

**Special Meeting of the
COMMITTEE ON
ENERGY AND THE ENVIRONMENT
AGENDA**

August 11, 2021 – 5:00 P.M.

On March 3, 2020 Governor Newsom proclaimed a State of Emergency due to COVID-19 and subsequently issued Executive Orders N-25-20 suspending provisions of the Brown Act allowing meetings via teleconferencing and members of the public to observe and offer comments telephonically or electronically.

Please click on the link below to join the meeting
<https://cityofpleasanton.zoom.us/j/95550298294>

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- Dial +1(699)900-6833

If you wish to speak on an item listed on this agenda, please complete and submit a speaker card here <http://forms.cityofpleasantonca.gov/f/EnergyEnvironment> by 5:00 p.m. the day of the meeting, August 11, 2021.

CALL TO ORDER

ROLL CALL

AGENDA AMENDMENTS

MINUTES

1. Approve the regular meeting minutes of May 26, 2021.

MEETING OPEN TO THE PUBLIC

2. Public comment from members of the audience regarding items not listed on the agenda.

OTHER MATTERS BEFORE THE COMMITTEE

3. CAP 2.0 forecast correction for adjusted business as usual scenario
4. Review quantitative analysis and recommend a set of actions for the CAP 2.0 to be considered by the City Council

MATTERS INITIATED BY COMMITTEE MEMBERS: Brief reports on conferences, seminars, and meetings attended by Committee members.

ADJOURNMENT

Accessible Public Meetings

The City of Pleasanton can provide special assistance for persons with disabilities to participate in public meetings. To make a request for a disability-related modification or accommodation (e.g., an assistive listening device), please contact the City Clerk's Office at 123 Main Street, Pleasanton, CA 94566 or (925) 931-5027 at the earliest possible time. If you need sign language assistance, please provide at least two working days' notice prior to the meeting date.

Next meeting is a Regular Meeting of the Committee on Energy and the Environment on September 22, 2021 at 5:00 p.m.

**MINUTES
CITY OF PLEASANTON
REGULAR MEETING OF THE COMMITTEE ON ENERGY AND THE ENVIRONMENT
May 26, 2021**

CALL TO ORDER

Vice Chair Liu called a teleconference regular meeting of the Committee on Energy and the Environment to order at the hour of 5:00 p.m.

ROLL CALL

Committee Members Present: Cartwright, Chang, Daggy, Jain, Liu, Brown, Kelly
Absent: none

AGENDA AMENDMENTS

None.

MINUTES

1. Approve the special meeting minutes of April 21, 2021 as submitted.
Motion by: Cartwright Seconded by: Brown
Ayes: Daggy, Liu, Jain, Chang, Cartwright, Kelly, Brown
Noes: none

Motion passed unanimously.

MEETING OPEN TO THE PUBLIC

2. Public Comment from members of the audience regarding items not listed on the agenda:

Mr. Greg Klein inquired about textile recycling in Pleasanton. Mr. Klein asked staff if they have followed up with certain textile recycling organizations. Mr. Reda explained that staff met with Pleasanton Garbage Service (PGS), and found out that they PGS has a textile recycling service with the organization Recycle for Change. Mr. Reda noted that City staff will work with PGS to ensure more messaging about this service reaches the public.

3. Welcome of new Committee Member Aryan Jain, Youth Member

Mr. Aryan Jain was welcomed by the Committee and introduced himself. Mr. Jain is a sophomore at Amador Valley High School and has experience working on water projects in Pleasanton with the Go Green Initiative. Mr. Jain also was an intern software engineer with EcoCart, a company that calculates the carbon impact of online orders and offsets the carbon impacts. Mr. Jain is excited to represent the youth in Pleasanton and is looking forward to contributing to the Committee.

OTHER MATTERS BEFORE THE COMMITTEE

4. Presentation – Update on Water Conservation Program and Draft Urban Water Management Plan given by Rita Di Candia, Environmental Services Manager

Rita Di Candia, Environmental Services Manager provided the Committee with the presentation. Ms. Di Candia gave an overview of the Environmental Services Division, focusing on the Division's duties related to water conservation. The Division is responsible for implementing a wide range of activities, including the City's Recycled Water program, regulatory compliance, such as Urban Water Management Plan (UWMP) updates to the state, and water conservation assistance to the community, which includes rebate programs, education and outreach, and the Controller Assistance Program. The Controller Assistance Program is a service in which staff will go to residents' homes and help them set their irrigation controllers so that their landscapes receive the appropriate amount of water throughout the year.

Ms. Di Candia spoke about the City's smart water portal, which allows residents to monitor their water usage in real time, and sign up for leak alerts, so that they will be notified if there is a leak in their home or property. Water leaks result in a significant amount of the water usage annually in Pleasanton, so this app can help residents track leaks quickly, resulting in monetary savings and water conservation.

Ms. Di Candia also spoke about the UWMP, a City document that tracks long-term water supply through 2045, in order to assess the availability and reliability of the water supply to meet current and future demands. Pleasanton owns and operates wells within the City, and the rest of the potable water supply comes from Zone 7 Water Agency. The City's recycled water supply, for use in commercial irrigation, comes from Dublin San Ramon Services District (DSRSD) and the Livermore Water Reclamation Plant.

Committee Member Brown asked Ms. Di Candia for more information regarding the impacts to Pleasanton's water supply before and after the recycled water program began in Pleasanton. Ms. Di Candia explained that the City is in contract with DSRSD, who clean the water, and rather than the water being emitted into the Bay, it is repurposed and used for irrigation in Pleasanton, which reduces pollution and increases potable water conservation.

Committee Member Daggy thanked Ms. Di Candia for the presentation and asked for clarification regarding signing up for the leak alerts. Ms. Di Candia confirmed that residents and business owners must sign up for the leak alerts, because the way the app is designed, people must agree to receive notifications. Mr. Daggy also mentioned that it may be difficult for residents to sign up for the rebate when transitioning their front yard to a drought-resistant landscape and asked staff to look into this.

Committee Member Kelly asked what the threshold is for leaks. Ms. Di Candia explained that the trigger point is one gallon per hour that runs continuously for 24 hours for residential homes. Also, staff assists customers with larger leaks manually, by phone call, email, or letter if they do not provide a phone number or email.

Committee Member Cartwright thanked Ms. Di Candia for the presentation and is happy the City has implemented a recycled water program. Mr. Cartwright then asked about the UWMP. How are the effects of climate change being factored into the longer-term projections of the UWMP? Ms. Di Candia explained that there is discussion about climate change in the UWMP. The City works closely with Zone 7 on the UWMP, because the City's water supply is largely dependent on Zone 7. Zone 7 is exploring other water supply options to help support the City in case of climate change impacts, including desalination and potable reuse.

Vice Chair Liu inquired about who funds water conservation rebates. Ms. Di Candia explained that the City collaborates with Zone 7 on rebates. Depending on the program, Zone 7 provides the entire rebate, or the City and Zone 7 both provide rebates to the customer.

5. Presentation from the Tri-Valley Air Quality Community Alliance

Committee member Bruce Daggy is volunteering for the Tri-Valley Air Quality Community Alliance (TVAQCA). It is an all-volunteer organization and began over a year ago. Mr. Daggy was joined by Dr. Ron Baskett, a member of the TVAQCA who is an air quality expert.

Mr. Daggy provided the Committee with an overview of the air quality in the Tri-Valley, explaining that ozone levels, fine particulate matter (PM 2.5), and toxic air contaminants all contribute to the air quality conditions. Because Pleasanton is in a valley, a lot of pollution blows into the region and remains here, which contributes to the pollution levels as well. The TVAQCA sent out a survey to ask residents about their beliefs in the air quality in the Tri-Valley. Many of the respondents have vulnerable members in their homes and believe that the air quality is a problem. 87% of respondents significantly factor in air quality into their living location decision, so it is important to improve the air quality in the region.

Mr. Baskett then provided a comprehensive scientific analysis of the air quality in the Tri-Valley, primarily focusing on how to achieve the TVAQCA's goal of continued improvement in air quality. The four steps to achieve this goal include: 1) characterizing our current air quality 2) summarizing health effects 3) developing a local emissions inventory and 4) engaging the community to develop strategies and solutions. Two of the largest causes of pollution are emissions from heavy duty trucks in the I-580 and I-680 corridor, and high levels of PM 2.5 due to wildfires in California. The health effects of pollutants such as ozone and PM 2.5 can be serious, particularly with vulnerable groups such as the youth and elderly.

Two of the largest local actions the community can take is electrifying buildings and supporting clean mobility, which are both topics that are explored in the draft CAP 2.0. The TVAQCA is very interested in assisting with CAP 2.0 actions that will improve air quality and public health, assisting with community outreach and education actions, and identifying funding opportunities for action support. For example, TVAQCA has an incentive program that assists commercial and municipal landscapers make the transition to electric landscaping equipment.

Ms. Brown thanked Mr. Daggy and Mr. Baskett for their presentation and appreciated the link of the TVAQCA's work to the CAP 2.0.

Mr. Cartwright asked about home air filters. He asked about how effective they are in improving air quality in homes and schools. Mr. Baskett explained that typically if they are part of the HVAC system they are very effective. Mr. Daggy added that HEPA filters on AC units and room air purifiers can be very effective in dealing with this too.

Chair Chang asked how to engage the community about poor air quality during wildfire events. Mr. Daggy explained that airnow.gov is a good resource for checking local air quality. Also, "Spare the Air" days are intended to notify the public about poor air quality as well.

6. Consideration of setting Special Meeting Date of June 23, 2021 at 5:00 p.m. for Committee on Energy and the Environment to discuss the CAP 2.0 actions with cost-benefit analysis

Zack Reda, Management Analyst explained that staff is currently working through the action list that is undergoing a cost-benefit analysis. Mr. Reda said that staff would like to come forward with a recommended list of actions for the Committee to consider at this date, rather than wait until the end of July for the next regular meeting of the Committee on Energy and the Environment.

Approve the setting of the Special Meeting date of June 23, 2021 at 5:00 p.m.

Motion by: Daggy Seconded by: Kelly

Ayes: Daggy, Liu, Jain, Chang, Cartwright, Kelly, Brown

Noes: none

Motion passed unanimously.

MATTERS INITIATED BY COMMITTEE MEMBERS

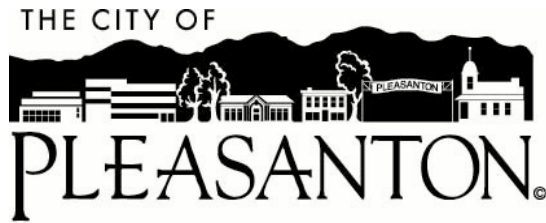
Vice Chair Liu was appointed as Community Advisory Committee member for East Bay Community Energy and attended the first meeting on May 17, 2021. One interesting thing learned was that starting next year (January 1, 2022), Brilliant 100 will no longer be offered.

ADJOURNMENT

The meeting was adjourned at 7:01 p.m.

Next regular meeting of the Committee is scheduled for August 11, 2021 at 5pm.

Respectfully Submitted,
Zachary Reda



The Committee on Energy and the Environment Agenda Report

August 11, 2021
Item 3

**SUBJECT: CAP 2.0 FORECAST CORRECTION FOR ADJUSTED BUSINESS AS
USUAL SCENARIO**

SUMMARY

The City's professional services team, Cascadia, identified a minor adjustment to the adjusted business-as-usual (ABAU) scenario for building energy, as described in Attachment 1. Specifically, residential electricity, non-residential electricity, and direct access electricity in the ABAU were updated. This slightly increases the total projected ABAU emissions (e.g., the total emissions in 2030 have increased by 448 metric tons of carbon dioxide equivalent). The City's greenhouse gas inventory (GHG) has been updated to reflect the change. The updated GHG inventory is provided as Attachment 2.

RECOMMENDATION

This item does not require any Committee discussion or action. This is an informational item.

Attachments

1. Cascadia Memorandum
2. [Updated GHG inventory](#) (*online only*)



To: Megan Campbell, City of Pleasanton

From: Andrea Martin, Director

Date: July 27, 2021

Subject: **CAP 2.0 Forecast Correction**

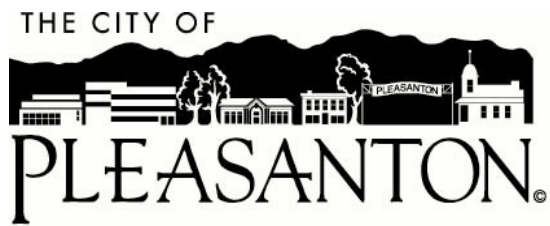
Dear Ms. Campbell,

The adjusted business-as-usual scenario for building energy was updated to account for a double-counting error. Estimated GHG reductions associated with CA state policy SB100 were previously over-estimated. This over-estimation occurred because the previous SB100 analysis did not account for anticipated kWh reductions associated with implementation of Title 24 building standards.

Sincerely,

A handwritten signature in black ink that reads "Andrea Martin". The signature is written in a cursive, flowing style with a horizontal line at the end.

Andrea Martin, Project Manager



The Committee on Energy and the Environment Agenda Report

August 11, 2021
Item 4

**SUBJECT: REVIEW QUANTITATIVE ANALYSIS AND RECOMMEND A SET OF
ACTIONS FOR THE CAP 2.0 TO BE CONSIDERED BY THE CITY
COUNCIL**

EXECUTIVE SUMMARY

In April 2021, the Committee on Energy and the Environment (Committee) provided guidance on which set of actions to move forward to the quantitative analysis phase of the Climate Action Plan 2.0 (CAP 2.0) project. That quantitative analysis was completed and is provided to the Committee for review. Staff seeks direction on which set of actions to move forward to City Council for consideration to be included in the CAP 2.0.

RECOMMENDATION

Review quantitative analysis and recommend a set of actions to move forward to City Council for consideration to be included in the CAP 2.0.

BACKGROUND

The CAP 2.0 aims to set policy direction (through strategies and actions) to meet the City's greenhouse gas (GHG) emission reduction target pathway. An initial list of over 150 actions was prepared based on review of the City's current Climate Action Plan (CAP), and a review of best practices and recently adopted CAPs by other similar cities. Input was received from the public through focus groups with stakeholders and implementation partners, the Committee (including the action workshop), and City staff. The list of 150 actions was reduced to a short list of actions that ranked highly across the action selection criteria (i.e., effectiveness, cost, feasibility, level of community support, equity, and co-benefits).

A cost/benefit analysis was prepared which includes estimated costs and GHG emissions reductions for each action on the short list. Some actions are noted as "supportive" indicating that emissions could not be easily quantified, would result in minor GHG reductions, or do not directly contribute to GHG reductions as calculated in the City's inventory. While these actions do not have a specific GHG mitigation noted, their costs are still estimated. Supportive actions may still be critical for CAP 2.0 success and/or contribute to resilience and adaptation.

The cost/benefit analysis will help determine the final set of actions included in the CAP 2.0. Staff has recommended a set of 15 primary actions and 10 secondary actions for inclusion in the CAP 2.0, Attachment 1, and seeks the Committee's recommendation to the City Council.

DISCUSSION

Cost/Benefit Analysis

The City's professional service team, Cascadia, prepared a cost/benefit analysis, which is provided as Attachment 2. The cost/benefit analysis provides estimates of GHG impact and cost for potential CAP 2.0 actions. The analysis also provides GHG impact estimates for existing/on-going City actions, which includes activities and programs already endorsed in City plans and policies (e.g., implementation of the Trails Master Plan) as well as implementation of mandated activities (e.g., SB 1382 compliance).

Cascadia modelled the GHG-reduction associated with various actions based on available information and case studies, including data on historic and projected energy usage, population and development trends, and technology and policy impact. They drew from literature and expert opinion (e.g., studies done by the U.S. Department of Energy and California Air Resources Board) as well as from available City data and staff input. The actions are assigned timeframes for implementation (i.e., near-term, mid-term, or long-term) and this phasing affects the GHG impacts (e.g., if an action is implemented in year 1, it will have more time to accumulate reductions than if it were implemented in year 8).

Costs for implementation of various actions are estimated for both the City and for the community, as detailed in Attachment 2. Staff time in the form of full-time equivalencies (FTE) is also estimated. Cost and staffing estimates are based on consultant experience, available literature, consultation with peer cities, and City staff input. Costs include initial

start-up/one-time costs and ongoing costs and/or savings. Cost effectiveness, in terms of cost per metric ton of carbon dioxide equivalent (MTCO₂e) is provided for each action where GHG mitigation is estimated, to provide a side-by-side comparison where possible.

The cost/benefit analysis highlights the crucial actions necessary to meet the CAP 2.0 target pathway and identifies the top 10 actions GHG mitigating actions. It also highlights which actions may be costly to the City or the community and conversely which actions may provide a cost savings. A significant number of actions incur costs to the City but generate cost savings to the community.

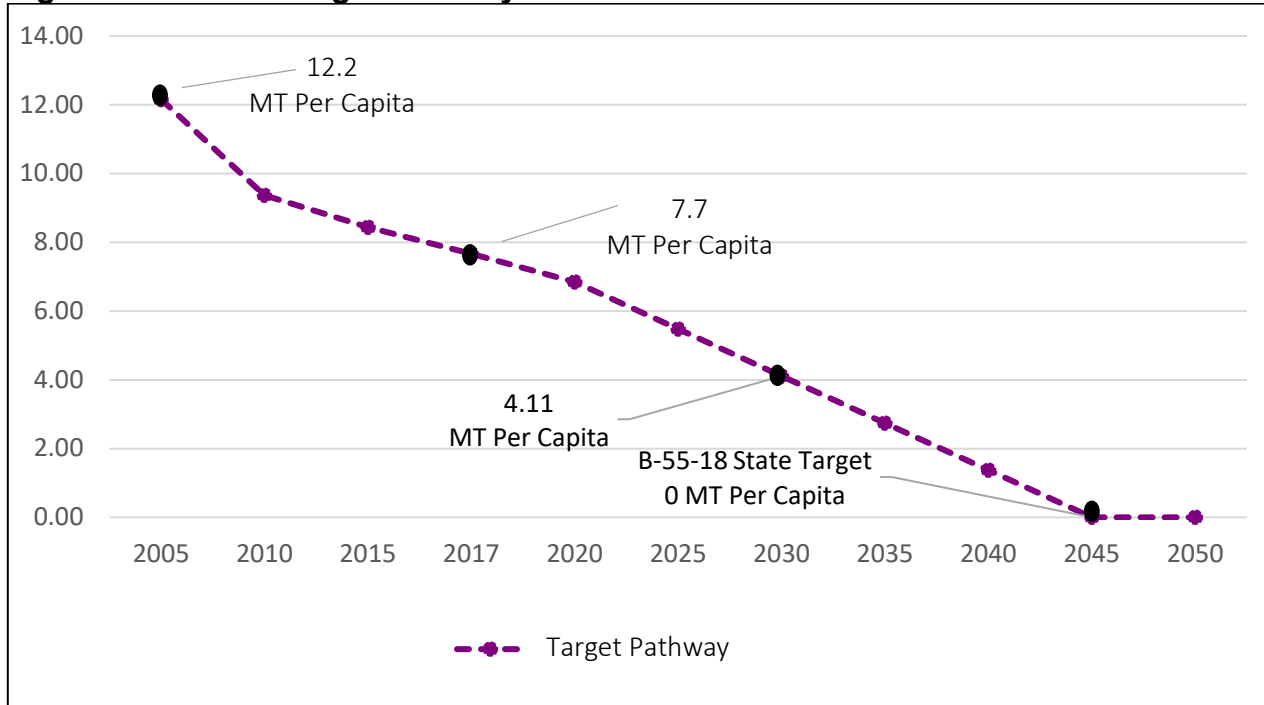
It should be noted that staff has identified some of the actions on the short list as “existing on-going” actions which means their GHG reductions should be counted but the costs are already considered in other City policies and plans – such actions will not be considered “new actions” in the Climate Action Plan, as described further below. As an example, action 1082 references the bicycle, pedestrian, and trails network expansion. This action is estimated to cost the City approximately \$13 million, based on percentages of total cost estimates provided in the Bicycle and Pedestrian Master Plan and Trails Master Plan. Irrespective of the adoption of the CAP, the City will move forward with implementation of various projects identified in these plans as part of its annual Capital Improvements Program; and as outlined in both plans, many projects would be supported by existing or anticipated funding sources including Measure BB, the City’s Traffic Impact Fee program, expansion of networks through development projects, grant applications, and Park Impact Fees, among other sources. As such, staff determined this action should be moved to the “existing on-going” actions list.

The City will need to make a strategic decision about the final package of new actions to be adopted as part of the CAP 2.0, recognizing various tradeoffs to be made between cost and effectiveness in reaching GHG targets. Staff does not recommend including every action on the short list. Staff’s recommendation both reduces emissions and cost, as described below. It is also worth noting, an Implementation and Monitoring Plan will be developed as part of CAP 2.0, which will identify potential funding sources (e.g., grants and federal, state, and local funding measures) that will help to offset costs of implementation estimated in the analysis.

CAP 2.0 Target Pathway

Earlier in the CAP 2.0 process, the Committee recommended, and City Council affirmed, a target pathway that meets the state GHG reduction target for 2045 (i.e., B-55-18 with a goal of carbon neutrality by 2045) and provides a linear trajectory of reductions back to 2020, as seen in Figure 1. The target pathway includes a short term 2030 emissions target of 341,118 MTCO₂e (calculated as mass emissions) and 4.11 MTCO₂e per capita. The long-term 2045 target (of 0 MTCO₂e per capita) is intended to be aspirational and set the trajectory of emissions reductions. The CAP will require an update around 2030 to assess emissions reductions, evaluate new legislation, and incorporate updated technologies that emerge. As such, the proposed action list focuses on GHG reductions through 2030 as its primary yardstick.

Figure 1: CAP 2.0 Target Pathway



GHG Emissions

As previously reviewed by the Committee in Pleasanton’s 2017 GHG emissions inventory, GHG emissions were forecasted out for future years (accounting for projected growth). This is called the business-as-usual (BAU) forecast. The BAU forecast is then adjusted to consider the effect of state and federal regulations (e.g., building codes and car efficiency standards) that will impact future emissions in Pleasanton. This is called the adjusted business-as-usual forecast (ABAU).

Further, staff identified several actions that the City is already undertaking and will continue to implement (e.g., SB 1383), which are noted as existing and on-going actions. Since these actions are not yet captured in the ABAU forecast, estimates are adjusted again accounting for continuation of these existing on-going City actions. The policy focus of the CAP 2.0 is the remaining gap between the projected emissions (adjusted for regulations and accounting for existing actions) and the established 2030 GHG emission reduction target.

If all actions from the short list are included in the CAP 2.0, the City is projected to exceed the 2030 target by an estimated 12,774 MTCO₂e (calculated as mass emissions) and 0.2 metric MTCO₂e per capita. This is shown in Figure 2 and 3, below. If all actions are implemented, the 2045 target is not currently being met. However as noted above, that target is meant to be aspirational and set up the pathway of reductions needed to reach zero emissions by 2045. This is consistent with other recently adopted CAPs including the City of Dublin. A 2030 update to the CAP will provide an opportunity to re-evaluate various aspects of the CAP and establish the pathway for the next decade.

Figure 2: Projected Emissions Graph

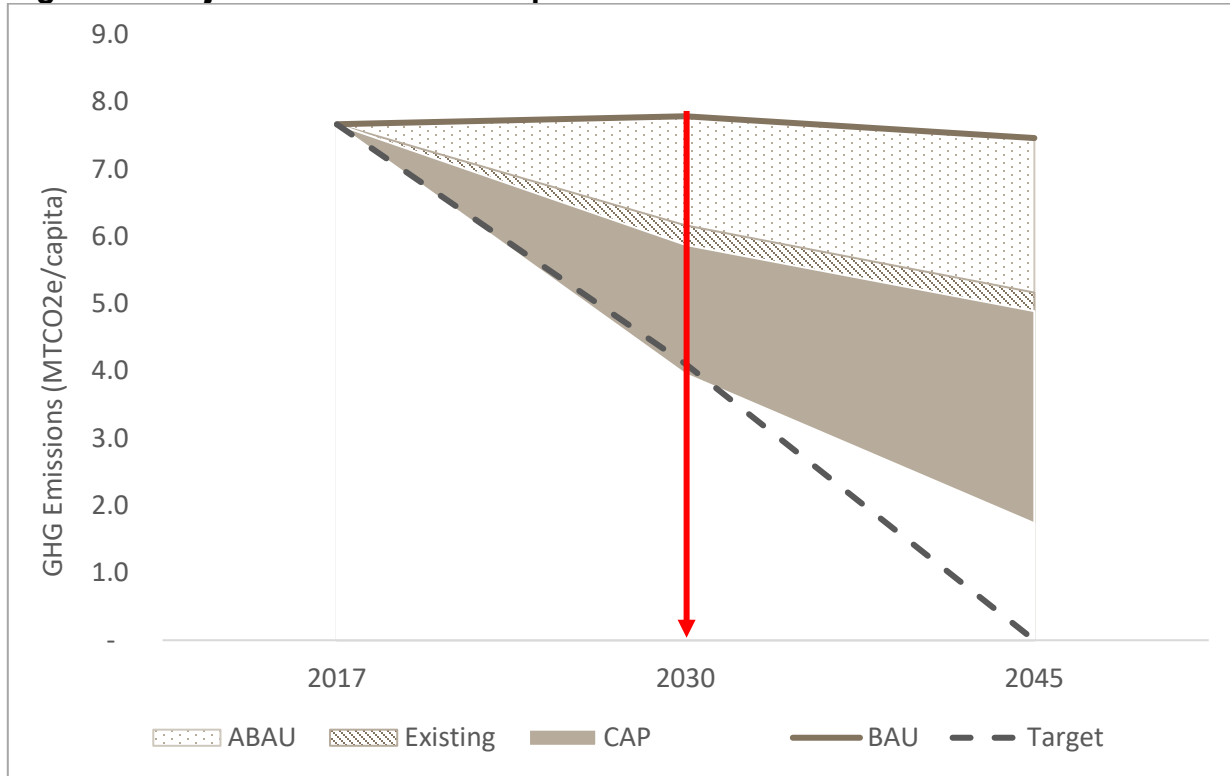


Figure 3: Projected Emissions Table

	Emissions in 2030- Mass Emissions (Per Capita) MTCO2E
BAU Emissions	646,644 (7.79)
ABAU Emissions	512,167 (6.17)
Existing On-going Action Emissions Reductions ¹	-58,960 (0.71)
New CAP Action Emissions Reductions	-124,792 (1.50)
Total Projected Emissions	328,415 (3.96)
Target Emissions	341,188 (4.11)
Projected Emissions Gap from Target	-12,773(-0.15) Exceeds target reductions

CAP 2.0 ACTIONS

Existing Actions

Staff suggests the actions identified as existing on-going should be maintained through the lifespan of the CAP 2.0 to ensure the City meets the GHG targets. If existing actions which mitigate GHG emissions are no longer pursued, the City will need to revisit the projected emissions to ensure the targets will be met. Existing actions are outlined in Attachment 1 and include implementation of the Bicycle and Pedestrian Master Plan and SB 1383.

New Actions

There are several combinations of new actions that would meet the established 2030 GHG emission target. To help inform its recommendation, staff evaluated several different

¹ This includes some actions moved to “existing on-going” by staff as outlined in Attachment 1 and 3.

scenarios to understand relative reductions, costs, and benefits, and to bracket the range of options.

For example, staff evaluated including all new actions in the short list. In this scenario, the estimated cost to the City would be approximately \$10.2 million with a savings to the community of approximately \$15.9 million through the ten-year implementation of the plan. While all actions on the short list have merit, including all the actions in the CAP 2.0 would be cost prohibitive (even when considering outside funding sources) and infeasible to the City both in terms of staff time and cost. Further, some of the actions offer negligible GHG mitigation, are excessively costly for either the community or City, and/or seem more appropriate for a community organization or other entity to undertake.

Staff also evaluated a scenario including just the minimum number of actions needed to achieve the GHG targets. In this scenario, the estimated cost to the City would be approximately \$1.9 million, with a savings to the community of approximately \$1.4 million through the ten-year implementation of the plan. Although implementing as few as 5 actions could result in meeting the 2030 targets, it also results in a narrow scope of actions allowing essentially no margin of error. Recognizing that the GHG reductions are estimates, actual reductions are subject to an inherent degree of variability. Limiting the scope of actions increases the risk that an underestimation would drastically alter projected reductions or that an unexpected challenge to effective implementation will curtail the City's ability to meet its 2030 target. Limiting the actions also reduces the resilience and adaption actions being pursued and ignores cost effectiveness.

Staff Recommendation

Considering all of the actions, the initial selection criteria, the cost-benefit analysis, and the desire to strike a balance between creating an achievable, but not overly narrow list of actions, staff has developed a recommended package of actions that includes 15 primary actions (predominately GHG mitigation) and 10 secondary actions (predominately resilience/adaptation), as described further below and seen in Attachment 1. Attachment 3 provides a redline of the strategies and actions as proposed by staff and includes the full text of the proposed actions.²

Primary Actions

Staff recommends a set of 15 primary actions which are largely GHG mitigating actions. As seen in Attachment 1, the list includes actions in several sectors including Buildings and Energy, Transportation and Land Use, Materials and Consumption, Natural Systems, and Community Resilience and Wellbeing. Staff recommends a mixture of large-scale actions (i.e., programs and initiatives that will take multiple years to implement) and small-scale actions (i.e., actions which are relatively quick to execute and can provide small, achievable successes that incrementally contribute to meaningful GHG reductions over-time). The mix of actions accounts for GHG mitigation, City cost, staffing assumptions, community cost, co-benefits, and community input. Implementing the primary actions will cost the City approximately \$1.1 million and save the community approximately \$1.8 million through ten-year implementation of the plan.

² The redlines include moving some actions to existing on-going, removing some actions, combining similar actions, and minor changes to the action language.

Secondary Actions

Staff recommends a set of 10 secondary actions which are predominately resilience and adaptation actions. As seen in Attachment 1, the list includes actions in Water Resources in addition to the sectors noted above. It is important to note that while some of the resilience and adaptation actions may not directly impact GHGs as calculated in the inventory, they often have other benefits (e.g., reducing wildfires or decreasing water consumption) and may have indirect GHG mitigation benefits. Staff suggests the phasing/timing of the secondary actions be flexible and these actions be implemented as resources (i.e., staff time and funding sources) permit and/or opportunities to partner regionally become available. If resources and/or partnerships do not become available for these actions, staff suggests they do not get pursued. However, continuing to include resilience and adaptation actions in the CAP 2.0 as secondary actions, allows them to remain “on the radar” as the City considers future work plan and staffing priorities, and allows the City to implement them when feasible and/or when opportunities arise.

Summary

Staff’s recommendation strikes a balance between co-benefits, community cost, City cost, community input, and staffing assumptions. It also continues to consider resilience and adaptation actions without overburdening the City budget and resources which supports the CAP 2.0 vision of not only reducing emissions but also improving quality of life and public health, cultivating community resilience and adaptability to future effects of climate change, and promoting thriving ecosystems and a vibrant economy. Figure 4 below summarizes the annual cost (to the City and to the community) of the recommended set of primary and secondary actions, as well as the associated GHG emissions reductions. The 2030 CAP 2.0 target is ambitious. However, implementing the recommended primary actions would mean that Pleasanton is anticipated to exceed the 2030 target by an estimated 5,886 MTCO_{2e} mass emissions and 0.07 MTCO_{2e} per capita, as seen in Figure 4 below.

Figure 4: Summary of Costs and Emissions Reductions for Recommended CAP 2.0 Actions

	Annual City Cost ³	Annual Community Cost Per Capita ⁴	Annual FTE ⁵	GHG Emissions
Primary Actions	\$111,391.60	-\$2.20	1.6	Emissions exceeds 2030 target by 5,886 MTCO _{2e}
Secondary Actions	\$10,328.90 ⁶	-\$16.33	1.5	Additional reductions in 2030 are 6,539 MTCO _{2e}

The total GHG emissions reductions indicated for the primary actions in Figure 4, represents an approximately one-percent buffer between the proposed 2030 emissions

³ Represented annually through 2031. Does not consider potential funding to offset the costs (e.g., grants or Measure BB)

⁴ Represented annually per capita (based on an average of the forecasted population) through 2031. Includes costs to developers, future residents, current residents, and businesses.

⁵ Represented annually and may be absorbed into existing positions across several City Departments.

⁶ One of the secondary actions included (1008 Energy Benchmarking and City Facility Retrofits) results in a net savings to the City through the lifespan of the plan, however this action will require a significant up-front investment in facilities.

and 2030 emissions target. While this buffer is relatively small, staff notes that it will increase as GHG mitigating secondary actions are implemented. The buffer will also increase if actions are completed ahead of their scheduled phasing. For example, and of note, on July 20, 2021, the City Council voted to move the community into Renewable 100 with East Bay Community Energy (EBCE). This action was conservatively evaluated in the cost-benefit analysis which assumed a 2023 start date to transition to Renewable 100. The July 20 decision provides a very significant step toward reducing GHG emissions and achieving Pleasanton's CAP 2.0 goals.

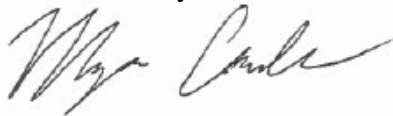
COMMITTEE REVIEW AND RECOMMENDATION

Staff currently recommends 15 primary actions and 10 secondary actions be included in the CAP 2.0, as represented in Attachment 1. Staff seeks the Committee's recommendation on a set of actions to include in the CAP 2.0. The Committee's recommendation will be provided to the City Council in September. The Committee can add, remove, or modify any actions recommended by staff. If actions are removed, staff asks the Committee to be mindful of the CAP 2.0 target pathway. If actions are added, staff asks the Committee to be mindful of cost (both the City and community) and resources beyond cost (e.g., staffing) to implement the actions.

Attachments

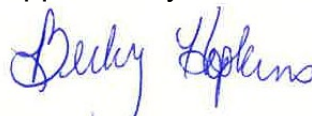
1. Recommended Draft Action List
2. Cost Benefit Analysis
3. Redlined Draft CAP 2.0 Actions and Strategies

Submitted by:



Megan Campbell



Approved by:



Becky Hopkins

Attachment 1- Proposed CAP 2.0 Action List

- Existing On-Going Actions Pages 1-2
- Proposed New Primary Actions Pages 3-4
- Proposed New Secondary Actions Pages 5



Existing On-Going Actions			
Sector	Action Summary ¹	GHG Reduction in 2030 ²	Cumulative GHG Reduction through 2030
Buildings and Energy	Maintain zero-emissions energy as the default east bay community energy choice for municipal operations	183	2,118
Buildings and Energy	Maintain zero-emissions energy as the default east bay community energy choice for the community (formally new action 1119)	30,374	277,840
Transportation and Land Use	Continue to implement the Bicycle and Pedestrian Master Plan and the Trails Master Plan and close bicycle, pedestrian, and trail network gaps (combined with new action 1082).	1,280	6,408
Transportation and Land Use	Continue working with regional partners to support the Valley Link project.	765	5,253
Transportation and Land Use	Continue to implement the City’s Complete Streets Program.	56	1,036
Transportation and Land Use	Adopt and implement the housing element aiming to achieve a jobs/housing balance (formally new action 1230).	3,717	18,800
Materials and Consumption	Continue to promote local purchasing for new businesses and residents to support local vendors, services, and stores.	-	-
Materials and Consumption	Implement SB 1383 which includes establishing a robust food recovery program, developing an implementation plan to reduce methane emissions by decreasing organics in the landfill), and increasing education and outreach around compliance.	22,585	135,118
Materials and Consumption	Implement textile recovery drop-off service (formally new action 1229).	 ³	

¹ These descriptions represent a summary of the actions, not the full language of the actions. Please see Attachment 3 for the full language.

² All GHG reductions in metric tons carbon dioxide equivalent (MTCO₂e)



³ Denotes actions that may have notable direct or indirect GHG savings that were not quantified due to measurement constraints.











Existing On-Going Actions			
Sector	Action Summary ¹	GHG Reduction in 2030 ²	Cumulative GHG Reduction through 2030
Materials and Consumption	Continue to provide outreach and education around reducing waste generation and increasing waste diversion.		
Natural Systems	Continue to implement the Pesticide Posting Program.		
Natural Systems	Continue to manage the amount, source, placement, and timing of plant nutrients and soil amendments in public spaces.		
Natural Systems	Continue to promote City's Water Conservation Program including rebates, workshops, and outreach.		
Water Resources	Continue to provide the controller assistance program to Pleasanton residents.		
Water Resources	Continue to monitor and provide outreach to the community regarding their water leaks based on their smart water meter data.		
Water Resources	Continue to promote the City's Water Conservation program including rebates, workshops, and outreach.		
Water Resources	Continue to require new developments of a certain size to have on-site stormwater management and minimal hardscape as regulated by the Alameda Countywide National Pollution Discharge Elimination System (NPDES) (formerly new action 1199).		
Community Resilience	Continue to partner with schools (e.g., provide funding and staff capacity) and support youth climate action activities		
Community Resilience	Continue to partner with local organizations to increase awareness of and access to green spaces and outdoor recreation for all residents.		
Community Resilience	Continue to maintain adequate and accessible cooling centers for extreme heat.		
Community Resilience	Continue to expand urban agriculture opportunities in community gardens, schools, parks, and on rooftops (e.g., Bernal Community Farm) (formerly new action 1143).		

Proposed New Primary Actions							
Sector	Action Summary	Phasing	Total FTE ⁴	Total City Cost ⁵	Total Community Cost	GHG Reduction in 2030	Cumulative GHG Reduction through 2030
Buildings and Energy	1001 Adopt all-electric reach codes requiring electrification for new construction (exceptions will be considered)	Near-term (0-3 years)	0.10	\$49,020	(\$2,784,572)	2,999	11,615
Buildings and Energy	1164 Prepare and implement existing building electrification plan (voluntary only) including grid analysis, municipal building electrification, community electrification incentives and outreach	Mid-term (4-7 years)	0.06	\$138,455	\$137,032	4,357	16,511
Buildings and Energy	1217 Modify definition of “covered project” in the Pleasanton Municipal Code (PMC) Green Building section to cover all new commercial buildings and residential homes	Near-term (0-3 years)	0.02	\$0	\$287,074	279	1,290
Buildings and Energy	1163 Encourage solar/battery on new developments	Near-term (0-3 years)	0.11	\$0	\$0	76	244
Transportation and Land Use	1056 Develop and implement a zero-emissions vehicle infrastructure plan which expands community EV infrastructure, electrifies portions of the municipal fleet, and bolsters community outreach and funding	Mid-term (4-7 years)	4.00	\$203,263	(\$24,556)	25,352	118,182
Transportation and Land Use	1190 Electrify municipal small engine equipment (e.g., mowers and tractors) and reduce emissions of off-road equipment upon replacement	Mid-term (4-7 years)	0.3	\$0	\$0		
Transportation and Land Use	1115 Expand community small-engine electrification (e.g., lawn mowers, leaf blowers)	Near-term (0-3 years)	0.23	\$0	(\$2,448,960)	1,446	6,250

⁴ Full-time equivalencies (FTE) shown through action implementation (2031).

⁵ Costs shown through action implementation (2031). Includes one-time and on-going costs.

Proposed New Primary Actions							
Sector	Action Summary	Phasing	Total FTE ⁴	Total City Cost ⁵	Total Community Cost	GHG Reduction in 2030	Cumulative GHG Reduction through 2030
Transportation and Land Use	1078 Require bicycle parking and amenities (e.g., showers) for new developments (includes 1079)	Near-term (0-3 years)	0.02	\$0	\$2,557,925	317	1591
Transportation and Land Use	1080 Develop and implement a bicycle rack request program for businesses	Mid-term (4-7 years)	0.07	\$7,562	(\$730,532)	584	1,823
Transportation and Land Use	1180 Increase public transit ridership by partnering with transit agencies (e.g., BART, ACE, and LAVTA) to improve access across the City	Long-term (8-10 years)	1.76	\$75,384	(\$1,277,220)	1,328	5071
Transportation and Land Use	1086 Promote LEED Neighborhood for new developments	Long-term (8-10 years)	0.04	\$910	(\$850,666)	1,803	16,611
Materials and Consumption	1194 Reduce consumption from single use plastic (e.g., implement single use plastic ban and/or require events to use reusables)	Mid-term (4-7 years)	0.27	\$0	\$0		
Natural Systems	1150 Develop and implement an Urban Forest Master Plan increasing carbon sequestration through trees (includes 1145)	Near-term (0-3 years)	4.02	\$486,089	\$469,585	73,253	366,263
Natural Systems	1219 Increase carbon sequestration on public and private lands through compost and mulch	Near-term (0-3 years)	2.5	\$34,711	\$2,868,511	621	3,890
Community Resilience and Wellbeing	1023 Develop and implement a comprehensive public outreach education program (includes 1204, 1228, and 1151)	Mid-term (4-7 years)	2.04	\$118,522	\$0	5,490	27,346

Proposed New Secondary Actions							
Sector	Action Summary	Phasing	Total FTE	Total City Cost	Total Community Cost	GHG Reduction in 2030	Cumulative GHG Reduction through 2030
Buildings and Energy	1169 Require new construction use lowest global warming potential refrigerants for appliances and HVAC systems	-	0.3	\$42,675	(\$262,307)		
Buildings and Energy	1008 Conduct energy benchmarking for City facilities and implement facility energy efficiency upgrades	-	0.97	(\$3,103,111)	\$0	34	351
Buildings and Energy	1176 Promote community energy efficiency upgrades	-	0.85	\$958,041	(\$1,959,201)	3,976	26,041
Transportation and Land Use	1184 Explore opportunities to decrease VMTs related to K-12 curricular and extracurricular events	-	4	\$571,058	(\$6,365,308)	2,529	12,708
Materials and Consumption	1047 Adopt City environmentally preferable purchasing policy	-	0.02	\$0	\$0		
Materials and Consumption	1198 Develop and implement an embodied carbon reduction plan that considers whole building lifecycle and low carbon construction products	-	0.21	\$0	(\$88,625)		
Natural Systems	1220 Track carbon sequestration technology developments	-	0.13	\$0	\$0	-	-
Water Resources	1087 Further incentivize water efficiency retrofits (e.g., drought-resistant landscape, more efficient appliances) (includes 1147)	-	0.3	\$1,634,626	(\$4,650,297)	-	-
Water Resources	1136 Develop a green stormwater infrastructure plan (e.g., incorporating green roofs, rainwater catchment, etc.)	-	0.3	\$0	\$0		
Community Resilience and Wellbeing	1096 Wildfire preparation, prevention, and education	-	7.5	\$0	\$0		



Detailed GHG & Cost Analysis Outcomes

For Pleasanton CAP 2.0 | July 30, 2021

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Executive Summary

This document summarizes findings from a quantitative assessment of the prioritized shortlist of actions for inclusion in the draft Pleasanton CAP 2.0. The quantitative assessment provides high-level estimates of the **costs** and **emission reductions** associated with each action to provide a defensible plan for meeting the City’s emission reduction goals. Key findings of the analyses include:

- Modeling suggests that implementation of proposed CAP 2.0 measures could **exceed the City’s proposed 2030 target** (4.11 MTCO_{2e} per capita) and SB-32 required reductions, resulting in emissions that drop from 13.6 MTCO_{2e} per capita in 1990 to **3.96 MTCO_{2e} per capita in 2030**. The following CAP strategies and actions are the highest contributors of GHG emission reductions through 2030:
 - Carbon sequestration (Urban Forest Master Plan)
 - Renewable electricity (Zero emissions as default EBCE choice)
 - Vehicle decarbonization (ZEV Infrastructure Plan)
 - Decarbonization of buildings (Existing Building Electrification Plan)
- Modeling suggests that the total net present value (NPV) City cost over the next ten years through 2031 of implementing all the actions in the shortlist will be **\$23 million**—equivalent to around **\$2.3 million per year**.
- The estimated NPV cost to the community over the next ten years through 2031 of implementing all the actions in the shortlist is a **net savings of \$10 million**—equivalent to around **\$1 million in savings per year** or \$12 in annual savings per capita. Much of these savings to the community are in the form of rebates/incentives and fuel cost savings.
- Implementing all the actions in the shortlist will require staff time, ranging from an estimated **5 to 8.25 FTE per year through 2031**. These FTE may be absorbed into existing staff duties or new staff may be hired. The following actions have the highest total FTE estimated from 2022-2031:
 - Bicycle, pedestrian, and trails network expansion
 - Wildfire preparation, prevention, and education
 - ZEV Infrastructure Plan
 - VMT reduction for K-12 activities
 - Urban Forest Master Plan

This document is organized as follows:

- The [Overview](#) introduces the approach and key assumptions that drove the analysis.
- The [Findings Summary](#) provides the emissions reductions, City staff time, NPV, and cost-effectiveness for proposed CAP 2.0 actions.
- The remaining sections detail emissions reduction and cost results by sector:
 - [Buildings & Energy](#)
 - [Materials & Consumption](#)
 - [Natural Systems](#)
 - [Water Resources](#)
 - [Transportation & Land Use](#)
 - [Community Resilience & Wellbeing](#)
- A detailed [References](#) list documents the sources used to conduct the analyses.

Overview

This document summarizes findings from a quantitative assessment of the prioritized shortlist of actions for inclusion in the draft Pleasanton CAP 2.0. The quantitative assessment provides high-level estimates of the **costs** and **emission reductions** associated with each action (detailed below), to provide a defensible plan for meeting the City’s emission reduction goals.

Some actions in the CAP are directly **quantifiable**, while others are not. Many of the actions in the prioritized shortlist may not be readily quantifiable, may result in inconsequential GHG reductions, or may have indirect benefits that do not result in emissions reductions as calculated in the City’s inventory. These actions, often defined as “**supportive**,” may be critical for implementation success even if they are not quantified. For example, actions to enhance energy battery storage are crucial for large-scale implementation of renewable energy and electrification, but do not themselves reduce GHG emissions. Another example is education and incentive programs, which can encourage reductions but do not necessarily result in significant reductions, depending on the reach, efficacy, and permanence of the implemented changes. In contrast, an ordinance to require all-electric new construction is a quantifiable action that carries a very high and defensible likelihood of significant and measurable emissions reductions.

Some proposed CAP 2.0 actions are focused on improving community resiliency to climate change impacts rather than reducing GHG emissions. While the resilience benefits of these “**climate adaptation**” actions were not quantified, taking action to build climate resiliency and preparedness are nonetheless critical for addressing climate change in the Pleasanton community and should be considered as an important part of Pleasanton’s climate action strategy.

The project team took an action quantification approach similar to that taken by the City of Dublin for their recent CAP, which provided quantitative estimates for CAP measures (see table on the following page). The approach of quantifying actions ensures that the package of measures in the Pleasanton CAP 2.0 will result in sufficient emissions reductions needed to meet short-term goals and establish a strong foundation for meeting long-term goals.

Action impact was explicitly modelled based on **available information** and **case studies**, including data on historic and projected energy usage, population and development trends, and technology and policy impact. The consultant drew from literature and expert opinion—including studies done by the U.S. Department of Energy and California Air Resources Board—as well as from available City data and staff input.

Actions were analyzed based on predetermined implementation **timeframes**, which were categorized as follows:

- Near-term (1-3 years); 2022 to end of 2024
- Mid-term (4-7 years); 2025 to end of 2028
- Long-term (8-10 years); 2029 to end of 2031

Actions were further divided into two categories:

- **Existing actions:** Actions that are already underway, planned, and/or budgeted for implementation and will result in future GHG emissions reductions.
- **CAP actions:** Actions that represent new or expanded activities as compared to the City's current or planned activities.

Cost Estimation

Action implementation costs were estimated for both costs to the City and community:

- **Community costs** estimate how much it will cost an average resident, business, or developer to implement the measure as compared to a business-as-usual scenario.
- **City costs** estimate costs related to consultant services and procurement.

Similar to the impact analysis, the consultant estimated costs for all measures in the prioritized shortlist. The estimated cost was based on consultant experience, available literature, consultation with peer cities, and City staff input, and included the following cost elements:

- **Initial start-up costs**, in the form of consultant and capital expenses.
- **Ongoing costs** through 2031 over a 10-year timeframe, including continued labor expenses, maintenance, and monitoring/evaluation of resource needs.

City staff time required for action implementation was evaluated separately and is not included in the cost estimations as some of the anticipated staff time may be absorbed into existing City staff.

City staff reviewed the cost estimations—especially the City cost element (e.g., estimated FTE requirements). To the extent possible, the consultant provided citations for consulted literature and case studies, although information on climate action costs is very limited at this time.

Where known, the analysis includes consideration of partnerships. However, the analysis does not include potential grants and other funding sources, so estimates here may be conservative representations of the City's final cost. A more detailed funding plan will be provided in future stages of the plan.

Emission Reduction Estimation

The consultant explicitly modelled emissions reductions associated with proposed CAP 2.0 actions. Modeling built from the emissions forecast and considered interacting actions to avoid double counting, such as impacts of EV vehicle use on community electricity consumption. All assumptions are provided for transparency and City/stakeholder review and outcomes are visualized in both table and graphical format.

Findings Summary







Results from the cost and impact analysis are summarized in the table below. The “Summary At-a-Glance” table on the subsequent page includes the following information associated with each proposed CAP 2.0 action:


- **Net Present Value (NPV) cost to the City and community:** The anticipated net cost of the action for the City government and Pleasanton community as a whole, considering current and future costs and cost savings benefits (through 2031). Negative NPV values represent cost savings.
- **GHG savings:** Estimated cumulative GHG emission reduction benefits resulting from action implementation (through 2030).
- **Cost effectiveness:** Estimated cost effectiveness of the action (cost per unit GHG emission reduction achieved).
- **Co-benefits:** Benefits that would result from the action in addition to direct climate benefits, including resilience, equity, job creation, public health, ecosystem and habitat health, and mobility and transport safety. In addition to the co-benefits highlighted, many actions—including many not quantified for GHG savings—also present an opportunity for City leadership, are foundational to overall sustainability or to ensure the success of more directly impactful actions, or support youth engagement and capacity for climate action














The Summary At-a-Glance table is followed by the following additional summary sections:

- **GHG Reductions** highlights the combined impact of all strategies and actions in reaching Pleasanton’s overall and per capita emissions reduction targets. It also summarizes which strategies and actions contribute most to emissions reduction.
- **Cost** details the estimated city staff time, in FTE, required to implement CAP 2.0. It also includes the NPV cost by strategy and by action, organized by sector.
- **Cost effectiveness** includes the overall cost-effectiveness of CAP 2.0 implementation for the City and community, highlights the most cost-effective actions, and summarizes cost effectiveness for every action.


















































Summary At-a-Glance

Co-Benefits Key		
 Resilience	 Public health	 Ecosystem and habitat health
 Equity	 Job creation	 Mobility & transport safety

Acronym/Abbreviation Key		
Comm.	Community	
NPV	Net present value	Net current value of all current and future cash flows associated with the project; takes into account both costs and cost savings (i.e., benefits). Negative values are a net cost savings.
GHG	Greenhouse gas	Methane, carbon dioxide, and nitrous oxides that contribute to climate change
MTCO _{2e}	Metric tons carbon dioxide equivalent	Common unit for quantifying GHG emissions
	Denotes actions with notable direct or indirect GHG savings that were not quantified due to measurement constraints.	

Sector	ID	Action	NPV Costs (\$)		GHG Savings (MTCO _{2e})*	Cost Effectiveness (\$/MTCO _{2e})*		Co-Benefits
			NPV Costs to City	NPV Costs to Community		City	Comm.	
BE	1001	All-electric reach code	\$49,020	-\$2,784,572	11,615	\$4	-\$240	
BE	1164V	Existing Building Electrification Plan	\$138,455	\$137,032	16,511	\$8	\$8	
BE	1169	Refrigerant management in new construction	\$42,675	-\$262,307		N/A	N/A	
BE	1217	Modify Municipal Code definition of covered projects	\$0	\$287,074	1,290	\$0	\$223	
BE	1176	Community energy efficiency upgrades	\$958,041	-\$1,959,201	26,041	\$37	-\$75	
BE	1167	LEED certification for new construction	\$7,843	-\$180,389	227	\$34	-\$793	
BE	1008	Energy Benchmarking and City Facility Retrofits	-\$3,103,111	\$0	351	-\$8,833	\$0	
BE	1119	Zero emissions energy as default EBCE choice ¹	\$0	\$20,919,524	277,840	\$0	\$75	
BE	1163	Solar & storage on new construction	\$0	\$0	244	\$0	\$0	
T&LU	1056	ZEV Infrastructure Plan	\$203,263	-\$24,556	118,182	\$2	\$0	
T&LU	1190	Municipal small-engine electrification and off-road equipment	\$0	\$0		N/A	N/A	

¹ EBCE = East Bay Community Energy

Sector	ID	Action	NPV Costs (\$)		GHG Savings (MTCO2e)*	Cost Effectiveness (\$/MTCO2e)*		Co-Benefits
			NPV Costs to City	NPV Costs to Community	Cumulative to 2030	City	Comm.	
T&LU	1115	Community Small-engine electrification	\$0	-\$2,448,960	6,250	\$0	-\$392	 
T&LU	1082	Bicycle, pedestrian, and trails network expansion	\$13,108,964	-\$3,800,771	3,204	\$4,091	-\$1,186	  
T&LU	1078	Workplace bike amenities	\$0	\$2,593,114	955	\$0	\$2,716	 
T&LU	1080	Bicycle rack incentive program	\$7,562	-\$730,532	1,823	\$4	-\$401	 
T&LU	1079	Required bike parking at MF/Comm developments	\$0	-\$35,260	636	\$0	-\$55	 
T&LU	1070	Increase active transportation	\$0	-\$392,340	920	\$0	-\$426	 
T&LU	1180	Increase transit ridership	\$75,384	-\$1,277,220	5,071	\$15	-\$252	
T&LU	1184	VMT reduction for K-12 activities	\$571,058	-\$6,365,308	12,708	\$45	-\$501	
T&LU	1159	Shared parking	\$0	\$0		N/A	N/A	
T&LU	1230	Housing Element	\$39,719	-\$11,150,518	18,800	\$2	-\$593	   
T&LU	1227	Trend changes from COVID	\$0	\$0		N/A	N/A	 
T&LU	1086	Promote LEED Neighborhood Development	\$910	-\$850,666	16,611	\$0	-\$51	 
M&C	1229	Textile recovery	\$0	\$0		N/A	N/A	
M&C	1194	Single use plastic reduction	\$0	\$0		N/A	N/A	 
M&C	1047	Environmentally preferable purchasing policy	\$0	\$0		N/A	N/A	 
M&C	1126	Collaborative consumption	\$297,774	-\$190,934		N/A	N/A	 
M&C	1137	Repair Industry	\$24,857	-\$37,659		N/A	N/A	  
M&C	1198	Embodied carbon reduction plan	\$0	-\$88,625		N/A	N/A	  
NS	1150	Urban Forest Master Plan	\$486,089	\$469,585	366,263	\$1	\$1	 
NS	1219	Soil management carbon sequestration projects	\$34,711	\$2,868,511	3,890	\$9	\$737	
NS	1220	Carbon sequestration research and tracking	\$0	\$0		N/A	N/A	
NS	1145	Climate adapted plantings	\$0	\$0		N/A	N/A	 

Sector	ID	Action	NPV Costs (\$)		GHG Savings (MTCO2e)*	Cost Effectiveness (\$/MTCO2e)*		Co-Benefits
			NPV Costs to City	NPV Costs to Community	Cumulative to 2030	City	Comm.	
NS	1099	Restore and conserve native grassland, rangeland, and riparian habitats	\$1,280,236	\$0		N/A	N/A	
NS	1204	Community conservation programs	\$0	\$0		N/A	N/A	
WR	1087	Water fixture retrofits	\$220,588	-\$2,942,142		N/A	N/A	
WR	1094	Expand recycled water	\$5,177,842	\$0		N/A	N/A	
WR	1147	Water Efficiency Programs	\$1,414,038	-\$1,708,155		N/A	N/A	
WR	1092	Stormwater runoff reuse	-\$400,570	-\$113,123		N/A	N/A	
WR	1136	Green Stormwater Infrastructure Plan	\$0	\$0		N/A	N/A	
WR	1199	On-site stormwater management	\$0	\$0		N/A	N/A	
CRW	1026	Neighborhood resilience hubs	\$369,290	\$0		N/A	N/A	
CRW	1143	Community gardens	\$115,355	\$0		N/A	N/A	
CRW	1130	CalFresh, WIC & Senior FMNP expansion	\$0	\$0		N/A	N/A	
CRW	1010	Reduce heat island effect	\$0	\$80,022		N/A	N/A	
CRW	1096	Wildfire preparation, prevention, and education	\$0	\$0		N/A	N/A	
CRW	1216	Institutionalize climate action	\$1,991,951	\$0		N/A	N/A	
CRW	1032	Prioritize adaptation and resilience in capital projects	\$46,192	\$0		N/A	N/A	
CRW	1038	Critical facility relocation	\$138,577	\$0		N/A	N/A	
CRW	1023	Comprehensive climate outreach	\$64,521	\$0	27,346	\$2	\$0	
CRW	1228	Sustainability Awards	\$4,981	\$0		N/A	N/A	
CRW	1151	Update CAP checklist	\$49,020	\$0		N/A	N/A	
TOTAL			\$23,415,234	-\$9,988,378	916,777	\$26	-\$11	

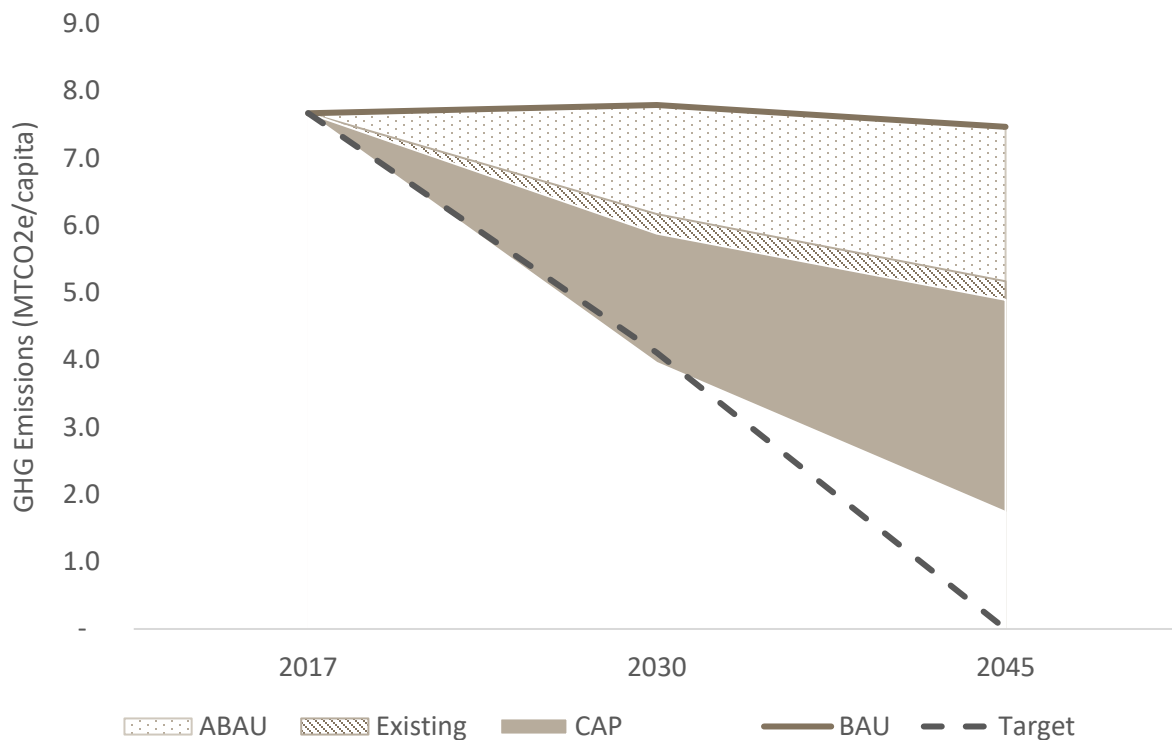
*Blank cells were not quantified because the action focuses on climate adaptation rather than climate mitigation.

GHG Reductions

Modeling suggests that all currently proposed CAP measures result in the City achieving its 2030 emission goal (4.11 MTCO₂e per capita) and SB 32 requirements. Specifically, modeling indicates the City could surpass this goal—reducing emissions to 3.96 MTCO₂e per capita in 2030. The following CAP strategies and actions are the highest contributors of GHG emission reductions through 2030:

- Carbon sequestration (Urban Forest Master Plan)
- Renewable electricity (Zero emissions as default EBCE choice)
- Waste diversion (SB 1383 implementation)
- Vehicle decarbonization (ZEV Infrastructure Plan)
- Decarbonization of buildings (Existing Building Electrification Plan)

Figure 1. Aggregated pre-capita GHG emissions.



Acronym Key:

ABAU: adjusted business-as-usual; emission reductions resulting from external federal and state policies.

Existing: emission reductions resulting from continuation of existing City actions.

CAP: Emission reductions resulting from CAP 2.0 implementation.

BAU: business-as-usual; emissions trajectory assuming no climate action.

Target: Target emissions trajectory

Table 1. GHG emission reductions associated with state and federal legislation adjustments, all potential CAP 2.0 strategies and actions, and existing City actions (in MTCO2e). Unless otherwise indicated, reductions are isolated to those achieved within the indicated year compared to the BAU scenario. Cumulative values are through 2030.

Sector	Strategy	Mass (MTCO2e)			Per-Capita (MTCO2e/person)		
		Cumulative	In 2030	In 2045	Cumulative	In 2030	In 2045
All	ABAU reduction	3,980,004	134,477	224,576	47.94	1.62	2.29
BE	Decarbonization of buildings	28,126	7,356	28,992	0.34	0.09	0.30
BE	Energy efficiency & consumption	27,909	4,342	143	0.34	0.05	0.00
BE	Renewable energy generation & storage	278,084	30,450	-	3.35	0.37	0.00
T&LU	Active, shared transport	31,567	7,140	6,124	0.38	0.09	0.06
T&LU	Sustainable land use	35,411	5,520	3,226	0.43	0.07	0.03
T&LU	Vehicle decarbonization	118,182	25,352	71,168	1.42	0.31	0.73
M&C	Waste diversion	-	-	-	--	-	-
M&C	Sustainable consumption	-	-	-	-	-	-
NS	Carbon sequestration	370,153	73,874	195,961	4.46	0.89	2.00
NS	Ecosystem resilience	-	-	-	-	-	-
WR	Supply & conservation	-	-	-	-	-	-
WR	Stormwater resilience	-	-	-	-	-	-
CRW	Community resilience	-	-	-	-	-	-
CRW	CC vulnerability	-	-	-	-	-	-
CRW	City ops integration	27,346	5,490	2,950	0.33	0.07	0.03
BE	Existing actions	2,118	183	-	0.03	0.00	0.00
T&LU	Existing actions	9,494	1,462	767	0.11	0.02	0.01
M&C	Existing actions	135,118	22,585	26,499	1.63	0.27	0.27
NS	Existing actions	-	-	-	-	-	-
WR	Existing actions	-	-	-	-	-	-
CRW	Existing actions	-	-	-	-	-	-
	Total Reductions	5,043,510	318,229	560,407	60.75	3.83	5.73
	Resulting Emissions	-	328,415	170,149	-	3.96	1.74

Table 2. Top 10 actions for reducing GHG emissions through 2030.

ID	Action	MTCO2e Reductions (mass), by year		MTCO2e Reductions (mass), cumulative	
		In 2030	In 2045	Cumulative - through 2030	Cumulative - through 2045
1	1150 Urban Forest Master Plan	73,253	195,340	366,263	2,441,753
	1119 Zero emissions energy as default East Bay Community Energy (EBCE) choice	30,374	0	277,840	524,332
2	MC2 SB 1383 Implementation	22,585	26,499	135,118	506,627
3	1056 ZEV Infrastructure Plan	25,352	71,168	118,182	855,919
4	1023 Comprehensive climate outreach	5,490	2,950	27,346	89,091
5	1176 Community energy efficiency upgrades	3,976	70	26,041	58,197
6	1230 Housing Element	3,717	2,257	18,800	64,825
7	1086 Promote LEED Neighborhood Development	1,803	969	16,611	36,376
8	1164V Existing Building Electrification Plan	4,357	6,034	16,511	95,279
9	1184 VMT reduction for K-12 activities	2,529	1,365	12,708	40,539

Table 3. Emissions trajectories under examined scenarios.

	MTCO2e Emissions (mass emissions)		MTCO2e Emissions (per capita)	
	In 2030	In 2045	In 2030	In 2045
BAU Emissions	646,644	730,555	7.79	7.47
ABAU Emissions	512,167	505,979	6.17	5.17
Existing On-Going Cap Reductions	-24,229	-27,266	-0.29	-0.28
CAP Action Reductions	-159,523	-308,565	-1.92	-3.15
Projected Emissions	328,415	170,149	3.96	1.74
% Reduction (compared to 1990 baseline)	52%	75%	71%	87%
Target	341,188	0	4.11	0.00
Projected Gap from Target	-12,774	170,149	-0.15	1.74

City Staff Time

The consultant examined anticipated City staff resources required for CAP implementation, detailed by action below. City staff time are presented in full-time equivalencies (FTE). City staff FTE are a required City resource—the FTE requirements may become part of existing staff duties and assigned to various divisions, or new staff may be required.

Sector	ID	Action	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
BE	1001	All-electric reach code	0.05	0.05									0.10
BE	1164	Existing Building Electrification Plan					0.10	0.10	0.10	0.10	0.10	0.10	0.60
BE	1169	Refrigerant management in new construction								0.10	0.10	0.10	0.30
BE	1217	Modify Municipal Code definition of covered projects	0.02										0.02
BE	1176	Community energy efficiency upgrades				0.25	0.10	0.10	0.10	0.10	0.10	0.10	0.85
BE	1167	LEED certification for new construction	0.01										0.01
BE	1008	Energy Benchmarking and City Facility Retrofits	0.25	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.97
BE	1119	Zero emissions energy as default EBCE choice	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	1.00
BE	1163	Solar and storage on new construction	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.11
T&LU	1056	ZEV Infrastructure Plan				1.00	0.50	0.50	0.50	0.50	0.50	0.50	4.00
T&LU	1190	Municipal small-engine electrification and off-road equipment				0.05	0.05	0.05	0.05	0.05	0.05		0.30
T&LU	1115	Community Small-engine electrification	0.05	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.23
T&LU	1082	Bicycle, pedestrian, and trails network expansion	0.50	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	25.28
T&LU	1078	Workplace bike amenities	0.01										0.01
T&LU	1080	Bicycle rack incentive program				0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.07

CAP 2.0 Action Quantification Outcomes

Sector	ID	Action	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
T&LU	1079	Required bike parking at MF/Comm developments	0.01										0.01
T&LU	1070	Increase active transportation				0.30	0.30	0.30	0.30	0.30	0.30	0.30	2.10
T&LU	1180	Increase transit ridership								0.59	0.59	0.59	1.76
T&LU	1184	VMT reduction for K-12 activities	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50			4.00
T&LU	1159	Shared parking								0.02			0.02
T&LU	1230	Housing Element	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.50
T&LU	1227	Trend changes from COVID	0.10	0.10									0.19
T&LU	1086	Promote LEED Neighborhood Development								0.02	0.01	0.01	0.04
M&C	1229	Textile recovery	0.01	0.01									0.02
M&C	1194	Single use plastic reduction	0.07	0.07	0.07	0.07							0.27
M&C	1047	Environmentally preferable purchasing policy	0.02										0.02
M&C	1126	Collaborative consumption			0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.62
M&C	1137	Repair Industry								0.10	0.10	0.10	0.30
M&C	1198	Embodied carbon reduction plan								0.05	0.08	0.08	0.21
NS	1150	Urban Forest Master Plan	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	4.00
NS	1219	Soil management carbon sequestration projects	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.50
NS	1220	Carbon sequestration research and tracking				0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.13
NS	1145	Climate adapted plantings								0.01	0.01		0.02
NS	1099	Restore and conserve native grassland, rangeland, and riparian habitats								0.27	0.27	0.27	0.81
NS	1204	Community conservation programs				0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.24
WR	1087	Water fixture retrofits	0.03	0.03	0.03	0.03	0.03						0.15
WR	1094	Expand recycled water								0.25	0.25	0.25	0.75

CAP 2.0 Action Quantification Outcomes

Sector	ID	Action	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
WR	1147	Water Efficiency Programs	0.03	0.03	0.03	0.03	0.03						0.15
WR	1092	Stormwater runoff reuse	0.50	0.50	0.50	0.50	0.50						2.50
WR	1136	Green Stormwater Infrastructure Plan								0.10	0.10	0.10	0.30
WR	1199	On-site stormwater management	0.01										0.01
CRW	1026	Neighborhood resilience hubs								0.10	0.10	0.10	0.30
CRW	1143	Community gardens	0.10	0.10	0.10								0.30
CRW	1130	CalFresh, WIC & Senior FMNP expansion	0.10	0.10	0.10								0.30
CRW	1010	Reduce heat island effect	0.01										0.01
CRW	1096	Wildfire preparation, prevention, and education	1.50	1.50	1.50	1.50	1.50						7.50
CRW	1216	Institutionalize climate action	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CRW	1032	Prioritize adaptation and resilience in capital projects				0.04							0.04
CRW	1038	Critical facility relocation				0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.35
CRW	1023	Comprehensive climate outreach	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	1.50
CRW	1228	Sustainability Awards	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10
CRW	1151	Update CAP checklist	0.10	0.10									0.20
		TOTAL	4.96	6.91	6.73	8.28	7.62	5.56	5.56	7.18	6.67	6.61	

Modeling suggests that the total net present value (NPV) City cost through 2031 of implementing all actions on the shortlist will be \$23.4 million—equivalent to around \$2.3 million per year.² The estimated cost to the community through 2031 is a net savings of \$10 million—equivalent to around \$1 million per year or \$12 in annual savings per capita. Much of these savings to the community are in the form of rebates/incentives and fuel cost savings.

Table 4. Net costs associated with proposed CAP 2.0 strategies and actions therein (negative values are net cost savings).

Sector	Strategy	Net Cost to City	Net Cost to Community
		NPV to 2031	NPV to 2031
B&E	Decarbonization of buildings	\$230,149	(\$2,909,848)
B&E	Energy efficiency & consumption	(\$2,137,227)	(\$1,852,516)
B&E	Renewable energy generation & storage	\$0	\$20,919,524
T&LU	Active, shared transport	\$13,762,968	(\$12,457,277)
T&LU	Sustainable land use	\$40,629	(\$12,001,184)
T&LU	Vehicle decarbonization	\$203,263	(\$24,556)
M&C	Waste diversion	\$0	\$0
M&C	Sustainable consumption	\$322,630	(\$317,218)
NS	Carbon sequestration	\$520,801	\$3,338,096
NS	Ecosystem resilience	\$1,280,236	\$0
WR	Supply & conservation	\$6,812,468	(\$4,650,298)
WR	Stormwater resilience	(\$400,570)	(\$113,123)
CRW	Community resilience	\$484,646	\$0
CRW	CC vulnerability	\$0	\$80,022
CRW	City ops integration	\$2,295,242	\$0
	TOTAL (NPV through 2031)	\$23,415,234	(\$9,988,378)
	AVG PER YEAR	\$2,341,523	(\$998,838)
	AVG PER CAPITA-YEAR*	\$29	(\$12)

*Using average projected population over the implementation time period (2022 through end of 2031).

² Does not include costs associated with City staff time or potential funding sources (e.g., grants).

Table 5. Net present value (NPV) net cost estimates for CAP 2.0 action implementation (through 2031).

Sector	ID	Action	NPV Costs (\$)	
			NPV Costs to City	NPV Costs to Community
BE	1001	All-electric reach code	\$49,020	-\$2,784,572
BE	1164V	Existing Building Electrification Plan	\$138,455	\$137,032
BE	1169	Refrigerant management in new construction	\$42,675	-\$262,307
BE	1217	Modify Municipal Code definition of covered projects	\$0	\$287,074
BE	1176	Community energy efficiency upgrades	\$958,041	-\$1,959,201
BE	1167	LEED certification for new construction	\$7,843	-\$180,389
BE	1008	Energy Benchmarking and City Facility Retrofits	(\$3,103,111)	\$0
BE	1119	Zero emissions energy as default East Bay Community Energy (EBCE) choice	\$0	\$20,919,524
BE	1163	Solar and storage on new construction	\$0	\$0
T&LU	1056	ZEV Infrastructure Plan	\$203,263	-\$24,556
T&LU	1190	Municipal small-engine electrification and off-road equipment	\$0	\$0
T&LU	1115	Community Small-engine electrification	\$0	-\$2,448,960
T&LU	1082	Bicycle, pedestrian, and trails network expansion	\$13,108,964	-\$3,800,771
T&LU	1078	Workplace bike amenities	\$0	\$2,593,114
T&LU	1080	Bicycle rack incentive program	\$7,562	-\$730,532
T&LU	1079	Required bike parking at MF/Comm developments	\$0	-\$35,260
T&LU	1070	Increase active transportation	\$0	-\$392,340
T&LU	1180	Increase transit ridership	\$75,384	-\$1,277,220
T&LU	1184	VMT reduction for K-12 activities	\$571,058	-\$6,365,308
T&LU	1159	Shared parking	\$0	\$0
T&LU	1230	Housing Element	\$39,719	-\$11,150,518
T&LU	1227	Trend changes from COVID	\$0	\$0
T&LU	1086	Promote LEED Neighborhood Development	\$910	-\$850,666
M&C	1229	Textile recovery	\$0	\$0
M&C	1194	Single use plastic reduction	\$0	\$0
M&C	1047	Environmentally preferable purchasing policy	\$0	\$0
M&C	1126	Collaborative consumption	\$297,774	-\$190,934
M&C	1137	Repair Industry	\$24,857	-\$37,659
M&C	1198	Embodied carbon reduction plan	\$0	-\$88,625
NS	1150	Urban Forest Master Plan	\$486,089	\$469,585
NS	1219	Soil management carbon sequestration projects	\$34,711	\$2,868,511
NS	1220	Carbon sequestration research and tracking	\$0	\$0
NS	1145	Climate adapted plantings	\$0	\$0
NS	1099	Restore and conserve native grassland, rangeland, and riparian habitats	\$1,280,236	\$0
NS	1204	Community conservation programs	\$0	\$0
WR	1087	Water fixture retrofits	\$220,588	-\$2,942,142
WR	1094	Expand recycled water	\$5,177,842	\$0
WR	1147	Water Efficiency Programs	\$1,414,038	-\$1,708,155
WR	1092	Stormwater runoff reuse	(\$400,570)	-\$113,123
WR	1136	Green Stormwater Infrastructure Plan	\$0	\$0
WR	1199	On-site stormwater management	\$0	\$0
CRW	1026	Neighborhood resilience hubs	\$369,290	\$0
CRW	1143	Community gardens	\$115,355	\$0
CRW	1130	CalFresh, WIC & Senior FMNP expansion	\$0	\$0
CRW	1010	Reduce heat island effect	\$0	\$80,022
CRW	1096	Wildfire preparation, prevention, and education	\$0	\$0
CRW	1216	Institutionalize climate action	\$1,991,951	\$0
CRW	1032	Prioritize adaptation and resilience in capital projects	\$46,192	\$0
CRW	1038	Critical facility relocation	\$138,577	\$0
CRW	1023	Comprehensive climate outreach	\$64,521	\$0
CRW	1228	Sustainability Awards	\$4,981	\$0
CRW	1151	Update CAP checklist	\$49,020	\$0
TOTAL			\$23,415,234	-\$9,988,378

Cost Effectiveness

On average, modeling suggests that implementing all of the actions on the shortlist will cost the City \$26 per MTCO_{2e} reduced and will save the community about \$11 per MTCO_{2e} reduced. Highly cost-effective actions include:

- All-electric reach code
- Existing Building Electrification Plan
- ZEV Infrastructure Plan
- Bicycle rack incentive program
- Required bike parking at MF/Comm developments
- LEED Neighborhood development
- Urban Forest Master Plan
- Housing Element of General Plan
- Community climate outreach

Table 6. Cost effectiveness of proposed draft CAP 2.0 actions. Actions marked as “N/A” were not quantified for GHG emission reductions.³

Sector	ID	Action	Cost Effectiveness (\$/MTCO _{2e})	
			City	Community
BE	1001	All-electric reach code	\$4	-\$240
BE	1164	Existing Building Electrification Plan	\$8	\$8
BE	1169	Refrigerant management in new construction	N/A	N/A
BE	1217	Modify Municipal Code definition of covered projects	\$0	\$223
BE	1176	Community energy efficiency upgrades	\$37	-\$75
BE	1167	LEED certification for new construction	\$34	-\$793
BE	1008	Energy Benchmarking and City Facility Retrofits	-\$8,833	\$0
BE	1119	Zero emissions energy as default East Bay Community Energy (EBCE) choice	\$0	\$75
BE	1163	Solar and storage on new construction	\$0	\$0
T&LU	1056	ZEV Infrastructure Plan	\$2	\$0
T&LU	1190	Municipal small-engine electrification and off-road equipment	N/A	N/A
T&LU	1115	Community Small-engine electrification	\$0	-\$392
T&LU	1082	Bicycle, pedestrian, and trails network expansion	\$4,091	-\$1,186
T&LU	1078	Workplace bike amenities	\$0	\$2,716
T&LU	1080	Bicycle rack incentive program	\$4	-\$401
T&LU	1079	Required bike parking at MF/Comm developments	\$0	-\$55
T&LU	1070	Increase active transportation	\$0	-\$426
T&LU	1180	Increase transit ridership	\$15	-\$252
T&LU	1184	VMT reduction for K-12 activities	\$45	-\$501
T&LU	1159	Shared parking	N/A	N/A
T&LU	1230	Housing Element	\$2	-\$593
T&LU	1227	Trend changes from COVID	N/A	N/A
T&LU	1086	Promote LEED Neighborhood Development	\$0	-\$51
M&C	1229	Textile recovery	N/A	N/A

³ Table presents costs over implementation timeframe (2022 to 2031) divided by cumulative MTCO_{2e} reductions through target year (2030).

Sector	ID	Action	Cost Effectiveness (\$/MTCO2e)	
			City	Community
M&C	1194	Single use plastic reduction	N/A	N/A
M&C	1047	Environmentally preferable purchasing policy	N/A	N/A
M&C	1126	Collaborative consumption	N/A	N/A
M&C	1137	Repair Industry	N/A	N/A
M&C	1198	Embodied carbon reduction plan	N/A	N/A
NS	1150	Urban Forest Master Plan	\$1	\$1
NS	1219	Soil management carbon sequestration projects	\$9	\$737
NS	1220	Carbon sequestration research and tracking	N/A	N/A
NS	1145	Climate adapted plantings	N/A	N/A
NS	1099	Restore and conserve native grassland, rangeland, and riparian habitats	N/A	N/A
NS	1204	Community conservation programs	N/A	N/A
WR	1087	Water fixture retrofits	N/A	N/A
WR	1094	Expand recycled water	N/A	N/A
WR	1147	Water Efficiency Programs	N/A	N/A
WR	1092	Stormwater runoff reuse	N/A	N/A
WR	1136	Green Stormwater Infrastructure Plan	N/A	N/A
WR	1199	On-site stormwater management	N/A	N/A
CRW	1026	Neighborhood resilience hubs	N/A	N/A
CRW	1143	Community gardens	N/A	N/A
CRW	1130	CalFresh, WIC & Senior FMNP expansion	N/A	N/A
CRW	1010	Reduce heat island effect	N/A	N/A
CRW	1096	Wildfire preparation, prevention, and education	N/A	N/A
CRW	1216	Institutionalize climate action	N/A	N/A
CRW	1032	Prioritize adaptation and resilience in capital projects	N/A	N/A
CRW	1038	Critical facility relocation	N/A	N/A
CRW	1023	Comprehensive climate outreach	\$2	\$0
CRW	1228	Sustainability Awards	N/A	N/A
CRW	1151	Update CAP checklist	N/A	N/A
TOTAL			\$26	-\$11

Buildings & Energy

GHG Reductions

GHG analysis assumptions and outcomes for the buildings & energy sector are summarized below. Blank “MTCO2e savings” cells indicate that the action was identified as supportive and not quantified.

Action Information							MTCO2e Savings		
ID	Action	Mitigation Action?	Direct/ Supportive	Timeframe	Key Assumptions	Key Sources	Cumulative - through 2050	Cumulative - through 2045	Cumulative - through 2030
1001	All-electric reach code	Yes	Direct	Near-term (1-3 years)	- 90% of natural gas switch to electricity for all new construction (assumes some exceptions).	N/A	349,891	216,497	11,615
1164	Existing Building Electrification Plan	Yes	Direct	Mid-term (4-7 years)	- 5% switch to electric by 2030.	Dublin CAP estimated 22% retrofits to all-electric (Appendix C, p.12)	125,398	95,279	16,511
1169	Refrigerant management in new construction	Yes	Supportive	Long-term (8-10 years)	N/A		-	-	-
1217	Modify Municipal Code definition of covered projects	Yes	Direct	Near-term (1-3 years)	- Covered buildings are 25% more efficient than previously.	US Green Building Council	8,124	7,748	1,290
1176	Community energy efficiency upgrades	Yes	Direct	Mid-term (4-7 years)	- 2025 start date. - 15% reduction in energy use as a result of program. (Assume slightly more savings than source due to inclusion of incentives.)	Dublin CAP identifies a meta-analysis that found that education-only campaigns can produce 10-12% energy savings.	58,516	58,197	26,041
1167	LEED certification for	Yes	Direct	Near-term (1-3 years)	- Covered buildings are 10% more efficient than current green building code.	Browne 2020 p. 8	1,574	1,527	227

CAP 2.0 Action Quantification Outcomes

Action Information							MTCO ₂ e Savings		
ID	Action	Mitigation Action?	Direct/ Supportive	Timeframe	Key Assumptions	Key Sources	Cumulative - through 2050	Cumulative - through 2045	Cumulative - through 2030
	new construction								
1008	Energy Benchmarking and City Facility Retrofits	Yes	Direct	Near-term (1-3 years)	- 20% reduction in City facility energy use by 2025, steady thereafter.	ACEEE 2018	590	590	351
1119	Maintain zero-emissions energy as default EBCE choice	Yes	Direct	Near-term (1-3 years)	- Zero electricity EF for residential/commercial starting in 2023. - Assume 5% opt-out rate.	California Public Utilities Commission (as referenced in Dublin CAP Appendix C, p. 5); EBCE	524,332	524,332	277,840
1163	Solar and storage on new construction	Yes	Direct	Near-term (1-3 years)	- 10% of new construction will have on-site solar by 2030, with continuing trend thereafter.	Consistent with voluntary participation rate cited in Action 1176.	3,240	3,240	244
1023	Comprehensive climate outreach	Yes	Direct	Near-term (1-3 years)	- 3% reduction in activity data by 2030 (energy consumption, solid waste disposal); ramping up starting in 2022; steady thereafter.	Consultant estimate	32,621	13,977	5,295
B&E 1	Maintain highest EBCE choice for municipal operations	Yes	Direct	Ongoing	- All electricity use is zero emissions in 2022 and beyond.	Consultant estimate	3,398	3,398	2,118

Cost

Cost assumptions and outcomes for the buildings & energy sector are summarized below:

Action Information		Outputs		City Inputs		Community References	
ID	Action	NPV Costs to City	NPV Costs to Community	City Cost Source(s)	City Cost Assumptions/Comments	Community Cost Source(s)	Community Cost Assumptions/Comments
1001	All-electric reach code	\$49,020	-\$2,784,572	CA Energy Codes & Standards Cost-Effectiveness Explorer 2019 Pleasanton studies; Dublin CAP - Appx C p. 8	Staff time required for cost effectiveness evaluation plus community outreach, reach code development, drafting an ordinance for City Council consideration, and initial implementation of the new ordinance. Reach code takes two years to get into place.	CA Energy Codes & Standards Cost-Effectiveness Explorer 2019 Pleasanton studies; Dublin CAP - Appx C p. 7; Electrification Cost Effectiveness Memo_Update_Final	All-electric buildings are generally cheaper to build and cheaper to operate over time when compared to traditional buildings with both gas and electricity - Assume \$95/yr in net utility savings per single-family household, \$21/yr for multi-family homes, \$24,300/yr for businesses (blend of retail and office buildings). Assumes new construction reflected by anticipated increases in households and businesses.
1164	Existing Building Electrification Plan	\$138,455	\$137,032	ACEEE Electrifying Commercial Buildings 2020 p. v; Dublin CAP - Appx C p. 13	One-time costs are to develop the plan and electrify municipal buildings. FTE is for ongoing implementation.	E3 report p. xi, 66 & 81; ACEEE Electrifying Commercial Buildings 2020 p. v; Dublin CAP - Appx C p. 13	According to E3, 84% of single-family households and 8% of multifamily households would achieve net lifecycle cost savings by completing a retrofit of the HVAC and hot water heater. An additional 16% of single-family homes and 39% of multifamily homes would see lifecycle costs of less than \$100 a year. (The remaining 53% of multifamily households could see up to \$200/yr added costs.) ACEEE's 2020 study found that 27% of commercial floor space heated with fossil fuel systems can be electrified today with a simple payback of less than 10 years and without any rebates or carbon pricing. In order to achieve a 10% overall reduction in natural gas use by 2030, retrofits on 20% of multi-family homes (8% with net savings, 12% with \$100/yr lifecycle costs) are assumed to begin mid-way into the implementation period to allow for program ramp-up.
1169	Refrigerant management in new construction	\$42,675	-\$262,307	CA Energy Codes & Standards Cost-Effectiveness Explorer 2019	Staff time required for community outreach, standards/code development, and implementation.	https://explorer.localenergycodes.com/pl/easanton	While low GWP refrigerants impact consumer up-front costs, high efficiency appliances are cheaper to operate over

CAP 2.0 Action Quantification Outcomes

Action Information		Outputs		City Inputs		Community References	
ID	Action	NPV Costs to City	NPV Costs to Community	City Cost Source(s)	City Cost Assumptions/Comments	Community Cost Source(s)	Community Cost Assumptions/Comments
				Pleasanton studies. Similar to action 1001 (Dublin CAP - Appx C p. 8) but forging new ground; good background info: https://www.cmsmechanical.com/the-path-to-a-safe-refrigerant-transition/	Standards/code takes three years to get into place.	city/forecast/12-PGE/studies/1,2,3	time - Assume \$150 in net annual savings per single family household.
1217	Modify Municipal Code definition of covered projects	\$0	\$287,074	CA Energy Codes & Standards Cost-Effectiveness Explorer 2019 Pleasanton studies. Similar to action 1001 (Dublin CAP - Appx C p. 8) but no need for cost-effectiveness study; requires more community outreach and education than amending energy code: https://localenergycodes.com/content/reach-codes/building-efficiency-renewables	Staff time required for community outreach, code development, and implementation. Assumes 1 year for code update to get into place.	https://explorer.localenergycodes.com/pl/easanton-city/forecast/12-PGE/studies/2,3?exclude_package_types=13,19,55,1,4,6,20,15&show_only_cost_effectiveness=	Expanding electrification requirements to cover new multi-family housing and commercial buildings may increase annual costs (\$168 per multi-family household), however including energy efficiency and high efficiency appliance requirements will likely result in substantial net savings (\$1,389 per retail building).
1176	Community energy efficiency upgrades	\$958,041	-\$1,959,201	EPA Energy Star Portfolio Manager p. 10; Ann Arbor CAP 3.0 - p. 52-55; Dublin CAP - Appx C p. 10	Assumes staff time for program implementation and annual funding for energy audits (300 per year averaging \$500 each); one-time cost to develop and set up incentives and annual cost to partner with organizations and offer rebates to enable low-income residents to benefit from energy efficiency improvements. Assumes rebates averaging \$10k covering half of Pleasanton households with under	EPA Energy Star Portfolio Manager p. 10; Dublin CAP - Appx C p. 10	Annual savings for City-funded energy audits (300 per year averaging \$500 each) plus net energy savings related to undertaking energy efficiency and renewable energy improvements.

CAP 2.0 Action Quantification Outcomes

Action Information		Outputs		City Inputs		Community References	
ID	Action	NPV Costs to City	NPV Costs to Community	City Cost Source(s)	City Cost Assumptions/Comments	Community Cost Source(s)	Community Cost Assumptions/Comments
					\$50k annual incomes during the 10-year period.		
1167	LEED certification for new construction	\$7,843	-\$180,389	CA Energy Codes & Standards Cost-Effectiveness Explorer 2019 Pleasanton studies. Similar to action 1001 (Dublin CAP - Appx C p. 8) but may require analysis beyond existing studies: https://localenergycodes.com/content/reach-codes/building-efficiency-renewables	One-time required for initial analysis to ensure effort will result in desired energy/GHG savings plus community outreach, code development, drafting an ordinance for City Council consideration, and implementation of the new ordinance. Code revision takes 1 year to get into place.	US GBC policy brief 2018; LEEDv4 in SF 2017; Browne 2020 p. 8	LEED Silver typically can be achieved with no additional costs; improves the quality, efficiency, and comfort of new buildings at no additional net cost to building owners and occupants. Achieving desired energy and GHG savings will also result in net utility savings for new construction, assumes 20% as seen in DC.
1008	Energy Benchmarking and City Facility Retrofits	-\$3,103,111	\$0	Corte Madera CAP p. 43-44; https://www.energysage.com/local-data/solar-panel-cost/ca/alameda-county/pleasanton/ ; https://www.energysage.com/local-data/energy-storage-cost/ca/alameda-county/pleasanton/	Assume staff and consultant time for benchmarking + performance monitoring; energy efficiency measures selected achieving 12 year simple payback shown as annual savings starting in year 3, including lighting and upgrades totaling \$560k plus installing solar+storage at 20 city facilities averaging 60 kW of PV each (averaging 14% capacity factor) and 52 kWh of batteries.	n/a - city facilities	n/a - city facilities
1119	Zero emissions energy as default East Bay Community Energy (EBCE) choice	\$0	\$20,919,524	EBCE Power Mix & Compare Plans; Dublin CAP - Appx C p. 24	Staff time for cost effectiveness analysis, supporting decision-making, and supporting education/outreach.	EBCE Power Mix & Compare Plans; Community Power Coalition; Dublin CAP - Appx C p. 5	Opting-up communitywide accounts to EBCE's Renewable 100 power portfolio will increase rates by 2%; assumes a 5% opt out rate.
1163	Solar and storage on new construction	\$0	\$0	CA Energy Codes & Standards Cost-Effectiveness Explorer; CA SGIP; Dublin CAP p. 1-7; Appx C p. 7 & 11	California Green building Code requires solar on new residential construction (other than for homes damaged or destroyed by disaster); assumes staff time to develop, administer and conduct outreach - 40 hours of one-	CA SGIP; Dublin CAP - Appx C p. 11	n/a - voluntary & variable

CAP 2.0 Action Quantification Outcomes

Action Information		Outputs		City Inputs		Community References	
ID	Action	NPV Costs to City	NPV Costs to Community	City Cost Source(s)	City Cost Assumptions/Comments	Community Cost Source(s)	Community Cost Assumptions/Comments
					<p>time staff costs to update checklist and develop promo materials, and 20 hours per year for ongoing outreach and implementation.</p> <p>Dublin CAP: "City cost associated with battery storage permit streamlining are anticipated to be between \$7,000 and \$10,000. Anticipated costs will be from staff time for review and possible updating of the battery storage permit application. Future staff time may be saved due to potential application streamlining."</p>		

Materials & Consumption

GHG Reductions

Action Information							MTCO ₂ e Savings		
ID	Action	Mitigation Action?	Direct/ Supportive	Timeframe	Key Assumptions	Key Sources	Cumulative - through 2050	Cumulative - through 2045	Cumulative - through 2030
1229	Textile recovery	Yes	Supportive	Near-term (1-3 years)	N/A	N/A	N/A	N/A	N/A
1194	Single use plastic reduction	Yes	Supportive	Mid-term (4-7 years)	N/A	N/A	N/A	N/A	N/A
1047	Environmentally preferable purchasing policy	Yes	Supportive	Near-term (1-3 years)	N/A	N/A	N/A	N/A	N/A
1126	Collaborative consumption	Yes	Supportive	Near-term (1-3 years)	N/A	N/A	N/A	N/A	N/A
1137	Repair Industry	Yes	Supportive	Long-term (8-10 years)	N/A	N/A	N/A	N/A	N/A
1198	Embodied carbon reduction plan	Yes	Supportive	Long-term (8-10 years)	N/A	N/A	N/A	N/A	N/A
1023	Comprehensive climate outreach	Yes	Direct	Near-term (1-3 years)	- 3% reduction in activity data (energy consumption, solid waste disposal).	Consultant estimate	25,086	19,464	4,144
MC1	Local purchasing	Yes	Supportive	Ongoing	N/A	N/A	N/A	N/A	N/A
MC2	SB 1383 Implementation	Yes	Direct	Ongoing	- 75% reduction in organics, applied in 2025 and continued through 2030 (and thereafter)	SB 1383 (consistent with Dublin CAP - Appendix C, p22)	642,951	506,627	135,118
MC3	Outreach and Education	Yes	Supportive	Ongoing	N/A	N/A	N/A	N/A	N/A

Cost

Action Information			Outputs		City Inputs		Community References	
ID	Action	Status	NPV Costs to City	NPV Costs to Community	City Cost Source(s)	City Cost Assumptions/Comments	Community Cost Source(s)	Community Cost Assumptions/Comments
1229	Textile recovery	High Priority	\$0	\$0	Redmond ESAP Action Costs - MWM Tab	No City costs other than FTE. Based on Redmond action to increase opportunities for sort and drop-off of reuse and recyclable materials.		No direct community costs as action is led by City -- however, haulers may choose to pass on some costs to customers.
1194	Single use plastic reduction	High Priority	\$0	\$0	Ann Arbor CAP (pg. 62-63); Dublin CAP - Appendix C (pg. 23, 27)	"Ideally the staff time needed to develop code will be built into existing processes. Costs for staff time is estimated between \$10,000 and \$15,000 (~0.1 FTE). The estimated cost range is based on the average cost to develop a new policy and/or code for the City of Dublin. (e.g., EPP, Low-Carbon Concrete, Life Cycle Emissions Code). Assumes nominal costs for partnership w/StopWaste.		There are no anticipated costs to the community.
1047	Environmentally preferable purchasing policy	High Priority	\$0	\$0	"			No costs to the community as this action is focused on municipal operations.
1126	Collaborative consumption	High Priority	\$297,774	-\$190,934	"Redmond ESAP Action Costs - MWM Tab (FTE Assumption)"		Consultant estimate	Assumes that 5% of total residents will participate in one collaborative consumption event, repairing one item that is worth \$50 (i.e., saving \$50 that would have otherwise been wasted by disposing that item).
1137	Repair Industry	High Priority	\$24,857	-\$37,659				No costs to the community since the incentives are generated by the City. Assumes that the cost of incentives to the City is realized as cost-savings to the community.
1198	Embodied carbon reduction plan	High Priority	\$0	-\$88,625	Dublin CAP - Appendix C (pg. 27) (Cost Assumptions)"	Initial costs for developing the policy are estimated to be between \$5,000 to \$10,000 in staff time (~0.02-0.05 FTE). Assumes a lower-end estimate given the existing resources from Alameda County. Assumes it will take less than 1 year to develop and approve EPP. Assumes costs for environmentally friendly purchases are cost neutral to traditional products -- however, prices will vary by product.	USFS Life-Cycle Assessments Can Help You Make Sustainable Choices	Costs to the community were based on a U.S. Forest Service sample analysis. Conducting the LCA was ~\$10,000 but had an average cost-savings ratio of 3.87 (i.e., \$38,700).

Natural Systems

GHG Reductions

Action Information							MTCO2e Savings		
ID	Action	Mitigation Action?	Direct/ Supportive	Timeframe	Key Assumptions	Key Sources	Cumulative - through 2050	Cumulative - through 2045	Cumulative - through 2030
1150	Urban Forest Master Plan	Yes	Direct	Near-term (1-3 years)	- 200 trees planted per year. - Annual sequestration assumes average 10" DBH of representative tree species.	Pleasanton CAP 1.0 EC4-3	3,540,542	2,441,753	366,263
1219	Soil management carbon sequestration projects	Yes	Direct	Near-term (1-3 years)	- All City managed acres under improved soil management by 2023. - 20% of community acres under improved soil management by 2030; steady thereafter. - Net sequestration at a rate of 0.2 MTCO2e/acre.	i-Tree Planting Calculator; City Parks Dept; De Gryze et al. 2009	16,314	13,208	3,890
1220	Carbon sequestration research and tracking	Yes	Supportive	Mid-term (4-7 years)	N/A	N/A	-	-	-
1145	Climate adapted plantings	Both	Supportive	Long-term (8-10 years)	N/A	N/A	-	-	-
1099	Restore and conserve native grassland, rangeland, and riparian habitats	No	N/A	Long-term (8-10 years)	N/A	N/A	-	-	-
1204	Community conservation programs	No	N/A	Mid-term (4-7 years)	N/A	N/A	-	-	-
NS1	Pesticide Posting Program	No	N/A	Ongoing	N/A	N/A	-	-	-
NS2	Municipal Landscape Management Practice	Both	N/A	Ongoing	N/A	N/A	-	-	-
NS3	Sustainable land management education	Both	Supportive	Ongoing	N/A	N/A	-	-	-

Cost

Action Information		Outputs		City Inputs		Community References	
ID	Action	NPV Costs to City	NPV Costs to Community	City Cost Source(s)	City Cost Assumptions/Comments	Community Cost Source(s)	Community Cost Assumptions/Comments
1150	Urban Forest Master Plan	\$486,089	\$469,585	Redmond ESAP Action Costs, Pleasanton CAP 1.0	See Redmond ESAP N1.89, N1.90, and N5.495. Assume same budget proposal for tree planting in public open space (\$305,000). \$150,000 one-time cost for developing the Urban Forest Master Plan. Combined staff cost for evaluating tree canopy and developing tree canopy plans for neighborhoods. Assume 200 trees planted per year with \$50 in tree planting materials per tree. Assume \$10,000 in annual incentives towards community planting (see Pleasanton CAP 1.0 EC4-3).	City of Oceanside - CAP Benefit Cost Report (pg. 17) El Cajon CAP_BenefitCostAnalysis (pg. 27)	Assume cost of \$3.06 per MTCO2e reduced, with an average annual MTCO2e savings of 20,348 per year (see impact analysis). The City of Oceanside CBA mentions that they can achieve an annual reduction of ~176 MTCO2e reductions a year from trees at a cost of ~\$315. This has been adapted to Pleasanton to assume a cost of \$539 (average of Oceanside and El Cajon CBAs). The community is anticipated to incur costs associated with the purchase, planting, and maintenance of trees within the urban forest. The price is estimated as the average costs outlined in the City of Oceanside and El Cajon CBA's. Overall costs to the community may be reduced based on the amount of incentives the City provides. While there are other external benefits associated with tree planting (e.g., reduced energy costs), these benefits are difficult to estimate with confidence and are therefore not included in this analysis. Assumes \$10k a year in incentives from City.
1219	Soil management carbon sequestration projects	\$34,711	\$2,868,511	Pleasanton CAP 1.0, Redmond ESAP Action Costs	Pleasanton CAP 1.0 says that the cost for implementing the community zero-waste plan and encouraging composting, recycling, and waste reduction would be 1/4 FTE (See SW2-2, SW2-6, SW2-7, SW2-16). Assume similar costs for implementing carbon sequestration projects and encouraging composting. Assume subsidy is equal to that of climate-adapted planting subsidy in Redmond ESAP (See N2.2.46). In Redmond, the initial cost is \$30,000 in startup costs with initial incentives and \$5000 in additional annual subsidies. Assume	CalRecycle_Estimated Costs of SB1383 (pg. 14)	Average cost per business would be approximately \$662 annually and assumes 5% of businesses participate each year. Average increased cost per household of \$17 per year and assumes that 5% of residents participate each year. Costs include the direct costs of expanding organic waste management infrastructure, expanding organic waste collection, and impacts from education, enforcement, and monitoring of soil projects.

CAP 2.0 Action Quantification Outcomes

Action Information		Outputs		City Inputs		Community References	
ID	Action	NPV Costs to City	NPV Costs to Community	City Cost Source(s)	City Cost Assumptions/Comments	Community Cost Source(s)	Community Cost Assumptions/Comments
					50% of these costs are already covered through SB1383 activities.		
1220	Carbon sequestration research and tracking	\$0	\$0	Redmond ESAP Action Costs	Assuming 40 hours of staff time dedicated towards research and mapping of carbon sequestration projects. This is based off of similar action of tracking trend changes from COVID.		No direct or significant financial cost change to community.
1145	Climate adapted plantings	\$0	\$0	Pleasanton CAP 1.0	Pleasanton CAP 1.0 estimates 25 hours of work for municipal code update.		No direct or significant financial cost change to community since this is action is specifically targeting City-owned property.
1099	Restore and conserve native grassland, rangeland, and riparian habitats	\$1,280,236	\$0	Redmond ESAP Action Costs	Assume similar costs as Redmond ESAP N1.5.30 and ESAP N1.5.27 combined. Assume \$60,000 (0.27 FTE equivalent) in restoration maintenance. Assume \$1.5 million in restoration planning, modeling, capital investments for 2 major watershed basins.		No direct or significant financial cost change to community.
1204	Community conservation programs	\$0	\$0	Pleasanton Budget FY2019-FY2020 Operating Budget	Assume that the general fund subsidy for the Pleasanton Youth/Teen program is increased by 10% (of \$76,737 over 4 years).		No direct or significant financial cost change to community.

Water Resources

GHG Reductions

No actions in this sector were quantified for GHG impact because they were either classified as “supportive” or climate adaptation actions.

Cost

Action Information		Outputs		City Inputs		Community References	
ID	Action	NPV Costs to City	NPV Costs to Community	City Cost Source(s)	City Cost Assumptions/Comments	Community Cost Source(s)	Community Cost Assumptions/Comments
1087	Water fixture retrofits	\$220,588	-\$2,942,142	Redwood City's water conservation programs	If using Redwood City's programs as an example, I estimated free home water savings kit at \$55, smart irrigation meter at \$170. The cost to the city is \$225.00 per 1000 residents-\$225x 1000= \$225,000. I estimated .25 FTE to work with Zone 7, schedule retrofit upgrades and perform water conservation evaluations. However, Pleasanton already has programs and this is an expansion that can easily be done without adding much, so reduced to 0.03 FTE.	Redwood City's water conservation programs	Cost savings of \$225 per resident who uses incentive (\$55 + \$170) estimated that 1,000 residents use this incentive. Annual savings of 50% on outdoor water use and 35% on monthly water usage per resident who uses the total of this incentive (smart irrigation meter, upgrades fixtures and has a home evaluation done by a water technician per the Redwood City's estimates). Assume average monthly bill is \$100.
1094	Expand recycled water	\$5,177,842	\$0	Dublin San Ramon Services District	In 2017, Pleasanton and two other cities expanded their purple pipes. Project was 2 years and it cost 18.2 million shared between the 3 cities. Pleasanton's share was 6.06 million.		No direct or significant financial cost change to community.
1147	Water Efficiency Programs	\$1,414,038	-\$1,708,155	http://www.cityofpleasantonca.gov/gov/depts/os/env/water/rebates.asp	Current incentives residential \$.25 per sf and \$.50 per sf to Irrigation Meter Customers who replace lawn for Bay-friendly landscape. Garden By Number Program offers \$50 to transform the front lawn. Per the Policy Institute of California, on page 9 Table 2, average lawn for the Bay Area is estimated at 6300sf. If using current Pleasanton incentives, that would max out the \$1,000 cap per resident. Assume 1,000 residents participate at the max rebate (\$1,000) over 5 years (200/year). Assume 100 business participate at the max rebate (\$5,000) over 5 years (20/year). However, Pleasanton already has programs and this is an expansion that can	City of Pleasanton water rebates and Public Policy Institute of California lawns and water demand	Current incentives residential \$.25 per sf and \$.50 per sf to Irrigation Meter Customers who replace lawn for Bay-friendly landscape. Garden By Number Program offers \$50 to transform the front lawn. Per the Policy Institute of California, on page 9 Table 2, average lawn for the Bay Area is estimated at 6300sf. If using current Pleasanton incentives, that would max out the \$1,000 cap per resident. Assume 1,000 residents participate at max rebate of \$1,000

CAP 2.0 Action Quantification Outcomes

Action Information		Outputs		City Inputs		Community References	
ID	Action	NPV Costs to City	NPV Costs to Community	City Cost Source(s)	City Cost Assumptions/Comments	Community Cost Source(s)	Community Cost Assumptions/Comments
					easily be done without adding much, so reduced to 0.03 FTE.		and 100 business participate at the max rebate of \$5,000.
1092	Stormwater runoff reuse	- \$400,570	-\$113,123	Economic Evaluation of Stormwater Capture	In the reference dataset, stormwater capture projects had a median levelized cost of \$816 per acre feet (n= 50) and 50% of projects were between \$246 and \$2,560 per acre feet. Urban stormwater capture projects monetized the volume of water in dollars, ranging from a total benefit of \$365 to \$12,800,000 per year. With a median net savings of \$127,000. Includes one-time 0.5 FTE for feasibility analysis and ongoing 0.5 FTE for project implementation. Also includes \$75k for consultant support of feasibility study.	Rainwater barrels and tanks	There would be a cost savings per year but it is based on size of catchment container and offset of water bill. I am putting an estimate of \$120 per year amortized out over each monthly bill at 10 per month. Assume up to 1,000 residents/businesses participate in rainwater capture program.
1136	Green Stormwater Infrastructure Plan	\$0	\$0	City of Dublin Green Stormwater Infrastructure Plan Appendix A pg 35	- .1 FTE to work with partners.		No direct or significant financial cost change to community.
1199	On-site stormwater management	\$0	\$0	Pleasanton CAP 1.0	Pleasanton CAP 1.0 estimates 25 hours of work for municipal code update.		No direct or significant financial cost change to community.

Transportation & Land Use

GHG Reductions

Action Information							MTCO _{2e} Savings		
ID	Action	Mitigation Action?	Direct/ Supportive	Timeframe	Key Assumptions	Key Sources	Cumulative - through 2050	Cumulative - through 2045	Cumulative - through 2030
1056	ZEV Infrastructure Plan	Yes	Direct	Mid-term (4-7 years)	- 20% increase in EV chargers. - 20% of passenger vehicle VMT from EVs by 2030. - Start ramping up beginning in 2023.	CARB (infrastructure needs); California Energy Commission (EV counts for Alameda County); N-79-20 (projected EV sales); similar assumptions were used for Dublin CAP	1,263,718	855,919	118,182
1190	Municipal small-engine electrification and off-road equipment	Yes	Supportive	Mid-term (4-7 years)	N/A	N/A	0	0	0
1115	Community Small-engine electrification	Yes	Direct	Near-term (1-3 years)	- 50% reduction in lawn & garden equipment emissions by 2030; ramping up in 2022. Steady thereafter.	EO N-79-20	41,127	31,346	6,250
1082	Bicycle, pedestrian, and trails network expansion	Yes	Direct	Near-term (1-3 years)	-50 miles of new bike lanes by 2030. - 1% passenger VMT reduction by 2030; steady thereafter. - 50% of MTCO _{2e} savings are attributable to the CAP; remainder attributed to existing bike/ped and trails master plans.	Dublin CAP; California Air Pollution Control Offers Association guidance; Fehr & Peers 2019; Alameda County VMT reduction tool; also consulted Pleasanton CAP 1.0	11,740	10,250	3,204
1078	Workplace bike amenities	Yes	Direct	Near-term (1-3 years)	- Commuting is 30% of passenger VMT. - Bicycling commuting doubles by 2030. - 0.2% VMT reduction by 2030.	CAPCOA 2010 (p. 202)	3,490	3,047	955
1080	Bicycle rack incentive program	Yes	Direct	Mid-term (4-7 years)	- 0.5% reduction in passenger VMT by 2030, steady thereafter.	CAPCOA 2010 (p. 202); Alameda County VMT reduction tool	9,473	8,145	1,823
1079	Required bike parking at MF/Comm developments	Yes	Direct	Near-term (1-3 years)	- 0.1% reduction in passenger VMT by 2030, steady thereafter.	CAPCOA 2010 (p. 202); Alameda County VMT reduction tool	2,323	2,029	636

CAP 2.0 Action Quantification Outcomes

Action Information							MTCO2e Savings		
ID	Action	Mitigation Action?	Direct/ Supportive	Timeframe	Key Assumptions	Key Sources	Cumulative - through 2050	Cumulative - through 2045	Cumulative - through 2030
1070	Increase active transportation	Yes	Direct	Mid-term (4-7 years)	- 0.25% reduction in passenger VMT by 2030, steady thereafter.	CAPCOA 2010 (p. 179)	4,851	4,165	920
1180	Increase transit ridership	Yes	Direct	Long-term (8-10 years)	- 3% reduction in passenger VMT by 2040, steady thereafter.	Pleasanton CAP 1.0; Fehr & Peers 2019; Alameda County VMT reduction tool	43,541	35,327	5,071
1184	VMT reduction for K-12 activities	Yes	Direct	Near-term (1-3 years)	- 2% reduction in passenger VMT by 2030, steady thereafter.	Fehr & Peers 2019; Alameda County VMT reduction tool	46,424	40,539	12,708
1159	Shared parking	Yes	Supportive	Long-term (8-10 years)	N/A		0	0	0
1230	Housing Element	Yes	Direct	Near-term (1-3 years)	- 3% reduction in passenger vehicle VMT annually by 2030. -10% improvement in jobs within 4 mi of residence by 2030 and continuing trend thereafter. - 0.3% VMT reduction per 1% improvement. - Start ramping up in 2023.	Impact of Jobs-Housing Balance on Passenger Vehicle Use and Greenhouse Gas Emissions. CARB. 2014.	74,559	64,825	18,800
1227	Trend changes from COVID	Yes	Supportive	Near-term (1-3 years)	N/A		0	0	0
1086	Promote LEED Neighborhood Development	Yes	Direct	Near-term (1-3 years)	- 1.5% reduction in passenger VMT by 2030, steady thereafter. - Assumed to have the same impact as the Housing element action (1230).	Impact of Jobs-Housing Balance on Passenger Vehicle Use and Greenhouse Gas Emissions. CARB. 2014. Alameda County VMT reduction tool	40,556	36,376	16,611
1023	Comprehensive climate outreach	Yes	Direct	Near-term (1-3 years)	- 3% reduction in activity data (energy consumption, solid waste disposal).	Consultant estimate	63,578	55,650	17,907
TLU1	Trails Master Plan	Yes	Supportive	Ongoing	N/A	N/A	5,870	5,125	1,602
TLU2	Bicycle & Pedestrian Master Plan	Yes	Supportive	Ongoing	- 50% of action 1082 savings attributed to the current plan.	N/A	5,870	5,125	1,602
TLU3	Regional transit support	Yes	Direct	Ongoing	- 11,000 VMT reduced per day - Start in 2025.	Mike Tassano (City Traffic Engineer)	15,133	13,460	5,253
TLU4	Complete Streets Implementation	Yes	Direct	Ongoing	- 0.5% VMT reduction annually.	Consultant estimate	1,774	1,646	1,036

Cost

Action Information		Outputs		City Inputs		Community References	
ID	Action	NPV Costs to City	NPV Costs to Community	City Cost Source(s)	City Cost Assumptions/Comments	Community Cost Source(s)	Community Cost Assumptions/Comments
1056	ZEV Infrastructure Plan	\$203,263	-\$24,556	Alternative Fuels Data Center: California Laws and Incentives; Dublin CAP	One-time cost to develop an EV infrastructure plan is anticipated to be \$150,000 and 40 hours of staff labor towards municipal ordinances. Costs to the City to install and maintain publicly available charging stations are anticipated to be in excess of \$100,000. Assume 50% of these costs are ongoing maintenance costs that will be covered by EBCE. Assume that 75% of the total project costs are covered by the Peninsula-Silicon Valley Project. Assume 1/2 time staff dedicated towards implementing this plan and another 1/2 staff towards outreach and engagement efforts.	Pleasanton Impact Analysis (ZEV Projection Model), Zero Emission Vehicle and Infrastructure Statistics, Cost-effectiveness Explorer, Pleasanton Housing Design Guidelines, Pleasanton Municipal Code, Dublin CAP	-Assume 4-year waiting period for implementation to start. - Assume 296 new multi-family units built by 2030 (30/year); 1.75 parking spaces/unit. - EV Infrastructure requirements will increase construction costs by \$400 or more per parking space. - Savings come from retrofit estimates of \$2,700 per parking space (cheaper to build new than retrofit). -Assume 20% of new MF units must have EV charging.
1190	Municipal small-engine electrification and off-road equipment	\$0	\$0	Redmond ESAP Action Costs (See T1.3.0).	Estimate 0.05 FTE to implement this action (fleet evaluation, replacement support and coordination). Assume no cost or savings as electric and gasoline off-road equipment usually break-even in costs in 5-10 years.		No direct or significant financial cost change to community.
1115	Community Small-engine electrification	\$0	-\$2,448,960	Yountville Gas Leaf blower Ban	Incentive program with \$30,000 budget funded by TVAQCA or BAAQMD to residents on a first-come, first-serve basis. Assume that the City costs are all staff time.	Consumer Reports: Leaf Blower Buying Guide, Consumer Reports: Electric Lawn Mowers That Rival Gas Models, Consumer Reports: Chainsaw Face-off, Home Depot: Pre-mixed Fuel Pack, Power Outdoor Equipment Global Market	Voluntary measure so assumption of \$0 cost to community. Electric maintenance equipment can be slightly more expensive up-front, but have similar overall costs as gasoline versions within 5-10 years with fuel cost-savings taken into account. The one exception is leaf blowers which have cheaper upfront and maintenance costs. Outdoor equipment sales were equal to 113 million units, which is roughly 34% of the U.S. population (332,643,210) in 2020. Assume 3% of Pleasanton households switches out their leaf blowers each year (because this is incentive-based). The cost difference between a gasoline vs electric leaf blower is \$480 - \$220 = \$260. The cost of a 6 pack of pre-mixed fuel is \$34.41.

CAP 2.0 Action Quantification Outcomes

Action Information		Outputs		City Inputs		Community References	
ID	Action	NPV Costs to City	NPV Costs to Community	City Cost Source(s)	City Cost Assumptions/Comments	Community Cost Source(s)	Community Cost Assumptions/Comments
1082	Bicycle, pedestrian, and trails network expansion	\$13,108,964	-\$3,800,771	Pleasanton Bike/Ped Plan, CAP 1.0, Pleasanton Trails Master Plan	<p>Costs reflect costs associated with Bike/Ped Master Plan and Trails Master Plan implementation:</p> <ul style="list-style-type: none"> - Assume 1/2 time staff position for Transit, Pedestrian and Bicycle Facilities Coordinator. - Assume 75 initial staff hours towards municipal code revisions and competitive grant applications and progress reporting indicators (see Pleasanton CAP 1.0 NM1-1, 1-2, 1-11). - \$400,000 in annual maintenance costs according to the PBMP (included in the ongoing FTE cost). - Assume doubling of Area 6 trails maintenance crew which is currently 3 crew members who spend 15% of their time on trails maintenance (0.15 FTE*3 crew members = 0.45 FTE) (see Trails Master Plan p.130). - Trails Master Plan construction, amenities, and trail road crossing costs total to \$63,846,398 in 2018 dollars (Table 5-5 in TMP). - Bike and Pedestrian Plan costs total to \$69,945,000 total in 2016 dollars (Table 7-2 in PBMP). - Assumes that city covers 20% match of capital infrastructure costs according to Pleasanton Bike/Ped Plan Funding sources notes in Appendix D (p. 164). - Assumes that 50% of costs attributed to existing, planned Trails Master Plan and Bike/Ped Plan implementation (consistent with impact analysis). 	Pleasanton Impact Analysis	Assume average annual passenger VMT reduction of ~3 million by 2030 (see impact analysis - ~1% VMT reduction by 2030). Estimated reduced gasoline costs for switching from car travel to bike/ped travel. Assumes displaced VMT are from gasoline-powered vehicles.

CAP 2.0 Action Quantification Outcomes

Action Information		Outputs		City Inputs		Community References	
ID	Action	NPV Costs to City	NPV Costs to Community	City Cost Source(s)	City Cost Assumptions/Comments	Community Cost Source(s)	Community Cost Assumptions/Comments
1078	Workplace bike amenities	\$0	\$2,593,114	Pleasanton CAP 1.0	Pleasanton CAP 1.0 Cost Benefit Analysis (CBA) estimates 25 hours of staff time per municipal code update.	Madrax: How to Affordably Park Multiple Bicycles, Recreation Management: Fundamental Considerations in Locker Room Design and Maintenance, City of Pleasanton Major Development Projects	Assume 3 new commercial developments per year. Assume each new commercial development builds 24 secure bike parking spaces with a cost of \$290 per bike. Assume each building has 640 square feet of locker room for each gender with a cost of \$700 per square foot (70% of high-end gym locker room cost per square foot). Average passenger VMT reduction of 0.1% per year (453,081 VMT - from impact analysis). Savings from fuel cost reductions.
1080	Bicycle rack incentive program	\$7,562	-\$730,532	Orlando Bicycle Rack Request Program	In 2019 dollars. Assume \$700 annual budget for bike rack installations. Assumes 40 hrs of staff time to set up the program. Assume 20 hours of annual staff time towards maintaining the inventory and corresponding with businesses and residents. Orlando has an annual budget of \$5000 to \$7000 for bike rack installations. With an installation price of \$100-350 per bike rack (we assume the upper end of \$350 per bike rack). Pleasanton is 10x smaller in land area than Orlando, so we assume \$700 budget with \$350 per bike rack which is 2 bike rack installations per year.		Average passenger VMT reduction of 0.2% per year (849,283 VMT - from impact analysis). Savings from fuel cost reductions. Assumes displaced VMT are from gasoline-powered vehicles.
1079	Required bike parking at MF/Comm developments	\$0	-\$35,260	Pleasanton CAP 1.0	Pleasanton CAP 1.0 estimates 25 hours of staff time per municipal code update.	Key Assumptions (Cost Effectiveness Explorer), Madrax: How to Affordably Park Multiple Bicycles	Assume 259 (4% of 6,470 multi-family units) new multi-family units built each year. Assume large multi-family developments build bike storage for 10% of its units with a cost of \$290 per bike. Average passenger VMT reduction of 0.1% per year (308,253 VMT - from impact analysis). Savings from fuel cost reductions. Assumes displaced VMT are from gasoline-powered vehicles.

CAP 2.0 Action Quantification Outcomes

Action Information		Outputs		City Inputs		Community References	
ID	Action	NPV Costs to City	NPV Costs to Community	City Cost Source(s)	City Cost Assumptions/Comments	Community Cost Source(s)	Community Cost Assumptions/Comments
1070	Increase active transportation	\$0	-\$392,340	Redmond ESAP Action Costs	Designated to 0.3 FTE due to additional staff time needed to identify potential funding opportunities to expand electric bicycle usage and pedestrianizing of streets.	Pleasanton Impact Analysis	Average passenger VMT reduction of 0.1% per year (456,117 VMT - from impact analysis). Savings from fuel cost reductions.
1180	Increase transit ridership	\$75,384	-\$1,277,220	Pleasanton CAP 1.0	Combined Pleasanton CAP 1.0 Cost Benefit Analysis estimates for TR1-2 through TR1-5 (100 hours upfront cost in staff time and 180 hours annually in staff costs= 0.087 FTE). Also included annual cost estimates for 0.5 FTE of a Transit, Pedestrian, and Bicycle Facilities Coordinator and 75k in capital improvements converted from 2012 dollars to 2021 dollars (See NM1-12).	Pleasanton Impact Analysis	Average passenger VMT reduction of 1.1% per year (5,464,707 VMT - from impact analysis). Savings from fuel cost reductions. Assumes displaced VMT are from gasoline-powered vehicles.
1184	VMT reduction for K-12 activities	\$571,058	-\$6,365,308	Pleasanton CAP 1.0, Redmond ESAP Action Costs	Based on NM1-8 in Pleasanton CAP 1.0 CBA and Redmond's ESAP actions-T1.1.13. Added the costs from these actions.	Pleasanton Impact Analysis	Average passenger VMT reduction of 1.1% per year (6,160,757 VMT - from impact analysis). Savings from fuel cost reductions. Assumes displaced VMT are from gasoline-powered vehicles.
1159	Shared parking	\$0	\$0	Pleasanton CAP 1.0	Based on Pleasanton CAP 1.0 CBA TDM1-1 (assumes 40 hours of staff time).		No direct or significant financial cost change to community.
1230	Housing Element	\$39,719	-\$11,150,518	Pleasanton CAP 1.0, Redmond ESAP Action Costs	Based on Pleasanton CAP 1.0 CBA staff research and municipal code revision cost and time estimates for measures LU1-1 through LU1-7 and LU2-1-LU2-7.	Pleasanton Impact Analysis	Average passenger VMT reduction of 1.7% per year (8,801,254 VMT - from impact analysis). Savings from fuel cost reductions. Assumes displaced VMT are from gasoline-powered vehicles.
1227	Trend changes from COVID	\$0	\$0	Redmond ESAP Action Costs	Assuming 200 hours of staff time dedicated towards research and mapping of transportation trends.		No direct or significant financial cost change to community.
1086	Promote LEED Neighborhood Development	\$910	-\$850,666	Pleasanton CAP 1.0	Assuming 50 hours of staff time dedicated towards research and production of a LEED promotional brochure and CAP checklist update. Assume 0.05 FTE for ongoing outreach costs.	USGBC Certification Fees, City of Pleasanton Major Development Projects, Pleasanton Impact Analysis, Impact of Jobs-Housing Balance on Passenger Vehicle Use and Greenhouse Gas Emissions	Average passenger VMT reduction of 1.5% per year (7,990,212 VMT - from impact analysis). Savings from fuel cost reductions. Assumes displaced VMT are from gasoline-powered vehicles.

Community Resilience & Wellbeing

GHG Reductions

Action Information							MTCO2e Savings		
ID	Action	Mitigation Action?	Direct/ Supportive	Timeframe	Key Assumptions	Key Sources	Cumulative - through 2050	Cumulative - through 2045	Cumulative - through 2030
1026	Neighborhood resilience hubs	No	N/A	Mid-term (4-7 years)	N/A	N/A	N/A	N/A	N/A
1143	Community gardens	No	N/A	Mid-term (4-7 years)	N/A	N/A	N/A	N/A	N/A
1130	CalFresh, WIC & Senior FMNP expansion	Yes	Direct	Near-term (1-3 years)	- 3% reduction in activity data (energy consumption, solid waste disposal).	Consultant estimate	N/A	N/A	N/A
1010	Reduce heat island effect	Yes	Supportive	Near-term (1-3 years)	N/A	N/A	N/A	N/A	N/A
1096	Wildfire preparation, prevention, and education	Yes	Supportive	Near-term (1-3 years)	N/A	N/A	N/A	N/A	N/A
1216	Institutionalize climate action	Yes	Supportive	Ongoing	N/A	N/A	N/A	N/A	N/A
1032	Prioritize adaptation and resilience in capital projects	No	N/A	Ongoing	N/A	N/A	N/A	N/A	N/A
1038	Critical facility relocation	No	N/A	Ongoing	N/A	N/A	N/A	N/A	N/A
1023	Comprehensive climate outreach ⁴	No	N/A	Mid-term (4-7 years)	N/A	N/A	102,726	89,091	27,346
1228	Sustainability Awards	No	N/A	Mid-term (4-7 years)	N/A	N/A	N/A	N/A	N/A
1151	Update CAP checklist	Yes	Direct	Near-term (1-3 years)	- 3% reduction in activity data (energy consumption, solid waste disposal).	Consultant estimate	N/A	N/A	N/A
CRW1	School climate action planning	Yes	Supportive	Near-term (1-3 years)	N/A	N/A	N/A	N/A	N/A
CRW2	Access to green spaces	Yes	Supportive	Near-term (1-3 years)	N/A	N/A	N/A	N/A	N/A
CRW3	Community cooling centers	Yes	Supportive	Ongoing	N/A	N/A	N/A	N/A	N/A

⁴ Mitigations accounted for in each respective sector (i.e., Buildings and Energy, Transportation and Land Use, and Materials and Consumption).

Cost

Action Information		Outputs		City Inputs		Community References	
ID	Action	NPV Costs to City	NPV Costs to Community	City Cost Source(s)	City Cost Assumptions/Comments	Community Cost Source(s)	Community Cost Assumptions/Comments
1026	Neighborhood resilience hubs	\$369,290	\$0	USDN-Resilience Hubs pg. 67-68	These are the calculations for 3 hubs. One-time cost at \$135,273 x 3 hubs is \$405,819. Annual cost per hub is \$4,612.		No direct or significant financial cost to community.
1143	Community gardens	\$115,355	\$0	Local Government Commission	The city provides administrative, office and staff support and in-kind equipment contributions. It oversees eight community gardens at a total annual cost of \$40,000. FTE breakdown based on Alameda's community garden in Sweeney Park in conjunction with Alameda Food Bank. Does not reflect one time start up cost.	Oakland Parks and Rec	If partnered with a nonprofit, no additional cost to low-income communities.
1130	CalFresh, WIC & Senior FMNP expansion	\$0	\$0	San Jose Parks and Rec partnering with Fresh Approach	The city provides administrative, office and staff support to help the program. Numbers are based off of administrative support position from Parks and Rec.		No direct or significant financial cost change to community.
1010	Reduce heat island effect	\$0	\$80,022	Pleasanton CAP 1.0; Ann Arbor CAP 3.0 p. 104-105 (tree canopy)	Staff time required for community outreach, code development, drafting an ordinance for City Council consideration, and implementation of the new ordinance. Code revision takes 1 year to get into place.	San Antonio CBA; Ann Arbor CAP 3.0 p. 104-105 (tree canopy); Pleasanton internal estimates	Hard and soft costs to plant 200 trees per year and/or similar measures. Action is for new development applications with planting and building already occurring; may entail changing paving color. Building Code already requires parking lot trees.
1096	Wildfire preparation, prevention, and education	\$0	\$0	Saratoga Community Wildfire Protection Plan	Funding could be from FEMA and grants from state and federal agencies to offset costs. Used FTE from Fire, Public Works and Sustainability Departments to accomplish this measure. Ex. Funding offsets - \$3,465,000 for CFIP cost share grants		There is no direct or significant financial cost change to the community.
1216	Institutionalize climate action	\$1,991,951	\$0	Pleasanton CAP 2.0; Dublin CAP Appx C p. 10	Staff time for promotion and monitoring will be ongoing but should decrease over time and related costs in future years should decrease annually, particularly as external funding sources are identified.		No direct or significant financial cost change to community.
1032	Prioritize adaptation and resilience in capital projects	\$46,192	\$0	Ann Arbor CAP 3.0 p. 100-101	One-time costs to conduct analysis, develop plans, and implement. Assumes once in place, City engineering staff will reference the plan with projects in a similar manner to the CAP checklist.		No direct or significant financial cost change to community.
1038	Critical facility relocation	\$138,577	\$0	Sample case studies: https://www.epa.gov/arc-x/anacortes-washington-rebuilds-water-treatment-plant-climate-	One-time costs are estimated for City to conduct analysis and develop high-level plans similar to the case studies identified using available EPA tools. FTE is for ongoing review. Cost estimate does not include relocation. FEMA funding may be available for detailed relocation plan development.		No direct or significant financial cost change to community.

CAP 2.0 Action Quantification Outcomes

Action Information		Outputs		City Inputs		Community References	
ID	Action	NPV Costs to City	NPV Costs to Community	City Cost Source(s)	City Cost Assumptions/Comments	Community Cost Source(s)	Community Cost Assumptions/Comments
				change, https://www.epa.gov/arc-x/quinault-indian-nation-plans-relocation			
1023	Comprehensive climate outreach	\$64,521	\$0	Ann Arbor CAP 3.0 p. 62-63 & 94-95 (\$1MM total over 10 years)	Staff time to develop plan, develop and implement calculator and webpages including annual cost for translations.		No direct or significant financial cost change to community.
1228	Sustainability Awards	\$4,981	\$0	ILG Beacon Program; Dublin CAP p. 1-7	Assume staff time for criteria development, selection, and webpage maintenance similar to https://dublin.ca.gov/1323/Green-Shamrock-Business-Recognition-Prog		No direct or significant financial cost change to community.
1151	Update CAP checklist	\$49,020	\$0	US GBC policy brief 2018; LEEDv4 in SF 2017; Dublin CAP Appx C p. 11	Assume 0.1 FTE staff time for analysis and implementation.		No direct or significant financial cost change to community.

GHG Analysis

Source Name	URL (if applicable)	Description
Dublin CAP		Appendix C contains detailed impact information and evidence per measure.
Pleasanton CAP 1.0		Impact estimations in the city's last CAP - Appendix D.
Hopkins et al. 2018. Decarbonization of Heating Energy Use in California Buildings	https://www.synapse-energy.com/sites/default/files/Decarbonization-Heating-CA-Buildings-17-092-1.pdf	Cited by Dublin CAP; stats on proportion of residential and commercial water and space heating from natural gas.
EIA 2018 Comparison of commercial green vs. non-green certified buildings	https://www.eia.gov/consumption/commercial/data/2012/pdf/green_buildings_cbecs.pdf	Study found that green certified buildings use about 25% less energy per square foot).
US Green Building Council, "LEED certification for residential"	https://www.usgbc.org/leed/rating-systems/residential	Cites that on average, certified homes use 20 to 30 percent less energy than non-green homes.
Browne-LEED Certification_July 2020	https://cfo.dc.gov/sites/default/files/dc/sites/ocfo/publication/attachments/LEED%20Certification%20Nyanya%20Browne_July%202020.pdf	Report on the effect of LEED certification on residential and commercial office buildings in Washington DC in 2018
ACEEE Strategies for Energy Savings in Buildings 2018	https://www.aceee.org/toolkit/2018/04/strategies-energy-savings-buildings	Reports that efficiency retrofits after energy audits can typically reduce energy bills by 5-30%. Comprehensive upgrades can reduce commercial building use by 20-50%.
CARB_Technical_Analysis_EV_Charging_Nonresidential_CALGreen_2019_2020	https://ww2.arb.ca.gov/sites/default/files/2020-09/CARB_Technical_Analysis_EV_Charging_Nonresidential_CALGreen_2019_2020_Intervening_Code.pdf	EV Charging Infrastructure: Nonresidential Building Standards. CARB staff recommends a minimum 10 percent requirement for new construction to assist with filling the mid-range gap in Level 2 chargers needed by 2025.
EO-N-79-20	https://www.gov.ca.gov/wp-content/uploads/2020/09/9.23.20-EO-N-79-20-Climate.pdf	Executive order calling for all passenger vehicle sales to be ZEVs by 2035 and by 2045 for medium- and heavy-duty vehicles.
California Energy Commission: Zero Emission Vehicle and Infrastructure Statistics	https://www.energy.ca.gov/data-reports/energy-insights/zero-emission-vehicle-and-charger-statistics	Statistics on the number of vehicles by fuel type in CA, including by County.
Fehr & Peers 2019 TDM-Strategies-Evaluation	https://www.fehrandpeers.com/wp-content/uploads/2019/12/TDM-Strategies-Evaluation.pdf	Provides updated elasticities and GHG reduction estimates compared to the CAPCOA 2010 guidelines for TDM measures.
CAPCOA 2010 Quantifying Greenhouse Gas Mitigation Measures	https://www.contracosta.ca.gov/DocumentCenter/View/34123/CAPCOA-2010-GHG-Quantification-PDF	GHG emission reduction estimates for a variety of project-level mitigation measures.
CARB 2014_Impact_of_Jobs-Housing_Balance_on_Passenger_Vehicle_Use_and_Greenhouse_Gas	https://ww2.arb.ca.gov/sites/default/files/2020-06/Impact_of_Jobs-Housing_Balance_on_Passenger_Vehicle_Use_and_Greenhouse_Gas_Emissions_Policy_Brief_0.pdf	
SB 1383	https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB1383	Requires actions to produce a 75% reduction in disposal of organic waste by 2025.

CAP 2.0 Action Quantification Outcomes

Source Name	URL (if applicable)	Description
California Public Utilities Commission, as cited in "Community Power Coalition" presentation	https://www.mcecleanenergy.org/wp-content/uploads/2018/06/June-2018_FINAL-1.pdf	Source cited in Dublin CAP for info on CCA opt-out rates.
i-Tree Planing Calculator	https://planting.itreetools.org/help/	Estimates carbon sequestration rates for tree plantings of various types, sizes, etc.
De Gryze et al. 2009 Modeling shows that alternative soil management can decrease GHGs	https://escholarship.org/content/qt83p4m8qn/qt83p4m8qn_noSplash_8dfcc7dde94247d48b7c00319007875e.pdf?t=lnp5mk	Provides estimates for carbon sequestration associated with improved soil management.

Cost Analysis

Source Filename	Description
Dublin CAP	Sept 2020; Appendix C contains detailed cost information and evidence per measure.
Pleasanton CAP 1.0	There were cost estimations in the city's last CAP - Appendix D.
Redmond ESAP Action Costs	Spreadsheet used by subconsultant to estimate costs to City of implementing plan measures.
Walnut Creek CAP	Appendix 2 contains the quantification of costs and reductions of municipal measures (page A2-1)
El Cajon CAP_BenefitCostAnalysis	Presents costs to the City and community per MTCO _{2e} reduced for various measures
08-10-2017 LEEDv4BDC vs CalGreen cost	Information about LEED certification.
LEED v4 Cost -USGBC Policy Brief 2018	Information about LEED certification.
Electrification Cost Effectiveness Memo_Update_Final	Oct 2020 Memo provided by subconsultant Rincon that estimates costs for building electrification.
Browne-LEED Certification_July 2020	https://cfo.dc.gov/sites/default/files/dc/sites/ocfo/publication/attachments/LEED%20Certification%20Nyanya%20Browne_July%202020.pdf
ACEEE Electrifying Commercial Buildings 2020	https://www.aceee.org/sites/default/files/pdfs/b2004.pdf
EPA Energy Star Portfolio Manager 2013	https://www.epa.gov/sites/production/files/2015-08/documents/overview_of_epas_energy_star_portfolio_manager.pdf
EBCE Power Mix & Compare Plans	https://ebce.org/our-power-mix/ ; https://ebce.org/compare-plans-business/ ; https://ebce.org/compare-plans-residential/index.htm
Community Power Coalition 2018	https://www.mcccenergy.org/wp-content/uploads/2018/06/June-2018_FINAL-1.pdf
CA SGIP	https://www.cpuc.ca.gov/sgip/
Local Gov't Commission- community gardens	https://www.lgc.org/resource/community-gardens/
Oakland Parks and Rec- Community Gardens	https://localwiki.org/oakland/Community_Gardens
USDN- Resilience Hub	http://resilience-hub.org/wp-content/uploads/2019/10/USDN_ResilienceHubsGuidance-1.pdf
SF Living Roof Cost Benefit Study page 9	https://default.sfplanning.org/Citywide/livingroof/SFLivingRoofCost-BenefitStudyReport_060816.pdf
Dublin San Ramon Services District - recycled wastewater	https://www.drsrd.com/Home/Components/News/News/1318/18?selectview=1&npage=4&arch=1
San Jose Park and Rec- Fresh Approach farmers market	https://www.sanjoseca.gov/Home/Components/News/News/2607/5103
Saratoga Community Wildfire Protection Plan Table 6.1-6.5 Timelines	https://www.saratoga.ca.us/DocumentCenter/View/1760/Saratoga-Community-Wildfire-Protection-Plan-CWPP?bidId=
Santa Clara County CCWP- funding sources for fire resiliency (D-3)	https://www.sccfd.org/images/documents/fire_prevention/CWPP/CWPP_Strategic_Countywide_Appendices_08_29_16.pdf
ILG Beacon Program	https://www.ca-ilg.org/beacon-program
CA Energy Codes & Standards Cost-Effectiveness Explorer	https://explorer.localenergycodes.com/pleasanton-city/forecast/12-PGE/studies/1,2,3?exclude_prototypes=5,6,7,3,21&show_only_cost_effectiveness=
City of Pleasanton Economic Profile	http://dev.cityofpleasantonca.gov/gov/depts/ed/profile.asp

CAP 2.0 Action Quantification Outcomes

Source Filename	Description
U.S. Energy Information Administration	https://www.eia.gov/tools/faqs/faq.php?id=45&t=8#:~:text=One%20thousand%20cubic%20feet%20(Mcf,1.037%20MMBtu%2C%20or%2010.37%20therms
Utilities Local: Pleasanton, CA	https://utilitieslocal.com/states/california/pleasanton/
U.S. Census QuickFacts	https://www.census.gov/quickfacts/pleasantoncitycalifornia
Pleasanton_FY1921_BudgetBook_Master_Doc 071919	City of Pleasanton Operating Budget for Fiscal Year 2019-2020 through Fiscal Year 2020-2021.
Ann Arbor Zero-Climate-Action-Plan-_3.0 Apr 2020	Ann Arbor's Living Carbon Neutrality Plan
CalRecycle_ Estimated Costs of SB1383	Presents monetary costs and non-monetary benefits of SB1383 implementation
Trails Master Plan	Includes cost estimates.
Pleasanton Bike/Ped Plan	Includes cost estimates.
Consumer Reports: Pay Less with Vehicle Maintenance with an EV	https://www.consumerreports.org/car-repair-maintenance/pay-less-for-vehicle-maintenance-with-an-ev/#:~:text=Consumers%20who%20purchase%20an%20electric,powered%20car%2C%20CR's%20study%20shows.&text=%E2%80%9CThe%20oil%20changes%20and%20engine,by%20the%20EV's%20relative%20simplicity.%E2%80%9D
Zero Emission Vehicle and Infrastructure Statistics	https://www.energy.ca.gov/data-reports/energy-insights/zero-emission-vehicle-and-charger-statistics
Yountville Gas Leaf Blower Ban	https://www.townofyountville.com/departments-services/public-works/electric-leaf-blower-incentive-program
Consumer Reports: Leaf Blower Buying Guide	https://www.consumerreports.org/cro/leaf-blowers/buying-guide/index.htm#:~:text=Gas%20handheld%20leaf%20blowers%20go,limited%20runtime%20per%20battery%20charge.&text=Wheeled%20blowers%20pack%20the%20most%20power%20by%20far.
Consumer Reports: Electric Lawn Mowers That Rival Gas Models	https://www.consumerreports.org/push-mowers/electric-lawn-mowers-that-rival-gas-models/#:~:text=The%20best%20electric%20push%20mower,out%20after%20about%2010%20years.
Consumer Reports: Chainsaw Face-off	https://www.consumerreports.org/chainsaws/electric-dewalt-vs-gas-stihl-chainsaw/
Home Depot: Pre-mixed Fuel Package	https://www.homedepot.com/p/TruFuel-50-1-Pre-Mixed-Fuel-6-Pack-6525638/202604386?source=shoppingads&locale=en-US&mtc=Shopping-B-F_D28I-G-D28I-28_37_OUTDOOR_POWER_ACC-NA-NA-NA-SMART-NA-NA-SMART_SHP&cm_mmc=Shopping-B-F_D28I-G-D28I-28_37_OUTDOOR_POWER_ACC-NA-NA-NA-SMART-NA-NA-SMART_SHP-7170000079956011-58700006728091443-92700060957828827&gclid=CjwKCAjwhMmEBhBwEiwAXwFoEa8n7-xTZnHJg721HVvXRH0PzUvSfsgtSWb0CHt5jzPgBXHdTuCkixoCpCMQAvD_BwE&gclidsrc=aw.ds
USGBC Certification Fees	https://www.usgbc.org/tools/leed-certification/fees
City of Pleasanton: Housing SiteDevelopment Standards and Design Guidelines	http://www.cityofpleasantonca.gov/civicax/filebank/blobdload.aspx?BlobID=33648
City of Pleasanton: Municipal Code	http://qcode.us/codes/pleasanton/?view=desktop&topic=18-18_88-18_88_035
City of Pleasanton Major Development Projects	http://www.cityofpleasantonca.gov/gov/depts/cd/planning/plans_n_programs/major_development_projects.asp
Alternative Fuels Data Center: California Laws and Incentives	https://afdc.energy.gov/laws/all?state=CA

CAP 2.0 Action Quantification Outcomes

Source Filename	Description
Power Outdoor Equipment Global Market	https://www.researchandmarkets.com/reports/338686/powered_outdoor_equipment_global_market
Madrax: How to Affordably Park Multiple Bicycles	https://blog.madrax.com/blog/indoor-bike-storage-solutions#:~:text=The%20cost%20for%20a%206,of%20%24521.50%20per%20parked%20bicycle.
Recreation Management: Fundamental Considerations in Locker Room Design and Maintenance	https://recmanagement.com/feature_print.php?fid=200705fe01
Orlando Bicycle Request Program	https://www.orlandosentinel.com/business/os-bz-bike-rack-request-program-20190612-baewcdvj6fgnwbk6dcvtal3rgq-story.html
City of Pleasanton - Incentive programs for Bay-Friendly Landscape	http://www.cityofpleasantonca.gov/gov/depts/os/env/water/rebates.asp
City of Dublin- 2019 Green Stormwater Infrastructure Plan	https://dublin.ca.gov/DocumentCenter/View/20955/2019-Green-Stormwater-Infrastructure-Plan-APPROVED
Economic Evaluation of Stormwater Capture	Diringer, S. E., Shimabuku, M., & Cooley, H.. (2020). Economic evaluation of stormwater capture and its multiple benefits in California. PLOS ONE, 15(3), e0230549. https://doi.org/10.1371/journal.pone.0230549
Rainwater barrels and tanks/ Incentives SF	https://www.urbanfarmerstore.com/wp-content/uploads/2018/10/Sizes-Prices-SF-Subsidy-Program-2018-9s.pdf
SF Water Public Utilities Commision	https://sfwater.org/index.aspx?page=178
Redwood City's Water Conservation programs	https://www.redwoodcity.org/departments/public-works/water/conservation/programs-and-giveaways
Public Policy Institute of Cal. Lawns and Water Demand (page 9)	https://www.ppic.org/content/pubs/cep/EP_706EHEP.pdf
Louisville-JeffersonCountyDiversionPlan_Appx C	Appendix C of the 10-year solid waste plan includes detailed cost information for waste reduction programs (section C4. Strategy Cost Assumptions)
Marin County Code Amendment Toolkit	https://www.marincounty.org/depts/cd/divisions/sustainability/low-carbon-concrete-project
USFS_Life-Cycle Assessments Can Help You Make Sustainable Choices	https://www.fs.fed.us/t-d/pubs/htmlpubs/htm08732839/page02.htm

Attachment 3- Redline Changes to Proposed Goals, Strategies, and Actions

August 11, 2021

Buildings & Energy

Goal

Reduce greenhouse gas emissions from buildings and associated energy consumption and increase buildings and energy resilience which will result in cost savings, improved public health, and improved infrastructure.

Existing Ongoing Actions

Action	Action Description
Maintain highest EBCE choice for municipal operations	Maintain the highest renewable energy choice as the default for all municipal facilities, including opportunities to secure Power Purchase Agreements with other EBCE jurisdictions.
<u>Maintain zero emissions energy as default East Bay Community Energy (EBCE) choice</u>	<u>Maintain the default EBCE electricity service to ensure the community is receiving zero-emission energy, if economically feasible.</u>

Strategy 1: Advance the decarbonization of buildings.

ID	Action	Action Description
1001	All-electric reach code	Adopt an all-electric building reach code for new construction that limits the development of new gas infrastructure where economically feasible. Ensure solutions are equitably tailored to different building, ownership, and use types. This will require a cost effectiveness evaluation and further outreach. Exceptions to the Code can be considered.
1164	Existing Building Electrification Plan	<p>Develop and implement an Existing Building Electrification Plan to advance electrification of buildings. As a part of this effort:</p> <p>Grid Analysis/Improvements</p> <ul style="list-style-type: none"> Work with EBCE, PG&E, and regional partners to ensure we have a robust regional electrical grid that minimizes the risk of power outages, increases storage, and reduces demand for diesel or gas generators. Consider opportunities for local renewable generation. Conduct an existing building electrification analysis to identify areas of opportunities, building types, and prerequisites needed to make electrification cost-effective in the community. <p>Municipal Buildings</p> <ul style="list-style-type: none"> Phase implementation of electrification into existing municipal buildings.

ID	Action	Action Description
		<p>Community Buildings</p> <ul style="list-style-type: none"> Review and enhance permitting process to simplify the process (e.g., permit streamlining) to encourage adoption of electrification and energy storage back-up practices throughout the community. Leverage partnerships to provide financial incentives for existing residential and commercial building electrification, (e.g., EBCE’s Resilient Home program). Establish and implement strategies to increase at-home battery storage installations to increase resiliency. Review the definition for “covered” projects and determine if the renovation threshold is appropriate. <p>Outreach/Education</p> <ul style="list-style-type: none"> Build a residential and business toolkit to help identify steps needed to electrify (e.g., panel upgrades, permit guides) and promote rebates and incentives (e.g., hot water replacements and induction cooking through EBCE, BayREN, etc.) to encourage and simplify the electrification process of existing buildings. Work with local businesses and change agents to influence behavior in community. Work with local organizations (e.g., Bay East Association of Realtors) to promote energy programs to homeowners. <p>Metrics/Evaluation</p> <ul style="list-style-type: none"> Build in evaluation metrics to determine progress towards meeting electrification goals. Stay apprised of existing building electrification regulations, studies, and regional efforts.
1169	Refrigerant management in new construction	Require that all new construction use the lowest global warming potential (GWP) refrigerants available for equipment and systems. <u>Secondary Action.</u>

Strategy 2: Improve energy efficiency.

ID	Action	Action Description
1217	Modify Municipal Code definition of covered projects	Modify the Pleasanton Municipal Code (PMC) to expand the definition of “covered projects” (within the Green Building Chapter of the PMC) to cover all new commercial buildings and all new residential homes.
1176	Community energy efficiency upgrades	Promote use of energy efficiency improvements (e.g., window upgrades, LED lighting) across the community through incentives, partnerships, and/or education and outreach. Focus outreach and resources on low-income households. This action can include establishing and implementing a revolving loan fund for home performance audits and system upgrades. <u>Secondary Action.</u>
1167	LEED certification for new construction	Modify the PMC to require commercial “covered projects” (within the Green Building Chapter of the PMC) to qualify for LEED silver certification.
1008	Energy Benchmarking and City Facility Retrofits	Use the Environmental Protection Agency’s Energy Star Portfolio Manager tool (or other similar tools) to measure and track energy and water usage across City facilities. Compare facilities performance over time, identify opportunities for efficiency upgrades and cost savings across City facilities, and conduct energy retrofits of existing City facilities and equipment. As part of this action, work with regional partners (e.g., EBCE) to identify municipal facilities where solar/storage systems will be the most effective and install solar/storage systems throughout municipal locations (e.g., parks, library, etc.). <u>Secondary Action.</u>

Strategy 3: Expand renewable energy generation and increase storage capacity.

ID	Action	Action Description
1119	Zero emissions energy as default East Bay Community Energy (EBCE) choice	Annually review EBCE’s rates and service options and opt up or maintain the default EBCE electricity service to ensure the community is receiving zero-emission energy, if economically feasible. <u>Moved to Existing.</u>
1163	Solar and storage on new construction	Encourage “covered projects” (within the Green Building Chapter of the PMC) to include solar installation that meets the power needs of the new development if feasible. Where solar is being installed, encourage storage systems.

Transportation & Land Use

Goal

Reduce greenhouse gas emissions from transportation and land use which will enhance community mobility, improve public health, and result in cost savings.

Existing Ongoing Actions

Action	Action Description
Trails Master Plan	Continue to implement the Trails Master Plan. <u>Combined with existing action below.</u>
Bicycle & Pedestrian Master Plan <u>and Trails Master Plan</u>	Continue to implement the Bicycle & Pedestrian Master Plan <u>and Trails Master Plan</u> . Implementation should be continued for existing programs (e.g., Commendable Commute program which collaborates with employers to provide incentives as part of transportation demand management (TDM) programs to encourage alternative modes of travel and reduce single-occupant vehicle use). <u>An emphasis should be placed on closing bicycle, pedestrian, and trail network gaps. This should include:</u> <ul style="list-style-type: none"> <u>Encouraging development project amenities (when amenities are required) to include contribution of funds or land to further the trails network as outlined in the Trails Master Plan and bicycle and pedestrian networks as outlined in the Bicycle & Pedestrian Master Plan.</u> <u>Supporting the expansion of the complete streets network as outlined in the Bicycle & Pedestrian Master plan with a focus on designated and protected bike lanes to businesses, parks, and schools.</u> <u>Prioritizing city contributions to building and expanding networks and improving public access to open space and waterways.</u> <u>Reporting progress indicators such as miles of new bike lanes and trails in CAP monitoring</u>
Regional transit support	Continue working with regional partners to support the Valley Link project.
Complete Streets Implementation	Continue to implement the City’s Complete Streets Program.

<u>Housing Element</u>	<u>Continue to support Housing Element implementation including aiming to achieve a jobs/housing balance, working with regional partners to prevent displacement and increase affordable housing, and encouraging transit-oriented development near BART stations, along transportation corridors, and in business parks.</u>
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Strategy 1: Advance vehicle decarbonization.

ID	Action	Action Description
1056	Create a ZEV Infrastructure Plan	<p>Develop and implement a Zero Emissions Vehicle (ZEV) Infrastructure Plan that strategically expands EV and other zero emissions fueling infrastructure throughout the community. The plan should include:</p> <p>Grid Analysis</p> <ul style="list-style-type: none"> • Review existing alternative fuels infrastructure to identify gaps (e.g., location and quantity of EV charging). <p>Community Infrastructure</p> <ul style="list-style-type: none"> • Expand publicly available EV infrastructure which may include installing EV chargers on municipal properties (e.g., parks, library, senior center, etc.). • Collaborate with existing gas stations to encourage installation of EV and alternative carbon free fueling stations. • Provide preferential parking for electric vehicles only in public parking lots. • Modify the Municipal Code Section requiring new apartment and condo complexes include EV charging. <p>Municipal Fleet</p> <ul style="list-style-type: none"> • Collaborate with East Bay Community Energy to establish and implement a plan that guides fleet transition to all-electric in the coming decade. <p>Education, Outreach, and Funding</p> <ul style="list-style-type: none"> • Conduct an education and outreach campaign in the community and in high schools about electric vehicles. • Partner with regional organizations (e.g., EBCE) to promote incentives and rebates. • Identify grant funds to help replace private vehicles with zero emission vehicles, with a focus on supporting EV purchases for low-income demographics. • Provide alternative financial models for city-owned EV charging, including sliding scales and EBT card features. • <u>Identify funding opportunities for electric bicycles.</u> <p>Regional Electrification</p> <ul style="list-style-type: none"> • Work with regional partners to create a job training program to expand trade knowledge around electric and zero emissions fueling alternative vehicles. • Support regional organizations (e.g., EBCE) and other regional efforts to transition medium and heavy-duty trucks to electric.
1190	Municipal small-engine electrification	<p>Evaluate the current fleet of Municipal off-road equipment (e.g., mowers, chippers, tractors, etc.) and identify equipment that falls below current emissions standards. Replace and update off-road equipment with lower emissions alternatives upon replacement. Across City operations, priority replacement for high emission equipment should be considered. Further, work with the Tri Valley Air Quality Community</p>

	and off-road equipment	Alliance to monitor advancements around battery technology in small-engine options and transition City operations to electric landscaping equipment when feasible.
1115	Community Small-engine electrification	Partner with local organizations (e.g., Tri Valley Air Quality Community Alliance) to provide incentives to the community to purchase all-electric small-engine equipment (e.g., lawn mowers, leaf blowers). Continue to investigate opportunities to incorporate all-electric small equipment in large scale commercial projects.

Strategy 2: Advance active, shared, and public transportation.

ID	Action	Action Description
1092	Bicycle, pedestrian, and trails network expansion	Close bicycle, pedestrian, and trail network gaps. This should include: <ul style="list-style-type: none"> Encouraging development project amenities (when amenities are required) to include contribution of funds or land to further the trails network as outlined in the Trails Master Plan and bicycle and pedestrian networks as outlined in the Bicycle & Pedestrian Master Plan. Supporting the expansion of the complete streets network as outlined in the Bicycle & Pedestrian Master plan with a focus on designated and protected bike lanes to businesses, parks, and schools. Prioritizing city contributions to building and expanding networks and improving public access to open space and waterways. Reporting progress indicators such as miles of new bike lanes and trails in CAP monitoring. <u>Moved to existing.</u>
1078	Workplace bike amenities	Update the Municipal Code to require showers, lockers, changing areas, bike parking, and protected bicycle storage for new commercial developments of a certain size; <u>and commercial, mixed-use, and multi-family projects to install bicycle parking,</u> (consistent with the Bicycle & Pedestrian Master Plan recommended programs 6.4.2 (2) and 6.6.2 (1)).
1080	Bicycle rack incentive program	Develop and implement a citywide bicycle rack request program that receives requests from businesses and residents to install bicycle racks free of charge on public property adjacent to business properties, consistent with the Bicycle & Pedestrian Master Plan recommended policy 4-2. Maintain an inventory of installed bicycle racks.
1079	Required bike parking at MF/Comm developments	Modify the Municipal Code section requiring commercial, mixed use, and multi-family projects install bicycle parking. <u>Combined with 1078.</u>
1070	Increase active transportation	Increase active transportation downtown and to planned events. Consider: <ul style="list-style-type: none"> Working with regional partners to develop and promote resources to encourage active transportation to planned events. Identifying potential funding opportunities to expand electric bicycle usage. “Pedestrianizing” Main Street on the weekends beyond COVID closures.
1180	Increase transit ridership	Partner with transit agencies (e.g., BART, ACE, and LAVTA) to improve access across the City. This can include: <ul style="list-style-type: none"> Providing convenient connections to destinations throughout the City (e.g., BART to Main Street and ACE to Hacienda). Providing connections between transit facilities and the bicycle/trails network. Ensuring sufficient transit connections to higher density areas with currently low or limited access. Enhancing secure bicycle parking at transit stations and major bus stops.

ID	Action	Action Description
1184	VMT reduction for K-12 activities	<p>Explore opportunities to reduce VMT related to K-12 curricular and extra-curricular activities. This can include:</p> <ul style="list-style-type: none"> • Partnering with the school districts and clubs to encourage active transportation (i.e., walking and bicycling) and carpooling to schools and after school activities (e.g., sports). • Partnering with the school districts to create a bicycle safety course that can be integrated into the curriculum (e.g., PE class or otherwise). • Partnering with the California Air District on the anti-idle campaign and working with schools to reduce idling. • Adjusting traffic signals to prioritize pedestrians and bicycles around schools. • Encouraging school bus ridership. • Incentivizing electric bicycle usage. <i>Secondary Action.</i>

Strategy 3: Advance sustainable land use.

ID	Action	Action Description
1159	Shared parking	Update the Municipal Code to expand provision 18.88.060 to allow businesses in all commercial, industrial, MU, and P zoning districts to offset parking count requirements for “discrete uses”. Encourage removal of fences between shared parking lots to allow greater mobility and develop incentives to increase interest in shared parking opportunities.
1230	Housing Element	Support Housing Element implementation including aiming to achieve a jobs/housing balance, working with regional partners to prevent displacement and increase affordable housing, and encouraging transit-oriented development near BART stations, along transportation corridors, and in business parks. <i>Moved to existing.</i>
1227	Trend changes from COVID	Partner with organizations like the Tri-Valley Air Quality Community Alliance and Bay East Realtors Association, to identify changes in transportation trends (e.g., reduced VMT) due to COVID-19 and how these trends have affected air quality in Pleasanton.
1086	Promote LEED Neighborhood Development	Promote and encourage the use of LEED for Neighborhood Development (LEED ND) as new developments are proposed and areas in the City are redeveloped. Mechanisms may include incorporating this into the CAP checklist for new development.

Materials & Consumption

Goal

Reduce greenhouse gas emissions from materials management and consumption which will support regional waste reduction efforts.

Existing Ongoing Actions

Action	Action Description
Local purchasing	Continue to promote local purchasing for businesses and residents to support local vendors, services, and stores and to reduce GHG emissions from commerce-related transportation, food production, and distribution.
SB 1383 Implementation	Implement SB 1383 which includes establishing a robust food recovery program, developing an implementation plan to reduce methane emissions by decreasing organics in the landfill), and increasing education and outreach around compliance.
Outreach and Education	Continue outreach and education around reducing waste generation and increasing waste diversion
<u>Textile recovery</u>	<u>Implement textile recovery drop-off service as outlined in the City’s Franchise Agreement with Pleasanton Garbage Service.</u>

Strategy 1. Increase waste diversion and optimize collection and disposal systems.

ID	Action	Action Description
1229	Textile recovery	Implement textile recovery drop-off service as outlined in the City’s Franchise Agreement with Pleasanton Garbage Service. <u>Moved to existing.</u>
1194	Single use plastic reduction	<p>Continue to explore viable paths to reduce single use plastic. This may include:</p> <ul style="list-style-type: none"> • Updating the Municipal Code to require large and special events producers to provide and use reusables (with an exception for BPI certified compostables)-, provide recycling and composting infrastructure, and divert waste from landfill after the event. • Working with regional partners (e.g., StopWaste) to promote participation in waste reduction and reusable programs (e.g., StopWaste Use Reusables), for businesses to incorporate more sustainable waste practices. • Working with regional partners (e.g., StopWaste) to support the development of local infrastructure or implement programs (e.g., Rethink Disposables) that enables greater adoption of reusables for dine-in restaurants and sustainable takeout food ware. • <u>Implement a Citywide ordinance that reduces single use plastics, and enhances the use of reusable products, particularly food and drink ware.</u>

Strategy 2. Enhance sustainable production and reduce consumption.

ID	Action	Action Description
1047	Environmentally preferable purchasing policy	Adopt an Environmentally Preferable Purchasing Policy. Include alternatives for the most carbon-intensive materials that the City purchases, such as building materials (e.g., concrete, metals, etc.). Use existing resources provided by Alameda County. <u>Secondary Action.</u>

ID	Action	Action Description
1126	Collaborative consumption	Encourage and support collaborative consumption (e.g., encouraging shared consumption) across the community which may include: <ul style="list-style-type: none"> Implementing mini-grant programs to support “collaborative consumption” community projects like tool libraries and repair cafes. Working with local and regional partners to conduct a public education and outreach campaign around local options for collaborative consumption options (e.g., tool-lending libraries, car share, and swap events).
1137	Repair Industry	Expand economic development strategies and tools such as grants and incentives to retain industrial and repair industry businesses. This may include partnering with local organizations (e.g., StopWaste) to support job training for repair of common tools and equipment.
1198	Embodied carbon reduction plan	<p>Develop and implementParticipate and support a regional Embodied Carbon Reduction Plan Embodied Carbon Reduction Plan (i.e., considering the footprint of the material including resources needed to produce the materials) to reduce the carbon content of materials that include a variety of approaches. This Plan should consider:</p> <ul style="list-style-type: none"> • Whole building lifecycle analysis for new construction and incentives for achieving reductions. • Participate in regional efforts to build local supply chains and economic opportunities. • Partnerships to promote low-carbon products. • Encourage carbon-smart and recycled building materials. • A low-carbon concrete requirement. • Education campaigns and resources. <u>Secondary Action.</u>

Natural Systems

Goal

Offset greenhouse gas emissions by fostering resilient natural landscapes which will improve habitats, ecosystems, and public health.

Existing Ongoing Actions

Action	Action Description
Pesticide Posting Program	Continue to implement the Pesticide Posting Program and follow the City’s Integrated Pest Management Program (IPM).
Municipal Landscape Management Practice	Continue to manage the amount, source, placement, and timing of plant nutrients and soil amendments in City parks, green spaces, and natural areas (e.g., applying recycled wood mulch from tree trimmings into planters, medians, and tree wells and leaving green waste on-site to the extent feasible).
Sustainable land management education	Continue the City’s Environmental Services Water Conservation efforts including encouraging lawn conversion and improving landscape design through education.

Strategy 1: Increase and optimize carbon sequestration and improve ecosystem resilience.

ID	Action	Action Description
1150	Urban Forest Master Plan	<p>Develop and implement an Urban Forest Master Plan that includes best practices for tree health and maintenance and reevaluates community tree regulations. The plan should aim to protect and increase tree canopy, and to ensure trees are replanted with a "right sized tree" with sufficient minimum soil volume (e.g., 1,000 cubic feet of soil per tree). As part of the plan:</p> <ul style="list-style-type: none"> • Consider a community planting program that incentivize the community and incorporates community education focusing on proper planting practices and benefits of canopy cover. • <u>Create a community guide with information on appropriate species (e.g., climate-adapted, drought-tolerant, and carbon sequestering species) and planting tips.</u> • <u>Require climate adapted plantings for projects of a certain size.</u> • Partner with the school districts to increase tree canopy on school campuses. • Partner with local organizations (e.g., Go Green Initiative) to encourage increased tree canopy throughout the City.
1219	Soil management carbon sequestration projects	<p>Increase carbon sequestration potential throughout the City to offset emissions, increase drought and flood-resistance of soil, and further SB 1383 compliance. As part of this effort:</p> <p>Public Lands</p> <ul style="list-style-type: none"> • Implement carbon sequestration projects on City property where feasible (e.g., soil at City parks, golf courses, and open spaces). • Reduce the use of synthetic nitrogen fertilizer with soil amendments such as manure or other organic by-products (e.g., compost and mulch) on new landscape installations. • Partner with Zone 7, East Bay Regional Park District, and other public agencies to expand sequestration potential on public lands within the City's boundaries. <p>Private Lands</p> <ul style="list-style-type: none"> • Subsidize the cost of compost. • Encourage the use of compost in new landscape projects and undeveloped lands that exceeds WELO standards. • Increase awareness through education campaigns.
1220	Carbon sequestration research and tracking	<p>Work with regional partners (e.g., StopWaste) and neighboring jurisdictions to develop methods to track carbon sequestration in the urban landscape. Stay apprised of leading research and technological advancements available that mechanically and naturally captures carbon and/or remove carbon by purchasing direct air capture and carbon sequestration. <u>Secondary Action.</u></p>

~~Strategy 2: Improve ecosystem resilience and maintain natural landscapes.~~

ID	Action	Action Description
1145	Climate adapted plantings	Require climate-adapted plantings that are sustainable for Pleasanton (e.g., minimize water usage, drought tolerant, etc.) with native plantings preferred for new landscape installations throughout the City that exceeds WELO standards. Combined with Action 1150.

ID	Action	Action-Description
1099	Restore and conserve native grassland, rangeland, and riparian habitats	Identify, restore, and conserve native grassland, rangeland habitat, and riparian habitat, such as conserving woodland riparian habitat areas and habitat near canals and streams, to mitigate flooding risk and to improve water quality. As part of this action expand creek conservation and advocacy programs through collaboration with Zone 7, Living Arroyos, and/or the Watershed Project and improve natural water conveyance corridors.
1204	Community conservation programs	Develop a Library and Recreation program dedicated to conservation and stewardship projects for different age groups, expanding upon the existing programs that exist (e.g., Ridge Runner, Arbor Day, and future bee and butterfly gardens programs). <u>Combined with Action 1023.</u>

Water Resources

Goal

Reduce greenhouse gas emissions from water usage (including conveyance) and prepare community water resources for a changing climate which will result in cost savings, enhance water quality and availability, improve infrastructure, and increase resiliency.

Existing Ongoing Actions

Action	Action Description
Controller Assistant Program	Continue to provide the controller assistance program to Pleasanton residents (through this program, City staff visits residents' homes, and helps them adjust their water controller to ensure they are watering their landscapes the right amount and at optimal times of the day).
Smart water meter installation	Continue to monitor and provide outreach to the community regarding their water leaks based on their smart water meter data.
Water Conservation Program	Continue to promote City's Water Conservation Program including rebates, workshops, and outreach.
<u>On-site stormwater management</u>	<u>Continue to require new developments of a certain size to have on-site stormwater management and minimal hardscape as regulated by the Alameda Countywide National Pollution Discharge Elimination System (NPDES).</u>

Strategy 1: Improve water supply & increase conservation.

ID	Action	Action Description
1087	Water fixture retrofits Efficiency and Retrofits	<u>Expand incentives to reduce water use including:</u> <ul style="list-style-type: none"> Partner regionally with Zone 7 to develop <u>expand</u> incentives and direct install programs to retrofit inefficient water fixtures in existing properties. <u>Enhance the existing incentives/rebates for native and drought-tolerant residential and commercial landscaping and removal of grass turfs/lawns. <i>Secondary Action.</i></u>
1094	Expand recycled water	As recycled water becomes available, expand its use throughout the City (e.g., purple pipe expansion).
1147	Water Efficiency Programs	Expand and enhance the existing incentives/rebates for native and drought-tolerant residential and commercial landscaping and removal of grass turfs/lawns. <i>Combined with 1087</i>

Strategy 2: Improve stormwater resilience.

ID	Action	Action Description
1092	Stormwater runoff reuse	Investigate the feasibility of using stormwater runoff, if all water quality measures are in place, for irrigation and groundwater recharge.
1136	Green Stormwater Infrastructure Plan	Develop and implement <u>Participate and support regional a</u> Green Stormwater Infrastructure Plan <u>ning efforts</u> that builds off and supports the City’s Municipal Regional Stormwater -NPDES permit to ensure a sustainable approach for managing stormwater runoff. The plan may should include: <ul style="list-style-type: none"> Actions to replace traditional grey infrastructure with bioretention areas, green roofs, permeable pavement, and rainwater catchment. Exploration of opportunities to retrofit or integrate green infrastructure into existing and new City facilities. Incorporation of green infrastructure and stormwater management with infrastructure projects. Ensure future infrastructure and retrofits are adequately sized to be able to handle future flows and storms exacerbated by climate change. <u><i>Secondary Action.</i></u>
1199	On-site stormwater management	Update the Municipal Code to require new developments to have on-site stormwater management and minimal hardscape. <i>Moved to existing.</i>

Community Resilience & Wellbeing

Goal

Prepare for climate and non-climate emergencies and integrate climate considerations across City and community decision-making.

Existing Ongoing Actions

Action	Action Description
School climate action planning	Continue to partner with schools (e.g., provide funding and staff capacity) and support activities of the climate action groups at schools, including connecting them to resources from GoGreen Initiative, StopWaste, and CA Youth Energy Services.
Access to green spaces	Continue to partner with local organizations to increase awareness of and access to green spaces and outdoor recreation for all residents.
Community cooling centers	Continue to maintain adequate and accessible cooling centers for extreme heat. Work with the county to ensure sufficient notification systems are in place to notify residents of extreme heat events and available transportation routes to these cooling centers. Potential locations include schools, city buildings, other public buildings, and multi-purpose rooms.
Community gardens	<u>Continue to partner with nonprofits, school districts, low-income communities, and underrepresented communities to expand urban agriculture opportunities (e.g., Bernal Community Farm) in community gardens, schools, parks, and on rooftops. Promote programs to teach residents how to garden.</u>

Strategy 1: Improve community resilience and reduce vulnerability to climate change.

ID	Action	Action Description
1026	Neighborhood resilience hubs	Fund and support the development of community facilities to serve as neighborhood resilience hubs to support residents and coordinate resource distribution and services before/during/after natural hazards and extreme events. Potential locations include schools, city buildings, other public buildings, and multi-purpose rooms.
1143	Community gardens	Partner with nonprofits, school districts, low-income communities, and underrepresented communities to expand urban agriculture opportunities in community gardens, schools, parks, and on rooftops. Promote programs to teach residents how to garden. <u>Moved to existing.</u>
1130	CalFresh, WIC & Senior FMNP expansion	Expand ability to use CalFresh, Women, Infants, and Children (WIC), and Senior Farmers Market Nutrition Program (FMNP) benefits for Community Supported Agriculture (CSAs) and farmers markets by working with CSAs to allow these funding sources and increasing MarketMatch at the Pleasanton Farmers Market.
<u>1023</u>	<u>Comprehensive climate awareness, education, and outreach</u>	<p><u>Implement comprehensive public/private climate awareness, education, and outreach. Consider climate campaigns within the CAP and phase campaigns over time accounting for staffing, resources, and balancing other community messaging. Outreach materials should be translated to Spanish, Chinese, and other commonly spoken languages in the community as identified by the Public Information Officer. Expanded efforts should include:</u></p> <ul style="list-style-type: none"> <u>Develop and implement an empowerment program that helps residents, businesses, neighborhood leaders, and visitors take action to reduce their personal carbon footprint and improve climate literacy. Include a carbon footprint calculator that generates a list of actions to reduce emissions at the household level and consider creating competitions to encourage adoption of programs.</u> <u>Develop a Library and Recreation program dedicated to conservation and stewardship projects for different age groups, expanding upon the existing programs that exist (e.g., Ridge Runner, Arbor Day, and future bee and butterfly gardens programs).</u> <u>Create “sustainability awards” presented by the City Council during Earth Week to increase climate awareness and recognize community efforts. Consider community nominations for “green” efforts throughout the City for business operations, development projects, and individual efforts throughout the City.</u> <u>Consider preparation of a checklist comparing LEED with CALGreen to simplify the process for development applications.</u>

Strategy 2: Reduce vulnerability to climate change.

ID	Action	Action-Description
1010	Reduce heat island effect	Require new development projects to implement measures to reduce heat island effects in the city. Considerations may include light-colored paving material for roads and parking areas, cool roofs for buildings, and shade trees for parking lots and pedestrian rights-of-way.
1096	Wildfire preparation, prevention, and education	Reduce community vulnerability and increase wildfire resilience. As part of this effort: <ul style="list-style-type: none"> • Leverage existing outreach and education campaigns and work with local organizations, (e.g., CAL FIRE Firewise, and Tri Valley Air Quality Community Alliance) to increase awareness of residential homeowner actions to reduce and mitigate wildfire risk (e.g., create defensible space, reducing fuel loads, cleaning out rain gutters of leaves). • Expand and improve targeted community messaging on how to respond to heat risks and poor air quality due to smoke. • Work with regional partners to modify development regulations and codes and implement retrofit programs to increase resilience to wildfires. • Work with CalFire and other partners to identify and implement controlled burns and other means to reduce combustible biomass and improve early wildfire detection for the City. • Provide clean air shelters in the event of poor air quality due to wildfires <i>Secondary Action.</i>

Strategy 3: Prepare and integrate climate considerations across City operations.

ID	Action	Action-Description
1216	Institutionalize climate action	Institutionalize climate considerations across City and community activities and decision-making. Dedicate at least one position (e.g., Sustainability Manager and/or Sustainability Management Analyst(s) focused on sustainability) to implement CAP tasks, manage the Energy Star Portfolio Manager for City facilities and identify opportunities for increased efficiencies and cost savings, maintain relationships with partner agencies and identify grants and funding opportunities as they become available, track legislative changes relating to the climate that affect municipal operations, track City emissions, and promote climate change awareness across all city functions.
1032	Prioritize adaptation and resilience in capital projects	Prioritize adaptation and resilience in Capital Improvement Projects (CIPs). An option could include introducing guidance methodology for formally integrating climate change, inherent uncertainties, timescales, economic lifecycle evaluations, project's annual impact, and other relevant criteria into the design review process for new infrastructure projects by leveraging existing vulnerability assessments, such as the CalTrans Climate Change Vulnerability Assessment.
1038	Critical facility relocation	Identify and consider relocation opportunities for critical facilities that are exposed to future climate threats.
1023	Comprehensive climate outreach	Develop and implement a comprehensive public/private education and empowerment program that helps residents, businesses, neighborhood leaders, and visitors take action to reduce their personal carbon footprint and improve climate literacy. Include a carbon footprint calculator that generates a list of actions to reduce emissions at the household level and consider creating competitions to encourage adoption of programs. The plan should review proposed climate campaigns within the CAP and phase education campaigns over time accounting for staffing, resources, and balancing other community messaging. Outreach materials should be translated to Spanish, Chinese, and other commonly spoken languages in the community as identified by the Public Information Officer. <i>Moved to Strategy 1.</i>

Attachment 3

1228	Sustainability Awards	Create “sustainability awards” presented by the City Council during Earth Week to increase climate awareness and recognize community efforts. Consider community nominations for “green” efforts throughout the City for business operations, development projects, and individual efforts throughout the City. <i>Combined with 1023.</i>
1151	Update CAP checklist	Update CAP development checklist to reflect CAP 2.0 and develop specific guidelines and requirements for its use, including reporting and evaluation mechanisms. Further, consider preparation of a checklist comparing LEED with CALGreen to simplify the process for development applications. <i>Partially will be done with adoption (updating checklists) and partially combined with 1023.</i>