipality of Tel Aviv-Yafo, Columbia University, NASA's Goddard Institute and Tel Aviv University. The data was collected in the framework of the Resilience Accelerator, a project conducted during 2019 under the auspices of a 100 Resilient Cities.

The findings were summarized into the following reference points:

- Tel Aviv-Yafo is located in an area that is getting increasingly hotter.
- In the next ten years, there will be a significant addition of days in which the temperature will rise above 33°C. According to analyses by Columbia University, these might reach as many as 30 days or more.
- Precipitation in the region is declining, but the intensity of single rainfall events is rising. Heavier storms are likely.
- As a coastal city, Tel Aviv-Yafo is exposed to storms from the sea, rising sea levels and coastal and cliff erosion.

Change	Features of the Change	Seasonality and Locality	Direction of change
Heat rise	The average temperature in Israel is expected to rise from the current period (2018) until the end of 2050 by approx. 0.9-1.2°C.	Summers are getting longer	↑
Extreme heat days	In recent decades a significant increase was found in days with a maximum temperature higher than 30°C.	Coastal plain and lowlands are the epicenters of warming	↑
Precipitation	According to climate models, precipitation quantities are expected to diminish, evaporation is expected to rise, and accordingly increased droughts are anticipated	The northern and central coastal plains, Golan Heights and Eastern Galilee, are the epicenters of precipitation decrease	↓
Extreme Climate Events	As the climate warms, chances for the occurrence of extreme events are growing		↑
Rising sea level	An increase of between 0.5-1 m by the end of the century	Coastal Plain	↑
Sea floods	As the climate warms and construction expands, the chance of occurrence of severe events increases.	Coastal Plain	↑
Pest and mosquito-borne epidemics	The rising heat and changes in precipitation regime, increase the population growth rate of mosquitos and pests	During transition seasons and in close proximity to wetlands	↑
Fires	Climate change increases the number and severity of fires, most of which are caused by humans	Summer and autumn, in forested areas	↑
Dust storms	The rising heat and evaporation generate an increase in dust storms		↑

Small change by 2050	Moderate change by 2050	Significant change by 2050	Significant change already apparent <sup>1</sup>
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<sup>3</sup> Yosef, Y., Baharad, A., Uzan, L., Osetinsky-Tzidaki, I., Carmona, I., Halfon, N., Furshpan, A., Levi, Y., Stav, N. (2019). Climate change in Israel – historical trends and future predictions of temperature and precipitation. Research Report No. 4000-0804-2019-0000075, Israel Meteorological Service.



## Vulnerability of Infrastructure and Resources

Local vulnerabilities stem from the interfaces between local characteristics and anticipated threats. **The Climate Adaptation Action Plan** analyzes and lists Tel Aviv-Yafo's vulnerability hotspots.

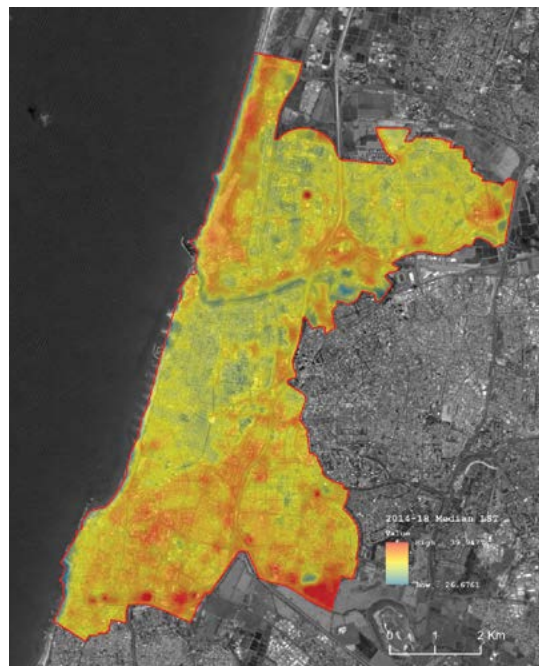
### Vulnerability of public space

The increase in gray (built) land cover and decline of green (natural) land cover affect the level of comfort in the urban space, its usage and potential attraction. The intensity of the public heat island depends on a number of factors, such as the size and structure of the city, energy and transportation consumption in it, the height of its buildings, the denseness of

parks and open spaces, the local topography and the area's wind regime. The population of the city has accelerated: from 433,000 in 2015 to 535,000 by 2030; and from 252,000 non-resident employees (approx. 60% of people employed in the city), to about 356,000 out-of-towners in 2030. The built-up area will also increase substantially, primarily in the north western part of the city.

Thermal mapping of Tel Aviv-Yafo shows that heat islands are present mainly in the city's south and east, while the city center, where buildings are relatively low and shaded, open to the sea breezes is much cooler.

**Map 1: Thermal mapping of Tel Aviv-Yafo, summer 2019<sup>4</sup>**



### Vulnerability of nature and trees

Vegetation in general, and trees in particular, contribute directly to the regulation of the urban microclimate. The distribution of vegetation and trees in the city is not uniform – neighborhoods

planned by the Geddes Plan are abundant with trees and shade, whereas the southern and eastern neighborhoods are less shaded. As a rule, although the number of trees in the city is growing, in many cases habitats are shrinking, tree quality is

<sup>4</sup> Landsat 8 Thermal Map, produced by the The Center for Resilient Cities and Landscapes, Columbia University for the Resilience Accelerator Tel Aviv-Yafo



declining and the shade cover is decreasing. A recent municipal study, indicates that there are significant differences between different neighborhoods, both in shading and canopy coverage<sup>5</sup>.

### Vulnerability of the coastal strip

Tel Aviv-Yafo, is a Mediterranean coastal city, and is affected and threatened by climate change. As the density and demand for uses and infrastructure along the coastline increases, so does the potential for damage to coastal assets: buildings, promenades, beach facilities, infrastructure, breakwaters, sandstone cliffs and natural values. Over the past decade, Tel Aviv-Yafo's coastline has been exposed to powerful winter storms that caused extensive damage to property and infrastructure along the coastal strip and damaged the kurkar (sandstone) cliffs.

### Water sector

Tel Aviv-Yafo's water comes primarily from the national water system, mainly the product of desalination. Most local wells were shut down due to pollution, in recent years there are efforts to reclaim the wells. As of 2020, six wells have

been meliorated. Climate change directly affects water consumption in the city, especially during the summer months. Since 2004, the municipality has had to add four months to the irrigation season. Rainwater is dwindling, and the extensive construction and groundcover reduces the ability of containment, seepage and natural regeneration of water reservoirs.

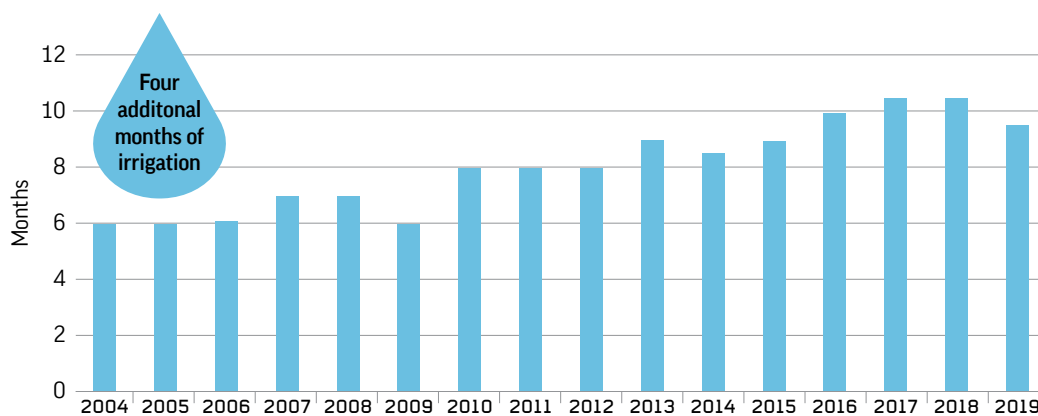
### Energy sector

In Israel, the vast majority of energy for electricity is supplied by the Israel Electric Corporation through the national power grid. Local production of solar power is still limited. The electricity system is reasonably prepared for earthquakes, but less prepared for other natural disasters, and particularly for extreme heat events and rising sea levels.

### Drainage Systems

Cloudburst events are still a rarity, but in the future will become more frequent, both due to climate change and because the runoff is affected by human actions, such as urbanization and changes in land use.

**Number of months in which the irrigation system was active (in public space, by years)**



5 Aleksandrowicz, Or, Tzur, S., et al. "Shade maps for prioritizing municipal microclimatic action in hot climates: Learning from Tel Aviv-Yafo." *Sustainable Cities and Society* 53 (2020)

**Map 2: Areas vulnerable to flooding correlated with emergency service calls in the years 2015-2019**

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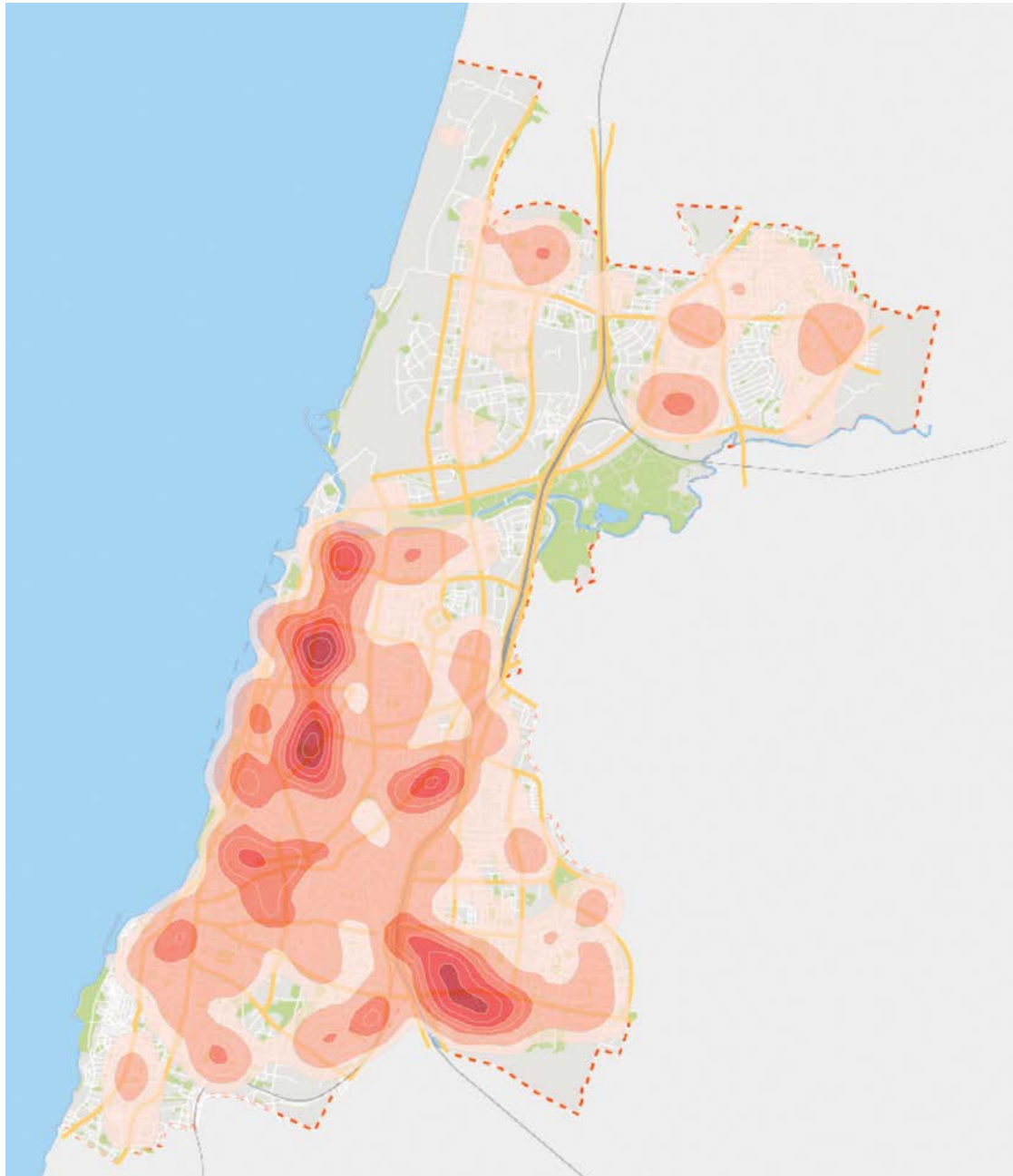




Photo: Guy Yechieli

## Vulnerability of City Residents

### Vulnerable Populations Exposed to Threats

The population of Tel Aviv-Yafo is relatively young and more affluent than Israel's population as a whole, however the city's vulnerable populations are concentrated in areas that are relatively more vulnerable to climate change, primarily heat and flooding.

#### Poverty

Some 10% (2016) of households in Tel Aviv-Yafo are defined as living below the poverty line and are the most vulnerable in any extreme event.

#### The elderly population

The elderly population in the city is expected to grow over the coming decades, while referring to age group of over 65 years old, from around 10% in 2009 to more than 20% in 2059. Exposure to extreme climate events can lead the elderly to health and mental deterioration. The elderly are more reliant on climatisation measures – heating and cooling – than the general population. Once disaster strikes, when

infrastructure collapse and supplies are cut off, the endurance of the older population is significantly lower than that of the general population.

#### People with disabilities

People with severe disabilities and people who are homebound are, to a great extent, in a similar situation to that of the elderly. There are 5,557 households with people with disabilities.

#### Health

The increasing severity of weather events directly impacts human health and life expectancy. Adequate and available healthcare services are necessary for adaptation and preparation for emergencies, in response to extreme weather events.

Healthcare services in Tel Aviv-Yafo are relatively good, compared with other areas in Israel, however, there is a continuing decline in hospital beds in the Tel Aviv District between 2000 and 2019.

### The Municipal Emergency System

The preparedness of local authorities in Israel to hazards, and emergency situations, is organized within the framework of the National Emergency Management.

The contingency scenarios are determined by the government and submitted to the City Management and its Security Division by the Homefront Command and the National Emergency Management Authority. From the national contingency scenario,

the Security and Emergency Services Division draws a municipal scenario – a guiding outline for the entirety of emergency preparedness actions, within the municipality's jurisdiction and responsibility. The flooding contingency scenario focuses on responding to impacts on areas in risk of flooding; the response is categorized by daily precipitation levels and wind intensity.



# 3

## ACTIONS



Photo: Barak Brinker

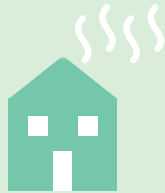


# Challenges

An analysis of the impacts produced a series of challenges that the city must address in order to ensure the contemporary quality of life for all residents over time:



The public sphere is heating



The Domestic space is warming



The city is sealed and emits heat



Increase in flood exposure



Decline in natural water sources



Ecological infrastructure functioning decreases



Increase in demand for emergency response



Growing burdens on urban services



Rise in the rate of the vulnerable population in the city

The actions required in response to the challenges are divided into two key tasks:



## Cooling the City

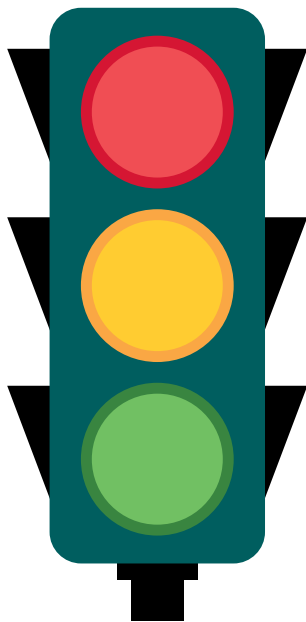
How can the city be cooled down without compromising the quality of life of its residents, despite climate change?



## Water Management

How can excess water be channeled so that it poses no danger and can be used during dry periods?

## Implementation of the actions through the coming decade, divided into three phases:



### Immediate Response

Actions needed to be performed during 2020-2021, in order to prevent undesirable outcomes and crossing points of no return.

### Transformation

Lateral actions aiming to systemically change the current state, gradually and incrementally. Implementation of this set of actions would minimize urban vulnerability and improve municipal adaptation.

### Opportunity for Innovation

Actions linking between adaptation to climate change and mitigation of GHG emissions, to improve urban sustainability and the quality of life in the city.

## Actions for implementation

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### Main Actions for Immediate Response:

The set of Actions for Immediate Response includes a series of activities to be undertaken in the short term, intended to generate quick changes:

**Emergency “Heat Procedure”** | An emergency procedure to be applied in cases of heat loads and heatwaves, which include: guidelines for outdoor activities, and information regarding recommended adaptation behavior.

**Energy independence in public buildings** | Self-supply of solar energy to be used in times of crisis, including connection of the production system and trainings to operate the system.

**Reducing tree cutting in the city** | Strict review of the process of tree cutting permits and clarification of guidelines for tree conservation.

**Economic assessment of vulnerability and adaptation to climate change** | Formulating economic risk assessments for key issues in the context of climate change: municipal assets and services, businesses and the community.



### Main Actions to Generate Transformation:

The sets of actions for transformation comprise lateral actions aiming to improve Tel Aviv-Yafo’s ability to adapt to climate change. Actions are gradual and incremental, prioritizing implementation in vulnerable areas first, followed by incremental implementation through the entirety of municipal jurisdiction.



# Cooling the City

## Action 1 | Improving Natural Cooling

Action Measure 1.1	Managing the Urban Forest			
<b>Goal</b>	To develop and manage the urban forest			
<b>Objectives for 2030</b>	An updating database of urban forest inventory	A set of tools for forest and tree treatment, adapted to climate change	A connected network of forested and planted spaces	
<b>Description</b>	A multi-year urban forestation action plan, assimilating an approach of tree management and cultivation in the city as a comprehensive system that acknowledges the connections and interactions between spaces and trees in the city			
<b>Implementation measure</b>	Description	Leader	Partners	Timeframe for implementation
<b>1.1.1</b>	Preparing a multi-year urban forestry action plan. The plan will include policies and tools for the preservation, intensification and cultivation of a healthy and sustainable urban forest for the welfare of city residents	City Architect's Office	City Beautification Division, Environmental and Sustainability Authority, Strategic Planning Unit	Short term By 2022
<b>1.1.2</b>	Establishing an urban forest inventory database	Computerization Division and City Beautification Division	Licensing and Construction Supervision Division, City Planning Division, City Architect's Office	Medium term By 2025
<b>1.1.3</b>	Mapping and implementing opportunities and threats to the city's trees in planning and execution (urban regeneration, infrastructure and construction works)	City Architect's Office and City Beautification Division	City Planning Division, Roads and Lighting Division, Licensing Center, Municipal Engineering Coordination Center, Transportation, Traffic and Parking Authority, Strategic Planning Unit	Short term By 2025
<b>1.1.4</b>	Defining a set of tools and budgeting forest and tree treatment; tree barcodes	City Beautification Division	Ganei Yehosha Park, Roads and Lighting Division	Gradual By 2030
<b>1.1.5</b>	Connecting the community with conservation and cultivation of the urban forest and tree planting	Environmental and Sustainability Authority	Community, Culture and Sports Administration, Education Administration, City Beautification Division, Social Services Administration	Medium term By 2025

Action Measure 1.2	Expanding Green Groundcover in the City			
<b>Goal</b>	To moderate the urban heat island phenomenon, enrich biodiversity, enhance CO <sub>2</sub> absorption, and increase Oxygen production			
<b>Objectives for 2030</b>	Intensifying roof coverage and green walls	Realizing maximal potential for additional sustainable green areas	Encouraging the public to increase green groundcover in private spaces	
<b>Description</b>	Examining all action channels for the increase of green groundcover in the city, setting designated quantitative targets for each action channel, and developing tools to promote objectives			
Implementation measure	Description	Leader	Partners	Timeframe for implementation
1.2.1	Promoting a set of guidelines for approval by the Local Planning Committee on the issue of green and brown roofs; forming a municipal index for green groundcover (similar to the shade index); measurement and monitoring	City Architect's Office	City Beautification Division, Environmental and Sustainability Authority	Short term By 2022
1.2.2	Exploring options for expanding green areas in the city instead of built-up groundcover and prioritizing living rooftops (parking lots, private spaces, public buildings, etc.)	City Architect's Office	City Beautification Division and Public Buildings Division	Medium term By 2025
1.2.3	Integrating sustainable gardening principles into the development and maintenance of green areas	City Beautification Division	Ganei Yehosha Park	Medium term By 2025
1.2.4	Defining a set of tools for the increase of green groundcover in private spaces, including community streets and shared courtyards	City Beautification Division and The Environmental and Sustainability Authority	Community, Culture and Sports Administration	Medium term By 2025
1.2.5	Training for professionals and residents and establishing demonstration sites for green roofs and walls	Environmental and Sustainability Authority and the City Beautification Division	City Architect's Office, Public Buildings Division, City Buildings Division, Social Services Administration	Gradual By 2030
1.2.6	Applying new building requirements for rooftop utilization for retention of runoff water (Blue Roof) or gardening (Green Roof)	City Architect's Office	City Planning Division, Licensing and Construction Supervision Division	Medium term By 2025
1.2.7	Allocating professional personnel to the issue of green walls and rooftops	City Beautification Division	Environmental and Sustainability Authority	Medium term By 2025



## Action 2 | Cooling Built-Up Public and Private Spaces in the City

Action Measure 2.1	Expanding Green Groundcover in the City			
<b>Goal</b>	To improve thermal comfort in the public sphere			
<b>Objectives for 2030</b>	Increasing the percentage of urban shade cover, adding shade in all public spaces in the city			
<b>Description</b>	Forming and meeting the Urban Treetops Cover target (trees only, base data 16% for 2019) Forming and meeting a Shade Continuity target (percentage of shaded public space, trees and other measures)			
Implementation measure	Description	Leader	Partners	Timeframe for implementation
<b>2.1.1</b>	Formulating an action plan to increase the percentage of urban shade cover	City Architect's Office	City Beautification Division, Roads and Lighting Division, Public Buildings Division, City Planning Division	Short term By 2022
<b>2.1.2</b>	Updating and adjusting shade guidelines objectives for 2030	City Architect's Office		Short term By 2022
<b>2.1.3</b>	Formulating quantitative and qualitative indices for shade in public spaces and buildings and updating them	City Architect's Office	Roads and Lighting Division, Public Buildings Division	Short term By 2022
<b>2.1.4</b>	Evaluating artificial shading measures	City Architect's Office	City Beautification Division	Medium term By 2025

Action Measure 2.2	Implementing Use of Climate-Adjusted Construction and Finishing Materials			
<b>Goal</b>	To reduce the use of heat storing and heat emitting materials in construction, development and infrastructure			
<b>Objectives for 2030</b>	100% of materials used in city construction, development and infrastructure will be materials suggested by a climate-adjusted construction and finishing material catalogue			
<b>Description</b>	Assimilation of heat emissions and warming considerations in the selection of materials in construction in the city			
Implementation measure	Description	Leader	Partners	Timeframe for implementation
<b>2.2.1</b>	Formulating a set of guidelines for the design of tower envelopes with an emphasis on their environmental impact	City Architect's Office	City Planning Division, Licensing and Construction Supervision Division	Gradual By 2030
<b>2.2.2</b>	Formulating guidelines and a materials catalog for climate-adjusted construction, and integrating it into the guidelines	City Architect's Office	Public Buildings Division, Roads and Lighting Division, City Planning Division	Medium term By 2025
<b>2.2.3</b>	Promoting the implementation of pilot projects in different areas of the city and establishing demonstration and implementation spaces for climate-adjusted materials	City Architect's Office	Public Buildings Division, City Buildings Division, Roads and Lighting Division, Licensing and Construction Supervision Division	Gradual By 2030

## Action 3 | Developing a Lifestyle Adapted to the Changing Environment

Action Measure 3.1	Adapted Lifestyle			
<b>Goal</b>	To ensure quality of life and health in a changing climate			
<b>Objectives for 2030</b>	Promoting a climate adapted lifestyle program in the community			
<b>Description</b>	Adapting infrastructure and recreation services to climate change for public benefit			
Implementation measure	Description	Leader	Partners	Timeframe for implementation
<b>3.1.1</b>	Extending the distribution of water drinking fountains	City Beautification Division	Public Buildings Division, Roads and Lighting Division, Municipal Engineering Coordination Center, Education Administration, City Architect's Office	Short term By 2022
<b>3.1.2</b>	Implementing a healthy lifestyle in a warming environment	Environmental and Sustainability Authority	Community, Culture and Sports Administration, Communications and Marketing Administration, Social Services Administration (Department of Public Health, Community Resources, Headquarters and Divisions), BeWELL Club, Beach Division	Medium term By 2025
<b>3.1.3</b>	Adapting recreation services to a warming environment	Community, Culture and Sports Administration, Social Services Administration	Beach Division	Gradual By 2030
<b>3.1.4</b>	Adapting Tel Aviv-Yafo beaches to accommodate more visitors, expanding the number of bathing beaches	Beach Division	Strategic Planning Unit, Atarim Coastline Development Corporation	Gradual By 2030

<b>Action Measure 3.2</b>	<b>Supporting Vulnerable Populations</b>			
<b>Goal</b>	To improve urban space and services, ensuring quality of life for vulnerable populations			
<b>Objectives for 2030</b>	All vulnerable populations in the city are accompanied for adaptation to a changing environment			
<b>Description</b>	Forming an urban plan to ensure continued life for vulnerable populations in the changing climate			
<b>Implementation measure</b>	Description	Leader	Partners	Timeframe for implementation
<b>3.2.1</b>	Mapping systemic needs for risk reduction for disadvantaged populations due to Climate change	Social Services Administration	Strategic Planning Unit, Center for Economic and Social Research, academia, Community, Culture and Sports Administration	Short term By 2022
<b>3.2.2</b>	Preparing an adaptation plan and forming a set of tools to assist areas and populations identified as vulnerable	Social Services Administration	Strategic Planning Unit, Community, Culture and Sports Administration	Short term By 2022
<b>3.2.3</b>	Refreshing an emergency system supportive of at-risk populations to cope with climate hazards – developing collaborations, establishing a mechanism and capabilities	Social Services Administration	Security and Emergency Services Division, Community, Culture and Sports Administration, Ministry of Welfare and healthcare systems in the city	Medium term By 2025
<b>3.2.4</b>	Preparing vulnerable populations to cope with climate changes	Social Services Administration	Security and Emergency Services Division, Community, Culture and Sports Administration, Ministry of Welfare and healthcare systems in the city	Medium term By 2025
<b>3.2.5</b>	Recruiting and integrating volunteers in guiding and accompanying Vulnerable populations and promoting a sustaining lifestyle	Social Services Administration	Community, Culture and Sports Administration, Environmental and Sustainability Authority, Resilience and Social Equality Authority	Medium term By 2025



# Water Management

## Action 1 | Improving Natural Retention

Action Measure 1.1	Improving Natural Retention			
<b>Goal</b>	To promote urban groundcover enabling water retention and absorption, using and use nature-based solutions as a leading approach in runoff management in the city			
<b>Objectives for 2030</b>	Defining a runoff coefficient to ensure improved adaptation to climate change in vulnerable areas and new/urban renewal neighborhoods	Improving water retention capacity in urban space		
<b>Description</b>	Implementing a "Water-Sensitive City" approach as a guiding approach for urban runoff management			
Implementation measure	Description	Leader	Partners	Timeframe for implementation
<b>1.1.1</b>	Defining a runoff coefficient in vulnerable areas and new / urban renewal neighborhoods	Stormwater Division		Medium term By 2025
<b>1.1.2</b>	Implementation of a "Water Sensitive City" Program – runoff management in the city	Construction and Infrastructure Administration	Stormwater Division, City Architect's Office, City Beautification Division, City Planning Division, Environmental and Sustainability Authority, Public Buildings Division, Roads and Lighting Division, Licensing and Construction Supervision Division, Mei Avivim water corporation	Medium term By 2025
<b>1.1.3</b>	Introducing a system of biofilters to generate seepage by natural means in green areas	City Beautification Division	Stormwater Division, City Planning Division, City Architect's Office	Gradual By 2030
<b>1.1.4</b>	Formulating and implementing strict guidelines for runoff management in the private sphere	City Architect's Office	City Planning Division, Environmental and Sustainability Authority, Licensing and Construction Supervision Division, Stormwater Division	Medium term By 2025



<b>1.1.5</b>	Minimizing sealed landcover in urban space by introducing elements for water retention and absorption in suitable sites such as overground car parks, rooftops, roads, plazas, bike paths and road shoulders	Construction and Infrastructure Administration	Stormwater Division, Ahuzot Hahof Municipal Parking Corporation, City Beautification Division, City Architect's Office, Roads and Lighting Division, Transportation, Traffic and Parking Authority, Traffic Division, Integrated Projects, Municipal Engineering Coordination Center, Stormwater Division	Gradual By 2030
<b>1.1.6</b>	Encouraging the public to improve water retention and absorption in the private sphere	Environmental and Sustainability Authority	Stormwater Division, City Architect's Office, City Beautification Division, Community, Culture and Sports Administration, Ezra and Bitzaron Municipal Building Company	Short term By 2022
<b>1.1.7</b>	Using nature-based solutions for water retention and absorption	City Beautification Division	Ganei Yehosha Park, Stormwater Division, City Architect's Office, Environmental and Sustainability Authority	Medium term By 2025
<b>1.1.8</b>	Mapping and maintaining seepage pits	Stormwater Division		Short term By 2022
<b>1.1.9</b>	Implementing elements for runoff planning in public buildings	Structural Division Public	City Architect's Office, Stormwater Division, City Buildings Division	Medium term By 2025

## Action 2 | Improving Coastal Resilience

Action Measure 2.1	Improving Resilience of the Coastal and Marine Ecosystem			
<b>Goal</b>	To reduce the vulnerability of the coast to winter storms, including runoff erosion and pollution, erosion of the beaches, the cliff and natural values on the shoreline			
<b>Objectives for 2030</b>	Maintaining a stable beach width (as a multi-year trend)	Maintaining the stability of the coastal cliff	Decreasing the number of flow failings/runoffs from channeling outlets into the sea and streams	
<b>Description</b>	Implementing nature-based solutions for the protection and preservation of the cliff, the coastline and the coastal and marine ecosystems			
<b>Implementation measure</b>	Description	Leader	Partners	Timeframe for implementation
<b>2.1.1</b>	Completing the marine protection pilot project	Roads and Lighting Division (Coastal Cliffs and Breakwater Unit), and Atarim Coastline Development Corporation		Medium term By 2025
<b>2.1.2</b>	Examining innovative ecological technologies for marine protection	Atarim Coastline Development Corporation	Stormwater Division, City Architect's Office, City Beautification Division, City Planning Division, Environmental and Sustainability Authority, Roads and Lighting Division	Medium term By 2025
<b>2.1.3</b>	Ensuring proper function of coastal drains	Stormwater Division	Mei Avivim water corporation, Beach Division, Atarim Coastline Development Corporation, Environment and Sustainability Authority	Gradual By 2030

Action Measure 2.2	Adaptation to Sea Flooding and Risk Reduction			
<b>Goal</b>	To adapt to the impacts of climate change, particularly winter storms, on infrastructure and assets in the sea and adjacent areas			
<b>Objectives for 2030</b>	Researching and monitoring the coast to create a status report and forecasts	Preventing and reducing damage to infrastructure and uses		
<b>Description</b>	Identifying and treating areas vulnerable to flooding and upgrading the system responsible for emergency response and tending to businesses along the shoreline			
<b>Implementation measures</b>	Description	Leader	Partners	Timeframe for implementation
2.2.1	Monitoring and measurements of the beach and sea (shoreline, cliff line, kurkar (sandstone) ridge, beach width, waves, currents, seabed and sand movements in marine space)	Roads and Lighting Division (Coastal Cliffs and Breakwater Unit), Atarim Coastline Development Corporation	Survey of Israel, Tel Aviv University, the Technion and the municipal Beach Division	Short term By 2022
2.2.2	Risk analysis of the shoreline and vulnerable areas	Roads and Lighting Division (Coastal Cliffs and Breakwater Unit), Atarim Coastline Development Corporation	Beach Division	Short term By 2022
2.2.3	Economic risk analysis of beach assets	Atarim Coastline Development Corporation		Medium term By 2025
2.2.4	Assessing the efficacy of land and sea structures to moderate wave energy and preserve the cliff toe and coastal strip	Roads and Lighting Division (Coastal Cliffs and Breakwater Unit), Atarim Coastline Development Corporation	City Planning Division	Short term By 2022



An example of mediterranean rain garden in the city . This garden includes a series of gravel channels and filtration ponds lined with native plants | Photo: Sharon Greenblat



### Action 3 | Adaptation to Flooding | Strengthening the Alert and Emergency Response System

Action Measure 3.1	Preparation for Flooding in the City			
<b>Goal</b>	To minimize the city's vulnerability to the effects of flooding			
<b>Objectives for 2030</b>	Reduction in the number of emergency calls in flooding events	Streamlining the flood victim assistance system	Minimizing flooding vulnerability zones	
<b>Description</b>	Identifying and treating areas vulnerable to flooding and upgrading the system responsible for emergency response and treatment of vulnerable populations			
<b>Implementation measure</b>	Description	Leader	Partners	Timeframe for implementation
<b>3.1.1</b>	Mapping and identifying areas vulnerable to flooding	Stormwater Division	Computing Division, 106 Plus Service Call Center, Mei Avvim water corporation	Short term By 2022
<b>3.1.2</b>	Strengthening infrastructure and buildings in vulnerable areas	Construction and Infrastructure Administration	Ezra and Bitzaron Municipal Building Company, Roads and Lighting Division, Social Services Administration, Community, Culture and Sports Administration	Gradual By 2030
<b>3.1.3</b>	Examining the need for updating storm procedures	Security and Emergency Services Division	Units partaking in storm procedures	Short term By 2022
<b>3.1.4</b>	Improving monitoring capabilities to identify needs and failures in the drainage system by means of measuring stations and sensors	Stormwater Division	Computing Division, Environmental and Sustainability Authority, Mei Avvim water corporation	Short term By 2022

### Action 4 | Water Saving

Action Measure 4.1	Gardening Water Savings			
<b>Goal</b>	To reduce the use of water for irrigation in the city in the public sphere			
<b>Objectives for 2030</b>	A decrease in water consumption per irrigated hectare			
<b>Description</b>	Assimilating water-saving measures in irrigation and landscaping in the public sphere			

Implementation measure	Description	Leader	Partners	Timeframe for implementation
4.1.1	Prioritizing local and water saving vegetation	City Beautification Division	City Architect's Office, Environmental and Sustainability Authority	Short term By 2022
4.1.2	Optimizing existing irrigation systems for the changing conditions	City Beautification Division		Medium term By 2025
4.1.3	Lawn reduction	City Beautification Division	Ganei Yehosha Park	Gradual By 2030

Action Measure 4.2	Water Savings in Buildings and Infrastructure			
<b>Goal</b>	To encourage water savings in the private sphere and reduce public water consumption			
<b>Objectives for 2030</b>	Decrease in water consumption in the city per capita			
<b>Description</b>	Minimizing urban depreciation, implementing measures and behavior changes for water-saving			
Implementation measure	Description	Leader	Partners	Timeframe for implementation
4.2.1	Continued streamlining of water systems and reducing depreciation	Mei Avivim water corporation	Stormwater Division	Short term By 2022
4.2.2	Promoting a multi-stage reclamation plan for polluted wells	Mei Avivim water corporation	Water Authority, Ministry of Health, Assets Division	Medium term By 2025
4.2.3	Requiring the implementation of the Green Building Standard sections promoting water saving	City Architect's Office	Public Buildings Division	Short term By 2022
4.2.4	Promoting guidelines for water saving behavior in municipal buildings, including using AC water and retaining rainwater for irrigation	City Buildings Division, Public Buildings Division	City Building Managers	Short term By 2022
4.2.5	Introducing water-saving stipulations in the specification of the municipal Green Label for Business	Environmental and Sustainability Authority	Community, Culture and Sports Administration	Short term By 2022
4.2.6	Refreshing and implementing a water saving campaign in the community and the education system	Mei Avivim Water Corporation in collaboration with the Environment and Sustainability Authority	Communications and Marketing Administration, Administration Spokesmen, Education Administration	Short term By 2022

# 4

## IMPLEMENTATION



Photo: Or Kaplan



## From Planning to Implementation

The submission of this Action Plan to the City Management marks the end of the planning phase and the start of the implementation stage. Implementation of the Plan will be conducted in three phases as listed above: immediate response; transformation, and opportunities for innovation. The immediate responses will be brought to execution promptly, the transitional adaptation actions and innovation opportunity related actions will be executed in the framework of the 2021-2022 work plans, and further expanded in work plans of future

years.

An assimilation and training process has been developed, in order to integrate both intra-municipal and external partners, and to ensure its positioning as a major, important and central municipal goal, combined with the formation of an open and accessible information system, the implementation of training processes, and the advancement of knowledge and awareness in the education system and the community.

## Monitoring and Evaluation

This Action Plan is being formed in an era of uncertainty concerning the intensity and extent of climate changes, its implementation will be advanced while the evolving situation is being constantly monitored. Accordingly, the plan is incremental and gradual, aiming to realize its objectives by the year 2030. Once every five years, the Municipal Steering Committee will conduct a review and reassessment of the status with respect to the goals, objectives and targets of the Action Plan. The review will be based on designated indicators, as well as evaluation of implementation of the work plans and projects. In light of the findings of the

review and reevaluation, the objectives as well as the detailed plans and implementation measures will be updated. The indicators are divided into three categories: situation indicators, action indicators and process indicators. Situation indicators monitor climate changes and features of urban vulnerability; action indicators represent an assessment of the realization of the plan's objectives and goals; and process indicators represent an evaluation of the progress of the implementation of the plan.



Photo: Green Course



## Climate state indicators

Topic	Indicator	Description and Notes	Baseline Data	Annual Indicators 2019
<b>Climate</b>				
<b>Heat</b>	No. of nights in which the temperature exceeds 27°C (Tel Aviv coast)	An increase indicates warming	Decade average = 6~	2019 = 2
	No. of days in which the temperature exceeds 32°C (Tel Aviv coast)		Decade average = 4.2	2019 = 1
	No. of heat waves (3 consecutive days in which the heat exceeds 28°C (Tel Aviv coast)	Heat wave frequency indicator	Decade average = 3	2019 = 4
<b>Precipitation</b>	No. of rainy days (with a threshold of 0.1 mm)	No. of rainy days in a year	Decade average = 54	2019 = 62
	No. of rainy days exceeding 30 mm	No. of days in which the storm alert rose to Level 2	Decade average = 2.7	2019 = 1
<b>Sea</b>	Annual average temperature	Warmer sea water due to climate change	2000-2019 Average = 23.2	
	Sea level	Expected sea level rise	1975 = 0.136	2019 = 0.136
<b>Vulnerability</b>				
<b>Population</b>	Population growth rate	Tracking the population growth	2019 = 1.7%	
	Vulnerable population groups, by city quarter	The poor, children, the elderly, single-parent families, persons with disabilities	To be compiled by 2021	
	No. of hospital beds per 1,000 people	By district	2010 = 2.04	2018 = 1.99
	Natural disaster	Monitored annually	To be compiled by 2022	
	No. of people hospitalized following natural disasters or weather-related hazards	Monitored annually in cooperation with the Sourasky Medical Center	To be compiled by 2021	
	Public property damage resulting from natural disasters or weather-related hazards	Monitored annually by the city	To be compiled by 2021	
<b>Ecological infrastructure</b>	Cliff width	Cliff width in specific places is indicative of cliff erosion	To be compiled by 2022	
	Condition of the local indicative species	Compared to a preliminary nature survey	To be compiled by 2023	

## Action indicators

Topic	Indicator	Description and Notes	Starting Point / Current Situation	Desired Progress Direction
<b>Cooling the city</b>	Tree canopy in the city	Relative to the entire urban space	To be compiled by 2021	
	The average difference between the temperatures measured at the stations in the city and at a station outside the city	The difference in temperature is indicative of the extent of the urban heat island	To be compiled by 2020	
	Use of private cars to get to work/studies	A decline in traffic reduces the emission of heat	2017 - 54% used private cars	
	Buildings complying with the green building standard or buildings that underwent green retrofitting	Compared to all completed construction	To be compiled by 2021	
<b>Water management</b>	Ratio between hotline calls and rainfall	The number of calls is indicative of flood effects	To be compiled by 2021	
	Urban sealing index	Tracking infiltration potential in the city	To be compiled by 2022	
	Percentage of buildings that independently treat all the runoff on their lot	Pertains to new construction as of 2021	To be compiled by 2022	
	Average annual water consumption per capita (m <sup>3</sup> )	An indicator of water consumption and savings	2019 = 65.3 m <sup>3</sup>	
	Percentage of water supply depreciation		2018 = 10.8%	
	No. of irrigation months per year	The number of months in which the Municipality waters public gardens	2004 = 6 months 2019 = 10 months	
<b>Improvement in the ecological infrastructure</b>	Urban coverage percentage	Ratio between urban coverage and the open space	To be compiled by 2022	
	No. of trees chopped down per thousand trees	Ratio between the no. of trees chopped down for construction purposes and the inventory of trees	2019 = 8.74	

Topic	Indicator	Description and Notes	Starting Point / Current Situation	Desired Progress Direction
Population support	Share of renewable energy production in the city	In the residential and business sectors	To be compiled by 2022	
	Percentage of public buildings on which solar systems have been installed	Out of all public buildings in the city (450)	2019 = 9%	
	Average energy consumption per capita (kWh per annum)	An indicator of consumption trends and the implementation of efficiency policies	2019 = 7,415	
	Share of the population suffering from energy poverty	Survey of acclimatization device usage	2019 = 21%	
	Satisfaction with the public space	Municipal survey	2016 = 72.2% satisfaction rate	

### Process indicators

Indicator	Description and Notes	Starting Point / Current Situation	Desired Progress Direction
<b>Actions</b>			
No. of participants in climate trainings	Out of all employees at City Hall and associated agencies	2021	
Status assessment by the Environment Committee	Annual assessment of the progress made in the action plan	2021	
No. of trainings and awareness events held for the public		2021	
No. of trainings and awareness events held in the school system		2021	
No. of research studies	No. of published research studies dealing with climate change in Tel Aviv-Yafo	2021	

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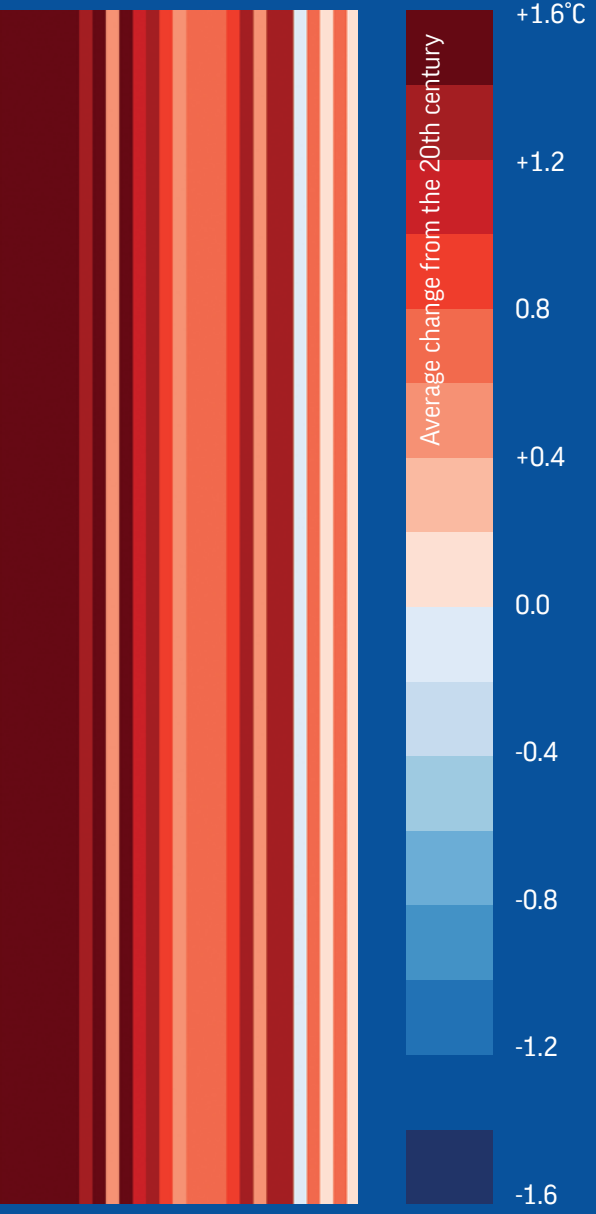
### External Leading Partners:

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The Israeli Meteorological Service

Ministry of Environmental Protection, Tel Aviv District





Source: Climate Lab Book <https://showyourstripes.info/>