

Analysis of strategic documents - adaptation of cities to climate change.

(Paris, Copenhagen, Oslo, New York, Boston, Philadelphia)

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Paris Climate Action Plan (2020)

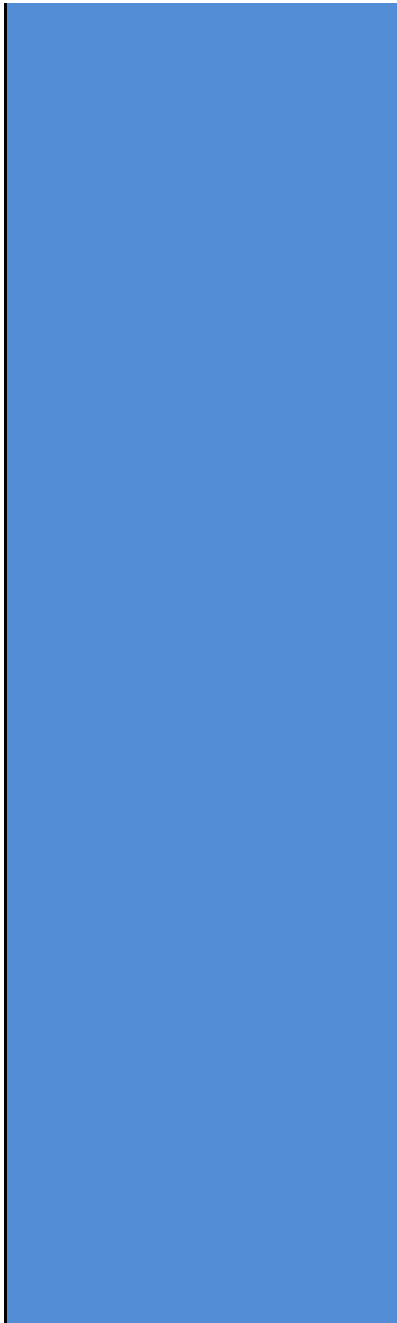
Key activities	Spatial activities/infrastructure: ❖green ◆grey	Social activities	Comment
Solar City , 100% renewable energy	Equipping 20% of roofs with solar panels by 2050	◆ Involvement of citizens (individual and collective consumption, production cooperatives)	Detailed solutions: Heating and Cooling Master Plan; The Energy Master Plan
	Development of urban solar power plants	◆ A "digital diet" program to reduce the energy load and network saturation (how to archive documents and inform employees of regulatory retention periods)	
	Testing and development of systems to recover energy generated and stored underground	◆	
	Continuation and development of projects to recover heat from wastewater and use it to heat buildings (e.g., city pools in Aspirant Dunand and Butte-aux-cailles)	◆	
	Transforming power grids into smart systems by 2030	◆	
Public, active and clean transportation	Low emission zone throughout the Paris metropolitan area	Development of the "car-free day" project	Detailed solutions: Paris Pedestrian Strategy (Stratégie Paris Piéton) (2017); Paris Cycling Plan (Plan Vélo de Paris) (2015)
	Transforming the Paris ring road	◆	
	"Paris Breathes" (<i>Paris Respire</i>) "breathing spaces" (<i>espaces de respiration</i>) program in all Paris neighborhoods, every Sunday and holiday from now until 2024.		
	New bike lanes, provision of more bicycle parking spaces	◆	
	Supporting the development of remote workplaces through the creation of premises in public and private buildings	◆	
	Construction of multi-modal logistics platforms for low-carbon freight transport	◆	

	Parking spaces for deliveries and services	◆	
Low-carbon and energy-positive buildings	<p>Renovation of 1 million apartments by 2050.</p> <p>Renewable or recovered energy equivalent to 60% of energy demand from now until 2030 and 100% by 2050 for all new buildings</p> <p>Easily adaptable (flexible/reversible) new office space: 30% target by 2030 , and 50% by 2050.</p> <p>Promoting common and shared spaces (work rooms, libraries, workshops, laundry rooms, etc.) in new buildings</p> <p>10% of adaptable and multi-purpose public facilities by 2025</p>	<p>◆</p> <p>◆</p> <p>◆</p> <p>◆</p> <p>◆</p> <p>◆</p>	<p>Strengthening the role of building caretakers (building caretakers), supporting their professional development (courses, training)</p> <p>Developing an action plan to establish energy poverty prevention policies (technical solutions and social support)</p> <p>Detailed solutions: Master Plan for the Energy Efficiency of Public Buildings (Schéma Directeur de Performance Énergétique des Bâtiments Publics) (in development)</p>
Climate-neutral, friendly city	<p>A Local Land-Use Plan with a stronger focus on energy, climate and urban greening issues</p> <p>New urban projects from 2030 which are carbon-neutral throughout their life cycle, i.e., from raw material extraction to construction to waste disposal</p> <p>"Concerted Renovation Zones" – combining energy renovation projects into zones</p>	<p>◆</p> <p>◆</p> <p>◆</p>	<p>New professions/roles related to sustainable urban development (energy coordinator, eco-manager)</p> <p>Detailed solutions/references: Paris Local Land-Use Plan (PLU); Saint Vincent-de-Paul Designated Development Zone project (the first carbon-neutral and resilient urban project)</p>
Closed-loop waste management with no unrecoverable waste	<p>Expansion of sorting and recovery centers to establish 20 recycling centers and associated repair shops by 2020</p> <p>Installation of sorting systems in all public places, including the "Trilib" system</p> <p>Installation of bulk composters at residential blocks and public facilities</p>	<p>◆</p> <p>◆</p> <p>◆</p>	<p>Zero waste events: from 100% disposable to 100% reusable</p> <p>Encouraging Parisians to change their habits and better manage their waste</p>

	<p>Development of organic waste recovery facilities (biogas production and industrial composting)</p> <p>50% "landfill-free construction" by 2030 and 100% by 2050</p>	<p>◆</p>	
Sustainable food	<p>Supporting urban agriculture in open spaces and on the walls and roofs of municipal buildings</p> <p>Providing information on urban agriculture and raising awareness of agricultural professions and food by establishing urban educational farms in large green spaces in central Paris</p> <p>Supporting the development of community gardens</p>	<p>❖ Encouraging stakeholders, partners and property owners to submit urban agriculture and permaculture projects</p> <p>❖ Encouraging involvement in permaculture (permaculture courses at École du Breuil, in conjunction with the Ferme de Paris organic educational farm and gardening workshops)</p> <p>❖ Promoting access to raw, fresh and local ingredients for the least well-off Parisians, shared kitchens for people in hostels, hotels or without enough cooking space</p> <p>Working with local stakeholders to ensure that everyone has access to meals containing more plant-based products; organizing a vegetarian day (no meat or fish)</p>	<p>Detailed solutions/references: The Parisculteurs project; Sustainable Food Plan</p>
Improving air quality	<p>Continuing to introduce the Zone à Circulation Restraint (ZCR), which will gradually exclude the most polluting vehicles according to their Crit'Air emissions stickers</p> <p>Implementing a restricted traffic zone (1st, 2nd, 3rd and 4th districts); introducing ultra-low emission routes (AUBE)</p>	<p>◆ Assisting individuals in purchasing non-polluting vehicles ("Air'volution" rating system)</p> <p>◆ Supporting the replacement of existing heating systems with high-efficiency wood-burning appliances and the conversion of open fireplaces to closed fireplaces with filters (fund for individuals)</p>	<p>Detailed solutions: Paris Environmental Health Plan (2015), Paris Resilience Strategy (2017); Paris Biodiversity Plan (2015); Paris Adaptation Strategy (2015); Paris</p>

	<p>Increasing the number of quieter and greener streets in each district</p> <p>Improving air quality in public transport, especially in underground rail transport</p>	<p>❖</p> <p>◆</p>	<p>Atmospheric Protection Plan.</p> <p>Providing information on effective ventilation and air circulation systems, as well as building materials and techniques to avoid; raising awareness and training professionals in this field</p>
<p>Strengthening solidarity and resilience in response to heat waves</p>	<p>Creating or providing at least 300 cold weather islands by 2030 (including museums, libraries, swimming areas, green spaces, etc.).</p> <p>Creating more "school oases": schools that have replaced asphalt with greenery</p> <p>Supporting the creation of building guidelines adapted to climate change, particularly relating to summer temperatures</p> <p>Improving insulation, solar protection and ventilation by including a "summer comfort" aspect in all energy renovations conducted by the city or submitted for authorization</p> <p>Making better use of roofs so they can help produce three resources: renewable energy from solar panels, food through urban agriculture, and water through rainwater harvesting and storage (roofs that cannot produce at least one of these resources should be covered with vegetation or reflective paint)</p>	<p>◆</p> <p>❖</p>	<p>Interactive map and app for identifying places to escape the heat</p> <p>Create a "civic solidarity network" that trains residents to become a force for resilience at the micro-local level</p> <p>Creating more social areas in neighborhoods in the form of local mutual aid networks, socially responsible stores and community venues</p>
<p>Biodiversity</p>	<p>Creating new gardens and green spaces by 2030, more urban greenery (plants around trees, in windows, greening of streets and stairs, etc.).</p>	<p>❖</p>	<p>Encouraging tree planting by various stakeholders (residents, businesses, organizations) and informing Parisians about the city's arboreal heritage and its</p> <p>Detailed solutions: Paris Biodiversity Plan (2015)</p>

	<p>Increasing the canopy of urban trees by 2%, equivalent to over 20,000 new trees</p> <p>Creating a composition of small urban forests, acting as shelters that offer cooler temperatures on hot days, by 2050</p> <p>Using permeable and bright materials and addition of vegetation during road system reconstruction</p> <p>Creating a green "lung" in the center of Paris, a common area with quiet traffic; prioritizing: street play, "lively" neighborhoods, urban vegetable gardens, community gardens, and pedestrian access to schools and other facilities</p>	<p>environmental value through geolocation tools</p> <p>❖ Encouraging tree planting and providing information about the city's arboreal heritage and its environmental value</p> <p>❖</p> <p>❖</p> <p>❖</p>	
Diversified water use	<p>Creating new ponds, reservoirs and rain gardens</p> <p>Increasing the availability of drinking water in public spaces by adding new water fountains</p> <p>Opening new swimming pools and swimming areas</p> <p>Developing solutions using non-potable water (including mine water and rainwater) for various applications</p> <p>Building structures for managing rainwater, such as impervious floodwater retention areas, reservoirs with variable water levels, parks that serve as floodplains, rainwater retention basins.</p> <p>Disconnecting rainwater from the sewer system (5th, 12th, 13th districts)</p>	<p>❖</p> <p>◆</p> <p>◆</p> <p>◆</p> <p>◆</p> <p>◆</p>	<p>Detailed solutions: Paris Biodiversity Plan (2015); Master Plan on non-drinking water uses and the non-drinking water network (2015); Paris Rain Plan</p>
Building engagement		Information campaign aimed at all audiences	Example projects: "Climate Kit" (in



Developing a "Climate Kit" including references, solutions and a compilation of local events to help people understand climate change

Creating a team of 150 Climate Ambassadors (volunteers) to encourage citizens to get involved in the city's climate neutrality program and increase its resilience

Informing children about sustainability from an early age and throughout their schooling

Encouraging behavioral change, through educational tools, training programs, competitions

Supporting the use of existing spaces to provide places where people can meet to talk to others or receive training on environmental and social issues

Supporting sustainable activities of the real estate sector

Promoting sustainable tourism

Engaging shopkeepers and small businesses in efficiency measures

Uniting activists linked to the sports sector to take action on climate and air quality

Developing low-carbon healthcare

development); Paris Commerce Énergie (a way for companies to cut energy costs); Clim'Way Paris® (a game in which players take part in Paris' fight against climate change); a simulator of CO₂ emission from food to raise awareness of greenhouse gas emissions from food; the solar registry (an interactive web app); CoachCopro®, developed by APC; Climat En'jeux (a game to develop green behavior), etc.

Encouraging higher education institutions and researchers to get involved in the energy transformation process

CPH 2025 Climate Plan Roadmap 2021-2025 (2020)

Key activities	Spatial activities/infrastructure: ❖green ◆grey	Social activities	Comment
Energy-efficient operations		<p>Working with building owners to reduce heat consumption through intelligent management systems</p> <p>Cooperation of the city with property administrators to reach out to cooperatives and associations with offers of energy efficiency initiatives</p>	
Renovations and new investments	Energy modernization of urban areas and buildings (reducing energy consumption by at least 20-30%)	◆	
Reconstructions	Conversion of oil-heated buildings	◆	
Photovoltaic modules	Preparing a plan for the development of photovoltaic systems (PV Action Plan).	◆	
Carbon-neutral district heating	Development of district heating production	◆	
	Development of the district heating system	◆	
Carbon-neutral utilities	Development of biogas production	◆	
	Development of the city's cooling network	◆	
	Transforming water and sewage systems and wastewater treatment plants to achieve climate neutrality	◆	
Wind and sun	Construction of onshore wind turbines	◆	

	Construction of offshore wind turbines	◆	
	Construction of large-scale photovoltaic systems	◆	
Raw materials and waste	Establishment of material recovery facilities (Dirty MRF)	◆	
	Biogas production from household waste	◆	
Mobility	Creation of a marine environmental zone in the inner basin of Copenhagen		
Energy consumption of the city	Energy-efficient operation of new city buildings	◆	
	Replacement of street lighting with more energy-efficient solutions (LED)	◆	
Urban forests	Planting 100,000 trees in Copenhagen	❖	
	Purchase of agricultural land outside the city to create new semi-urban woodlands	❖	
Training and information			<p>Climate Ambassador Training Programme (instilling in students the resourcefulness and motivation to be active co-creators and communicators of a sustainable future)</p> <p>Climate Action Showroom (inspiring politicians, experts, planners, educators, civic groups and students to get involved in climate action)</p> <p>Climate Training Programme (providing all children and youth with climate training)</p>

Copenhagen Climate Adaptation Plan (2011)

Key activities

Spatial activities/infrastructure: ❖green ◆grey

Social activities

Comment

Protection from rainstorms	Establishment of rainwater retention tanks (Harrestrup Å and Søborghusrenden area)	◆	Informing the public and businesses about opportunities for building resilience against climate change
	Disconnection of rainwater from the sewer system using SUDS [Sustainable Urban Drain System]	◆❖	
	Setting up pumps	◆	
	Use of solutions to drain rainwater from town squares, sports facilities, parks, streets, buildings (<i>Plan B Solutions</i>)	◆❖	
	Protecting vulnerable infrastructure – subways, trains, tunnels, historical buildings		
	Moving electrical cabinets from low locations	◆	
	Relocating vulnerable functions from the basement level (service rooms, electrical panels, etc.).	◆	
Protection against high water levels	Creating embankments	◆	
	Raising buildings	◆	
	Establishment of a high water warning system	◆	
	Protection of exposed infrastructure – subways, trains, tunnels		
	Relocation of vulnerable infrastructure and functions	◆	
Protection against high temperatures and heat islands	Creating green structures, preserving and complementing existing green infrastructure and incorporating SUDS solutions	❖	
	Establishment of retention tanks	◆	
	Creating green walls and other street greenery, rain gardens, green roofs, new tree plantings	❖	

Groundwater	<p>Sealing basements and foundations in relation to the current groundwater level in public buildings</p> <p>Sealing and regular maintenance of sewage and water supply systems</p> <p>Adapting local plans to projected groundwater and rainwater levels and sea levels</p>	<p>◆</p> <p>◆</p>	
Countering indirect threats	<p>Providing access to cool spaces in buildings and outdoors (in playgrounds, schools, kindergartens, shopping malls, cinemas, etc.).</p> <p>Creating greater biodiversity, e.g. by selecting plants that are more tolerant of moisture and periodic flooding</p>	<p>◆❖</p> <p>❖</p>	Room for Nature - A Strategy for Biodiversity (2011)
Green Copenhagen	<p>Preparing a plan for the development of blue and green infrastructure</p> <p>Developing a cost-effective and sustainable irrigation system that collects rainwater for watering street trees in the city, etc.</p> <p>Preparing a climate change-adapted planting strategy for parks and green spaces</p>	<p>❖</p> <p>❖</p> <p>❖</p>	
Buildings and roads	<p>Registering the current status and safety of city buildings and roads and preparing an action plan, including an analysis of investment needs</p>	<p>◆</p>	<p>Preparing informational materials and campaigns on the possibility of making buildings climate resilient</p> <p>Preparing guidelines and materials for city government employees to provide basic knowledge of the importance of climate change and opportunities for public action</p>

Climate Strategy for Oslo towards 2030 (2020)

Key activities	Spatial activities/infrastructure: ❖green ◆grey	Social activities	Comment
Land development	Managing forested areas in and around Oslo to conserve carbon storage and enable nature to adapt to climate change	❖	
	Preservation and restoration of watercourses, fjords, parks and outdoor recreation areas	❖	
	Development of the city from the center outward, with higher density around public transport nodes	◆	
Transport	Preferred transportation: on foot, cycling, public transportation. Reducing vehicle traffic by 20 percent by 2023 and by a third by 2030 compared to 2015 (including accelerated construction of bicycle infrastructure)	◆	
	Parking spaces and taxi ranks in the city center for zero-emission vehicles; pilot project to establish a zone that allows only private and commercial zero-emission vehicles	◆	
	Development of zero-emission ports including infrastructure for electric ship charging	◆	
Building and construction	Building and construction free of fossil fuels and then emission-free by 2030	◆	
Energy	Locally produced energy (including more solar panels on rooftops)	◆	
	Efficient use of electricity and heat and reduction of energy consumption in buildings	◆	
Consumption	Reducing emissions associated with the consumption of building materials in construction and building projects, including more flexible buildings (used for multiple purposes), built using climate-friendly materials	◆	Outreach activities to help residents make climate-friendly consumer choices

Climate management

Encouraging climate-friendly behavior among residents and the business community through communication, dialogue, training and cooperation

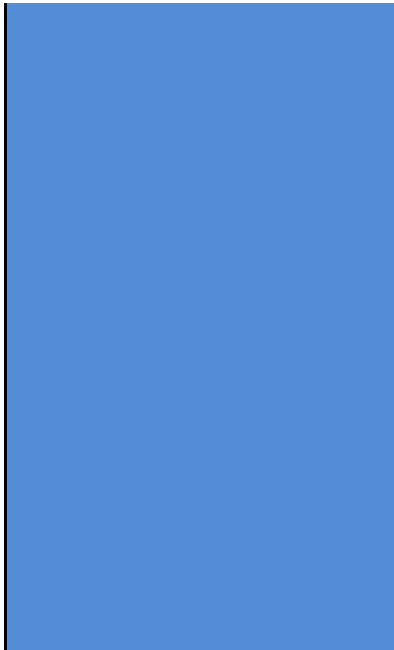
Developing climate-friendly innovations and restructuring by working closely with the city's business community with scientists, organizations and residents

OneNYC2050 (2019)

Key activities	Spatial activities/infrastructure: ❖green ◆grey	Social activities	Comment
Ensuring clean electricity	<p>Creating a renewable electricity grid — gaining access to large-scale renewable energy sources such as solar, hydroelectric, and onshore and offshore wind outside the city limits</p> <p>500 MW of energy storage (permits for all small and medium-sized installations)</p> <p>More solar and green roof installations on new sites across the city, expansion of the accelerator program</p>	<p>◆</p> <p>◆</p> <p>◆❖</p>	
Reducing greenhouse gas emissions and increasing energy efficiency	<p>Mandatory energy consumption limits for existing buildings, drastic emissions reductions in buildings over 25,000 square feet</p> <p>Zero net emissions for all new buildings</p>	<p>◆</p> <p>◆</p>	<p>1.5°C: Aligning New York City with the Paris Climate Agreement (2013)</p>

	<p>Reducing greenhouse gas emissions in city-owned buildings (portfolio-based approach for city buildings) ◆</p> <p>Zero net emissions at municipal wastewater treatment facilities – fermentation of wastewater and organic waste and generation of renewable electricity ◆</p>	
<p>Promoting sustainable transport</p>	<p>Increasing the number of publicly available electric vehicle chargers – installing a network of fast charging stations on city-owned land ◆</p> <p>Sectioning off street space near the curb for zero-emission vehicles ◆</p> <p>Introduction of commercial waste collection zones</p>	
<p>Adopting a zero waste strategy</p>	<p>Zero-waste buildings in all new government building projects ◆</p>	
<p>Supporting residents to transition to a more sustainable lifestyle</p>		<p>Expanding the GreenNYC program (a program that supports residents' behavior that contributes to emissions reductions) to include single-use plastics and other non-recyclable or compostable waste, as well as campaigns supporting residents in switching to electric vehicles and implementing energy efficiency measures</p> <p>Expanding the NYC Carbon Challenge (a program targeting New York City institutions committing to reduce emissions beyond what is required by law) to measure additional sources of emissions, including transportation and waste, and expanding to include new building categories</p>

		<p>More sustainable consumption practices in government operations (ending the purchase of unnecessary disposable plastic food items, reducing beef purchases and phasing out the purchase of processed meat)</p> <p>Expanding climate and sustainability education in schools and engaging young people in climate action (Solar Schools curricula and youth climate summits)</p>	
<p>Reduce physical risks associated with climate change through strategic projects</p>	<p>Coastal protection – projects located in Lower Manhattan, Red Hook, the Rockaways, Jamaica Bay, the East Shore of Staten Island and other threatened areas</p> <p>Strengthening energy and telecommunications resources, as well as transportation services, wastewater treatment plants and sewage piping to ensure the continuity of strategic services</p> <p>Improving the condition and resilience of green and natural infrastructure for more effective stormwater management, coastal protection and heat mitigation, and providing spaces that offer opportunities for education, engagement and management, and fostering social interaction</p>	<p>◆</p> <p>❖</p>	<p>Detailed solutions are specified in the following projects: Lower Manhattan Climate Resiliency Study; Battery Wharf Reconstruction Project, Battery/South Battery Park City Resiliency Project, Two Bridges Coastal Resiliency Project; Financial District and South Street Seaport Climate Resiliency Master Plan and in Climate Resiliency Design Guidelines; Coastal Protection Design Guidelines (in development); NYC CoolRoofs program</p>
<p>Supporting residents in adaptation activities</p>		<p>Increasing awareness of flood risk, use of flood insurance and building resilience (for property owners and tenants in floodplains)</p>	<p>Examples of activities: Community Preparedness Boot Camps; "Be a Buddy" media campaign; annual</p>



Increasing civic engagement (promoting volunteer opportunities, building volunteer capacity in non-profit organizations and agencies that provide services to vulnerable New Yorkers, and engaging a diverse group of city residents as volunteers)

symposium for the local community and religious organizations; Community Preparedness Council (three times a year); quarterly meetings with representatives of non-profit organizations

Encouraging community organizations and small businesses to take adaptation measures (developing action plans and supporting climate-friendly investments)

Engaging residents in activities to prepare for extremely hot weather (managing street trees and green infrastructure; painting roofs white)

Creating new income opportunities through climate action

Supporting the development of companies focusing on responsible innovation (e.g. the Urbantech NYC program)

Preparing for work in the "green economy" through training programs (e.g., the City's Green Jobs Corps program)

Creating programs and new models that use the city as a platform for technology and innovation (e.g., NYCx Co-Labs and Moonshot Challenges, in which the city, businesses and communities collaborate; Demonstrations for Energy Adaptability (IDEA) – a program that engages businesses to test new or underutilized energy technologies in city-owned

buildings; and the RISE : NYC program, which provides small businesses affected by Hurricane Sandy with access to innovative technologies to support resilience)

Philadelphia Climate Action Playbook (2021)

Key activities	Spatial activities/infrastructure: ◆ green ◆ grey	Social activities	Comment
City-wide supply of clean electricity	100% renewable energy	◆	Detailed solutions: Philadelphia Energy Campaign (2016) Municipal Energy Master Plan (2017) Utility Wide Strategic Energy Master Plan (2017) Powering Our Future: A Clean Energy Vision for Philadelphia (2018) Clean Energy Vision Action Plan (2018) Philadelphia Gas Works Diversification Study (2020)
City solar installations	Removal of barriers to solar installations, including financial and legal barriers	◆	
	Promoting solar panels on rooftops and new buildings	◆	
Clean urban energy	Photovoltaic installations in municipal facilities Investigating the feasibility of installing geothermal heating, cooling and hot water systems in urban facilities	◆	
Energy efficient buildings	Legal regulations for optimizing buildings for energy efficiency	Programs aimed at low-income residents to increase energy efficiency and comfort in their homes	
Reducing energy consumption in the city	LED street lighting throughout the city	◆	
Low-carbon thermal energy	Promoting geothermal heating and cooling systems and solar thermal systems	◆	

Transit	A citywide transit plan that expands transit routes for public and active transportation	◆		Detailed solutions: Vision Zero Action Plan (2017); Connect: Philadelphia's Strategic Transportation Plan (2018); Energy Action Plan (2018); Philadelphia Trail Plan PCPC (2018); Municipal Clean Fleet Plan (in development); Public Transit Plan (in development).
	Development plans and projects to promote public and active transportation options	◆		
High quality bus network	Identifying opportunities to improve transit routes (e.g., the <i>Roosevelt Boulevard:Route for Change</i> project)	◆		
Network of high-quality bicycle lanes	Increasing the number of bicycle lanes in the city to 300 miles	◆	Development of the IndeGo bike sharing program	
Reduction of waste	Pilot project of municipal composting plants		<p>Engaging residents, businesses and institutions in reducing waste and litter through digital media, grassroots efforts and education</p> <p>Zero Waste Partnership Program</p> <p>Projects aiming to reduce wasting food</p> <p>Expanding the Community Composting Network (increasing residents' access to composting)</p>	The Zero Waste and Litter Action Plan (2017);Utility Wide Strategic Energy Master Plan (2017); Municipal Waste Management Plan (2018); Litter Index Report (2019); Municipal Building Waste Audit Report (2019); Compost Feasibility Study (in development).
Clean public space			Expansion of the PPP Community Cans program (increasing the coverage of rubbish bins)	Detailed solutions: Green City Clean Waters (2011); Urban Forest Strategic Plan (in development); Urban Agriculture Master Plan (in development);
Green public space	Increasing the number of trees throughout the city (TreePhilly and Green City programs, Clean Waters)	❖		
	Developing an Urban Forest Strategic Plan (identifying opportunities for evenly integrating vegetation into the urban fabric)	❖		

Climate change-oriented planning	Creating a city-wide adaptation plan that takes into account the impact of climate change on future planning		Detailed solutions: Growing Stronger: Towards a Climate-Ready Philadelphia (2008); Eating Here: Greater Philadelphia's Food System Plan (2011); Good Eats Report (2019); Urban Agriculture Strategic Plan (in development); Citywide Climate Change Adaptation Plan (in development).
Communities prepared for climate change		<p>Implementing the recommendations of the <i>PDPH Climate Change and Health Plan</i></p> <p>Local (neighborhood) activities, such as <i>Beat the Heat Hunting Park</i></p>	
Green labor force		<p>Developing a clean energy workforce (PEA, GreenFutures and PowerCorpsPHL)</p> <p>Encouraging businesses to take sustainable actions (Zero Waste Partnership Program, corporate tax relief)</p>	
Local food	Development of FarmPhilly projects, the Urban Agriculture Master Plan	❖	
Engaging citizens in climate action		Empowering residents to take climate action at home, work and in their community (Greenworks on the Ground and Citizens Planning Institute programs and events such as the Philly Spring Cleanup)	