CITY OF
PALO ALTO

2020 Sustainability and Climate Action Plan
Potential Goals and Key Actions

DRAFT

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2020 SUSTAINABILITY AND CLIMATE ACTION PLAN POTENTIAL GOALS AND KEY ACTIONS

Palo Alto has long been a leader in sustainability, making impressive progress towards reducing its carbon impacts, greenhouse gas emissions, and resource consumption since adopting a Sustainability Policy[1] in 2001, reflecting the City's intention to be a sustainable community - one which meets its current needs without compromising the ability of future generations to meet their own needs. Since then, the City has undertaken a wide range of initiatives to improve the sustainability performance of both government operations and the community at large, including: adopting one of the first municipal Climate Action Plans[2] in the US in 2007; adopting a Sustainability and Climate Action Plan (S/CAP) Framework[3] in 2016, which includes an aspirational goal of reducing Greenhouse Gas (GHGs) emissions 80 percent below 1990 levels by 2030[4]; providing 100 percent carbon neutral natural gas since July 2017 — making the City of Palo Alto Utilities the first utility in the world to provide carbon neutral electricity and natural gas as a standard to all customers — having provided 100 percent carbon neutral electricity since 2013; and, in December 2017 accepting the 2018-2020 Sustainability Implementation Plan (SIP) "Key Actions" as a summary of the City's work program[5]. Sustainability is also embedded in the 2030 Comprehensive Plan[6] (adopted in 2017), with 10 goals and over 50 actions outlined in the 2030 Comprehensive Plan Implementation Plan that are explicitly or implicitly related to sustainability.

While GHG emissions reduction is not the only goal of the S/CAP, it is a major one. To achieve an 80 percent reduction target by 2030, Palo Alto will need to meet a target "GHG reduction budget" of about 224,600 MT CO2e[7]. The analyses in the 2016 S/CAP Framework (conducted in 2014-2015) projected that more than half of the needed additional reductions (117,900 MT CO2e) could come from mobility related measures, just under half (97,200 MT CO2e) from efficiency and fuel switching measures (largely in buildings), and about four percent (9,500 MT CO2e) from continuation and extension of Palo Alto's zero waste initiatives. These reduction targets are outdated and don't include recent sustainability initiatives, actions, and projects. The analyses will be revised to include current information and staff will update this document when more accurate reduction targets are established.

As a result of various City-led initiatives, programs, and activities focused on climate change and sustainability, by the end of 2018 Palo Alto had reduced GHG emissions an estimated 56.5 percent from the 1990 baseline, despite a population increase of 20.4 percent from the 1990 baseline.

[1] https://www.cityofpaloalto.org/civicax/filebank/documents/7856
[2] https://www.cityofpaloalto.org/civicax/filebank/documents/9946
[3] https://www.cityofpaloalto.org/civicax/filebank/documents/60858
[4] https://www.cityofpaloalto.org/news/displaynews.asp?NewsID=3534&TargetID=268
[5] https://www.cityofpaloalto.org/civicax/filebank/documents/63141
[6] https://www.cityofpaloalto.org/civicax/filebank/documents/62915
[7] MT CO2e = metric tons of CO2 equivalent

Overall, the performance of City Municipal Operations showed a 65.8 percent reduction in Scope 1 and Scope 2 emissions[8] from the 2005 baseline year.

For the City to continue progress towards its climate and sustainability goals and targets, a 2020 S/CAP Update is necessary to further study the highest impact actions to take. While the SIP focused on two key concerns—CO2 emissions and Water—and four key areas of activity: Energy, Mobility, Electric Vehicles, and Water, the 2020 S/CAP Update will include Key Actions in the following areas: Energy, Mobility, Electric Vehicles, Water, Climate Adaptation and Sea Level Rise, Natural Environment, and Zero Waste. This document outlines the proposed goals and Key Actions that will be the foundation for the 2020 S/CAP. Some of the Key Actions can be readily implemented at a staff level; some will require review and approval by Council; and some may require environmental review, including under the California Environmental Quality Act (CEQA), prior to adoption and implementation. All of the Key Actions will go through an impact analysis, which will detail the costs and benefits (including co-benefits), expected GHG remissions reductions, and sustainability benefits. In addition, in March 2019 Council approved a Sea Level Rise Adaptation Policy to provide a roadmap for creating a comprehensive Sea Level Rise Adaptation Plan, which will be incorporated into the 2020 S/CAP Update.

The City is fully committed to a sustainable future. The City owns, operates, and maintains a full-service utilities portfolio that provides electric, gas, water, and wastewater services to residents and businesses in Palo Alto. Palo Alto's continued leadership in advancing sustainability commitments has succeeded mainly because of the continued cooperation across City Departments and diverse community stakeholders, and the support of City Council. The 2020 S/CAP will be a major step forward towards the 2030 goal of 80 percent GHG reduction, which far exceeds the state of California's world-leading reduction goals of 40 percent by 2030 and 80 percent by 2050. As the rest of the country looks to California for leadership in sustainability, the City of Palo Alto will continue to lead by example.

Key Timeline Dates:

- February 2020: Council Informational Report on 2020 S/CAP Update
- March 2020: Council Approval of 2020 – 2021 Sustainability Work Plan
- March 2020: 2020 S/CAP Update Community Engagement Workshop
- April – October 2020: 2020 S/CAP topic – specific meetings
- Spring 2020: Sea Level Rise Vulnerability Assessment commences
- May 2020: Updated Business as Usual Forecast completed
- Summer 2020: Impact Analysis of 2020 S/CAP Key Actions completed
- Fall 2020: Council Study Session on 2020 S/CAP Update
- Fall 2020: 2020 S/CAP Summit to finalize goals and Key Actions
- December 2020: Draft CEQA Report completed

[8] Scope 1 and Scope 2 emissions are non-biogenic emissions that are caused by human activity. Biogenic emissions are assumed to be net carbon neutral and not reported under GHG emission reporting protocols. Scope 2 emissions from electricity were eliminated starting in 2013 by the purchase of Renewable Energy Credits (RECs) under the Carbon Neutral Plan.

- April 2021: Final CEQA Report completed
- April 2021: Sea Level Rise Adaptation Plan completed
- April 2021: Council Adopts 2020 S/CAP Update
- 2025: Update the S/CAP with further key actions
- 2030: Achieve S/CAP Goals, including 80% GHG Reduction

2020 Sustainability and Climate Action Plan GOALS

- Reduce Greenhouse Gas (GHG) emissions from the direct use of natural gas in Palo Alto's building sector by 40% below 1990 levels by 2030
- Increase Heat Pump Water Heater adoption to 25% by 2030
- Increase all-Electric homes to 10% of all residential single-family homes by 2030

- Increase active transportation mode share to 25% for local work trips by 2030.
- Increase availability of transit and shared mobility services by increasing to 75% the proportion of residents within a quarter-mile walkshed of frequent transit by 2030.
- Implement Complete Streets and build out the Bicycle and Pedestrian Transportation Plan.

- Increase the number of EVs registered in Palo Alto, as a share of total vehicles registered, from 7% in 2018 to 50% by 2030
- Target to facilitate 50% of vehicles owned by low income households to be EVs by 2030
- Ensure there are adequate numbers and types of EV chargers in Palo Alto to support the growing number of EVs registered in and commuting to Palo Alto
- Expand the number of EVs in the City's fleet as the EV fleet market evolves

- Reduce per capita water use compared to 2019
- Increase the percentage of recycled water used (volume of recycled water/recycled water filter capacity) by 10% in 2022 compared to 2019
- Reduce the total dissolved solids by 50% compared to 2019 base year
- Manage stormwater to slow the flow to receiving waters and improve water quality to protect the SF Bay, while also treating it as a beneficial resource for alternative uses

- Develop a multi-year Sea Level Rise Adaptation Plan for Council Review by April 2021 to include a sea level rise vulnerability assessment and a community engagement strategy for plan development and implementation

- Renew, restore, and enhance resilience of our natural environment
- Maximize biodiversity and stewardship of flora, fauna, and air, soil, and water resources
- Reduce environmental impacts of our actions
- Increase tree canopy to 40% city-wide coverage by 2030
- Expand the designation of pesticide-free parks and city facilities

- Divert 95% of waste from landfills by 2030, and ultimately achieve zero waste to landfill
- Implement short- and medium-term initiatives identified in the *2018 Zero Waste Plan*

ENERGY

Building efficiency and electrification are key to achieving Palo Alto's - and California's – greenhouse gas (GHG) reduction goals. Overcoming building electrification barriers at both the local and regional level will be necessary to increase market adoption in existing buildings. Electrification - and encouraging existing buildings to upgrade to modern energy efficiency levels - may pose significant strategic and operating challenges for the City of Palo Alto Utilities (CPAU) but is an important strategy to meeting the City's aggressive GHG reduction goal.

GOALS

- Reduce GHG emissions from the direct use of natural gas in Palo Alto's building sector by 40% below 1990 levels by 2030
- Increase Heat Pump Water Heater adoption to 25% by 2030
- Increase all-Electric homes to 10% of all residential single-family homes by 2030

KEY ACTIONS

- Meet or exceed City Council-adopted energy efficiency targets
- Explore electrification of city-owned facilities with the goal of phasing out fossil fuel use in existing municipal buildings
- Phase out fossil fuel use in new and existing buildings through a combination of programs & mandates (includes partnerships and collaborations to support market transformation)
- Increase awareness and adoption of efficient electric alternatives to gas appliances and all-electric buildings through community engagement
- Implement an all-electric utility rate
- Explore opportunities to increase energy resilience (e.g. energy storage, microgrids)
- Explore the impact of building decarbonization on City's gas utility and develop mitigation strategies
- Continue to purchase carbon offsets to match natural gas emissions as a transitional measure. Evaluate potential local offset purchases

KEY PERFORMANCE INDICATORS

- GHG emissions from the building sector
- Heat Pump Water Heater plus new residential construction permits
- Number of all-Electric homes / customers on all-electric utility rate

Emissions from natural gas use represent about 32 percent of Palo Alto's remaining carbon footprint if we exclude PaloAltoGreen Gas offsets. The decreasing emissions of California and Palo Alto's energy supply due to renewable energy opens the opportunity to reduce natural gas use through electrification in addition to continued efficiency measures. Palo Alto will first seek to reduce natural gas usage through energy efficiency and conservation, followed by electrification of water heating, space heating, clothes drying and cooking where practical and cost effective.

MOBILITY

Road transportation represents the largest percentage of Palo Alto's existing carbon footprint – and a congestion headache. GHG emissions are a function of two factors: Vehicle Miles Traveled (VMT), addressed here, and the carbon intensity (GHG/VMT), addressed in the next section. Reducing GHG/VMT is largely driven by Federal Standards, state policy and vehicle offerings (including fuel efficiency and EVs). However, VMT and EV adoption can be influenced by local programs and policies.

GOALS

- Increase active transportation mode share to 25% for local work trips by 2030.
- Increase availability of transit and shared mobility services by increasing to 75% the proportion of residents within a quarter-mile walkshed of frequent transit by 2030.
- Implement Complete Streets and build out the Bicycle and Pedestrian Transportation Plan.

KEY ACTIONS

- Fund the TMA with the goal of reducing SOV commute-trips downtown by 30%.
- Make transit investments that significantly enhance coverage, service quality, frequency, speed and/or access.
- Expand and improve bicycle and pedestrian facilities, connectivity, convenience, and/or safety in a manner that significantly increases the % of trips taken by walking or biking.
- Adopt TDM Ordinance per Comp Plan Policy.
- Increase the number of City Employees utilizing commute benefits.
- Encourage the use of bike and/or scooter sharing, and the provision of required infrastructure throughout Palo Alto, especially at transit stations and stops, job centers, community centers, and other destinations.
- Enhance traffic signals to improve traffic flow and reduce idling and associated GHG emissions.
- Increase the number of bike facilities, including bike parking and signalized intersections with bicycle accommodations (e.g. bicycle signal heads, bicycle detection, colored bicycle lanes)

KEY PERFORMANCE INDICATORS

- Commute mode share for all modes
- Transit ridership and proportion of residents within a quarter-mile walkshed of frequent transit
- Commute Benefits participation by City Employees
- Miles of bikeways and number of enhanced intersections

The mobility marketplace is changing rapidly: Lyft and Uber are changing the landscape; Autonomous Vehicles are anticipated to increase in market share; and, land use and mobility interact in substantial and complex ways.

ELECTRIC VEHICLES

More than half of Palo Alto's emissions come from transportation, making adoption of Electric Vehicles (EVs) a crucial component to reaching our carbon reduction goals. Compared to fossil fuel vehicles, EVs are cheaper to drive, have lower maintenance costs, and produce no emissions. Driving and charging an EV in Palo Alto especially makes sense given the City's carbon neutral electricity supply and low electric retail rates.

GOALS

- Increase the number of EVs registered in Palo Alto, as a share of total vehicles registered, from 7% in 2018 to 50% by 2030
- Target to facilitate 50% of vehicles owned by low income households to be EVs by 2030
- Ensure there are adequate numbers and types of EV chargers in Palo Alto to support the growing number of EVs registered in and commuting to Palo Alto
- Expand the number of EVs in the City's fleet as the EV fleet market evolves

KEY ACTIONS

- Ensure that at least 75% of the community is aware of the environmental and economic benefits of electric vehicles and the programs available to them.
- By 2022 quantify the public and private EV charger network needed within the community to support 50% EV penetration in Palo Alto, and develop an implementation plan to establish that charging network.
- Develop programs to assist and incentivize private EV charging installations in hard to reach locations such as multifamily properties, non-profits, and small commercial sites to ensure adequate and diverse EV charging infrastructure.
- By 2022, develop a strategic plan to encourage charging of inbound EVs within Palo Alto.
- Continue to electrify municipal fleet as opportunities arise, and by 2021 develop a comprehensive fleet electrification workplan and associated EV charging needs.

KEY PERFORMANCE INDICATORS

- EVs registered in Palo Alto
- EVs registered in low income households in Palo Alto
- Percentage of EVs in City's fleet and availability of municipal charging infrastructure
- Number and type of EV charging ports/infrastructure in Palo Alto
- Percentage reduction of transportation-related emissions due to EVs

Palo Alto has the highest adoption rate of Electric Vehicles (EVs) in the US, with 1 in 3 new vehicles registered as electric in 2017. Survey results show that 70% of Palo Alto residents are extremely interested in their next vehicle to be an EV if they knew EV charging would be readily available.

WATER

Water is a limited resource in California, and its availability will be further impacted by climate change and new environmental regulations. Both potable water supplies and hydroelectric needs could be challenged by long-term shifts in California's precipitation regime. With shifting climate patterns, and significant long-term water supply uncertainty, it would be prudent to reduce water consumption while exploring ways to capture and store water, as well as to increase the availability and use of recycled water.

GOALS

- Reduce per capita water use compared to 2019[9]
- Increase the percentage of recycled water used (volume of recycled water/recycled water filter capacity) by 10% in 2022 compared to 2019
- Reduce the total dissolved solids by 50% compared to 2019 base year
- Manage stormwater to slow the flow to receiving waters and improve water quality to protect the SF Bay, while also treating it as a beneficial resource for alternative uses[10]

KEY ACTIONS

- Maximize cost-effective water conservation & efficiency
- Expand the use of effluent from the RWQCP through Non-Potable Reuse, Indirect Potable Reuse, or Direct Potable Reuse
- Establish quantifiable baseline and targets for implementation of green stormwater infrastructure on private property, municipal facilities and public rights-of-way by 2024
- Design and build a salt removal facility for the PA Wastewater Treatment Plant
- Develop a "One Water" Portfolio for Palo Alto

KEY PERFORMANCE INDICATORS

- Per capita water use (Gallons Per Capita Per Day)
- Percentage recycled water use
- Total dissolved solids in recycled water

Water reuse will increase in importance as California's population expands and climate change and new environmental regulations pose uncertainties in imported water supply availability. Whether a water supply shortage exists or not, "Making Water Conservation a California Way of Life" is a concept embraced by the City.

[9] Water use goals will be updated to indoor residential use targets and irrigation use targets after Making Conservation a California Way of Life regulations are established

[10] Green Stormwater Infrastructure (GSI) goals will be updated once additional quantification work is conducted over the next three years to provide accurate, realistic and publicly vetted metrics.

CLIMATE ADAPTATION AND SEA LEVEL RISE

The State of California anticipates that relative sea level rise projections stemming from GHG emissions and related climate change pose significant economic, environmental and social risks to communities along the San Francisco Bay Shoreline, including the City of Palo Alto. Research shows that these projections may worsen if GHG emission trajectories continue unabated. To prepare for rising tides in the years ahead, the City of Palo Alto City Council adopted a Sea Level Rise Adaptation Policy in March 2019 which bridges the high-altitude general policy statements in various City plans to an eventual nuts-and-bolt Sea Level Rise Adaptation Plan and timeline which staff aims to complete by April 2021.

GOAL

- Develop a multi-year Sea Level Rise Adaptation Plan for Council Review by April 2021 to include a sea level rise vulnerability assessment and a community engagement strategy for plan development and implementation

KEY ACTIONS

- Commence work on Sea Level Rise Vulnerability Assessment (Spring 2020)
- Begin development of a Sea Level Rise Adaptation Plan (specific plan elements to be determined for staff and Council consideration during 2020)
- Review the recommendations of SAFER levee alignment (SAFER is the *Strategy to Advance Flood protection Ecosystems, and Recreation* feasibility report coordinated by San Francisquito Creek Joint Powers Authority)
- Discuss the Sea Level Rise levee alignment alternatives with Valley Water and other adjacent neighboring agencies
- Implement the Sea Level Rise Adaptation Plan after Council adoption.

KEY PERFORMANCE INDICATORS

- Completed Sea Level Rise Vulnerability Assessment
- Council-approved Sea Level Rise Adaptation Plan
- Council review of proposed sea level rise levee alignments (2021)

Sea level rise in San Francisco Bay is anticipated to range between three feet to more than ten feet by 2100 with rising tides likely thereafter. In Palo Alto, many City services and infrastructure that are essential to the City's public health, safety, and economy are located within areas that are predicted to be inundated by Bay water if adaptation measures are not implemented. How will we prepare? What will we protect? How will we adapt? Where will we, if necessary, retreat?

REGENERATION AND NATURAL ENVIRONMENT

Sustainability is not only about mitigation, adaptation, and resilience, but also regeneration – identifying opportunities for renewal, restoration, and growth of our natural environment. Palo Alto will continue to build and restore the natural environment and its ecosystem services and the bio-capacity that supports it, including soils, tree canopy, biodiversity, and other components. Enhancing and maintaining Green Stormwater Infrastructure will use natural areas and systems to provide habitat, flood protection, storm water management, cleaner air, cleaner water, and human health enhancement.

GOALS

- Renew, restore, and enhance resilience of our natural environment
- Maximize biodiversity and stewardship of flora, fauna, and air, soil, and water resources
- Reduce environmental impacts of our actions
- Increase tree canopy to 40% city-wide coverage by 2030
- Expand the designation of pesticide-free parks and city facilities

KEY ACTIONS

- Explore programs and policies that use Palo Alto's public and private natural capital (e.g., canopy, soils, watersheds) to provide local carbon offsets and other environmental benefits
- Evaluate and modify plant palette selection to maximize biodiversity and soil health to adapt to the changing climate, and incorporate buffers for existing natural ecosystems
- Coordinate implementation of the Urban Forest Master Plan and Parks Master Plan to create pathways to parks and encourage appreciation of natural ecosystems
- Explore expanding the requirements of the Water Efficient Landscape Ordinance (WELO) to further the S/CAP Goals
- Implement the Green Stormwater Infrastructure plan
- Ensure No Net Tree Canopy Loss
- Develop methods to allow for both solar panels and trees
- Reduce the toxicity and the total amount of pesticides used in the city
- Ensure the protection of our ecosystem through the plan review and permitting process
- Restore degraded areas and channelized creeks and create wildlife corridors

KEY PERFORMANCE INDICATORS

- Tree Canopy
- Percent reduction of pesticide use

In 2005, Palo Alto adopted the Ahwahnee Principles for Resource Efficient Land Use[11] (as modified for local use), a set of guidelines emphasizing sustainable urban planning. These principles were developed by the Local Government Commission and modified to adapt them to the particular situation in Palo Alto.

[11] https://www.cityofpaloalto.org/civicax/filebank/documents/32650

ZERO WASTE

Reducing waste is an important strategy for both GHG reductions and overall sustainability. Approximately 42% of GHG emissions in the U.S. are associated with the flow of materials through the economy, from extraction or harvest of materials and food, production and transport of goods, provision of services, reuse of materials, recycling, composting, and disposal. Zero Waste is a holistic approach to managing materials in a closed loop system (circular economy), where all discarded materials are designed to become resources for others to use.

GOALS

- Divert 95% of waste from landfills by 2030, and ultimately achieve zero waste to landfill
- Implement short- and medium-term initiatives identified in the *2018 Zero Waste Plan*

KEY ACTIONS

- Expand the Deconstruction and Construction Materials Management Ordinance
- Eliminate disposable cups and containers by expanding the Disposable Foodware Ordinance
- Require food waste prevention and edible food recovery measures for commercial edible food generators
- Promote residential food waste reduction
- Incentivize the use of reusable diapers
- Champion waste prevention, reduction, reusables, and the sharing economy (e.g., waste prevention technical assistance for businesses, provide waste reduction grants, promote adoption of a "Zero Waste lifestyle", promote access to goods over ownership)
- Embed Green Purchasing into City procedures

KEY PERFORMANCE INDICATORS

- Diversion rate
- Number of *Zero Waste Plan*[12] initiatives implemented

Palo Alto's current diversion rate is 82%. Diversion includes all waste prevention, reuse, recycling, and composting activities that divert materials from landfills. Getting to our 95% goal will require refinement of existing programs, the addition of new policies and programs, working with manufacturers to redesign products, and working with businesses and residents that purchase products that will eventually become waste. In 2018, Palo Alto City Council accepted the updated *Zero Waste Plan*, which contains new programs and initiatives needed to meet the City's sustainability and zero waste goals.

[12] https://www.cityofpaloalto.org/civicax/filebank/documents/66620