City of Palo Alto
City Council Staff Report

(ID # 7304)

Report Type: Action Items   **Meeting Date: 11/28/2016**

Summary Title: Discuss and Approve S/CAP Framework, Principles & Guidelines

Title: Discuss and Approve Sustainability and Climate Action Plan (S/CAP) Framework, Principles & Guidelines

From: City Manager

Lead Department: City Manager

Recommendation
Staff recommends that City Council
1) Discuss and adopt the attached (Attachment A) Sustainability/Climate Action Plan Framework (S/CAP Framework), including its Guiding Principles, Decision Criteria and Design Principles as the road map for development of subsequent S/CAP Implementation Plans (SIPs); and
2) Direct Staff to return to Council with S/CAP Implementation Plans, possibly in phases, early in 2017.

Executive Summary
On April 18, 2016, Council reviewed the Draft Palo Alto Sustainability/Climate Action Plan (S/CAP), provided comments to Staff, and adopted the S/CAP's Primary Goal*: The achievement of an 80% reduction in Greenhouse Gasses (GHGs) below 1990 levels by 2030*. Staff is now returning to Council with a revised document to reflect Council guidance from the April 18 meeting.

This document is called the S/CAP "Framework" because it provides an overall perspective on the City's 2030 climate strategy, Guiding principles and Design principles, and Decision criteria, along with Strategies and Targets (with GHG estimates) from the April Draft S/CAP, and a road map for a more detailed implementation plan(s). Its significance is that it has been streamlined by moving the "action items" included in the April 2016 report into more detailed Sustainability Implementation Plans (SIPs), under development. This has allowed staff to reshape the action items from the draft S/CAP into new implementation plans with a near term, 2020 horizon. This will allow easier and more accurate assessment of the costs and ROI on recommended actions to make progress towards our 2030 goal.

Staff envisions a new SIP to be developed every following five years to guide our S/CAP efforts and inform annual budget decisions. It also allows staff to return to Council to meet your directive (C) from the April meeting, supporting the General Framework of the S/CAP. Staff thought that this bifurcation would make it clearer about support for the General Framework, understanding that some of the most intensive discussion about the S/CAP will occur during review of the specific actions in the Implementation Plans to come to Council next year. Staff appreciates that discussion on those plans could engender or require subsequent changes to the Strategies and Targets in this Framework.

In the coming months, staff will refine the S/CAP Implementation Plans, solicit community input, and bring them for review and adoption by the City Council. Staff recommends that Council adopt the S/CAP Framework now, and direct Staff to bring the Sustainability Implementation Plans (Sips) back to Council in early 2017. The initial plans are organized into seven areas, and staff may bring them back in phases.

Background

On 4/18/16 City Council received and discussed the draft Sustainability/Climate Action Plan (S/CAP), and unanimously (8-0) approved the following resolution[1]:

A. Adopt a goal of 80% greenhouse gas (GHG) reduction by 2030, calculated utilizing the 1990 baseline;
B. Direct staff to return within two months with a process for integration of the Sustainability and Climate Action Plan (S/CAP) with the Comprehensive Plan Update;
C. Support the general framework of the S/CAP;
D. Support the S/CAP Guiding Principles, which are to be reviewed and formally adopted within six months.

In response to these directives:

- (B.) Staff have developed and have begun implementing a process for integration of the Sustainability and Climate Action Plan (S/CAP) with the Comprehensive Plan Update
- (C.) Staff have formed seven inter-departmental teams to develop "Sustainability Implementation Plans" (SIPs) covering the key S/CAP sections: Mobility, Efficiency and Electrification, Water, Zero Waste, Municipal Operations, Natural Environment, and Adaptation/Sea Level Rise.
- (D.) The Framework document before the Council tonight includes the Guiding Principles

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[1] http://www.cityofpaloalto.org/civicax/filebank/documents/52025

In the context of Council's directive *supporting the general framework of the S/CAP*, since Council reviewed the draft in April, relevant developments in the City have included:

- Development of a Carbon Neutral Natural Gas strategy (which moves City the next step along the trajectory from Carbon Neutral Electricity to Carbon Neutral Utility to Carbon Neutral City);
- Adoption of an advanced Green Building Ordinance and Energy Reach Code;
- Continued analysis of electrification options;
- Exploration of Zero Net Energy buildings and districts.

Since Council reviewed the draft in April, relevant developments in the world have included:

- Paris climate agreement entered into November 4 by 195 countries;
- Governor Brown signed SB32, requiring California to reduce greenhouse gas emissions 40% below 1990 levels by 2030;
- Many more cities have committed to 100% renewable electricity.

Discussion

Staff has divided the draft S/CAP Council reviewed in April into two elements:

- A "Framework" document, including narrative, Guiding principles, Design principles and Decision criteria, and Goals and Strategies and Targets, as the base document of the S/CAP (with Action steps that were listed under strategies in the April 2016 Draft removed). The Framework document, and its 2030 trajectory, is the focus of discussion tonight.

- "Sustainability Implementation Plans" (SIPs) covering each section of the S/CAP Framework. These rework the Actions steps from the April draft (and removed from the Framework document before you). These SIPs—focused on the 2020 time frame—will include more detail than the initial lists of Action steps, including prioritized actions needed to accomplish S/CAP goals, as well as budget and staffing estimates as needed. In some cases, they also include further elaboration or clarification of goals and strategies in the April S/CAP draft.

  (Staff is completing SIPs covering the seven program chapters of the S/CAP, including mobility, efficiency and electrification, municipal operations, water, zero waste, natural environment, adaptation/sea level rise. Staff will bring these to Council for review in a series of decisions beginning in early in 2017. Staff will develop implementation plans for the other S/CAP chapters—Community Behavior and Culture Change, Utility of the Future, Information Systems, and Funding Strategies—in future work phases.)

The S/CAP Framework differs from the April draft in several ways (key changes are highlighted in Attachment A):

- Most sections have had minor modifications to goals and strategies.
- Several sections (Water, Adaptation/Sea level Rise, Natural Environment) have been substantially expanded with additional and/or modified goals, and a number of new strategies.
- The goals and strategies in the Efficiency and Electrification section have been modified and reorganized.
- The action Items have been removed and redeployed to the SIPs.

The S/CAP Framework document includes Guiding Principles, Design Principles and Decision Criteria (see Attachment C), all intended to provide a clear, shared, common platform to help Council, staff, and community stay on course as we address the dozens and ultimately hundreds of decisions that will need to be made over the coming decade in order to realize Palo Alto's 2030 sustainability and climate goals:

- The Guiding Principles provide a durable foundation "for effective and sustainable decision-making" as the City navigates the inevitable twists and turns that will arise as we implement.
- The Design Principles provide guidance to staff, Council and community in "developing and evaluating future programs" to implement the S/CAP;
- The Decision Criteria will guide Council and staff in "selecting specific programs and policies to pursue, and in allocating public resources to support them."

(Note that while Council previously called out the Guiding Principles in April, Council should pay special attention to the Decision Criteria, which can serve as a hedge against concerns about the impacts of Council's decisions.)

Staff will continue to report progress to Council annually (or more often as warranted), and anticipates updating the SIPs and the S/CAP in 2020 and 2025.

Resource Impacts
Revisions to the Framework and development of the SIPs has required an estimated 300 hours of staff time to date; resource requirements to complete the SIPs will depend on Council guidance. Recalibration of GHG reduction estimates, if desired, will require an extension of the contract with the consultants that prepared the S/CAP.

Policy Implications
As indicated above, the City Council has embraced the S/CAP goal of reducing Palo Alto's GHG emissions to 80% below 1990 levels by 2030, which will also be the horizon year of the updated Comprehensive Plan. The S/CAP also addresses a number of other sustainability topics that

overlap and complement the updated Comprehensive Plan, making coordination between the two planning efforts a critical exercise. Staff has been working to ensure this integration, has conducted a "cross-walk" analysis of both plans, assisted by a sustainability subcommittee of the Comprehensive Plan Community Advisory Committee (CAC).

While this effort is not yet complete, the two planning efforts are proceeding in parallel, including:

- Incorporation of key S/CAP goals and strategies into the Comp Plan as Comp Plan policies and programs;
- "Cross-walk" and identification and resolution of potential conflicts between the drafts;
- Incorporation of the entire S/CAP into the Comp Plan "by reference," acknowledging that the S/CAP will be a living document which is likely to be revised and updated more frequently than the Comp Plan.
- Exploration of Comp Plan references *within* the S/CAP as well.

Attachment B includes the handout prepared for the sustainability summit that summarized our initial approach to the integration of these two planning efforts.
(Note: As part of the Council's parallel discussion of the revisions to the Comprehensive Plan, it may be helpful to discuss the value of formally aligning more of the City's planning efforts like the S/CAP, the Urban Forest Master Plan, the Parks and Recreation Master Plan and detailed area plans with the General Plan (after its adoption) that forms the core of our current Comprehensive Plan.)

Environmental Review
Plans like the S/CAP are subject to review under the California Environmental Quality Act (CEQA) if they establish mandatory policies or implementation actions that may have a significant environmental impact (good or bad). This evening's recommended action would involve adoption of a policy "framework" and direction that is viewed as non-binding and thus would not be subject to CEQA. Following Council consideration of the SIPs, environmental review (potentially in the form of a separate "negative declaration" or relying on the Comp Plan EIR) would have to occur if Council chooses to adopt the S/CAP with mandatory policies, principles and actions.
Attachments:
- ATTACHMENT A: SCAP "Framework" (PDF)
- ATTACHMENT B: Handout Regarding SCAP & Comp Plan Relationship   (PDF)
- ATTACHMENT C: S/CAP Framework Excerpt: Guiding Principles, Decision Criteria, and Design Principles Summary   (DOCX)

CITY OF
PALO ALTO

SUSTAINABILITY
AND CLIMATE
ACTION PLAN

Framework, Principles, Guidelines, Goals & Strategies
November 2016

FORWARD

We live in a time of challenge and change. The California economy, powered by the innovation engine of Silicon Valley, anchored in Palo Alto, has transformed the world. Companies like Google, Twitter, and Facebook have transformed the way we live and work. Now the world threatens to transform California. The drought—or, as some suggest, the "multi-decadal mega-drought"[1]—challenges not just our lawns, agriculture and hydroelectric power supplies, but the premise on which California civilization was built. Climate chaos may not devastate us the way that it threatens to devastate coastal regions from Bangladesh to south Florida, but heat, flooding and super storms will take their toll, and will take hundreds of billions of dollars to adapt to.

And yet… this cloud presents a silver lining. Perhaps a golden one. For in the challenge of responding to climate change, we find ourselves facing what Pogo called insurmountable opportunities, what those wild-eyed radicals at Goldman Sachs see as the massive economic opportunity of a new energy economy–once again anchored here.

We are called upon to lead. Many would say the United States has lagged in response to climate challenge, compared to Europe, or China, though President Obama's recent Executive Orders on emissions and energy has called the federal government to the challenge. Many would say that California has led in response to climate challenge–from revolutionizing utility regulation in the 1970s to driving the market for clean energy to our world-leading climate goals–now ratcheted up again by Governor Brown's recent Executive Orders on emissions, energy and water. Many would say that Palo Alto has been a leader in this process, with our early climate action plan, our carbon neutral electricity, and our actions to support green buildings and electric vehicles. Well, it's time for us to lead again, with a new sustainability and climate action plan that sets a new bar for leadership, that builds quality-of-life, prosperity and resilience for this community, and that sets an example once again for other communities to emulate.

We must understand and prepare for the risks ahead: climate change, with hotter and drier weather, combined with sea level rise and flooding; disruptions in resource flows and human migrations; the rise and collapse of companies and even industries; and the challenge of reinventing a way of life that was based on conditions that we may never see again.

This plan identifies a pathway to reduce our emissions 80% by 2030. Governor Brown has proposed 40% emissions reductions for California by 2030. Palo Alto is already at 36%. But achieving that next 40% will not be easy, since it will require transforming transportation and dramatically reducing the climate impact of our use of natural gas for heating our buildings and water.

Because we can do this. Here.

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[1] http://www.climatecentral.org/news/is-the-wests-dry-spell-really-a-megadrought-16824

INTRODUCTION

As the heart of the region that drives the eighth largest economy in the world, what is created in Palo Alto has influence far beyond its borders. Palo Alto has made impressive—and in some cases remarkable—progress toward reducing its carbon impacts, greenhouse gas emissions, and resource consumption since establishing its first Climate Protection Plan in 2007.

While cities around the world ratchet up their own sustainability initiatives, Palo Alto will need to act boldly in order to maintain its legendary leadership position—and to ensure the wellbeing of this community in the face of the challenges ahead.

In the nine years since Palo Alto created one of the first climate protection plans in United States, the world has gotten hotter, the west has gotten dryer, and more cities have stepped into the ranks of climate leadership.

Palo Alto is poised to take the next step in climate and sustainability leadership. The Sustainability and Climate Action Plan (S/CAP) is Palo Alto's ambitious plan to create a prosperous, resilient city for all residents. To support Palo Alto's leadership position on climate protection, the S/CAP provides a roadmap for how the City will continue its environmental stewardship, and exceed state requirements for greenhouse gas (GHG) emission reductions.

The Framework is intended as a strategic plan that sets direction and overall goals, suggests initial priority actions and proposes high-level implementation pathways to achieve them. This document—a subset of the draft S/CAP presented to Council in April—provides the overall strategic framework for the SCAP, including goals, key strategic initiatives to meet those goals, and principles, guidelines and criteria to guide Council, staff and community in the development of implementation plans to fulfill these goals. Staff will bring initial 2016-2020 implementation plans—including both actions from the April draft that have been removed from this Framework, and additional actions that have been developed by staff teams over the last six months—to Council for view and action in the coming months.

The S/CAP presents a scenario, not a prediction. It presents a clear direction—move rapidly toward deep de-carbonization through a suggested portfolio of measures that show net positive financial benefit, and an estimate of the upfront investment required to generate those benefits. The specific measures, rates of adoption and impacts presented here are best estimates based on currently available information in a rapidly changing technology landscape; in order to be agile, adaptive and effective in the face of these changes, Palo Alto will update the S/CAP every five years, and develop more granular five-year work plans and short-term programs, rather than attempt to build a detailed 14-year work plan.

The time to act is now. In this new climate action plan, we identify a roadmap to move from carbon neutral electricity to a carbon neutral utility—and ultimately towards a carbon neutral city.

A ROADMAP:
TOWARD A CARBON NEUTRAL CITY

Palo Alto's Greenhouse Gas Baseline and Trends

By 2015, Palo Alto had already reduced GHG emissions an estimated 36% since 1990[2]—a remarkable achievement in 24 years, with most of it accomplished in the ten years since 2005—largely as a result of the leadership of Palo Alto Utilities and the City Council's 2013 commitment to carbon neutral electricity. Palo Alto's largest remaining sources of greenhouse gas emissions are road transportation (approximately 65%) followed by natural gas use (approximately 26%). **Figure 2** illustrates this trend, and Figure 3 provides another view of the relative size of Palo Alto's emissions sources in 2015.

The estimated 36% GHG reductions to date were achieved through building efficiency measures and introduction of carbon neutral electricity (as well as societal trends such as more efficient appliances, not shown explicitly here). Over the next 13 years, a variety of external trends (designated in this Plan as "business as usual 1" or BAU1), including Federal and state policy (such as building efficiency and vehicle efficiency standards) and demographic changes, are expected to reduce Palo Alto emissions to an estimated 45% below 1990 emissions by 2030[3]—in line with the State of California's recently approved 2030 reduction target of 40%. Initiatives that the City has already approved or set in motion (such as existing City of Palo Alto Utilities (CPAU) efficiency incentive programs, Palo Alto's existing Green Building Ordinance and Reach Code, and the Bicycle and Pedestrian Plan), will bring emissions down to an estimated 52% of 1990 levels—provided Council maintains support for existing programs and approves these programs when they come before them. This reflects Palo Alto's longstanding commitment and initiatives already underway to drive deep carbon reductions ahead of the state or those being pursued by most other cities. Even though these Palo Alto plans are both aggressive and innovative, for the purpose of this report we categorize them as "business as usual "—since these efforts are already in the queue.

The additional GHG reduction between those already "in-the-pipeline" reductions and the 80% reduction target for 2030 is about 224,600 MT CO2e[4], and is Palo Alto's target "GHG reduction budget." The Draft S/CAP projects that 117,900 MT CO2e, or more than half of the needed additional reductions, can come from mobility related measures, 97,200 MT CO2e, or just under half from efficiency and fuel switching measures (largely in buildings), and 9,500 MT CO2e, or 4% from continuation and extension of Palo Alto's zero waste initiatives. The Draft S/CAP also proposes other sustainability measure that don't have direct or easy to determine GHG impacts but that are important for other reasons, such as water sustainability, health of the natural environment and community resilience.

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[2] Palo Alto emissions in the 1990 baseline year are estimated at 780,119 MTCO2e, a restatement of prior estimates based on revised analyses using updated emissions models. Most emissions noted in this report as called "estimates," since only utility consumption (electricity, natural gas and water) are measured. Transportation emissions are modeled every few years; solid waste related emissions are calculated using established EPA protocols. Solid waste related emissions were not included in the CompPlan DEIR.

[3] Based on the "business as usual" analysis conducted for the CompPlan DEIR.

[4] MT CO2e = metric tons of CO2 equivalent

Figure 1. Palo Alto Community-wide GHG Emissions (MT CO2e)
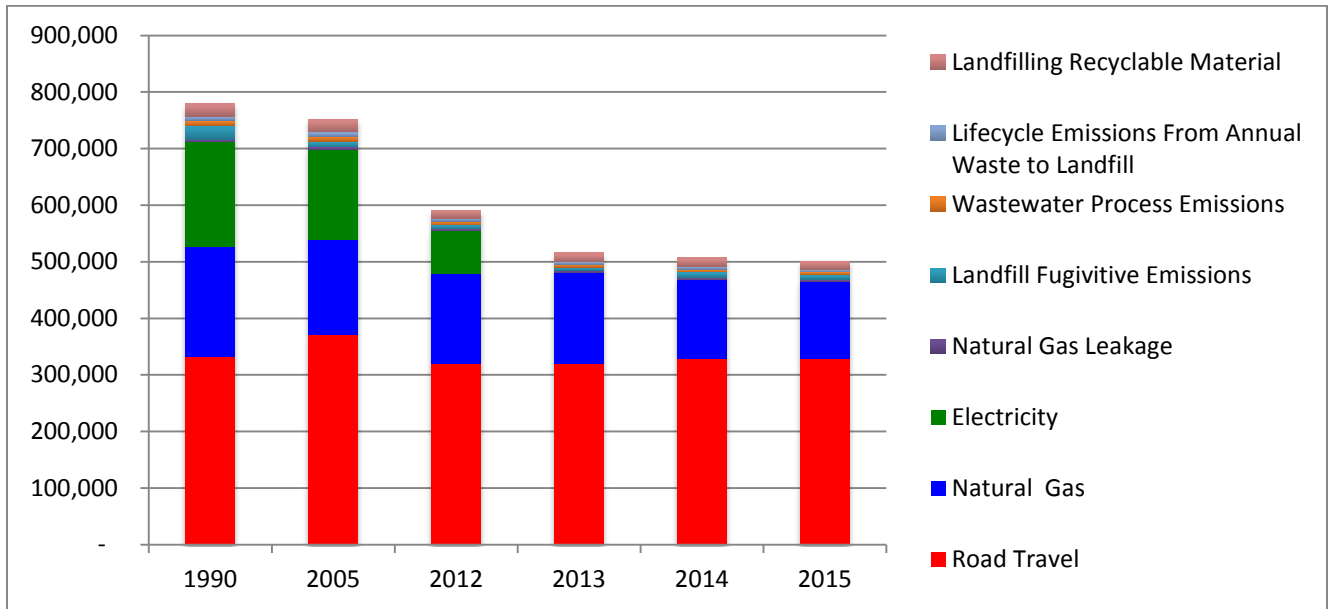
Figure 2. Palo Alto 2015 Community-wide GHG Emissions Sectors
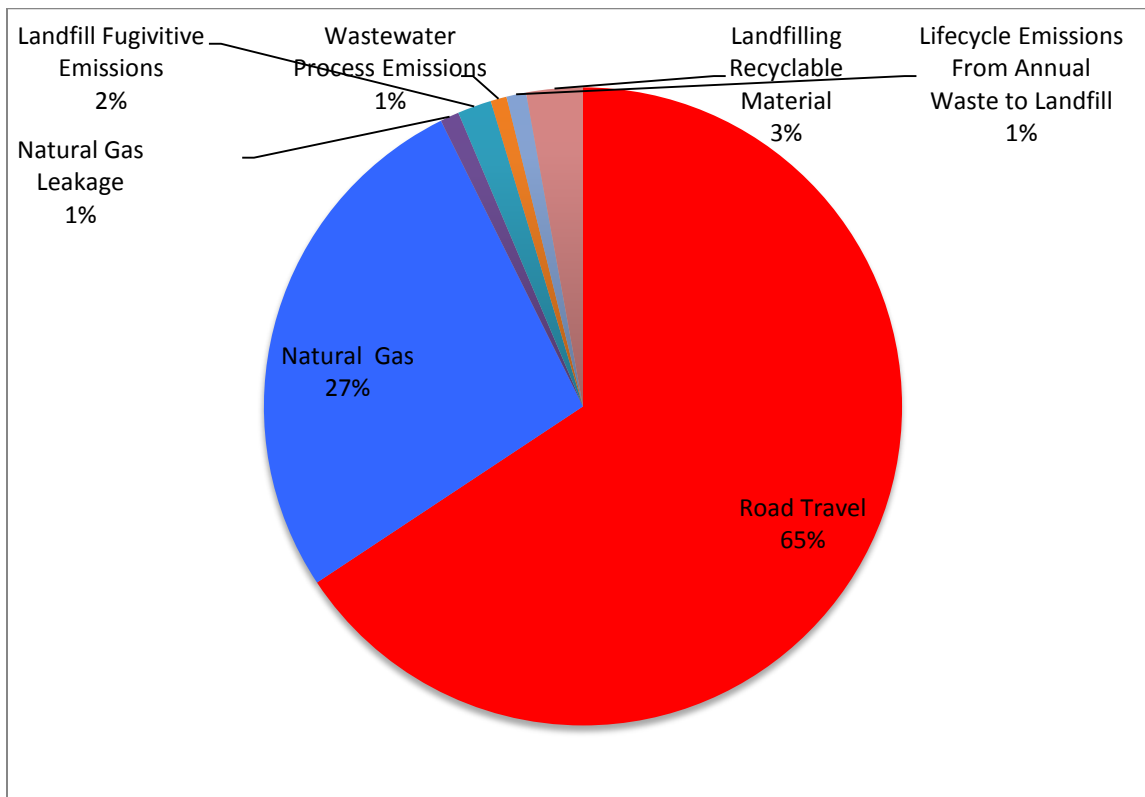
A detailed emissions analysis can be found in Appendix D.

Figure 3. Overview of Palo Alto GHG Reduction Target relative to Business-as-Usual (MT CO2e)

Efficiency = 133,400

Carbon neutral electricity = 145,400

BAU1 (state) = 80,800

BAU2 (existing initatives) = 48,500

S/CAP Initiatives =
Mobility = 117,900
Electrification = 97,200
Zero waste = 9,500

Legend: - - - - 2030 BAU   — · Existing initiatives   —— 80 x 30 Target
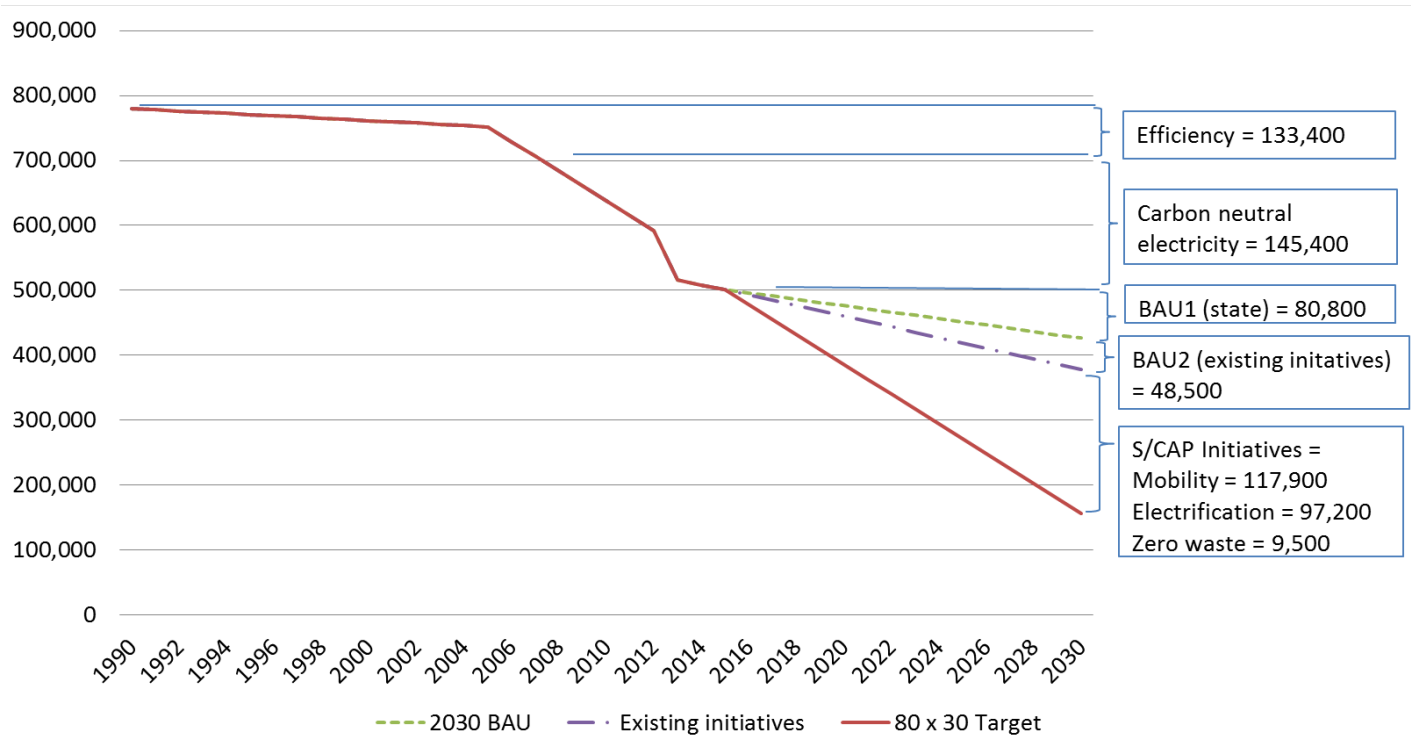
A Roadmap for "80 x 30"

Palo Alto has substantially exceeded the 20% reduction goals set by Council in 2007 Climate Protection Plan, and is positioned to establish new goals for Palo Alto to continue its global leadership, commit to a low- or zero-carbon future, and create a roadmap to that future.

This plan focuses on pathways to a low-carbon future, and initiatives addressing water, green infrastructure, adaptation and regeneration as part of a holistic framework for sustainability. Specifically, it contains Goals and Strategies for reducing Palo Alto's GHG emissions from the current level of 36% below 1990 levels to 80% below 1990 levels by 2030 ("80x30"), 20 years ahead of the State of California 80x50 target. This represents a GHG reduction "budget" of 260,000 tons (as shown in Figure 5 and detailed below), and will be possible only if Palo Alto continues its longstanding commitment to sustainability and if a number of assumptions that are outside the City's control come to fruition.

Figure 4: 80x30 GHG Reduction Budget (MT CO2e)
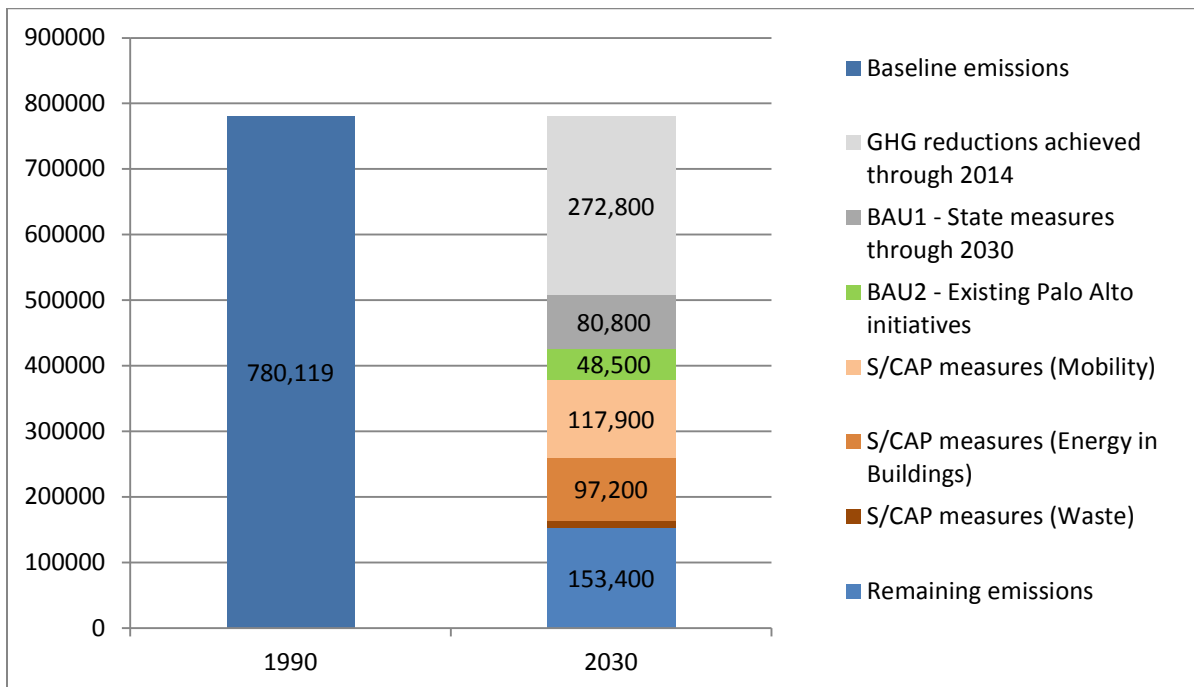
Reducing greenhouse gas emissions in order to avoid potentially catastrophic climate change is a key driver for the S/CAP, but it is not the only indicator for sustainability. Therefore, the S/CAP is organized around seven sustainability chapters, including some without direct quantifiable impacts on greenhouse gas emissions, but which are central to a holistic approach for sustainability in Palo Alto that protects and enhances our natural resources for generations to come. These are summarized below, and described in more detail in the chapters that follow.

Chapters for Sustainability and Climate Action

S/CAP's Goals and Strategies for GHG reduction are summarized here:

- **Mobility:**
  - *Make it more convenient not to drive* by developing responsive, multimodal, service-focused transportation services
  - *Shift subsidies* from free parking to support non-SOV travel
  - *Encourage land use* patterns that reduce both congestion and climate impacts.

- o *Support policy changes that **promote EV charging infrastructure** in public and private development and that encourage EV use by residents and commuters*
- **Building Energy Efficiency & Electrification:**
  - o ***Pursue large gains in energy, and materials efficiency*** in buildings and operations
  - o *Pursue the adoption of an Energy Reach Code that **drives energy efficiency through our building codes***
  - o Emphasize ***integrative design*** and ***streamlined policy*** approaches
  - o Explore ***building stock upgrades*** to Zero Net Energy or Net Positive through design, efficiency, renewables and bundled services packages
  - o ***Encourage all-electric*** new construction (if technically and legally feasible, cost effective and directed by City Council)
  - o ***Rapidly upgrade existing building stock*** resource efficiency (residential and commercial)
  - o Support a systematic ***shift from natural gas to all-electric systems*[5] *and/or renewable natural gas*** (if technically and legally feasible, cost-effective and directed by City Council)
- **Zero Waste and the Circular Economy**
  - o ***Divert 95% of Waste*** from Landfills by 2030, and ultimately achieve Zero waste
  - o ***Minimize Energy and Pollution*** from waste collection, transportation and processing

- **Water Management:**
  - o ***Reduce*** Water Use
  - o Utilize ***the right water*** quality for the right use
  - o Ensure ***sufficient water*** quality and quantity
  - o ***Protect*** the Bay, other Surface Waters, and Groundwater
  - o ***Lead*** in Sustainable Water Management
- **Sea Level Rise Response:**
  - o ***Plan*** for the Coming Changes in our Climate and Environment
  - o ***Protect*** the City from Climate Change-Induced Hazards
  - o ***Adapt*** to Current and Projected Environmental Conditions
  - o ***Empower*** the Local Community and Foster Regional Collaboration
- **Municipal Operations – Leading the Way**
  - o Create Energy and Water ***Efficient City Buildings***
  - o Minimize ***City Fleet*** Emissions and Maximize its Efficiency
  - o **"*Default to Green*"** purchasing for products and services
  - o ***Embed sustainability*** in city procurement, operations and management
  - o ***Set targets and tracking performance metrics*** for City sustainability performance
  - o **"*Walk the talk*"** by ensuring the City goes first on any sustainability actions requested or required of the community
- **Natural Environment Protection:**
  - o ***Renew, Restore, and Enhance resilience*** of our natural *environment*
  - o ***Align Planning*** for Management of our Natural Environment with the S/CAP and other key City Plans
  - o ***Maximize Carbon Sequestration and Storage*** in the Natural Environment
- **Utility of the Future:**
  - o ***Adapt CPAU*** offerings and business model to potentially disruptive challenges facing the utility industry, including distributed generation & storage, and "grid defection"
  - o ***Explore micro-grids, nano-grids*** and other resilience strategies
- **Community Behavior and Culture Change**
  - o Challenge community to ***consider the impact on future generations*** of choices in lifestyle, purchases and investment.
  - o Engage and support community through ***neighborhood initiatives***, interactive tools, etc.
- **Information systems:**

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[5] See analysis of electrification strategies, Staff Report 5971, August 2015

- o *Advance "smart city" platforms* for transportation, utilities, buildings, operations, finance, etc.
  - o Provide *transparent reporting and open data* to track performance, build knowledge and fuel innovation
- **Financing Strategies:**
  - o *Finance cost-effective initiative* through multi-channel, non-general fund, local and external investment in support of these goals, to the extent permitted by existing legal and regulatory framework applicable to the City.

These measures will require strategies that address three domains of action (shown in **Figure 5**), all of which are critical to realizing the sustainability vision:

- institutions that form the structure of policies and programs,
- behavioral change to modify mindsets and personal actions, and
- financial considerations that drive markets.

Figure 5. S/CAP Three Domains of Action
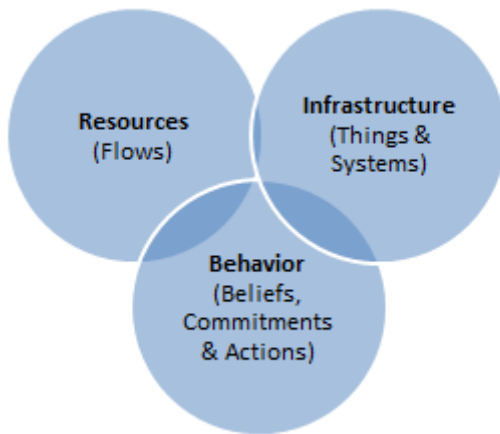
A few core moves

Palo Alto's sustainability strategies ultimately rely on a few "core moves" for reducing impact on the environment and GHG emissions, and doing so in ways that improve the quality of life of our community:

- Reducing resource use, for example through energy efficiency measures;
- Shifting resource use impacts, for example by electrification;
- Transforming systems, for example by outcompeting single occupancy driving with mobility services.

REDUCE   **SHIFT**   **TRANSFORM**

- Energy efficiency
- Water conservation
- Walking/biking instead of driving
- Zero waste

- Convert to electric vehicles
- Electrify water and space heating
- Greywater or rainwater instead of potable water

- Mobility as a Service instead of individual car ownership
- Walkable/bikeable neighborhoods and Transit-oriented development
- Utility of the Future

Zones of Control and Influence

Palo Alto's ability to enact these core moves throughout the community is embedded within a regional, state and global context of regulatory and jurisdictional boundaries. **Figure 6** illustrates Palo Alto's levels of control and influence.

- City government has control over its own operations, including municipal buildings, fleet, procurement and service delivery—for example, environmentally preferable purchasing.
- It can establish policies, codes, mandates, regulations and standards that drive the GHG emissions reductions of our residents and workforce—for example, our photovoltaic (PV) readiness requirements for new construction and major renovations.
- It can influence community behavior through education, outreach and voluntary programs—such as CPAU's incentive programs.
- And it can work with neighboring jurisdictions and regional authorities to develop collaborative initiatives—such as regional transportation initiatives— and to influence regional, state and national policy.

Figure 6. Palo Alto Jurisdictional Influence and Control

- City operations
- City codes, mandates and ordinances
- Incentives, rebates, education and outreach
- Regional and statewide policy
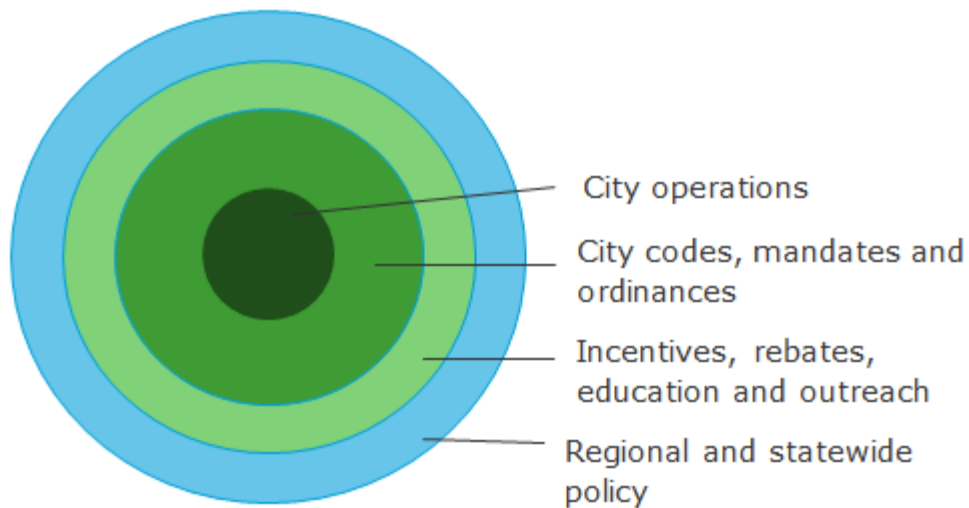
Levers, Goals, Strategies and Actions

Figure 7 presents the key components of Palo Alto's path to further GHG reductions:

- The primary levers with which we can shift emission trends
- The goals we will establish to activate those levers
- The strategies and actions by which we will achieve those goals

Figure 8 summarizes the emissions reduction potential of the proposed strategies, and the key players responsible for implementation, and **Figure 9** shows this summary by goal. For several strategies, Palo Alto will need to work with regional and state entities to advocate for policies and programs to support Palo Alto efforts and initiatives. The levers, goals, strategies and actions are based on Palo Alto's baseline emissions sources, existing and planned initiatives and a literature review of best practices for city climate action planning for effective new GHG reduction opportunities. (Note: Not all the strategies and actions in this Plan are summarized here, since some don't have direct GHG reduction impacts, or those impacts are impossible to estimate at this time.)

Figure 7. Overview of 3 Key Levers, Goals and Strategies for GHG Reductions
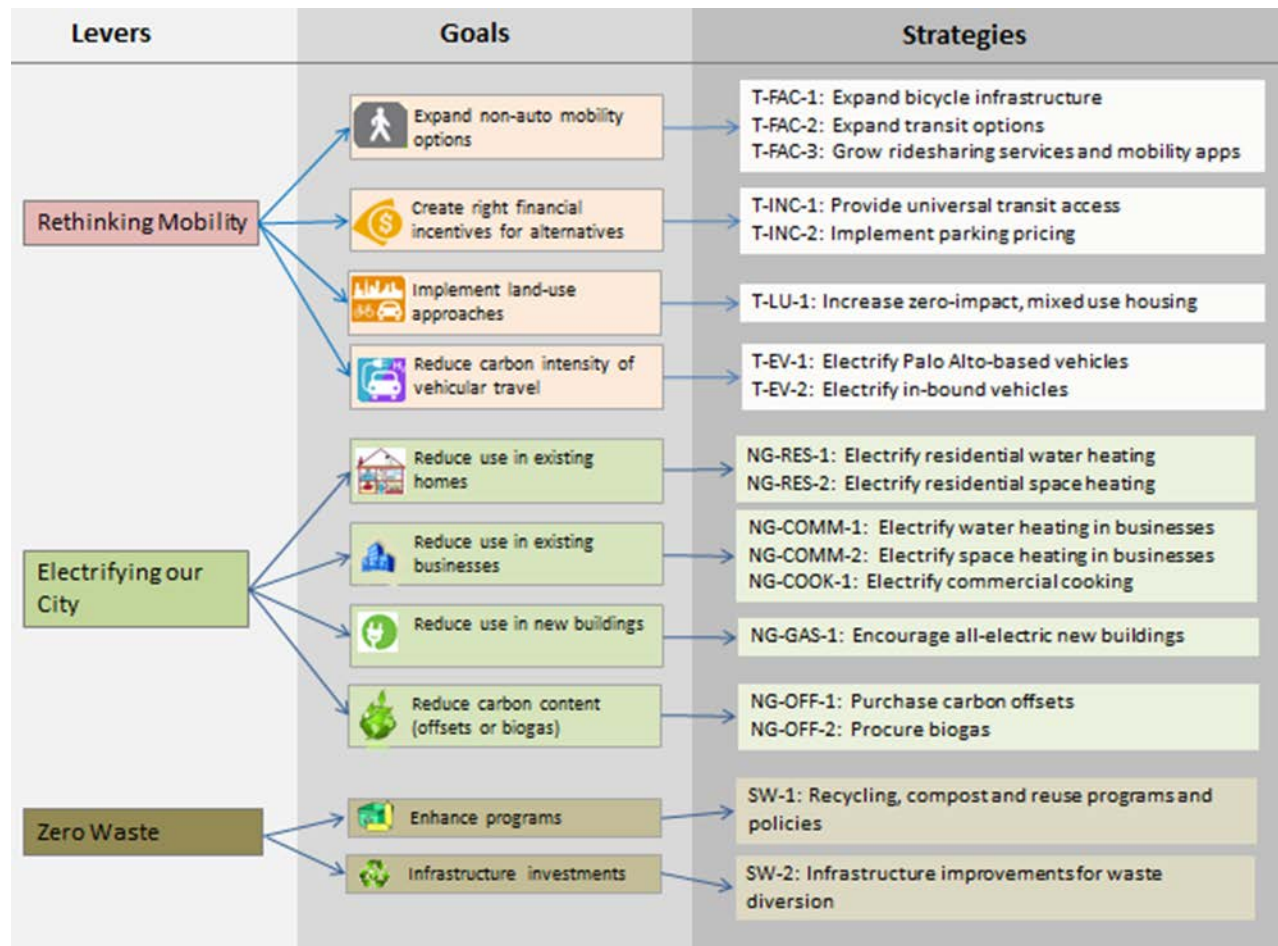
Figure 8. S/CAP Strategies to Achieve 80 x 30 Goal[6]

Levers	Goals	Strategy	Jurisdiction PA = Palo Alto R = Regional S = State	GHG Avoided in 2030 (MT CO2e)	Percent of Total S/CAP Emissions Reductions	Percent of Reductions from 1990 Baseline
Rethinking Mobility	Expand non-auto mobility options	T-FAC-1. Expand bicycle infrastructure	PA	8,400	4%	1%
		T-FAC-2. Expand transit options	PA, R	19,200	9%	2%
		T-FAC-3. Grow ridesharing services and mobility apps	PA	6,400	3%	1%
	Create right financial incentives	T-INC-1. Provide universal transit passes	PA	7,600	3%	1%
		T-INC-2. Implement parking pricing and feebates	PA	18,400	8%	2%
	Adapt land use patterns	T-LU-1. Increase zero-impact, mixed use housing	PA	2,900	1%	0.5%
	Reduce carbon intensity of vehicles	T-EV-1. Electrify Palo Alto-based vehicles	PA	25,200	11%	3%
		T-EV-2. Electrify inbound vehicles	PA, R	29,800	13%	4%
Electrifying our City	Reduce use in existing businesses	NG-COMM-1. Electrify water heating in businesses	PA, S	21,200	9%	3%
		NG-COMM-2. Electrify space heating in businesses	PA, S	15,900	7%	2%
		NG-COOK-1. Electrify commercial cooking	PA, S	11,300	5%	1%
	Reduce use in existing homes	NG-RES-1. Electrify residential water heating	PA, S	13,600	6%	2%
		NG-RES-2. Electrify residential space heating	PA, S	23,300	10%	3%
	Reduce use in new buildings	NG-GAS-1. Encourage all-electric new buildings	PA, S	11,900	5%	2%
Zero Waste	Enhance programs and infrastructure	SW-1. Achieve zero waste	PA	9,500	4%	2%

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[6] The figures in this table are *estimates* based on staff and consultant analyses of the estimated GHG reductions from each strategy. These estimates are built on documented assumptions, and are subject to many factors (including technology and costs) that could change over the 2030 horizon.

			224,600	100%	29%
TOTAL					

Figure 9. Summary of Anticipated S/CAP Emissions Reductions
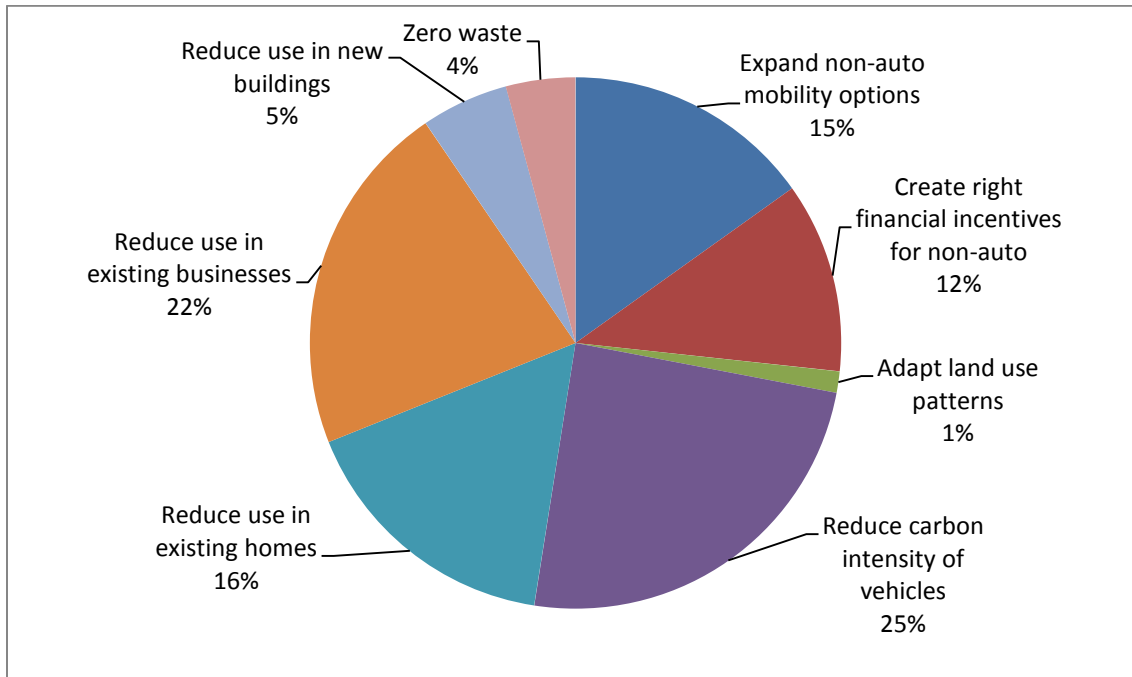
Key assumptions

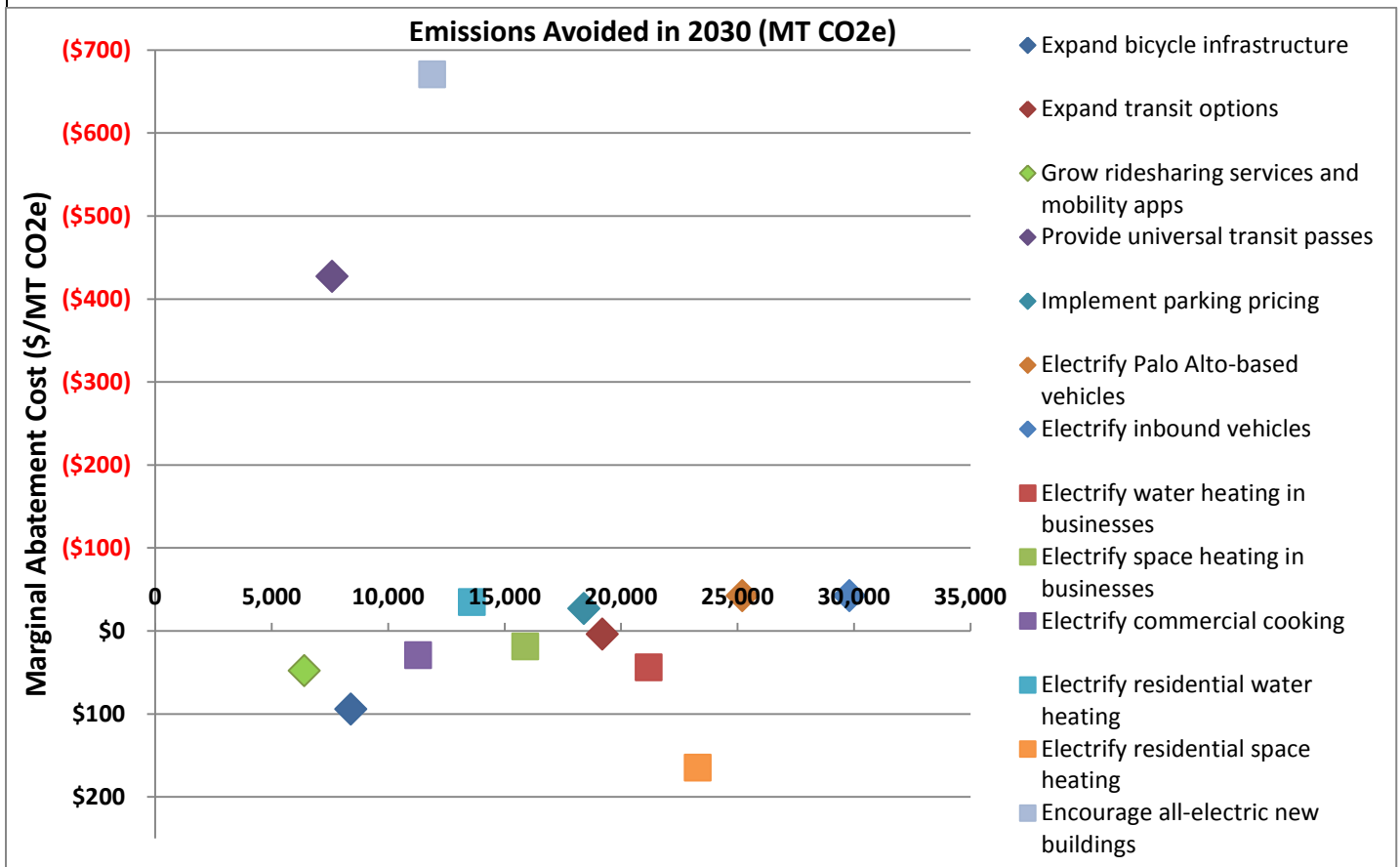The key assumptions underlying the projections for the impacts of these initiatives are shown in Table 8. Some are controversial, but will hopefully provoke a grounded exploration of options and consequences.[7] Many are ambitious, and will require rapid rates of uptake of new technologies. For example, S/CAP projects that 90% of vehicles owned in Palo Alto will be EVs by 2030. Is that possible? We don't know, given that the State projects only 30%. More useful questions might be "What measures could we undertake to accelerate that change, or to take advantage of potential market changes that move more quickly than projected (as we have seen for years with PVs, EVs and other technologies)?" and "What policies could we pursue that might eliminate barriers that would otherwise hinder the rapid expansion and proliferation of Electric Vehicles in Palo Alto?"

The relative GHG reduction impacts (in metric Tons CO2e) and associated "mitigation costs" (in $/mT) are shown in Figure 10. (The measures further to the right indicate greater impact; the measures higher on the chart indicate more favorable economics.)

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[7] Note that in all these scenarios, reductions are partially driven by factors outside our control, including Federal and state policy, legal and regulatory constraints, cost-effectiveness of measures and technology, the pace of technology innovation, and behavioral changes by our population. In this way, the S/CAP may be similar to California Air Resources Board's (CARB's) update to the State's scoping plan, which suggests that near-term actions and targets need to be specific, quantifiable, and within an agency's control, while longer term actions and targets may require changes in technology and/or actions by others, and could be less precise. It should be noted, however, that the Draft S/CAP in some cases builds on the assumptions in the State's Scoping Plan, suggesting – for example – that the City seek to achieve a level of Electrical Vehicle (EV) ownership (for residents and commuters) three times what the CARB is targeting state-wide for 2030.

Figure 10. Prioritizing Actions by GHG Impact & Mitigation Cost[8]

Chart: Emissions Avoided in 2030 (MT CO2e) vs. Marginal Abatement Cost ($/MT CO2e)

Legend:
- Expand bicycle infrastructure
- Expand transit options
- Grow ridesharing services and mobility apps
- Provide universal transit passes
- Implement parking pricing
- Electrify Palo Alto-based vehicles
- Electrify inbound vehicles
- Electrify water heating in businesses
- Electrify space heating in businesses
- Electrify commercial cooking
- Electrify residential water heating
- Electrify residential space heating
- Encourage all-electric new buildings

The Power of "Unreasonable" Goals

The SCAP goals are ambitious, as called for by the Paris climate agreement. They also may be uniquely achievable by Palo Alto, because of the city's significant head start, its carbon neutral electricity platform and its control of Palo Alto Utilities. They are in any event not certain to be successfully accomplished, since they depend on many variables, both within our control—such as the desirability of CPAU services and incentives and the effectiveness of City programs—and many factors outside our control—such as the pace of price/performance improvement of electric vehicles and the effectiveness of State climate programs.

Despite that uncertainty, stretch goals drive innovation better than safe ones. Setting a big goal and perhaps not fully reaching will likely get us farther than setting a safe goal and reaching it, especially in a time of rapid change. Our key question should not be "Are we confident we can achieve it?" No one knows if ambitious climate goals are achievable, based on today's know how and experience; Johanna Partin, Director of the Carbon Neutral Cities Alliance, observes that "most of the CNCA cities…have a pretty good sense of how they're going to get to somewhere between 25-70% of their target by 2020/25/30, but no one yet knows exactly how they're going to get to 100% of their goal." We only know that we must do our best to find ways to achieve them.

Better questions might be: Is the goal worthy? Is the strategic direction right? Are the first steps right? If so, then let's get going, and re-evaluate goals and progress in five years; let's support proposed goals with bottom up

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[8] This chart presents a synthesis of staff and consultant analyses of the "marginal abatement costs" of key GHG reduction strategies, based in the estimated GHG reductions from each strategy and the estimated investments that would be required to achieve them.

analyses, assessing "what combination of measures might make it possible to meet that specific goal?" As General (and later, President) Dwight D. Eisenhower observed, "Plans are useless. Planning is essential."

Guiding Principles

The Vision Statement for the 1998 Comprehensive Plan Governance Element declares that:

> "Palo Alto will maintain a positive civic image and be a leader in the regional, state, and national policy discussions affecting the community. The City will work with neighboring communities to address common concerns and pursue common interests. The public will be actively and effectively involved in City affairs, both at the Citywide and neighborhood levels."[9]

S/CAP builds on that vision with these guiding principles as a basis for effective and sustainable decision-making:

- Consider "sustainability" in its broadest dimensions, including quality of life, the natural environment and resilience, not just climate change and greenhouse gas emissions reductions.
- Address the sustainability issues most important to the community and select most cost-effective programs and policies—recognizing that this will entail moral and political, as well as economic, decision factors.
- Seek to improve quality of life as well as environmental quality, economic health and social equity.
- Foster a prosperous, robust and inclusive economy.
- Build resilience—both physical and cultural—throughout the community.
- Include diverse perspectives from all community stakeholders, residents, and businesses.
- Recognize Palo Alto's role as a leader and linkages with regional, national and global community.

Design Principles

In both evaluating this S/CAP, and in developing and evaluating future programs guided by it, Palo Alto is guided by these design principles:

- Focus on what's feasible—recognizing that technology and costs are shifting rapidly.
- Prioritize actions that are in the City's control – recognizing that we can urge others to join us, but leading by example is most effective
- Be specific about the actions and costs to achieve near-term goals, while accepting that longer-term goals can be more aspirational
- Use ambient resources: Maximize the efficient capture and use of the energy and water that fall on Palo Alto.
- Full cost accounting: Use total (life cycle) cost of ownership and consideration of externalities to guide financial decisions, while focusing on emission reductions that achievable at a point in time (i.e. not on life cycle emissions).
- Align incentives: Ensure that subsidies, if any, and other investment of public resources encourage what we want and discourage what we don't want.
- Flexible platforms: Take practical near term steps that expand rather than restrict capacity for future actions and pivots.

Decision Criteria

In selecting specific programs and policies to pursue, and in allocating public resources to support them, Palo Alto will be guided by these decision criteria:

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[9] http://www.paloaltocompplan.org/plan-contents/governance-element/

- Greenhouse gas impact
- Quality of life impact
- Mitigation cost
- Return on investment (ROI)
- Ecosystem health
- Resilience
- Impact on future generations

Overarching Policies and Legal Issues

The proposals set forth in the draft S/CAP will need to be specifically analyzed in the context of applicable local, state and federal legal requirements, policy tradeoffs, budget and cost considerations, technological feasibility and economic impacts to the City prior to any adoption. Implementation of any of the new policies and programs described in the draft S/CAP will also be subject to the same considerations, as determined periodically by the Palo Alto City Council, and will continue to take into account existing local, state, and federal laws, regulations, and programs to avoid unnecessary duplication, minimize uncertainty, and maximize predictability.

Measures presented here constitute a preliminary menu of options for Council to consider as potential methods for achieving greenhouse gas reduction goals adopted by Council; the proposals set forth in the draft S/CAP are for discussion and the City of Palo Alto.

1. MOBILITY

Road transportation represents about 61% of Palo Alto's carbon footprint—and a congestion headache for everyone. Palo Alto's existing Comprehensive Plan calls for reducing reliance on the automobile, and we've made some progress, with reductions in commute trips by Single Occupant Vehicles (SOV) from 75% to 62% between 2000 and 2014 and to 55% for commuters to Downtown. We've also dramatically reduced car trips to Palo Alto schools, with 44% of high school students commuting by bicycle. Beyond our borders, federal CAFE standards have reduced the carbon intensity of the US vehicle fleet. But congestion continues unabated, and the majority of Palo Altans, and commuters to Palo Alto still make SOV trips in fossil fuel powered vehicles.

GHGs from road travel are a function of two factors: Vehicle Miles Traveled (VMT), and the carbon intensity of that travel (GHG/VMT). Reducing GHG/VMT is largely a function of vehicle technology, driven for example by Federal CAFE standards, state policy, improved fuel efficiency, electrification and customer adoption. Most of these factors are outside the purview of cities, but Palo Alto has some ways to influence VMT, by developing attractive alternatives to SOV trips, and GHG/VMT, largely by encouraging electrification of City, resident and commuter fleets.

Traditional approaches to transportation—adding capacity by building roads and parking—send the wrong signals, encourage SOV travel and add pain. But what if we asked a different question: **How could we make it more convenient for anyone, anywhere, anytime to not have to get into a car and drive?**

The key tools the City has for doing so include:

- Optimizing transit
- Electrifying Vehicles
- Incentivizing People to change their travel modes
- Integrating Transportation Network Companies (TNCs) and Autonomous Vehicles
- Implementing land use policies that support these shifts.

1.1 Goal: Expand non-auto mobility options

This goal focuses on improving alternative modes of transportation to support non-automobile based mobility. The key: making it more convenient for anyone, anywhere, at any time, not *have* to drive by

- Expanding existing initiatives (such as bike infrastructure)

- Targeting specific populations with relevant non-SOV services that they can afford

- Developing advanced, software-based solutions (MaaS)

- Continually tracking performance of these programs overtime

"Mobility as a Service" (MaaS) is an integrative approach that proposes to shift the traditional focus from fixed transportation to flexible, responsive transportation services designed to meet people's diverse and changing needs

> TDM/TMA: The City supports a number of emerging transportation demand management (TDM) initiatives including its first Transportation Management Association (TMA), which will develop, manage, and market transportation programs to reduce single occupancy vehicle trips in the Downtown Core area. The Comprehensive Plan Update also provides an opportunity to establish policies that outline when TDM should be applied and programs that specify how compliance will be periodically measured and enforced. TDM plans for individual development projects can establish TDM requirements and set enforceable SOV mode-share targets. TDM plans would establish a list of acceptable TDM measures that include transit use, prepaid transit passes, commuter checks, car sharing, carpooling, parking cash-out, bicycling, walking, and education and outreach to support the use of these modes. They should provide a system for incorporating alternative measures as new ideas for TDM are developed.

by providing seamless regional multi-modal mobility services, including improved transit, and bike share; dynamic, on-demand shuttles; flexible first & last mile solutions; walkable/bikeable communities; and smart apps that provide convenient access to all of these.

Figure 11. Mobility as a Service (MaaS) Schematic
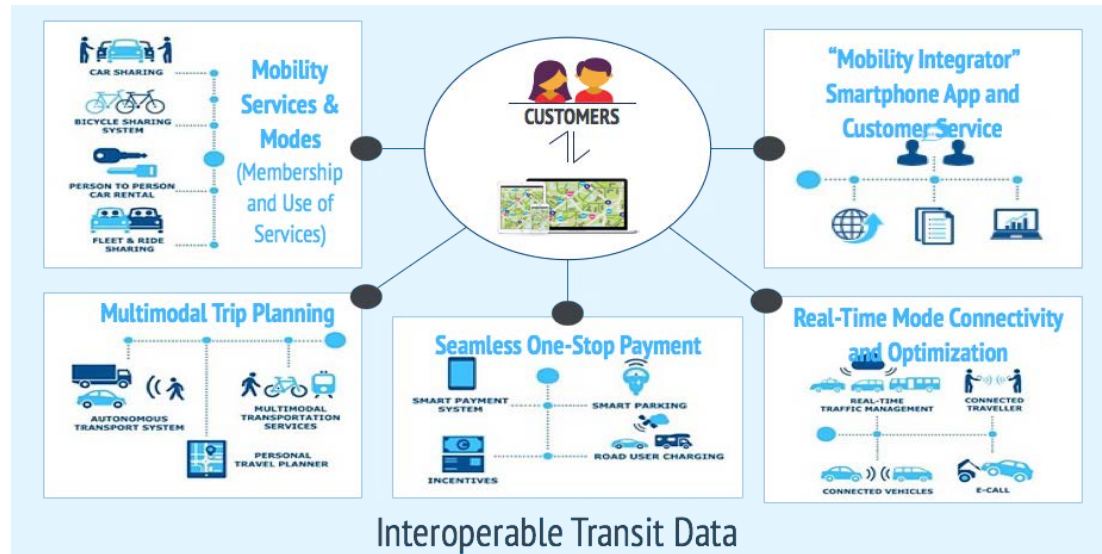
Source: Finland Ministry of Transport and Communications & Rocky Mountain Institute

Strategy	2030 Target	2030 GHG Emissions Reduction
T-FAC-1. Expand bicycle infrastructure	Increase bike boulevard miles to 26 miles Increase bike mode share, including work commute trips, from 7% to 25%	8,400 MTCO2e
T-FAC-2. Expand transit options	Increase transit ridership by 60%	19,200 MTCO2e
T-FAC-3. Grow ridesharing services and mobility apps	Increase in rideshare mode	6,400 MTCO2e

1.1.1 Strategy: Expand bicycle infrastructure (T-FAC-1)

1.1.2 Strategy: Expand transit options (T-FAC-2

1.1.3 Strategy: Grow ridesharing services and mobility apps (T-FAC-3)

1.2 Goal: Create the right incentives for mobility

Despite the goal in Palo Alto's 1998 Comprehensive Plan to reduce dependence on the private automobile, the City provides free parking in public lots and garages—thus incentivizing driving to the tune for $3600/year[10]—and has plans to build additional parking capacity. Instead, Palo Alto will identify ways (starting with a paid parking study this spring) to phase out automobile subsidies by charging for parking—ideally in coordination with neighboring jurisdictions—and investing the proceeds (as Stanford has successfully done[11]) in alternatives like transit, bicycle infrastructure, ride sharing, walkable neighborhoods, etc.

Strategy	2030 Target	2030 GHG Emissions Reduction
T-INC-1. Provide universal transit passes	75% of residents and employees have universal transit passes	7,600 MTC02e
T-INC-2. Implement parking pricing	100% of City sites and 50% of private sites have parking pricing	18,400 MTCO2e

1.2.1 Strategy: Provide universal transit access (T-INC-1)

1.2.2 Strategy: Implement parking pricing (T-INC-2)

1.3 Goal: Seek balanced development

Palo Alto can potentially reduce commute-related VMT though development patterns that support shorter commutes and complete neighborhoods, by enabling people to live closer to where they work. This is a sensitive and controversial topic, but its impact is so significant that it must be included here, and discussed and resolved in the community.

Palo Alto has long had an imbalance between jobs and housing, with almost three times as many jobs as employed residents in 2014. This imbalance between jobs and employed residents contributes to local and regional traffic, greenhouse gas emissions, and other impacts, as some workers travel long distances between their residence and workplace. The imbalance is projected to grow if the City does not take affirmative steps to address the issue through the Comprehensive Plan Update. These steps could include:

- Increased housing densities
- Increased areas under existing maximum zoning rules
- Additional regulation of employment densities
- Additional commercial downzoning

This strategy would include adopting a land use and transportation scenario to enable additional growth and development in transit accessible areas, *provided that all such development was designed for low traffic/energy/carbon/water impact* and would be approved only with an integral plan resulting in no net increase in vehicle trips to/from Palo Alto. (Mitigation Measure Trans1a in the Comprehensive Plan EIR would provide this type of requirement.)

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[10] Amortized cost of providing parking spaces at investment of ~$60,000 per space.

[11] Stanford's program has reduced SOV rates from 72% to 42%, and avoided $107 million in capital expenditures for parking structures that were no longer needed. See, for example, http://bit.ly/1RCmSS2

Strategy	2030 Target	2030 GHG Emissions Reduction
T-LU-1. Develop zero-impact, mixed-use housing	Target 2.95 jobs-housing ratio[12]	2,900 MTCO2e

1.3.1 Strategy: Increase zero-impact, mixed-use, "transit-oriented" housing (T-LU-1)

1.4 Goal: Reduce the carbon intensity of vehicular travel

Expanding the percentage of trips taken in EVs would have the largest impact on emissions from road transportation, which is in turn the largest category of Palo Alto emissions. Since the city's electricity is 100% from renewable resources, taking steps to encourage all new vehicles purchased to be EVs or other zero emissions technology would significantly reduce emissions associated with on-road vehicles.

> **Vehicle Trip Cap:**
>
> Mountain View sets *maximum* parking requirements and eliminates minimum off-street requirements, and targets 30-45% single-occupancy vehicle mode share, depending on the density of employment within buildings. One employer faces penalties of $100K for each 1% over the cap. Similar caps are in place in Sunnyvale, Menlo Park and Cupertino.
>
> A mitigation measure in the Comp Plan Draft EIR suggests a similar approach, requiring aggressive TDM plans, with quantitative performance measures and enforcement, as well as requirements to off-set any new trips that cannot be reduced through TDM.

Palo Alto already has one of the highest rates of EV ownership in the country (estimated by staff at 3-4% of registered vehicles), but several factors limit EV adoption, including price (which is dropping rapidly), total cost of ownership (often poorly understood), and vehicle performance— especially "range anxiety."

Initiatives to overcome these barriers, and keep Palo Alto's EV adoption well ahead of the State's aggressive goals, could include: public education, target incentives and charging infrastructure development.

Based on the ratio of jobs to employed residents and an analysis of VMT, approximately 93% of Palo Alto's transportation-related emissions are estimated to be related to trips into or out of Palo Alto for work, shopping and other purposes (i.e. the VMT is not associated with trips that are internal to Palo Alto). An estimated 78% of the total vehicle trips have origins or destinations external to Palo Alto. [13]

Strategy	2030 Target	2030 GHG Emissions Reduction
T-EV-1. Electrify Palo Alto-based vehicles	90% of vehicles in Palo Alto are zero emission	22,900 MTCO2e

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[12]This jobs-housing ratio is expressed as the ratio between jobs and employed residents. Staff has analyzed the GHG impacts of various job housing ratios. We have included a moderately aggressive option here, recognizing that Council will determine appropriate targets; the alternate scenarios are available for Council's consideration.

[13] Estimated 95,742 jobs and 34,428 employed residents. (Source: 2016 Official City Data Set.) Estimates of Internal, Internal-External, and External-Internal VMT and vehicle trips are from the Comp Plan Draft EIR p. 4.13-45. S/CAP allocates road emissions differently than the Comp Plan analysis, where emissions from all trips, which are assumed to be round trips, are equally split between inbound and outbound. Since potential strategies available to Palo Alto to affect those trips are different for inbound vehicles than for those based in Palo Alto, the S/CAP allocates these emissions based on trip origination.

T-EV-2. Electrify inbound vehicles	50% of inbound vehicles (non-Palo Alto based) are zero emission	27,000 MTCO2e

1.4.1 Strategy: Explore ways to expand charging infrastructure across Palo Alto (T-EV-0)

1.4.2 Strategy: Electrify and decarbonize Palo Alto-based vehicles (T-EV-1)

1.4.3 Strategy: Electrify and decarbonize inbound vehicles (T-EV-2)

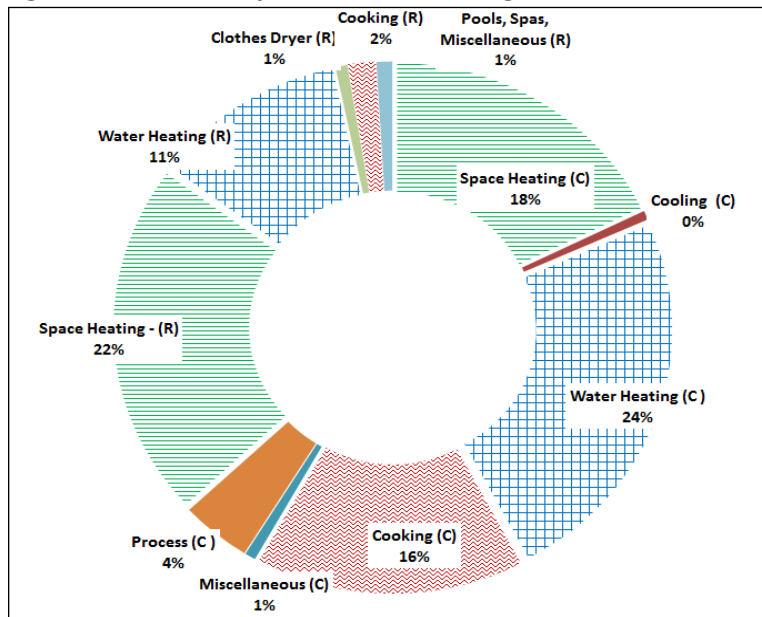# 2. BUILDING ENERGY, EFFICIENCY and ELECTRIFICATION

Palo Alto has made remarkable progress in advancing energy efficiency, through CPAU's incentive programs and the City's nation-leading Green Building Ordinances and Energy Reach Codes, and in decarbonizing its electricity sector, through CPAU's carbon neutral electricity (CNE) initiative, which is largely responsible for Palo Alto's remarkable 36% GHG emissions reduction to date. The CNE Resource Plan, adopted in 2013, directed CPAU to eliminate fossil-generated electricity by (1) expanding purchases of long-term renewable energy contracts to about half of Palo Alto's electricity needs by 2017, (2) relying on existing carbon-free hydroelectric resources for the other half of electric supply needs, and (3) purchasing short-term renewable resources and/or renewable energy credits (RECs) to counterbalance emissions from remaining "brown" or "market power purchases until those long-term renewable energy contracts are in the place.

Emissions from natural gas use currently represent ~25% of Palo Alto's remaining carbon footprint.[14] CNE opens to opportunity reduce natural gas use through electrification—"fuel switching" various natural gas uses to electricity—in addition to continued efficiency measures.

The vast majority of natural gas usage is related to today's building stock (existing buildings), with commercial and industrial buildings accounting for 63% of natural gas usage in the City. Palo Alto will first seek to reduce natural gas usage through energy efficiency and conservation, followed by electrification of water heating, space heating and cooking where cost effective. Figure 12 illustrates the estimated distribution of natural gas usage in Palo Alto.

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[14] Natural Gas (i.e., methane) is a potent greenhouse gas, with a global warming potential (GWP) at least 23 times that of CO2. Recent research suggests that the climate impacts may be 80-100% higher.

Figure 132: Summary of Natural Gas Usage in Palo Alto Buildings

The S/CAP roadmap is based on six leverage points:

- *Tenant improvement pathway:* energy efficiency upgrades, and electrification requirements

- *Voluntary retrofit pathway:* Palo Alto Utilities incentive programs (point-of-sale/distributors and contractors), education/outreach

- *Predictive failure analysis:* to anticipate potential equipment replacement opportunities…

- *Replace-on-burnout:* develop programs to quickly retrofit with efficient electric equipment, particularly for small businesses.

- *Time-of-sale pathway:* energy efficiency upgrades and electrification requirements

- *Institutional pathway:* removing barriers by streamlining permitting, advocating at the state level to address California Energy Commission (CEC) requirements for cost-effectiveness (so we can require electric equipment), making it easier to "do the right thing" (service and convenience)

2.1 Goal: Reduce GHG emissions and energy consumption in buildings through energy efficiency and design

Efficiency comes first. More efficient buildings require less electricity, natural gas and water, ultimately reducing carbon emissions while minimizing demand on CPAU purchases and saving customers money. Reduced electrical demand from efficiency—even of Palo Alto's already carbon neutral electricity—provides more capacity to meet electricity needs generated by the EV growth and the fuel switching initiatives described below.

New construction offers a unique opportunity to build zero net energy buildings with low or no incremental costs, while existing buildings offer the largest opportunity to reduce total GHG emissions by improving their efficiency over the lifecycle of the building. In parallel, measurement and verification are key to ensure we meet the emission goals we have targeted. Finally, to achieve our emission goals we need to pursue Zero Net Energy (ZNE) Buildings and Districts that focus on offsetting building energy needs through on-site renewables at the building and district scale. California is requiring "net zero energy" for all new

residential construction by 2020, and all new commercial construction by 2030. Palo Alto is currently considering whether and how to accelerate those deadlines in future Building Code cycles.

2.1.1   Strategy: Require advanced efficiency standards that exceed state minimum requirements. (NG-EE-1.1, NG-EE-1.2)

2.1.2   Strategy: Examine the life cycle of buildings and determine appropriate triggers in the permitting process to mandate deeper efficiency retrofits for existing buildings.

2.1.3   Strategy: Require Net Zero (or Net Positive) buildings in advance of State standards.

2.1.4 Strategy: Participate in the formation of Zero Net Energy District(s) in collaboration with industry stakeholders.

2.1.5   Strategy: Ensure residents and businesses are well-informed about advanced efficiency and electrification options.

2.1.6 Strategy: Accelerate new and existing CPAU programs to encourage building efficiency and electrification.

2.2   Goal: Use performance requirements and transparency to drive learning and accountability around building efficiency

In order to understand how new and existing building are operating before and after construction we need benchmark and commissioning data. Transparent performance tracking can be an unusually effective and economical tool for driving and ensuring improved building performance, and focusing awareness on progress and opportunities.

2.2.1 Strategy: Ensure buildings perform as designed, through commissioning programs and other post-occupancy performance tracking and regulatory processes.

2.2.2 Strategy: Drive performance improvement through benchmarking programs that collect and report sustainability performance data on buildings in Palo Alto.

2.3 Goal: Reduce natural gas use in buildings through electrification

Reduce natural gas usage through energy efficiency and conservation, followed by electrification of water heating, space heating and cooking where cost effective. Find ways to reduce or eliminate gas use by encouraging the more efficient gas or all electric appliances such as cook tops and clothes driers.

2.3.1 Strategy: Periodically evaluate electrification of water heating and space heating for cost-effectiveness and technical feasibility, and identify barriers and policy levers.

2.3.2 Strategy: Incentivize all-electric new buildings. (NG-GAS-1)

2.3.3   Strategy: Incentivize electrification of existing buildings. (NG-RES, NG-COMM, NG-COOK)

2.3.4 Strategy: Facilitate deployment of local distributed energy resources (PV, demand response, energy storage, optimal EV charging, etc.)

2.3.5 Strategy: Develop retail rate design options and new customer financing options to spur new efficiency and electrification investments

2.3.6 Strategy: Advocate for regulatory changes to accelerate efficiency and electrification

2.4   Goal: Reduce the carbon intensity of natural gas use

Palo Alto will continue to explore opportunities to procure biogas and/or carbon offsets in the short term, while working towards reduced natural gas consumption.

2.4.1 Strategy: Eliminate natural gas emissions with carbon offsets or biogas (NG-OFF-1)

3. ZERO WASTE AND THE CIRCULAR ECONOMY

Reducing the amount of waste discarded in landfills is an important strategy for both greenhouse gas reductions and overall sustainability. Diverting waste from landfills occurs through product changes, material use reduction, reuse, recycling and composting. .Equally important, these diversion strategies will create a "circular economy" where materials, water and energy do not create waste or pollute, but rather contribute their value back into a sustainable, circular cycle of human and ecosystem activity.

Achieving "zero waste" will require reducing the overall amount of waste generated within the City—through purchasing decisions and material use reduction (and ultimately product design), as well as more effective sorting, recovery and recycling.

In 2007, the City completed a Zero Waste Operational Plan established a goal of 73% diversion by 2011 and 90% by 2021— well beyond state requirements[15]. This new S/CAP sets a new goal of 95% Diversion by 2030.

3.1 Goal: Divert 95% of waste from landfills by 2030, and ultimately achieve Zero Waste to landfills

3.1.1 Strategy: Perform new waste characterization and establish new programs to reduce waste

3.1.2 Strategy: Improve existing programs to reduce waste

3.1.3 Strategy: Utilize the City's Municipal Code and support State Extended Producer Responsibility (EPR) laws to require more diversion, reuse and salvage

3.2 Goal: Minimize energy use and pollutant formation from waste collection, transportation and processing

3.2.1 Strategy: Change waste collection fleet to lower carbon-use vehicles

3.2.2 Strategy: Use local and more efficient processing facilities

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[15] California Assembly Bill 939 was passed in 1989, and mandated local jurisdictions to meet a solid waste diversion goal of 50% by 2000. Furthermore, each jurisdiction was required to create an Integrated Waste Management Plan that looked at recycling programs, purchasing of recycled products and waste minimization.

4. WATER MANAGEMENT

Palo Alto has done an outstanding job of meeting annual water use reduction requirements of the current "drought." But both potable water supplies and hydroelectric needs could be challenged by long-term shifts in California's precipitation regime.

With shifting climate patterns[16], significant uncertainty exists about whether drought conditions are the "new normal" for California, with a possible "new normal" of less (and less reliable) precipitation. Moreover, most climate projections show increases in average temperatures and reduced snowpack where Palo Alto sources much of its water—which could impact Palo Alto's hydroelectric power and thus its carbon neutral electricity strategy.

Given current climatic projections, long-term increases in water supplies from San Francisco Public Utilities Commission (SFPUC) appear highly unlikely. It would be prudent to reduce water consumption while exploring ways to increase the availability and use of recycled water.

4.1 Goal: Reduce consumption of water

CPAU water demand management measures (DMMs) have supported customers in reducing water use 27% between 2000 and 2010. CPAU's drought response programs have enabled the City to reduce water use by 24% in 2015 compared with 2013 levels, far ahead of the State's mandated reduction requirements. Long-term water reduction strategies should focus not only on implementing these procedures during times of drought, but rather using the incentives and policy drivers listed in the water management plan to drive sustained water consumption reduction.

4.2 Goal: Utilize the right water supply for the right use

4.3 Goal: Ensure sufficient water quantity and quality

4.4 Goal: Protect the Bay, other surface waters, and groundwater

4.5 Goal: Lead in sustainable water management

(NOTE: The strategies that follow apply to multiple goals.)

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[16] The California Department of Water Resources (http://www.sei-international.org/news-and-media/3252), the Association of California Water Agencies (http://www.acwa.com/events/2016-executive-briefing-defining-new-normal) and others are examining the potential impacts of Climate Change on Hydrologic Trends and Water Management.

4.5.1 Strategy: Verify ability to meet City's long term water needs

4.5.2 Strategy: Encourage water conservation for existing infrastructure

4.5.3 Strategy: Improve Palo Alto's recycled water quality

4.5.4 Strategy: Investigate all potential uses of recycled water

4.5.5 Strategy: Investigate ways to reuse non-traditional water sources

4.5.6 Strategy: Minimize water use in new buildings, renovations, and landscaping

4.5.7 Strategy: Continue to improve quality of storm water

4.5.8 Strategy: Capture and infiltrate storm water; maintain hydrologic cycle

4.5.9 Strategy: Convert the RWQCP to a beneficial resource recovery facility

4.5.10 Strategy: Support both regional and building-level net-zero water efforts

5. MUNICIPAL OPERATIONS – LEADING THE WAY

The City of Palo Alto has long demonstrated its commitment to sustainability and reductions of greenhouse gas emissions through its municipal operations. Palo Alto city government's environmental footprint is small—3.1% of citywide electricity use, 2.9% of natural gas use and 5.3% of water use in FY 2014. But resource efficiency, low carbon and other sustainability initiatives can save money, improve operating performance, reduce emissions, and provide leadership for the community. And the City's important role in leading by example has a powerful impact, both by providing a governing framework that supports sustainability throughout the community and inspiring within our community and to neighboring communities. The city government's commitment: "We walk the talk, and we go first."

5.1 Goal: Create energy and water efficient City buildings

The City spends approximately $6 million annually on utilities; "typical" 10-20% potential efficiency savings could result in more than $600,000 saved per year. The City requires LEED certification for all new City buildings over 10,000 square feet, and assessment of "green building" potential for substantial renovations and additions over 5,000 square feet. These requirements may not have captured all opportunities, and advances in green building design and technology continually open new ones.

5.1.1 Strategy: Use existing Capital Improvement Program (CIP) projects as mechanism to implement feasible electrification, efficiency and advanced technology opportunities

5.1.2 Strategy: Use city buildings as demonstration projects for advanced building Technologies

5.1.3 Strategy: Strengthen the current energy efficiency and sustainability requirements (including LEED requirements) for City building projects

5.2 Goal: Minimize emissions and maximize efficiency of the City fleet

5.2.1 Strategy: Continue to electrify City fleet vehicles wherever possible

5.2.2 Strategy: Explore new models for City fleet vehicle operations

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5.3 Goal: "Default to Green" Procurement for Products and Services

In 2007, the City authorized the implementation of a green purchasing program, and subsequently adopted a Green Purchasing Policy (GPP) in 2008, which supports existing environmental policies and Council direction to reduce GHG, pesticides and mercury, and achieve Zero Waste and pollution prevention goals. In 2015, the City Manager established a "default to green" strategy that makes the greener product the norm rather than the exception. Staff will always have the option to purchase alternative products, wherever cost or performance requirements make the green product inappropriate, but by making the greener purchase easier, and supported by tools that assist staff in choosing the best option, the City hopes to embed greener purchasing into City processes. (This has been accomplished for paper and toner purchases, and is underway for fleet purchases.)

[A 2014 OSS analysis showed that the Scope 3 GHG impacts of City purchases would add an estimated 25% to City government emissions.]

5.3.1 <mark>Strategy: Establish Green Purchasing criteria in all priority categories</mark>

5.3.2 <mark>Strategy: Fund Green Purchasing programs, products and services</mark>

5.3.3 <mark>Strategy: Embed Green Purchasing into City procedures</mark>

5.3.4 <mark>Strategy: Educate staff about Green Purchasing policies</mark>

5.3.5 <mark>Strategy: Track and report progress</mark>

5.4 Goal: Embed sustainability in City management systems, processes and operations

Wherever possible, the City will embed sustainability criteria in City management systems processes and Operations, to ensure that the programs identified in this Plan are addressed early, as part of standard operating procedure rather than special "sustainability add-ons."

5.4.1 Strategy: Infuse sustainability throughout City operations

6. ADAPTING TO CLIMATE CHANGE & SEA LEVEL RISE
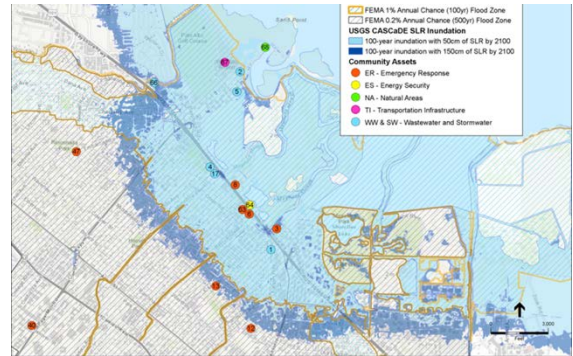
The first imperative of climate change planning is mitigation, the reduction in the emissions of greenhouse gases so that the impacts can be kept as small as possible. However, even if all carbon emissions were stopped today, some of these effects are likely to continue for decades into the future. Palo Alto's greatest climate change risks are a product of the City's bayside setting, the inherent sensitivities of its Mediterranean climate, and its dependence on imported water from the distant Sierra Nevada mountains as its primary water and hydro- electric supply.

Sea-level rise is expected to affect low-lying areas of Palo Alto surrounding the San Francisco Bay with more frequent and severe flooding. The State of California has adopted guidance and planning sea level rise projections for the San Francisco Bay region from the National Research Council (NRC, 2012[17]) of projected 11 inches of sea level rise by 2050 (with a range of 5 to 24 inches) and 36 inches by 2100 (with a range of 17 to 66 inches by 2100.[18]

Figure 16 and **Figure 17** provide an overview (leveraging Silicon Valley 2.0, a regional planning effort to minimize the anticipated impacts of climate change) of community assets identified at risk of sea level rise/flooding and fire risk. (See detailed assessment of risks and potential responses in Appendix F.) City staff have several related work streams underway.

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[17] National Research Council (NRC), 2012*. Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future.* http://www.nap.edu/catalog.php?record_id=13389

[18] California, via the Ocean Protection Council, (OPC, 2013[18]), has adopted the San Francisco Bay region sea level rise projections from the National Research Council (NRC, 2012[18]), which includes an allowance for vertical land motion.

Figure 14. Palo Alto Community Assets at Risk from Sea Level Rise and Associated Flooding

Palo Alto Flood Risk and Community Assets Map
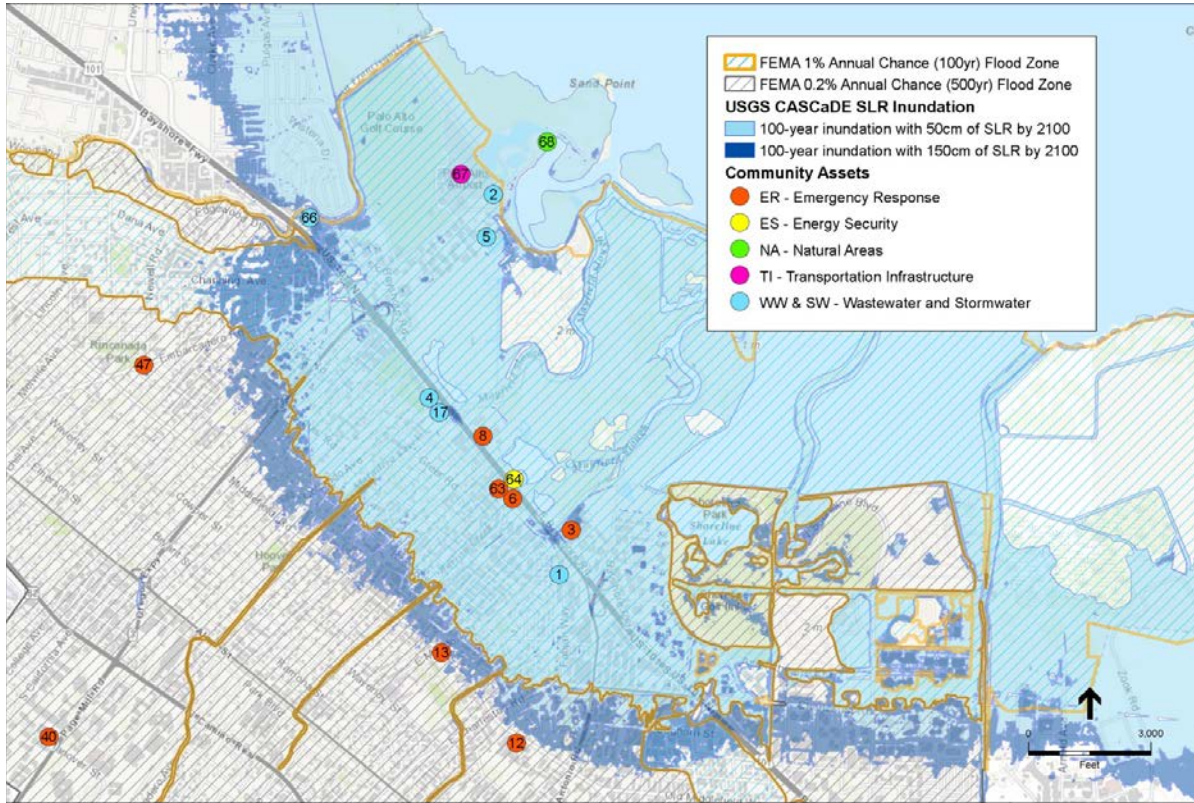
SOURCE: USGS (SLR inundation), FEMA (flood zones), City of Palo Alto (City Limits, asset locations), ESRI (basemap background)

Figure 15. Change in Fire Exposure Risk, Showing Community Asset Locations
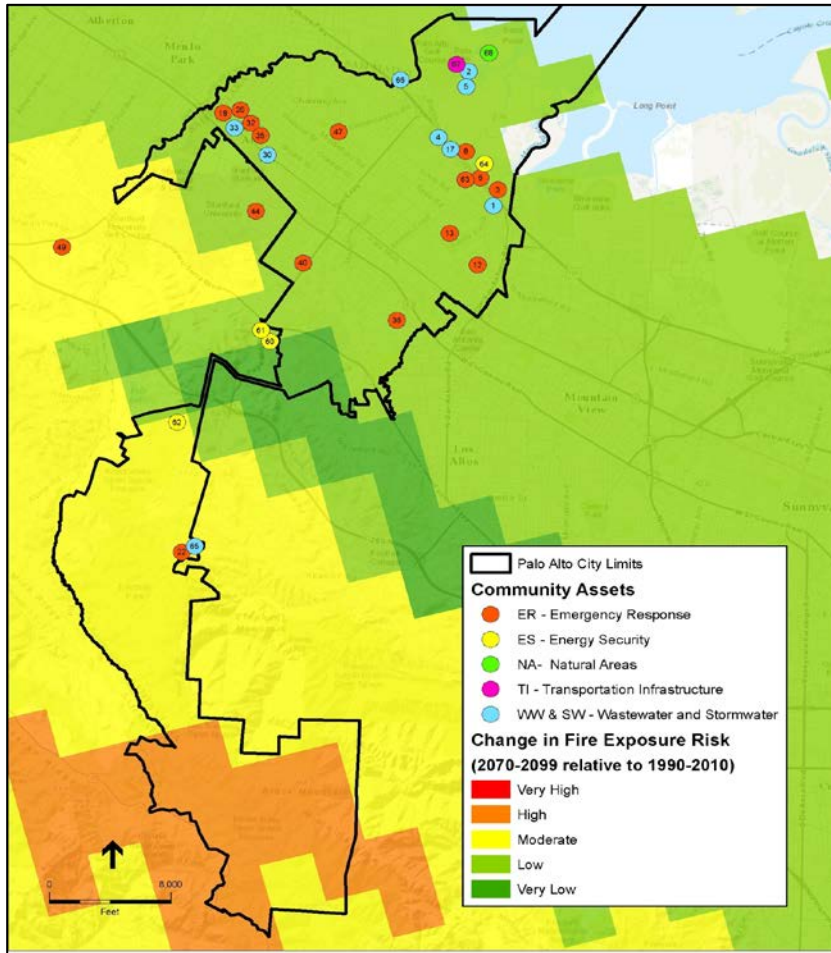
Guiding Principles for Sea Level Rise Response

Recognizing the most immediate risks related to sea level, particularly for critical facilities along the San Francisco Bay Shoreline, Palo Alto has identified six guiding principles:

(1) For city of Palo Alto capital projects, use sea level rise assumptions consistent with the State of California adopted guidance, with a minimum of 55 inches based on Bay Conservation Development Corporation (BCDC) numbers.
(2) Continue to monitor latest climate change and sea level rise science and adapt as needed if sea level rise occurs at a more rapid pace and/or higher levels than projected
(3) Ensure engineering solutions are adaptable to changing climate predictions
(4) Consider tools to protect, adapt and retreat as appropriate and cost-effective
(5) For areas that are to be protected, consider additional tools in case severity and speed of sea level rise increase, such as designing structure that can get wet and locating sensitive equipment higher in a building
(6) Continue to collaborate with regional planning efforts on studies of climate impacts and strategies to respond to sea level rise

6.1 Goal: Plan for coming changes in our climate and environment

6.1.1 Strategy: Ensure appropriate water and energy forecasting and Supply

6.2 Goal: Protect the City from climate change induced hazards

6.2.1 Strategy: Build resiliency into City planning and CIP projects

6.2.2 Strategy: Protect existing public & private infrastructure and critical services

6.2.3 Strategy: Optimize and preserve ecosystem services as protections from the sea

6.2.4 Strategy: Implement County Hazard Mitigation Plan

6.2.5 Strategy: Secure funding for coastal protection projects

6.3 Goal: Adapt to current and projected environmental conditions

6.3.1 Strategy: Strengthen City building requirements and buildings

6.3.2 Strategy: Adopt policies to support adaptation

6.3.3 Strategy: Consider and plan for managed retreat where needed

6.4 Goal: Empower the local community and foster regional collaboration

6.4.1 Strategy: Participate in regional alliances

6.4.2 Strategy: Improve governance of SLR issues

6.4.3 Strategy: Strengthen communications with local corporations

6.4.4 Strategy: Strengthen neighborhood connections

6.4.5 Strategy: Encourage residents to participate in the City's Storm Water Incentive Programs

7. NATURAL ENVIRONMENT

Sustainability is not only about mitigation and resiliency to change, but also about regeneration and identifying opportunities for renewal, restoration and growth of our natural resources and environment. Green infrastructure management provides one of the rare opportunities to enhance ecosystem positives such as sequestration of carbon, recharge of groundwater reserves, local food, walk-ability and bike-ability, and improved human health rather than solely reduction of negative impacts such as pollution and waste. Sequestering and storing carbon in trees, vegetation and soil will be an increasing part of climate solutions. The urban forest also shades, cools, slows water evaporation from soils and has many contributions to other non-carbon aspects of sustainability which are addressed in the S/CAP framework below.

Palo Alto will continue to build the natural resources, "common wealth" and biocapacity that sustains it: soils, vegetation, tree canopy, biodiversity, water and many other critical components. Green infrastructure refers to natural areas and systems to provide habitat, flood protection, storm water management, cleaner air and cleaner water.

7.1 Goal: Renew, restore and enhance resilience of our natural environment

7.1.1 Strategy: Adapt canopy, parklands, biodiversity, soil health to changing climatic regimes

7.1.2 Strategy: Value and enhance the common wealth for future generations.

7.1.3 Strategy: Deploy Green Infrastructure.

7.2 Goal: Align S/CAP planning for the Natural Environment with other City Plans

7.2.1 Strategy: Reference, Summarize and Interpret Relevant Plans

7.3 Goal: Maximize Carbon Sequestration and Storage in the Natural Environment

7.3.1 Strategy: Manage Soil, Plants, and Trees to Maximize Carbon Benefits and Other Ecosystem Services

8. PALO ALTO'S UTILITY OF THE FUTURE
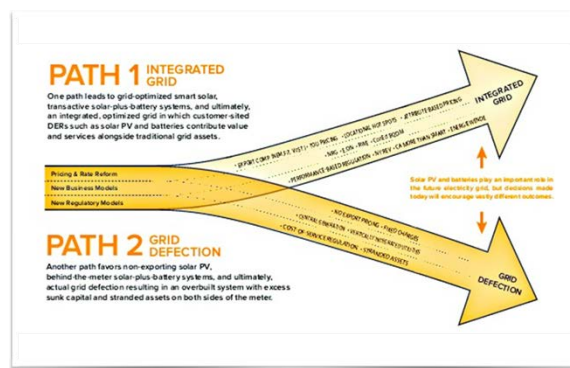
The utility industry is changing. Rapidly dropping costs of renewable and distributed power sources, energy storage, electric vehicles and energy-related telecommunications are combining to challenge the traditional utility framework and business. CPAU is tracking these trends, has begun piloting residential "smart meters" in a few hundred locations and begun assessing the load and storage impacts of electric vehicles on the grid. These trends intersect sustainability and climate action concerns, and raise both significant challenges and opportunities for CPAU.

CPAU will explore and evaluate the "Utility of the Future" concept—including potentially moving from a centralized utility provisioning model to a more agile one of greater embracing distributed energy generation and storage, an increased focus on energy services in addition to energy generation and distribution.

8.1 Goal: Advance smart grid strategies

Smart grid strategies connect to Palo Alto's existing, smart city and open data strategies, and offer the promise of more responsive and efficient energy systems, and more connected and satisfied customers.,

8.1.1 Strategy: Deploy Smart Grid as key part of "smart and connected city"

8.1.2 Strategy: Evaluate and advance appropriate distributed generation and storage strategies

8.2 Goal: Evaluate and adapt the CPAU business model

The utility industry faces a potentially disruptive future—driven by changing technology, economics and customer expectations, as well as policy changes—that could include the challenge of "grid defection" as customers become their own providers, and of new regulatory models and new competitors that shift revenues from utilities to other participants in the energy system. Few utilities have begun to consider how to adapt to the creative destruction in by the proliferation of distributed generation and energy efficiency; many are actively resisting the transition. CPAU, small and locally controlled, has the capabilities to rapidly evolve the business models these trends are demanding.

8.2.1 Strategy: Consider long-term CPAU strategy in light of rapidly changing technology

8.2.2 Strategy: Leverage the resiliency and potential cost benefits of distributed energy resources (e.g., solar, storage, microgrids)

8.3 Goal: Continue to advance carbon neutrality

CPAU will continue to play a central role in Palo Alto's carbon neutrality trajectory.

8.3.1 Strategy: Continue to support electrification programs and requirements, including restructuring rates and upgrading grid, as warranted

8.3.2 Strategy: Develop hydroelectric power contingency plans

9. COMMUNITY BEHAVIOR, CULTURE & INNOVATION
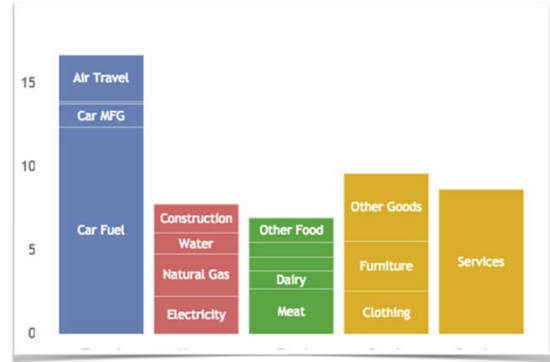
Ultimately the way individuals and businesses act dictates our consumption patterns and thus our impact on natural resources. To truly address the challenges of climate change and sustainability, individual behavior will have to continue to change. In fact, the GHG impact of individual purchasing decisions—not reflected in Palo Alto's GHG inventory, above—is significant. (See Figure 16, below.) Achieving that change will require broad community engagement, participation, guidance— and individual initiative. To support that, the City will actively inform & convene stakeholders, support individual & collaborative action, and disclose and report impacts of both City and community-wide initiatives and impacts.

9.1 Goal: Provide a platform for community change in culture, behavior and innovation

9.1.1 Strategy: Shift cultural norms to encourage supportive change in behavior, lifestyle, purchasing and investment

9.1.2 Strategy: Facilitate personal and neighborhood action

Figure 17: Palo Alto Per Capita GHG emissions, including "Scope 3" Impact of Purchases

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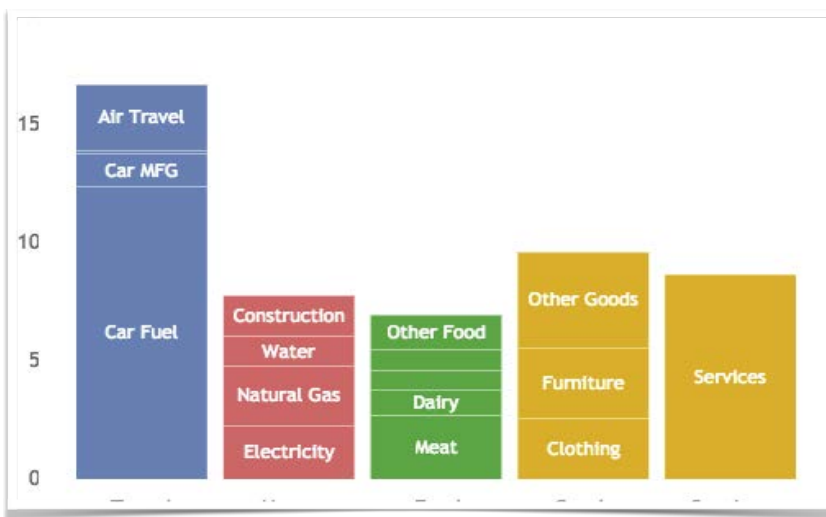
9.1.3 Strategy: Develop Smart City and Power of Open Data

10. FINANCING, FUNDING AND INVESTMENTS

The total financial impact of the goals and strategies identified in this plan is estimated to result in a net present value of $400 million generated by estimated City investments of $10 million combined with investments across the Palo Alto economy of approximately $760 million over the next 14 years. (These are best estimates in the face of rapidly evolving technologies and rapidly improving price/performance ratios in energy, mobility and other sectors; they should be revised regularly.)

This return on investment may seem surprising that reducing GHG emissions are estimated to provide a net positive economic benefit, since most people have long thought that environmental quality costs money. But efficiency has long delivered good return on investment, and renewable energy is becoming increasingly competitive compared to fossil fuels. This makes carbon neutrality a good investment seen in the light of alternative costs if Palo Alto were to continue to source its energy from fossil fuels. Additionally, the levers and strategies identified in this plan also contribute to improving the health and quality of life for Palo Alto residents and businesses by reducing congestion, noise and local pollution.

Financing these pathways

Staff has identified a variety of potential sources of funds to finance the S/CAP; all of these sources (including private financial vehicles) need a more complete assessment of applicable legal and regulatory requirements and the risks and obligations associated with the various approaches.[19] These include operating savings, parking feebates, utility rates, revolving loan funds, local offsets, carbon tax or fee, voluntary contributions, green bonds, transfer taxes, public/private partnerships and private financial vehicles.[20] There is evidence that market demand exceeds supply for well-constructed sustainability and climate related investment opportunities; as a result some initiatives discussed here may be financeable through private investors.

Capital formation

People—and companies—sometimes resist environmental improvements for fear they are too expensive, or say we'll do as much as we can afford. But as the late Ray Anderson, founder and CEO of Interface, would say, "If you think sustainability is expensive, you're doing it wrong."

Analysis shows that sustainability can be a good investment. But it is an investment—and like any other can be structured in many ways

Many funding options are available and new forms are continually emerging. In most cases, innovation comes from combining instruments in creative ways to achieve specific goals rather than creating entirely new mechanisms. The "best" choice of funding vehicle for a particular entity is one that compliments the current political and cultural context of a region by allocating costs and benefits equitably. Figure 18 summarizes key financing options and their estimated scale.

Figure 198: Potential Financing Sources and Amounts

STRATEGIES	DESCRIPTION	POTENTIAL FUNDS	COMMENTS
Utility Costs Operating Savings	Allocate 50% of cost savings from retrofit of City buildings	$0.6m/yr	Current spend ~$6m/year; estimated 10% savings
Parking Feebates	Phase out free parking; apply revenues to commute alternatives	$10-20m/yr	(Modeled on the Stanford engine)
Utility Reserve	Apply 10% of Utility Reserve to finance low-carbon initiatives	$5m/yr	
Revolving Loan Fund	Establish bond-funded low-interest revolving loan fund for on-bill financing of efficiency projects	TBD	
Green Bonds	Issue green bonds to finance green infrastructure and low carbon initiatives	TBD	Beneficial interest rates since demand exceeds supply
Local Offsets	Switch GreenGas to opt-out; use portion of funds to finance qualified local projects (5% first year)	$1.6m/year	
Carbon Tax	Explore and pilot local carbon tax or fee	$5-15m/yr	See Boulder, for example. Would likely require ballot measure.
Total		$22.2-32.2m/yr	

10.1 Goal: Utilize diverse financial pathways to drive S/CAP implementation

- Evaluate the economic and legal feasibility of the financing measures identified in Figures 18.
- Utilize the general fund to incentivize investments to promote appliance switching, which may not be possible for the Enterprise funds to finance due to legal restrictions.
- Establish internal carbon pricing for all City departments and financial activities.
- To the extent feasible, include carbon pricing into the gas rates to fund efficiencies and fuel switching.
- Identify a neighborhood or commercial district as a special district to carry out innovative pilot projects around GHG reduction, electric transportation development, or other approaches.

11. IMPLEMENTATION: TURNING VISION INTO ACTION

Achieving the emissions reductions detailed in this plan requires that the strategies are implemented in a timely, coordinated and sustained way. Partial or poorly coordinated implementation will reduce the emissions reduction potential of the S/CAP.

Monitoring and Tracking Progress

The Office of Sustainability will be responsible for monitoring and reporting on the progress of the S/CAP on the following schedule:

- Community greenhouse gas inventory: Annually.
- S/CAP Strategy Indicators: Annually

Below, we summarize the key performance indicators associated with each Strategy:

Table 1. Summary of S/CAP Strategy Indicators for Monitoring Progress[21]

Levers	Goals	Strategy	2030 Performance Target	2030 GHG Emissions Reduction (MTCO2e)
Rethinking Mobility	Expand non-auto mobility options	T-FAC-1. Expand bicycle infrastructure	Increase bike boulevard miles to 26 miles Increase in bike mode share to 30%	8,400
		T-FAC-2. Expand transit options	Increase transit ridership by 60%	19,200
		T-FAC-3. Grow ridesharing services	Increase in rideshare mode	6,400
	Create right financial incentives	T-INC-1. Provide universal transit passes	75% of residents and employees have universal transit passes	7,600
		T-INC-2. Implement parking pricing	50% of sites have parking pricing	18,400
	Implement land use approaches	T-LU-1. Increase zero-impact housing	Target 2.95 jobs-housing ratio	2,900
	Reduce carbon intensity of vehicles	T-EV-1. Electrify Palo Alto-based vehicles	90% of vehicles based in Palo Alto are zero emission	25,200
		T-EV-2. Electrify inbound vehicles	50% of inbound (not based in Palo Alto) vehicles are zero emission	29,800
Electrifying our	Reduce use in existing businesses	NG-COMM-1. Electrify water heating in businesses	85% of commercial water heating is electric	21,200
		NG-COMM-2. Electrify space	85% of commercial space heating is	

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[21] The figures in this table are *estimates* based on staff and consultant analyses of the estimated GHG reductions from each strategy. These estimates are built on documented assumptions, and are subject to many factors that could change over the 2030 horizon.

			heating in businesses	electric	15,900
		NG-COOK-1. Electrify commercial cooking	50% of commercial cooking is electric	11,300
	Reduce use in existing homes	NG-RES-1. Electrify residential water heating	Close to 100% of water heaters are electric	13,600
		NG-RES-2. Electrify residential space heating	70% of residential space heating is electric	23,300
	Reduce use in new buildings	NG-GAS-1. Encourage all-electric new buildings	New buildings are zero net energy ahead of state targets	11,900
Zero Waste	Enhance programs and infrastructure	SW-1. Achieve zero waste	Achieve 95% diversion rate	9,500

CONCLUSION

Climate change is a global problem and only through local solutions designed to meet the needs of our community can we mitigate and adapt to its impacts and protect the environment. While the challenge of climate change is unprecedented, local-level solutions can reduce emissions, increase efficiency, promote economic development, and improve quality of life for residents.

Together, we can continue to foster a vibrant economy, increase our resiliency and support Palo Alto's vision for a livable and sustainable community for generations to come. The City of Palo Alto has taken a significant step toward a more sustainable future with this climate action plan. This Plan has identified areas and opportunities to reduce GHG emissions within the community and City operations that along with statewide efforts can achieve our environmental goals.

While an important first step, this plan will remain a living document, to be updated as technology and policies progress, to support the City's efforts to manage GHG emissions for a sustainable future for all.

GLOSSARY

BAU: Business as Usual. Measures, initiatives or impacts that do not depend on new City of Palo Alto action

BAU 1: BAU resulting from demographic projections, external (State and Federal) policy choices. Based on CompPlan analysis, modified by S/CAP consultants to distinguish certain elements. (See BAU2)

BAU 2: BAU resulting from existing (enacted and/or in progress)

Palo Alto: The entire Palo Alto community, including COPA, residents and businesses

CNE: Carbon Neutral Electricity

CPAU: City of Palo Alto Utilities

COPA or The City: City of Palo Alto municipal government, including City of Palo Alto Utilities

EV: Electric Vehicle

GHG: Greenhouse gas emissions

MaaS : Mobility as a Service

PV: Photovoltaic System

SOV: Single Occupant Vehicles
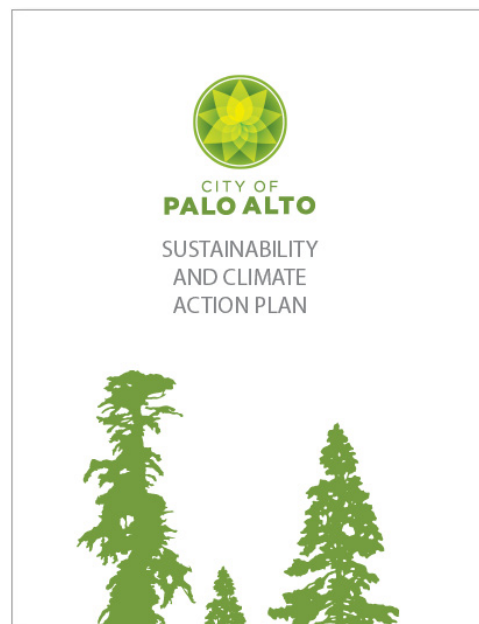
S/CAP: Sustainability and Climate Action Plan

TNCs: Transportation Network Companies

VMT: Vehicle Miles Traveled

How Will the **Comprehensive Plan Update** & the **Sustainability & Climate Action Plan** Work Together?

Our Palo Alto

Comprehensive Plan Update

Planning & Community Environment
250 Hamilton Ave.
Palo Alto, CA 94301
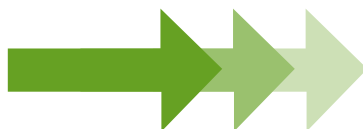
Palo Alto's Comprehensive Plan Update and the Sustainability and Climate Action Plan are being prepared in parallel and will both address issues related to sustainability.

CITY OF **PALO ALTO**

SUSTAINABILITY AND CLIMATE ACTION PLAN

Palo Alto's **Comprehensive Plan Update** and the **Sustainability and Climate Action Plan (S/CAP)** are being prepared in parallel and will both address issues related to sustainability, including reducing greenhouse gas (GHG) emissions and single occupant vehicle trips, conserving energy, water, and other natural resources, and adapting to expected changes in climate and resulting impacts such as sea level rise, drought, increased flooding and fire risk, etc. The following points describe how these two concurrent planning efforts interact with each other.

The **Comprehensive Plan Update** will embrace principles of sustainability via new goals, policies, and implementation programs, particularly in the Transportation, Land Use & Community Design, Natural Environment, and Safety elements of the updated plan. A subcommittee of the Citizens Advisory Committee has been formed to work across elements on this issue. Also, the use of icons or a special section in the final plan can allow readers

to find goals, policies, and programs related to sustainability and climate change adaption wherever they occur in the document.

The **Comprehensive Plan Update** will describe the intent and scope of the **Sustainability and Climate Action Plan** and explicitly incorporate the plan by reference, similar to how other important community plans will be referenced (e.g. the Baylands Master Plan; the Local Hazard Mitigation Plan; the Parks, Trails and Open Space Master Plan; the Urban Forest Master Plan, etc.).

As a more focused plan, the **Sustainability and Climate Action Plan** will be much more specific than the Comprehensive Plan Update when it comes to strategies for reducing greenhouse gas (GHG) emissions and for addressing other sustainability-related topics. The **Sustainability and Climate Action Plan** will also look out farther than the Comprehensive Plan Update horizon year of 2030.

Both the **Comprehensive Plan Update** and the **Sustainability and Climate Action Plan** will require review pursuant to the California Environmental Quality Act (CEQA) and the Draft Environmental Impact Report (EIR) that is being prepared for the **Comprehensive Plan Update** will contain a conservative (i.e. probably high) forecast of community-wide GHG emissions in the year 2030. The **Sustainability and Climate Action Plan** will be more aspirational in assuming aggressive emission reductions.

Finalization, adoption and implementation of the **Sustainability and Climate Action Plan** will be included as a mitigation measure in the **Comprehensive Plan Update** Draft EIR to ensure that the City meets or exceeds the State's targets for GHG emission reductions in 2030 and 2050.

Interested in helping craft solutions to the critical issues facing us now and into the future? Join us at the Sustainability and Climate Action Summit: **www.cityofpaloalto.org/scapreg**

Attachment C: Principles and Criteria

Guiding Principles

The Vision Statement for the 1998 Comprehensive Plan Governance Element declares that:

> "Palo Alto will maintain a positive civic image and be a leader in the regional, state, and national policy discussions affecting the community. The City will work with neighboring communities to address common concerns and pursue common interests. The public will be actively and effectively involved in City affairs, both at the Citywide and neighborhood levels."[1]

S/CAP builds on that vision with these guiding principles as a basis for effective and sustainable decision-making:

Consider "sustainability" in its broadest dimensions, including quality of life, the natural environment and resilience, not just climate change and greenhouse gas emissions reductions.

Address the sustainability issues most important to the community and select most cost-effective programs and policies—recognizing that this will entail moral and political, as well as economic, decision factors.

Seek to improve quality of life as well as environmental quality, economic health and social equity.

Foster a prosperous, robust and inclusive economy.

Build resilience—both physical and cultural—throughout the community.

Include diverse perspectives from all community stakeholders, residents, and businesses.

Recognize Palo Alto's role as a leader and linkages with regional, national and global community.

Design Principles

In both evaluating this S/CAP, and in developing and evaluating future programs guided by it, Palo Alto is guided by these design principles:

Focus on what's feasible—recognizing that technology and costs are shifting rapidly.

Prioritize actions that are in the City's control – recognizing that we can urge others to join us, but leading by example is most effective

Be specific about the actions and costs to achieve near-term goals, while accepting that longer-term goals can be more aspirational

Use ambient resources: Maximize the efficient capture and use of the energy and water that fall on Palo Alto.

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[1] http://www.paloaltocompplan.org/plan-contents/governance-element/

Full cost accounting: Use total (life cycle) cost of ownership and consideration of externalities to guide financial decisions, while focusing on emission reductions that achievable at a point in time (i.e. not on life cycle emissions).

Align incentives: Ensure that subsidies, if any, and other investment of public resources encourage what we want and discourage what we don't want.

Flexible platforms: Take practical near term steps that expand rather than restrict capacity for future actions and pivots.

Decision Criteria

In selecting specific programs and policies to pursue, and in allocating public resources to support them, Palo Alto will be guided by these decision criteria:

- Greenhouse gas impact
- Quality of life impact
- Mitigation cost
- Return on investment (ROI)
- Ecosystem health
- Resilience
- Impact on future generations