



City of Larkspur

CLIMATE ACTION PLAN 2030

July 2021



**CITY OF LARKSPUR
RESOLUTION 45/21**

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LARKSPUR
UPDATING THE CITY'S CLIMATE ACTION PLAN AND
ADOPTING THE LARKSPUR CLIMATE ACTION PLAN 2030**

WHEREAS, there is broad scientific agreement that to stave off the worst effects of climate change, communities will need to reduce their greenhouse gas (GHG) emissions by 80% below 1990 levels by the year 2050 and drawdown climate warming GHG emissions such as carbon dioxide from the atmosphere to secure a safe future for us all;

WHEREAS, the City of Larkspur recognizes that local governments play an important role in reducing greenhouse gas emissions in their municipal operations and communities, and mitigating the future impacts of climate change;

WHEREAS, on November 7, 2007, the City of Larkspur adopted Resolution No.44/07 resolving to participate in the Cities for Climate Protection Campaign and, as a participant, pledges to take a leadership role in promoting public awareness about the causes and impacts of climate change;

WHEREAS, on June 3, 2009, the City of Larkspur approved Larkspur's 2005 Greenhouse Gas Emissions Inventory and directed staff to complete a Climate Action Plan to reduce government and community GHG emissions over the next ten years;

WHEREAS, on July 21, 2010, the City of Larkspur adopted a Climate Action Plan with a greenhouse gas emissions reduction target of 15% below 2005 levels by 2020;

WHEREAS, a Climate Action Plan (CAP) is a document that contains goals, policies, and objectives to reduce greenhouse gas emissions;

WHEREAS, over the past decade, the City has developed and implemented many projects and programs to improve energy efficiency at both the municipal and community levels and has reduced its GHG emissions beyond its 2020 target;

WHEREAS, Assembly Bill 32, the Global Warming Solutions Act set a goal of reducing GHG emissions to 1990 levels by 2020 and Senate Bill 375, the Sustainable Communities and Climate Protection Act, established Statewide GHG emissions reduction targets of 40% below 1990 levels by 2030;

WHEREAS, the Larkspur CAP incorporates the City's 2018 Greenhouse Gas (GHG) Emissions Inventory, which identifies the sources of greenhouse gas emissions generated by the community, and the Larkspur CAP estimates how these emissions might change over time under a business-as-usual forecast that utilizes build-out estimates and regional forecasts;

WHEREAS, the Larkspur 2018 GHG Emissions Inventory showed that nearly half of Larkspur's community emissions comes from passenger vehicles and the CAP identifies building out the Electric Vehicle charger infrastructure and encouraging Zero Emissions Vehicle ownership through incentives is the most impactful way to reduce emissions in transportation;

WHEREAS, the Larkspur 2018 GHG Emissions Inventory also showed that residential emissions generated the second highest greenhouse gas emissions in Larkspur and the CAP states that encouraging energy efficiency upgrades and adopting more energy efficiency standards, including electrifying all commercial and residential appliances for new construction and remodels will help the City meet its reduction target;

WHEREAS, the Larkspur CAP focuses on the efforts Larkspur can make to reduce its greenhouse gas emissions and mitigate, to the extent feasible at the local level, the impacts of climate change;

WHEREAS, the Larkspur CAP provides strategies and specific actions for energy use, transportation, waste, water, and natural systems that substantial evidence demonstrates, if fully implemented, will collectively achieve the targeted emissions level for the year 2030;

WHEREAS, the strategies and specific actions of the Larkspur CAP are developed in collaboration with the Marin Climate and Energy Partnership and are based upon the best practices and state-of-art approaches implemented and adopted by communities throughout the region to address GHG reduction, including San Rafael, San Anselmo, and the County of Marin;

WHEREAS, a Draft CAP was presented to the City Council on March 17, 2021 and staff subsequently held a public workshop on April 29, 2021, and received several letters as well as public comments in the course of the workshop;

WHEREAS, the Draft CAP was updated to include suggestions from many of the commenters, including an implementation plan including timelines and performance measures to enable the City to track its progress and set priorities; and

WHEREAS, the Draft CAP identifies state and local strategies to reduce emissions over 40% below 1990 emissions in 2030, which exceeds the State' s 2030 goal; and

WHEREAS, the City Council held public hearing on the Draft CAP on June 16 and July 21 2021 and considered all written and verbal testimony on the matter;

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Larkspur hereby resolve, declare, determine and order as follows:

1. Finds the above recitals to be true and correct and constitute the determinations of the City Council made in support of this resolution.
2. Approves the Larkspur Climate Action Plan 2030 as referenced in this resolution; and attached as Exhibit A;
3. Declares that adoption of the Larkspur Climate Action Plan 2030 (CAP) is exempt from environmental review under section 15307 of the California Environmental Quality Act (CEQA Guidelines, which exempts "Actions by regulatory agencies for protection of natural resources." In addition, adoption of the CAP is exempt under the under CEQA Guidelines section 15061(b)(3), because it can be seen with certainty that there is no possibility that the project may have a significant effect on the environment.

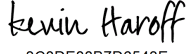
IT IS HEREBY CERTIFIED that the City Council of the City of Larkspur duly introduced and regularly adopted the foregoing resolution at a regular meeting held on July 21, 2021, by the following vote:

AYES: COUNCILMEMBER: Candell, Hillmer, Paulson, Way, and Mayor Haroff


NOES: COUNCILMEMBER: None

ABSENT: COUNCILMEMBER: None

ABSTAIN: COUNCILMEMBER: None









DocuSigned by:

3C8DE88B7D6543E...

Kevin Haroff, Mayor









ATTEST:
DocuSigned by:

12CB4196622747E...

Alison Foulis, City Clerk

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WHAT YOU CAN DO

LOW CARBON TRANSPORTATION	
	<ul style="list-style-type: none"> • Drive an all-electric or plug-in hybrid vehicle. • Bike, walk, or take transit whenever possible. • Shut your car off when you are sitting idle. • Use electric tools, including leaf blowers and lawn mowers, wherever possible.
RENEWABLE ENERGY & ELECTRIFICATION	
	<ul style="list-style-type: none"> • Switch to MCE Deep Green or PG&E Solar Choice 100% renewable electricity. • Install a solar energy system on your home or business and consider battery storage. • Replace appliances that use natural gas for ones that use electricity. • Investigate heat pump technology so you can swap out heaters and furnaces that use natural gas when it is time to replace them.
ENERGY EFFICIENCY	
	<ul style="list-style-type: none"> • Replace indoor and outdoor lights with LED bulbs and turn them off when not in use. • Have an energy assessment done for your home or business. • Upgrade insulation, seal leaks, and install a programmable thermostat. • Purchase Energy Star appliances and equipment. • Unplug electronic appliances when not in use and set the thermostat to use less heat and air conditioning.
WASTE REDUCTION	
	<ul style="list-style-type: none"> • Buy only as much as you need. • Buy locally grown food and eat less meat. • Put your food scraps in the green can and/or compost them at home. • Donate extra food and used clothing and housewares. • Don't be a "wishful" recycler. Be scrupulous about how you sort your recyclables.
WATER CONSERVATION	
	<ul style="list-style-type: none"> • Replace your lawn with a drought-tolerant garden. • Install a drip irrigation system and check it regularly for leaks. • Install low water flow faucets, showerheads, and toilets. • Buy water-efficient dishwashers and clothes washers when it is time to replace them.
SEQUESTRATION AND ADAPTATION	
	<ul style="list-style-type: none"> • Plant trees appropriate to you situation. • Add compost to your soil • Purchase carbon offsets for airplane flights and other emissions that are difficult to mitigate. • Find out if your home or business is vulnerable to sea level rise at Our Coast Our Future. • Prepare for more wildfires. Join a Firewise Community, create a defensible space, harden your home, and have an emergency evacuation plan. Learn how at www.firesafemarin.org • Install solar with battery storage to get through power outages.
COMMUNITY ENGAGEMENT	
	<ul style="list-style-type: none"> • Sign up for Resilient Neighborhoods and join a Climate Action Team. • Commit to reducing your carbon footprint by taking the actions identified in this Plan. • Spread the word – advocate to your neighbors, employees, co-workers, etc.
IMPLEMENTATION AND MONITORING	
	<ul style="list-style-type: none"> • Get involved! Attend City Council meetings, Climate Action Plan implementation forums, and other public forums to voice your support for actions contained in this Plan.

SECTION 1: INTRODUCTION

What is a Climate Action Plan?

A Climate Action Plan (CAP) is a tool that any organization can use to develop the programs and actions needed to reduce greenhouse gas emissions (GHGs), which are the pollutants that cause climate change, and other negative impacts to the environment. Generally, these CAPs are focused on this *'mitigation'* aspect of climate change, but some also lay out a strategy for *'adaptation'*, or how the organization will plan to deal with the effects of climate change such as sea level rise, or increased flooding, heat waves, and wildfires. Larkspur's CAP is primarily focused on mitigation measures.

The need for local governments to act on climate change has never been more urgent, as demonstrated by 2020's devastating wildfires layered over a global pandemic. The City of Larkspur has long been dedicated to environmental leadership, and this plan continues that legacy by incorporating new ideas and ambitious targets.

Background

The City of Larkspur understands that climate change has the potential to significantly affect Larkspur's residents and businesses, as well as other communities around the world. The City also recognizes that local governments play a strong role in reducing greenhouse gas emissions and mitigating the potential impacts of climate change.

This CAP seeks to reimagine a community that is substantially less dependent on fossil fuels and provides a prosperous environment for both current and future generations, while not exporting environmental damage and GHG emissions to other parts of the Bay Area, nation, or world.

The purpose of this Climate Action Plan is to compile existing and potential strategies (i.e., actions, projects, and programs) that the City's government operations and the community take to address climate change. It provides a brief background on what climate change is and its potential impacts but focuses on the efforts Larkspur can take to reduce its greenhouse gas emissions and mitigate, to the extent feasible at the local level, the potential impacts of climate change. Through actions outlined in this Plan, such as increasing energy efficiency of buildings, encouraging less dependence on the automobile, and using clean, renewable energy sources, the community can experience lower energy bills, improved air quality, reduced emissions, and an enhanced quality of life. Since the City's initial preparation of the 2005 Greenhouse Gas Emissions Inventory and the 2010 Climate Action Plan, Larkspur has met its 2020 emissions reduction goal. This updated plan acknowledges that climate action planning is an ongoing planning process that includes assessing, planning, mitigating, and adapting to climate change.

There is broad scientific agreement that to stave off the worst effects of climate change, communities will need to reduce their greenhouse gas emissions by 80% below 1990 levels by the year 2050. We are already seeing the effects of climate change locally and throughout the world with hotter temperatures, more severe storms, and more volatile and unpredictable weather. Recently, the State of California adopted an interim reduction target of 40% below 1990 levels by 2030 to stay on track. This updated plan sets out a road map to do just that.

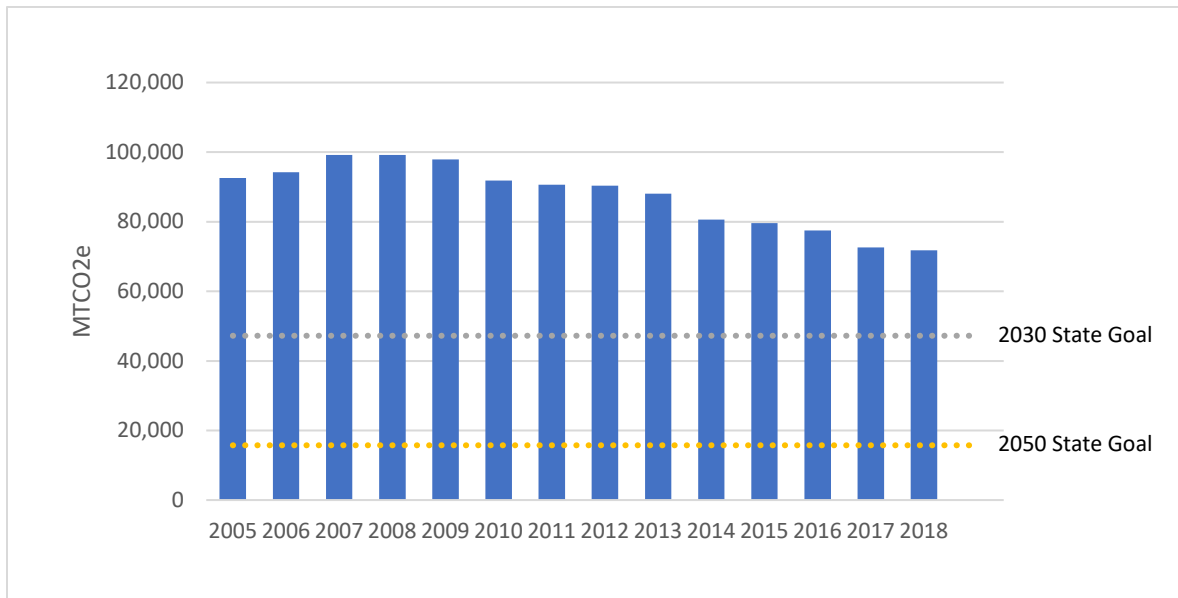
In addition to the California greenhouse gas emission goals listed above, Governor Brown's 2018 Executive Order B-55-18 added the State goal of reaching zero net greenhouse gas emissions (emissions less sequestered greenhouse gases) as soon as possible and no later than 2045. Since then, many climate scientists have concluded that 2045 is insufficient to avoid the worst consequences of climate change and are urging net zero emissions be achieved by 2030. This Climate Action Plan identifies several actions to sequester greenhouse gasses but does not estimate the potential reduction that could result from sequestration.

An additional consideration in planning climate action is that all the State goals above are subject to acceleration between now and 2030 and Federal climate goals may be issued. In the event California's goals for reducing carbon emissions and achieving net zero emissions are accelerated or Federal climate goals are issued, the City of Larkspur will revisit its Climate Action Plan and adjust it as necessary to stay consistent with State and Federal climate goals.

Larkspur works with the Marin Climate & Energy Partnership (MCEP) to build upon best practices learned from other similar communities in the region. Larkspur publishes annual community greenhouse gas (GHG) emissions estimates through the MCEP. Annual inventories help the City to monitor its progress more closely in meeting its local goal to reduce community emissions 15% below 2005 emissions by 2020 and to meet the statewide goal to reduce emissions 40% below 1990 levels by 2030. In addition to the community inventories, MCEP periodically prepares inventories for government operations emissions.

The most recent inventory report reviews emissions generated from the community from 2005 through 2018. The inventory shows that the Larkspur community has reduced emissions 23% since 2005. Emissions dropped from about 92,602 metric tons carbon dioxide equivalents (MTCO_{2e}) in 2005 to 71,740 MTCO_{2e} in 2018. The community emissions trend and targets are shown in Figure 1. Larkspur needs to reduce emissions another 24,510 MTCO_{2e} to meet the State target for 2030 and another 56,000 MTCO_{2e} to meet the State target for 2050, which is 80% below 1990 levels.

FIGURE 1: LARKSPUR COMMUNITY EMISSIONS TREND, 2005-2018



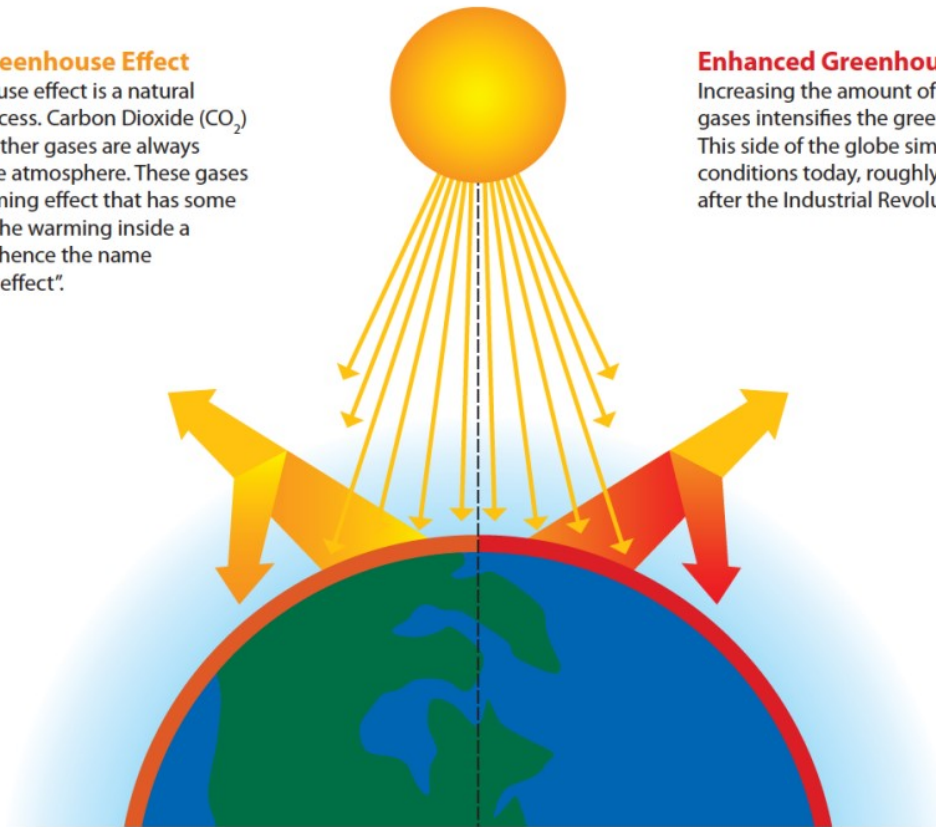
What are Greenhouse Gas Emissions and How Do They Contribute to Climate Change?

Greenhouse gases (GHGs) are gases in Earth's atmosphere that allow the sun's rays to enter our atmosphere and trap the resulting heat generated by the rays. These gases are naturally occurring and make Earth suitable for life. While we depend a certain level on these gases to keep our earth habitable, certain human activities have been shown to emit GHGs, increasing their concentration in the atmosphere to unsustainable levels and trapping more heat, resulting in an increase in Earth's average temperature (Figure 2). This intensification of the natural greenhouse effect affects local and global climate patterns, and which in turn amplifies many hazards including flooding, wildfire, drought, and storms.

FIGURE 1: THE GREENHOUSE EFFECT

Natural Greenhouse Effect

The greenhouse effect is a natural warming process. Carbon Dioxide (CO₂) and certain other gases are always present in the atmosphere. These gases create a warming effect that has some similarity to the warming inside a greenhouse, hence the name "greenhouse effect".



Enhanced Greenhouse Effect

Increasing the amount of greenhouse gases intensifies the greenhouse effect. This side of the globe simulates conditions today, roughly two centuries after the Industrial Revolution began.

Source: California Waterboard/Marion Koshland Science Museum Of The National Academy Of Sciences

These GHGs include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (Table 1)¹. Each one has a different degree of impact on climate change. To facilitate comparison across different emission sources with mixed and varied compositions of several GHGs, the term "carbon dioxide equivalent" or CO₂e is used across this CAP. One metric ton of CO₂e may consist of any combination of GHGs and has the equivalent Global Warming Potential (GWP) as one metric ton of carbon dioxide (CO₂). As gathering data and quantifying emissions can be quite difficult for some sources, community inventories at the local government level typically concentrate on the three primary GHGs: CO₂, CH₄, and N₂O.

¹ Water vapor is the most dominant greenhouse gas, but it is not measured as a part of a greenhouse gas inventory and for that reason is not included in this discussion.

TABLE 1: GREENHOUSE GASES

Gas	Chemical Formula	Emission Source	Global Warming Potential
Carbon Dioxide	CO ₂	Combustion of natural gas, gasoline, diesel, and other fuels	1
Methane	CH ₄	Combustion, anaerobic decomposition of organic waste in landfills, wastewater, and livestock	28
Nitrous Oxide	N ₂ O	Combustion, wastewater treatment	265
Hydrofluorocarbons	Various	Leaked refrigerants, fire suppressants	4 to 12,400
Perfluorocarbons	Various	Aluminum production, semiconductor manufacturing, HVAC equipment manufacturing	6,630 to 11,100
Sulfur Hexafluoride	SF ₆	Transmission and distribution of power	23,500

Source: International Panel on Climate Change (IPCC) Fifth Assessment Report, 100-year values, 2014

According to the U.S. Environmental Protection Agency’s 2019 “Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2018,” the majority of GHG emissions comes from fossil fuel combustion which in turn is used for electricity, transportation, industry, heating, etc. The burning of fossil fuels occurs across nearly every sector of the global economy, in ways that have become foundational to the ways that most people move, eat, and live.

It is the charge of this plan to diminish our community’s dependence on fossil fuels and drastically decrease our associated GHG emissions.

How will Climate Change Impact California and Marin?

As described above, the Earth’s climate is warming, mostly due to human activities such as changes in land cover and emissions of certain pollutants. GHGs are the major human-induced drivers of climate change. These gases warm the Earth’s surface by trapping heat in the atmosphere.

California is already experiencing climate change impacts. Sea levels along the coast of southern and central California have risen about 6 inches over the past century and even moderate tides and storms are now producing extremely high sea levels.² Since 1950, the areas burned by wildfire each year has been increasing, as warming temperatures extend the fire season and low precipitation and snowpack

² Louise Bedsworth, Dan Cayan, Guido Franco, Leah Fisher, Sonya Ziija, “Statewide Summary Report,” in California’s Fourth Climate Change Assessment, publication number: SUMCCCA4-2018-013, 2018, p. 31.

create conditions for extreme, high severity wildfires to spread rapidly. Seventeen of the state’s twenty largest fires have occurred since 2003, and the five largest fires have occurred since 2017.³ The megafires of 2020, sparked in many cases by lightning strikes, have so far burned over 3.75 million acres across California.

As temperatures continue to rise, California faces serious climate impacts, including:

- More intense and frequent heat waves
- More intense and frequent drought
- More severe and frequent wildfires
- More severe storms and extreme weather events
- Greater riverine flows
- Shrinking snowpack and less overall precipitation
- Accelerating sea level rise
- Ocean acidification, hypoxia, and warming
- Increase in vector-borne diseases and heat-related deaths and illnesses
- Increase in harmful impacts to vegetation and wildlife, including algal blooms in marine and freshwater environments, spread of disease-causing pathogens and insects in forests, and invasive agricultural pests.

Overall temperatures are projected to rise substantially throughout this century. In Marin County, temperatures are expected to rise about 4°F by 2100 if global emissions peak around 2040 and then decline, the so-called “low emissions” scenario. If the world fails to act and we continue the path we are on, temperatures are projected to rise 10°F by the end of the century (the “high emissions” scenario).

As the climate changes, some of the more serious threats to public health will stem from more frequent and intense extreme heat days and longer heat waves. Extreme heat events are likely to increase the risk of heat-related illness, such as heat stroke and dehydration, and exacerbate existing chronic health conditions. Extreme heat days in Marin are expected to increase from 4 days to 9 days under the low emissions scenario and to as many as 25 days under the high emissions scenario.

Higher temperatures will make Marin more vulnerable to wildfire and sea level rise. By the end of the century, sea level is projected to rise 2.4 to 3.4 feet, and possibly as much as 10 feet. At 5 feet of sea level rise, flooding may inundate downtown San Rafael, Redwood High School in Larkspur, Town Center in Corte Madera, Mill Valley Middle School, the Cove Shopping Center in Tiburon, and thousands of homes and businesses located near Marin’s shorelines and creeks. Flooding will be even worse during storms, which are expected to increase in frequency and intensity.

What Role Does Government Play?

International, national, and statewide GHG reduction goals and policies affect the County’s own goals and policies. Whether trying to meet or exceed those goals, California and Marin are known for their environmental stewardship and willingness to be leaders on the international and national stage.

³ Cal Fire, “Top 20 Largest Wildfires,” 9/4/2020.

International	<ul style="list-style-type: none"> • The United Nations coordinates global commitments and targets to reduce emissions (such as the Paris Climate Accord) . • The United Nations also supports the advancement of climate science through the Intergovernmental Panel of Climate Change (IPCC). The IPCC coordinates the work of scientists across the world to continually update models and assess the science related to climate change. This work in turn informs the way that national, state, and local governments understand and address the human activities that contribute to climate change and the ways that climate change might impact earth’s environment.
National	<ul style="list-style-type: none"> • Currently, there is no federal legislation mandating comprehensive GHG emissions reporting or reduction in the United States.
State	<ul style="list-style-type: none"> • California first established statewide GHG emission reduction targets in 2005. • California has used its climate goals to develop regulations to reduce emissions across a variety of sectors, including: <ul style="list-style-type: none"> ○ Setting more strict fuel economy standards for vehicle manufacturers that would like to sell cars in the state. ○ Establishing zero-net energy building targets for new development. ○ Direct management of emissions from power plants and other stationary sources. • California has also used SB 375, which was passed in 2008, to reduce emissions from cars and light trucks by promoting compact mixed-use, commercial, and residential development. SB 375 required local governments in California to consider GHG emissions, leading to successful proliferation of climate action plan development throughout the state.
Local	<ul style="list-style-type: none"> • Looks at GHG emissions generated by their communities. • Sets long term GHG emission reduction targets that align meet or exceed statewide goals through local Climate Action Plans. • Develops policies and programs to achieve CAP GHG emission reduction goals.

What Has Been Done So Far: Larkspur Actions

Larkspur businesses, agencies, and residents have been at the forefront of mitigation efforts such as renewable energy, low-carbon transportation, composting, and water conservation. In 2011, Marin Clean Energy was adopted by the City of Larkspur and most electricity users went immediately to purchasing 50% carbon-free electricity for their homes and businesses. Larkspur was one of the first communities to participate in curbside recycling thanks to Marin Sanitary Service’s (MSS) forward-thinking owners. In 2014 MSS and Central Marin Sanitation Agency began converting food scraps into energy through their innovative Food to Energy project. By the end of the 2011-2017 drought, Larkspur water users reduced their water consumption by an average of approximately 25%. And in 2017, Marin Municipal Water District began purchasing 100% renewable Deep Green electricity from MCE Clean

Energy, which reduced Larkspur resident and businesses' water-related greenhouse gas emissions dramatically.

Other recent actions include:

- Replacement of police station with LEED Platinum building with solar (in conjunction with the Town of Corte Madera).
- Installation EV charging stations in Piper Park and at Central Marin Police Station
- Approved EV charging at Bon Air Shopping Center.
- Conducted an evaluation to determine potential for solar installation on City facilities.
- Purchased two EV passenger vehicles for City fleet.

Where We Are At: Emissions Trend and Status

The first step toward developing a climate action plan is to identify sources of emissions and establish baseline levels. In 2020, the Marin Climate & Energy Partnership prepared a Greenhouse Gas Emissions Inventory for unincorporated community emissions for the years 2005 through 2018 consistent with the methodology used for other Marin cities and towns. The inventory quantifies GHG emissions from a wide variety of sources, from the energy used to power, heat, and cool buildings, to the fuel used to move vehicles and power off-road equipment, to the decomposition of solid waste and treatment of wastewater. Emissions are quantified according to methodologies established by the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (v. 1.2). The inventory provides a detailed understanding of where the highest emissions are coming from, and, therefore, where the greatest opportunities for emissions reductions lie. The inventory also establishes a baseline emission inventory against which to measure future progress.

Community emissions are quantified according to these seven sectors:

- The **Residential** sector represents emissions generated from the use of electricity, natural gas, and propane in residential buildings.
- The **Non-Residential** sector represents emissions generated from the use of electricity and natural gas in commercial, industrial, and governmental buildings and facilities.
- The **Transportation** sector includes tailpipe emissions from passenger vehicle trips originating and/or ending in unincorporated areas, a share of tailpipe emissions generated by medium and heavy-duty vehicles travelling on Marin County roads, and emissions from transit vehicles and the SMART train when operating within the City limits. Electricity used to power electric vehicles is embedded in electricity consumption reported in the Residential and Non-Residential sectors.
- The **Waste** sector represents fugitive methane emissions that are generated over time as organic material decomposes in the landfill. Although most methane is captured or flared off at the landfill, approximately 25% escapes into the atmosphere.
- The **Off-Road** sector represents emissions from the combustion of gasoline and diesel from the operation of off-road vehicles and equipment used for construction, landscape maintenance, and agriculture.
- The **Water** sector represents emissions from energy used to pump, convey, treat, and distribute potable water from the water source to water users in Larkspur.

- The **Wastewater** sector represents stationary, process, and fugitive GHGs that are created during the treatment of wastewater generated by the community and emissions created from energy used to process wastewater.

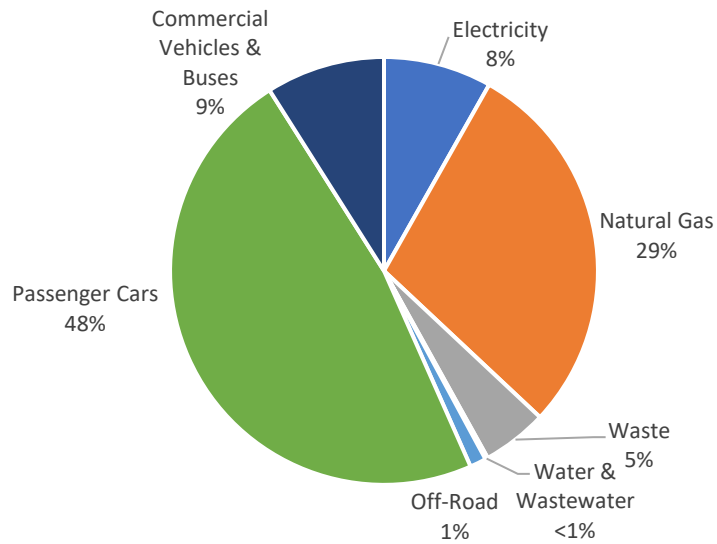
Community emissions totaled 92,602 metric tons of carbon dioxide equivalents (MTCO_{2e}) in 2005. By 2018, emissions had dropped to 71,740 MTCO_{2e}, a 23% reduction. This is well below the State target for Larkspur, which is 15% below baseline (2005) emissions by 2020. While emissions declined in almost all sectors, the largest reductions were due to reduction in the carbon intensity of electricity, improvements in energy conservation and efficiency, and improvements to vehicle fuel efficiency. Emissions from City operations, which make up less than 1% of community-wide emissions, fell 2% by 2015. For more details, see the City’s latest Greenhouse Gas Emissions Inventory.

TABLE 2: EMISSIONS SUMMARY BY SECTOR (MTCO_{2e})

Year	Residential	Non-Residential	Transportation	Waste	Off-Road	Water	Wastewater	Total	% Change from 2005
2005	23,897	17,700	45,012	3,966	1,246	507	275	92,602	
2006	23,707	17,303	47,285	3,925	1,281	444	264	94,209	2%
2007	25,882	18,961	48,404	3,522	1,526	597	332	99,225	7%
2008	26,346	19,194	48,559	2,931	1,260	551	339	99,179	7%
2009	25,803	18,140	49,464	2,522	1,102	553	299	97,884	6%
2010	23,650	15,589	48,516	2,481	1,032	316	246	91,830	-1%
2011	23,260	15,376	48,099	2,418	1,024	223	228	90,627	-2%
2012	22,746	15,208	48,377	2,507	1,010	242	242	90,332	-2%
2013	21,703	15,336	46,935	2,532	991	282	237	88,014	-5%
2014	17,846	13,960	44,774	2,573	977	246	205	80,581	-13%
2015	17,960	13,429	44,110	2,695	966	202	203	79,563	-14%
2016	17,573	12,528	42,957	3,185	946	136	186	77,512	-16%
2017	15,678	10,552	41,956	3,330	920	39	140	72,614	-22%
2018	15,805	10,730	40,626	3,552	887	14	125	71,740	-23%
Change from 2005	-8,091	-6,970	-4,386	-414	-359	-493	-150	-20,863	
% Change from 2005	-34%	-39%	-10%	-10%	-29%	-97%	-55%	-23%	

As shown in Figure 3, most emissions come from passenger vehicle trips generated by Larkspur residents, employees, and visitors. The second greatest source of emissions is natural gas used in Larkspur homes and non-residential buildings and facilities.

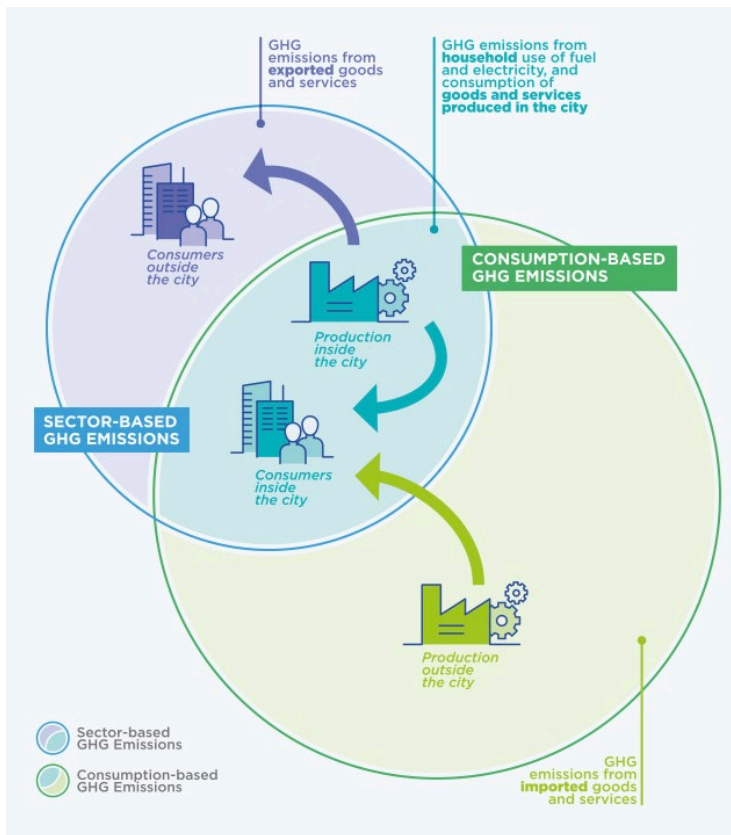
FIGURE 3: COMMUNITY EMISSIONS BY SOURCE, 2018



Consumption-Based Inventory

In addition to the sectors outlined above, which measures the emissions that are generated within the City’s borders, there are also emissions associated with the goods and services that residents in Marin consume. These are referred to as “consumption-based emissions” or “embodied emissions” (both terms are used interchangeably in this document). Rather than assessing emissions that are generated within a jurisdictional boundary, consumption-based inventories estimate the emissions based on the goods and services consumed within a place. This includes emissions from raw material extraction, manufacturing, distribution, retail, and disposal. Historically, local governments have only included emissions that occur within their boundaries, including emissions associated with goods that will eventually be exported (Figure 3). However, in communities like Marin County (as in many other communities in the United States) where goods are more often imported than exported, consumption emissions can be up to 800% higher than their sector-based emissions inventory. Consumption emissions are harder to track and have fewer defined pathways for policy intervention from local governments, so the City continues to follow ICLEI’s Community Protocol and focus on actionable programs and policies to address local emissions. This CAP, wherever possible, seeks to take into account the whole picture of local contributions to climate change and includes measures to address these emissions in the built environment.

FIGURE 4: SECTOR-BASED VS. CONSUMPTION-BASED GHG EMISSIONS

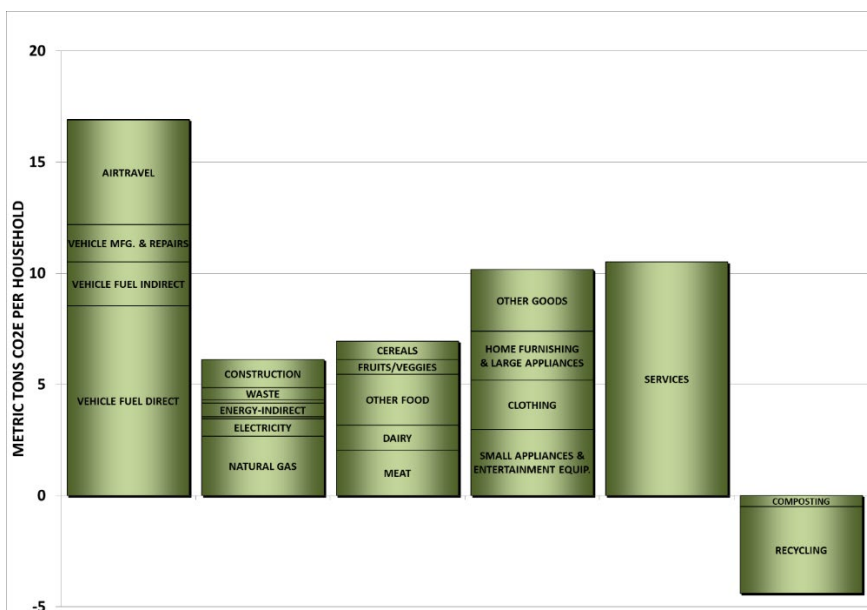


Source: C40 Cities, "Consumption-Based GHG Emissions of the C40 Cities"

visit the [SF Bay Area Carbon Footprint Map](#).

In 2016, the Bay Area Air Quality Management District (BAAQMD) and U.C. Berkeley developed a [Consumption-Based Inventory](#) to better understand how purchasing habits contribute to global climate change. This consumption-based inventory includes emission sources that do not get counted in the typical "sector-based" GHG inventory, as well as other items that are difficult to quantify like airplane travel and upstream emissions from the production, transport and distribution of food and household goods. Figure 5 shows the results of the consumption-based inventory for Larkspur households. According to this inventory, the average Larkspur household generates 50 MTCO₂e per year. As a comparison, the City's community-wide emissions of 72,746 MTCO₂e works out to about 12 MTCO₂e per household. For more information on this and to see carbon footprints by

FIGURE 5: AVERAGE LARKSPUR HOUSEHOLD CARBON FOOTPRINT



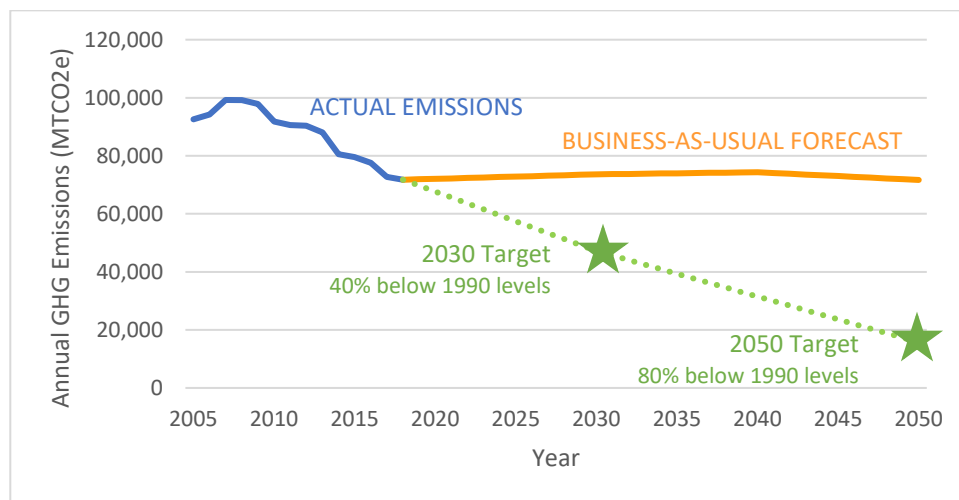
Source: CoolClimate Network

Although this Climate Action Plan does not specifically inventory consumption-based emissions, the ‘What You Can Do’ table includes many actions residents can take to reduce their consumption-based emissions in addition to the basic advice to consume less, reuse more, repair more, and recycle. It is anticipated that over the period of this CAP, the methodology to inventory and reduce consumption-based emissions will advance. Given the high level of consumption-based emissions attributable to Larkspur residents, the City of Larkspur commits to monitor and apply advances in inventorying and encouraging residents to reduce consumption-based emissions as they become available.

Emissions Forecast and Reduction Targets

The Climate Action Plan includes a “business-as-usual” (BAU) forecast in which emissions are projected in the absence of any policies or actions that would occur beyond the base year to reduce emissions. The forecasts are derived by “growing” (increasing) 2018 emissions using forecasted changes in population, number of households, and jobs according to projections developed by the Association of Bay Area Governments. Transportation emissions are projected utilizing data provided by the Metropolitan Transportation Commission, which incorporate the vehicle miles traveled (VMT) reductions expected from the implementation of [Plan Bay Area 2020](#) and the [Regional Transportation Plan](#) adopted in 2017. Emissions are expected to rise about 2.6% by 2030 and 3.6% by 2040. Because ABAG and MTC have not developed projections for 2050, the rate of population growth forecasted by the California Department of Finance for Marin County was used to project population, household, jobs, and VMT for 2050. The Department of Finance projects that Marin’s population will decrease 3.6% between 2040 and 2050. As a result, emissions would be approximately 71,700 MTCO_{2e} by 2050 under the BAU forecast, a decrease of 0.1% from 2018 levels. The Climate Action Plan establishes targets that meet the State’s goals to reduce emissions to 40% below 1990 levels by 2030 and 80% below 1990 levels by 2050. In Larkspur, that means emissions would need to drop to 47,227 MTCO_{2e} by 2030 and 15,740 MTCO_{2e} by 2050. The Plan lays out measures that will meet the 2030 target and put the City on a trajectory to meet the 2050 goal. The community emissions trend, forecast and targets are shown in Figure 6 below. While State actions will secure to meet a significant portion of reductions, continued reductions through community efforts are needed to meet these goals.

FIGURE 6: EMISSIONS TREND, FORECAST AND TARGETS

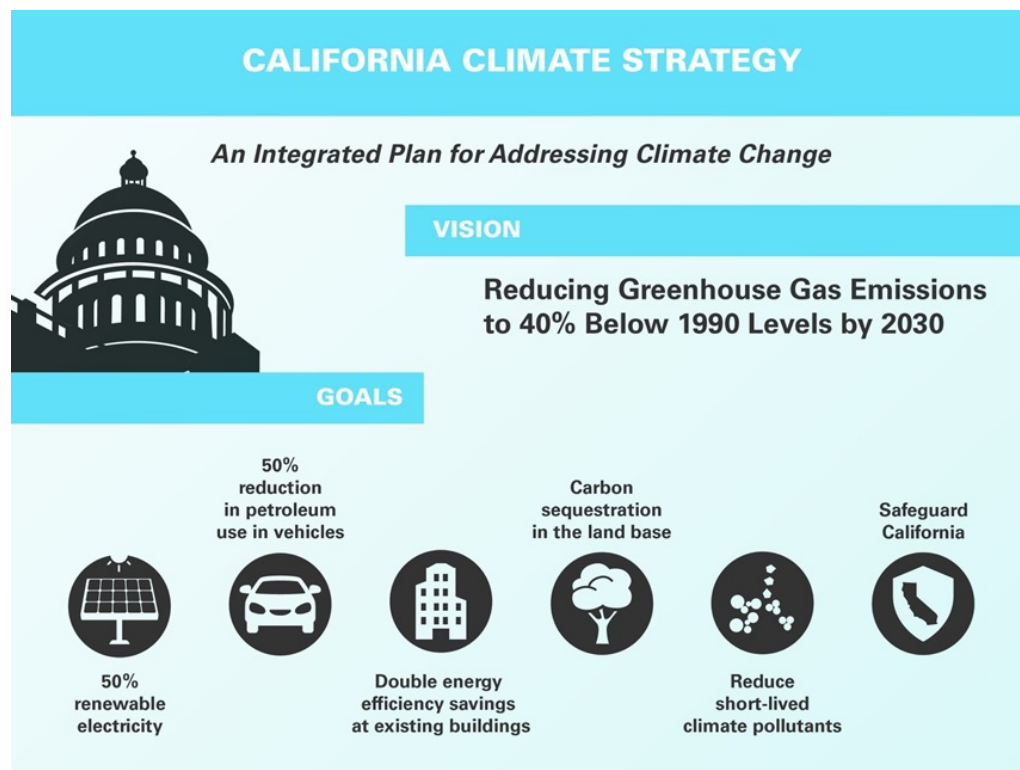


State Pillars & DRAWDOWN: Marin

Larkspur does not exist in a vacuum, and we are leveraging or trying to combat regional, state-wide, national, and even international actions and trends, we also have the ability and responsibility to collaborate with other efforts and campaigns. Larkspur is already working collaboratively with other local agencies (through MCEP) and building upon best practices learned from other similar communities in the region.

To meet greenhouse gas reduction and climate change goals, the State of California established the [Six Pillars](#) framework in 2015 when Governor Jerry Brown was inaugurated for his second term as governor. These include (1) reducing today's petroleum use in cars and trucks by up to 50%; (2) increasing from one-third to 50% our electricity derived from renewable sources; (3) doubling the energy efficiency savings achieved at existing buildings and making heating fuels cleaner; (4) reducing the release of methane, black carbon, and other short-lived climate pollutants; (5) managing farm and rangelands, forests and wetlands so they can store carbon; and (6) periodically updating the state's climate adaptation strategy. The measures contained in this Climate Change Action Plan are designed to support and implement the Six Pillars and the goals of [California's 2017 Climate Change Scoping Plan](#) on a local level.

FIGURE 7: CALIFORNIA'S 6 PILLARS CLIMATE STRATEGY



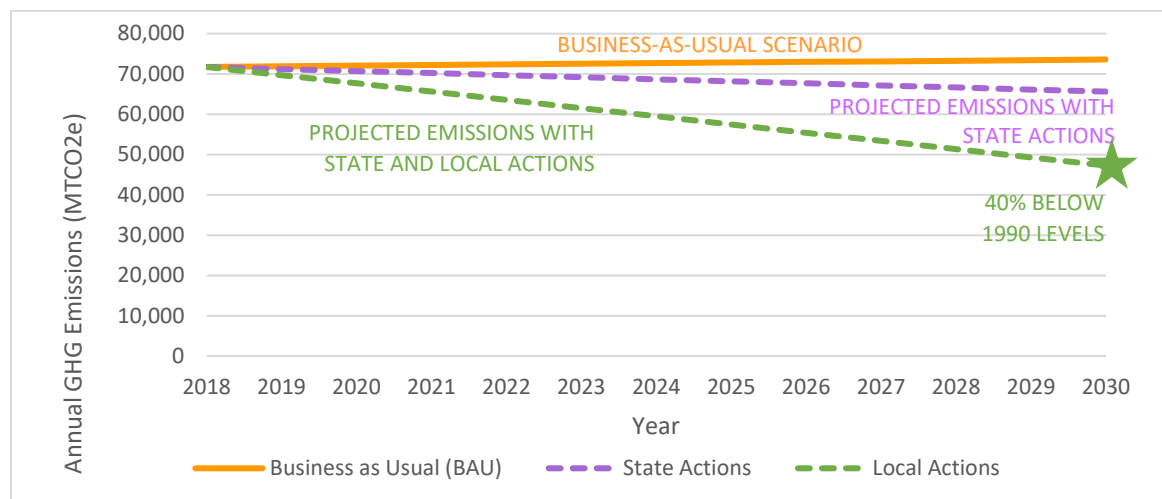
In October 2017, the Marin County Board of Supervisors adopted [Resolution 2017-04](#) – “Supporting Actions to Dramatically Reduce Carbon Emission and Achieve a Climate Resilient Future.” The resolution committed the Board to working with County staff and community leaders to develop and implement policies that will dramatically reduce greenhouse gas emissions and prepare the County for climate change impacts. These policies and the overarching effort were branded Drawdown: Marin (www.drawdownmarin.org). Drawdown: Marin is a comprehensive, science-based, community-wide campaign. Like the State’s Six Pillars, there are six areas of focus: (1) 100% Renewable Energy, (2) Low-Carbon Transportation, (3) Energy Efficiency in Buildings and Infrastructure, (4) Local Food and Food Waste, (5) Carbon Sequestration, and (6) Climate Resilient Communities. Drawdown: Marin is currently developing and prioritizing solutions that will be endorsed by the collaborative and recommended for funding and implementation.

Actions to Reduce Greenhouse Gas Emissions

The Climate Action Plan includes a variety of regulatory, incentive-based, and voluntary strategies that are expected to reduce emissions from both existing and new development in Larkspur. Several of the strategies build on existing programs while others provide new opportunities to address climate change. State actions will have a substantial impact on future emissions. Local strategies will supplement these State actions and achieve additional GHG emissions reductions. Successful implementation will rely largely on the combined participation of Larkspur residents, businesses, and community leaders.

The following sections identify the State and local strategies included in the Climate Action Plan to reduce emissions in community and government operations. Emissions reductions are estimated for each strategy; combined, they show that the City could reduce emissions 40% below 1990 levels by 2030, which is enough to meet the State goal for those years. Community emissions are projected to be 47,094 MTCO_{2e} in 2030 with all State and local actions implemented, while the reduction target is 47,227 MTCO_{2e}. As shown in Figure 8, State actions represent about 30% of the reduction expected through implementation of the Climate Action Plan while local actions represent about 70%.

FIGURE 8: CUMULATIVE IMPACT OF REDUCTION STRATEGIES



Summary of State Actions

The Climate Action Plan incorporates State reduction strategies that have been approved, programmed and/or adopted and will reduce local community emissions from 2018 levels. These programs require no local actions. As such, the State actions are first quantified and deducted from projected community emissions so as to provide a better picture of what still needs to be reduced at the local level to get to the overall reduction targets. State actions and emissions reductions are shown in Table 3 and detailed in the appendix.

TABLE 3: EMISSIONS REDUCTIONS FROM STATE ACTIONS

State Action	Emissions Reductions by 2030 (MTO ₂ e)
Light and Heavy-Duty Vehicle Regulations	6,565
Renewable Portfolio Standard	740
Title 24 Energy Efficiency Standards	431
Total	7,736

Note: Numbers may not total due to rounding.

Summary of Local Strategies

The local mitigation measures presented in the following sections, and as summarized in Table 4 below, achieve greenhouse gas emissions reductions in the community of approximately and 18,770 MTCO₂e by 2030.

TABLE 4: LOCAL EMISSIONS REDUCTION STRATEGIES

Strategy	GHG Reductions by 2030 (MTCO ₂ e)	Percent of Reductions
Low Carbon Transportation	8,557	46%
Renewable Energy and Electrification	4,352	23%
Energy Efficiency	3,278	17%
Waste Reduction	2,581	14%
Water Conservation	2	<1%
Sequestration and Adaptation	n/a	n/a
Community Engagement	n/a	n/a
Implementation and Monitoring	n/a	n/a
Total	18,770	100%

Note: Percentages may not total 100% due to rounding.

These local strategies will be detailed in the following sections. Together, the projected reductions from State and local actions total 26,506 MTCO₂e by 2030. Community emissions are projected to be 47,094

MTCO_{2e} in 2030 with the full implementation of the CCAP. This is 40% below 1990 levels and meets the reduction target set by the State.

Social Equity

Climate change and equity are interconnected. Often, the communities who have contributed the least to global warming, including low-income communities, communities of color, indigenous peoples, and developing nations, suffer first and most from climate change. The City acknowledges disadvantaged communities have existed and still exist in Marin County and seeks to design and implement solutions with them. This requires internal and external on-going work to normalize, organize, and internalize equity principles and approaches.

One definition of social equity is the “just and fair inclusion into a society in which all can participate, prosper, and reach their full potential.”⁴ Equity is the means to ensure equality for all. An example of how that might work with climate action measures is with energy efficiency. Giving rebates to homeowners to swap out natural gas appliances helps reduce to GHG emissions by switching to low carbon electricity. But if financial incentives are only available to those with means to purchase new appliances it leaves out a section of the community without means. Programs that acknowledge this disparity might offer bigger discounts to low-income households. Additionally, the City acknowledges that appliance upgrades may not be a high priority for all residents. Part of the City’s on-going work is to build and nurture relationships with diverse community groups so that they can share what are their priorities and the City can attempt to integrate those priorities into its climate action efforts.

⁴ PolicyLink, “The Equity Manifesto.”

SECTION 2: MEASURES

Local Measures to Reduce Greenhouse Gas Emissions

Each of the following sections provide a summary table of local measures and associated GHG reductions, followed by a description of the specific actions the City will undertake to implement each measure. The methodologies and implementation targets used to calculate emissions reductions are described in the appendix. Sometimes, there is no direct or reliable way to estimate GHG savings for a particular measure or the savings are embedded in another measure. In this case, the GHG reduction is identified as “not applicable” or “n/a.” For example: Community Engagement is essential for success in many of the measures set forth throughout the Plan but counting savings in this section would then be double-counting savings from other measures such as those in Low Carbon Transportation or Energy Efficiency. People need to know about a program to take advantage of it, but the actual emissions reductions will come from participating in the program itself. Therefore, the savings are counted for that program.



LOW CARBON TRANSPORTATION

45% of potential reductions

Nearly 60% of Larkspur community emissions comes from transportation, and until the recent commercial success of electric vehicles, it has been hard to see how we were going to reduce transportation emissions. Improvements in fuel efficiency have driven emissions down – the passenger vehicle fleet in Marin County is about 16% more fuel-efficient than it was ten years ago – but vehicle miles traveled by passenger vehicle trips starting and/or ending in Larkspur have actually gone up about 11% over the same period. Surveys show that alternative transportation rates have improved over the years, from about 20% to 25% of commuters between 2009 and 2017, thanks in part to improvements in the bicycle and pedestrian network and public information campaigns to get people to carpool, bicycle, walk and take transit. But we will not reduce emissions significantly more at this rate.

All of that is now changing with the viability of zero emission vehicles (ZEVs), especially here in Larkspur where electricity is fairly clean and expected to get cleaner. ZEVs include all-battery as well as plug-in hybrid vehicles. Marin County is a leader in ZEV adoption rates – second only to Santa Clara County – and ZEVs already comprise about 4% of all registered passenger vehicles in Marin. Our plan is to increase that rate to 33% by 2030 by building out the EV charging infrastructure and encouraging ZEV ownership through incentives, public education, and development requirements. This is an aggressive target, but one that complements the State’s goal to put 5 million ZEVs on the road by 2030. Improvements in battery and charging technology, expected cost reductions, and automakers’ commitments to significantly expand ZEV offerings point to an all-electric future. Of course, new cars are typically out of the reach of low-income household budgets, but programs that incentivize used EV car purchases and installation of EV chargers in lower-income neighborhoods can help ensure the benefits of EV ownership are shared by all. That said, we cannot rely on ZEVs alone to meet our transportation reductions; reducing congestion, enhancing opportunities for biking and walking, and incentivizing public transit carry co-benefits and can be enjoyed by all.

Things You Can Do

- #1 Drive an all-electric or plug-in hybrid vehicle.
- #2 Bike, walk or take transit whenever possible.
- #3 Shut your car off when you are sitting idle.
- #4 Walk or bike to school.
- #5 Use electric tools, including leaf blowers and lawn mowers, wherever possible.

The City will take the following actions to reduce emissions from transportation sources.

TABLE 5: LOW CARBON TRANSPORTATION MEASURES TO REDUCE COMMUNITY EMISSIONS

ID	Measure	GHG Reduction by 2030 (MTCO ₂ e)	Share of Reductions
LCT-C1	Zero Emission Vehicles	6,808	80%
LCT-C2	Bicycling and Micromobility	196	2%
LCT-C3	Walking	21	<1%
LCT-C4	Safe Routes to School	68	1%
LCT-C5	Public Transit	183	2%
LCT-C6	SMART Train	549	6%
LCT-C7	Employee Trip Reduction	77	1%
LCT-C8	Parking Requirements	23	<1%
LCT-C9	Traffic System Management and Vehicle Idling	460	5%
LCT-C10	Smart Growth Development	n/a*	n/a
LCT-C11	Electric Landscape Equipment	85	1%
TOTAL		8,469	100%

**Emissions reductions due to smart growth development are embedded in vehicle miles traveled projections utilized in the development of the emissions forecast. To avoid double-counting, they are not included here.*

LCT-C1: Zero Emission Vehicles

Develop a Zero Emission Vehicle Plan that will result in at least 33% of passenger vehicles in Larkspur to be zero emission vehicles (ZEVs), including plug-in electric vehicles (EVs) and hydrogen fuel cell electric vehicles, by 2030. Incorporate the following actions in the plan as feasible:

- a. Where there is paid parking restricted parking, provide free parking for ZEVs at City parking lots and parking spaces and other measures that incentivize use of ZEV.
- b. Provide wayfinding signage to public EV chargers.
- c. Work with MCE, PG&E and other entities to identify multi-family and workplace charging sites appropriate for available incentive programs, such as EV Charge Network.
- d. Participate in a countywide effort by MCE, PG&E, and others to provide rebates for new or used electric vehicles and/or charging stations.
- e. Pursue opportunities to expand the City’s EV charging network through innovative programs, such as installing chargers at existing streetlight locations.
- f. Require new and remodeled commercial and multi-family projects to install a minimum number of electric vehicle chargers for use by employees, customers, and/or residents.
- g. Accommodate new electric vehicle charging stations in existing commercial parking lots.
- h. Require new and remodeled single-family and multi-family projects to install electrical service and conduits for potential electric vehicle use.
- i. Consider requiring new and remodeled gas stations to provide EV fast chargers and hydrogen fueling stations.
- j. Participate in regional efforts and grant programs to encourage widespread availability of EV charging stations.

- k. Target policies to support ZEV adoption, including used vehicles, in low income and disadvantaged communities.
- l. Participate in programs to promote EV adoption, including "Drive an EV" events and other media and outreach campaigns.
- m. Encourage or require, as practicable, ride hailing and delivery service companies to utilize zero emission vehicles.

LCT-C2: Bicycling and Micromobility

- a. Encourage bicycling and micromobility as an alternative to vehicular travel. Promote safe bicycling and micromobility, including e-bikes, electric scooters, and electric skateboards, through outreach channels and partner agencies.
- b. Establish and maintain a system of bicycle facilities that are consistent with the City's Bicycle and Pedestrian Master Plan and Complete Streets policies.
- c. Implement the City's Bicycle and Pedestrian Master Plan's recommendations to support and expand bicycling and micromobility.
- d. Update the Capital Improvement Program to maintain and improve the system of multiuse pathways and bicycling facilities that are consistent with the City's Bicycle and Pedestrian Master Plan and Complete Streets policies.
- e. Support regional efforts to establish a bike and/or scooter share program.

Micromobility

Micromobility refers to forms of transportation, human-powered or electric, that can occupy space alongside bicycles. It includes electric scooters and skateboards, docked and dockless shared bikes, and other forms of small, lightweight devices operating at speeds typically below 20 mph. Micromobility devices do not have an internal combustion engine.

LCT-C3: Walking

Encourage walking as an alternative to vehicular travel through outreach channels and partner agencies. Establish and maintain a system of pedestrian facilities that are consistent with the City's Bicycle and Pedestrian Master Plan and Complete Streets policies to facilitate pedestrian access throughout the City and particularly to and from transportation facilities. Update and implement the Capital Improvement Program as necessary to construct and maintain this pedestrian system.

LCT-C4: Safe Routes to School

Continue to support the Safe Routes to School Program and strive to increase bicycling, walking, carpooling, and taking public transit to school.

- a. Work with school districts, the Transportation Authority of Marin (TAM) and other organizations to promote school and student participation.

- b. Identify issues associated with unsafe bicycle and pedestrian facilities between neighborhoods and schools, apply for Safe Routes to School grants, and execute plans to improve pedestrian and bicycle facilities.

LCT-C5: Public Transit

Support and promote public transit by taking the following actions:

- a. Work with Marin Transit and Golden Gate Transit to maximize ridership by making transit more frequent, accessible, cost-beneficial, and convenient through expansion and/or improvement of transit routes, schedules, and bus shelters.
- b. Work with TAM, employers, and others to provide “first and last mile” programs to maximize utilization of public transit.
- c. Provide safe routes to the ferry landing and other transit facilities that encourage bicycle and pedestrian connections.
- d. Encourage school districts to restore a “Yellow School Bus” program and student use of regular transit to reduce school traffic.
- e. Encourage transit providers, including school buses, to use renewable diesel as a transition fuel and to purchase electric buses whenever replacing existing buses.
- f. Encourage Golden Gate Transit District to provide secure bicycle parking at the Larkspur ferry landing.

LCT-C6: SMART Train

Encourage residents, commuters, and employees to take the SMART train. Work with Sonoma-Marín Area Rail Transit, TAM, and local employers to promote ridership and provide shuttles and first and last mile programs. Provide safe bicycle and pedestrian connections to the SMART station.

LCT-C7: Employee Trip Reduction

Reduce vehicle miles traveled commuting to work through the following actions:

- a. Work with the Transportation Authority of Marin (TAM), the Metropolitan Transportation Commission (MTC), and the Bay Area Air Quality Management District (BAAQMD) to promote transportation demand programs to local employers, including rideshare matching programs, vanpool incentive programs, emergency ride home programs, telecommuting, transit use discounts and subsidies, showers and changing facilities, bicycle racks and lockers, and other incentives to use transportation other than single occupant vehicles.
- b. Update the City's Trip Reduction Ordinance to reflect the most recent BAAQMD regulations.
- c. Work with MTC to identify and notify non-compliant businesses in Larkspur and encourage their participation in providing transportation demand management programs.
- d. Work with TAM on developing a county-wide Transportation Demand Management Program to encourage trip reduction throughout County.

LCT-C8: Parking Requirements

Promote a walkable city by reducing parking requirements where feasible. Apply minimum parking requirements in commercial areas to encourage residential development and community-serving uses in

those areas near neighborhoods and transit. Elsewhere, apply minimum parking requirements based on implementation of robust transportation demand programs and proximity and frequency of transit services. Encourage unbundling of parking costs (e.g., separating the cost of renting a parking space from the cost of renting an apartment).

LCT-C9: Traffic System Management and Vehicle Idling

- a. Implement signal synchronization to minimize wait times at traffic lights and to reduce congestion through increased traffic flow.
- b. Utilize intelligent traffic management systems to improve traffic flow and guide vehicles to available parking.
- c. Encourage drivers and autonomous vehicles to limit vehicle idling through public outreach and engagement campaigns.
- d. Investigate adopting policies for public employees to minimize idling of city vehicles.

LCT-C10: Smart Growth Development

Promote land use and development policies that prioritize infill housing and mixed-use development near commercial services and transit facilities, as opposed to development in peripheral areas that require use of vehicles to access transit and services.

LCT-C11: Electric Landscape Equipment. Encourage the use of electric landscape equipment instead of gasoline-powered equipment through engagement campaigns and local ordinances.

TABLE 6: LOW CARBON TRANSPORTATION MEASURES TO REDUCE GOVERNMENT OPERATIONS EMISSIONS

ID	Measure	GHG Reduction by 2030 (MTCO _{2e})	Share of Reductions
LCT-M1	Zero and Low Emission City Vehicles	17	19%
LCT-M2	Low Carbon Fuels	57	65%
LCT-M3	City Employee Commute	8	9%
LCT-M4	Municipal Small Off-Road Equipment	6	7%
TOTAL		87	100%

LCT-M1: Zero and Low Emission City Vehicles

Purchase or lease zero-emission vehicles for the City fleet whenever feasible, and when not, the most fuel-efficient models available. Promote City adoption and procurement of zero-emission vehicles and electric vehicles charging infrastructure to the public.

LCT-M2: Low Carbon Fuels

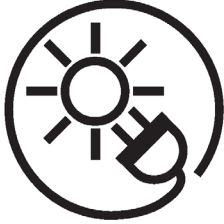
Use low-carbon fuel such as renewable diesel as a transition fuel in the City's fleet and encourage the City's service providers and joint powers agencies to do the same, until vehicles are replaced with zero-emissions vehicles.

LCT-M3: City Employee Commute

Continue to provide City employees with incentives and/or reduce barriers to use alternatives to single occupant auto commuting, such as transit use discounts and subsidies, bicycle facilities, showers and changing facilities, ridesharing services, vanpools, emergency ride home service, flexible schedules, and telecommuting when practicable.

LCT-M4: Municipal Small Off-Road Equipment

Replace portable generators, leaf blowers and other landscape equipment with zero emission equipment.



RENEWABLE ENERGY AND ELECTRIFICATION

23% of potential reductions

Energy that comes from renewable sources, including solar, wind, geothermal, and small hydroelectric, are the cleanest and most-environmentally friendly energy sources. Here in Larkspur, where there is an abundance of sunny days, solar energy is a particularly good energy source. According to [Project Sunroof](#), 86% of Larkspur buildings have roofs that are solar-viable⁵. These 2,800 roofs could generate over 79 million kWh per year, which is more than the total electricity usage in Larkspur in 2017. Solar system costs keep falling, too, which make them an attractive option for home and commercial building owners. Our Climate Change Action Plan projects that we can get about 26% of our electricity from locally produced solar energy systems by 2030, up from about 4% currently, just by maintaining the current growth rate.

When solar is not an option due to a shady roof or a reluctant landlord, residents and business owners can purchase 100% renewable electricity from MCE Clean Energy and PG&E. MCE and PG&E electricity have a high percentage of renewable and GHG-free content, which means it is some of the cleanest electricity in the country. MCE's goal is to provide 100% renewable and GHG-free electricity to all its customers by 2025. Considering that MCE currently carries about two-thirds of the total electricity load in Larkspur, that action alone will significantly reduce emissions.

Since Marin's electricity is very clean, and getting cleaner, swapping out appliances and heating and cooling systems that use natural gas for ones that use electricity is ultimately cleaner than relying on natural gas. If you are constructing a new home or building, consider going all-electric. Battery prices are falling, and will soon be a cost-effective option, too. Eventually, we will need to replace the majority of natural gas appliances and equipment if we are going to hit our long-term goals. Utilities will need to expand grid capacity, develop electricity storage, and ensure system

Things You Can Do

#1 Switch to MCE Deep Green or PG&E Solar Choice 100% renewable electricity option.

#2 Install a solar energy system on your home or business and consider battery storage.

#3 Replace appliances that use natural gas for ones that use electricity.

#4 Investigate heat pump technology so you can swap out heaters and furnaces that use natural gas when it is time to replace them.

⁵ Project Sunroof data explorer (November 2018). Technical potential is based on electricity generation by the rooftop area suitable for solar panels assuming economics and grid integration are not a constraint. Every included panel receives at least 75% of the maximum annual sun in the county. Every included roof has a total potential installation size of at least 2kW. Only areas of the roof with enough space to install four adjacent solar panels are included.

reliability. Fortunately, ongoing research and development of energy storage systems are creating new business opportunities and making an all-electric, 100% renewable future possible. The City will take the following actions to reduce emissions from energy use.

TABLE 7: RENEWABLE ENERGY AND ELECTRIFICATION MEASURES TO REDUCE COMMUNITY EMISSIONS

ID	Measure	GHG Reduction by 2030 (MTCO _{2e})	Share of Reductions
RE-C1	Renewable Energy Generation and Storage	397	9%
RE-C2	GHG-Free Electricity	2,160	50%
RE-C3	Building and Appliance Electrification	1,795	41%
RE-C4	Innovative Technologies	n/a	n/a
TOTAL		4,352	100%

RE-C1: Renewable Energy Generation and Storage

Accelerate installation of residential and commercial solar and energy storage systems.

- a. Provide permit streamlining and reduce or eliminate fees, as feasible.
- b. Update building codes, development codes, design guidelines, and zoning ordinances, as necessary, to further facilitate small, medium, and large-scale installations, where appropriate.
- c. Encourage installation of solar panels over parking areas on commercial projects and large-scale residential developments through ordinance, engagement campaigns, or agency incentives.
- d. Identify and promote financing and loan programs for residential and non-residential projects.
- e. Encourage battery storage in conjunction with renewable energy generation projects through engagement campaigns and partner agency incentives.

RE-C2: GHG-Free Electricity

Encourage residents, landlords, and businesses to switch to 100 percent renewable electricity (MCE Deep Green, MCE Local Sol, and PG&E Solar Choice) through engagement campaigns and partner agency incentives and work with MCE Clean Energy to assure that it reaches its goal to provide electricity that is 100 percent GHG-free by 2022.

RE-C3: Building and Appliance Electrification

Accelerate electrification of building systems and appliances that currently use natural gas, including heating systems, hot water heaters, stoves, and clothes dryers.

- a. Promote available rebate programs such as Electrify Marin.
- b. Consider adopting an ordinance no later than 2024 that requires homeowners to replace natural gas appliances, such as water heaters, stoves, cooktops, clothes dryers, and heating systems with

high-efficiency electric appliances at time of replacement, where feasible, and possibly at time of sale.

- c. Prohibit the use of natural gas end uses in new residential buildings in the City’s green building ordinance no later than the adoption of the 2022 California Building Standards code update. Extend the same prohibition to new nonresidential buildings no later than the 2025 code cycle.

RE-C4: Innovative Technologies

Investigate and pursue innovative technologies such as micro-grids, battery storage, and demand-response programs that will improve the electric grid’s resiliency and help to balance demand and renewable energy production.

TABLE 8: RENEWABLE ENERGY MEASURES TO REDUCE GOVERNMENT OPERATIONS EMISSIONS

ID	Measure	GHG Reduction by 2030 (MTCO ₂ e)	Share of Reductions
RE-M1	Solar Energy Systems	n/a	n/a
RE-M2	Deep Green Electricity	n/a	n/a
TOTAL		n/a	n/a

Note: There are no GHG savings attributed to these measures because the City was purchasing 100% renewable electricity in 2018.

RE-M1: Solar Energy Systems for Municipal Buildings

Install solar energy systems at municipal buildings and facilities where feasible and investigate and pursue innovative technologies such as battery storage and demand response programs.

RE-M2: Municipal Deep Green Electricity

Continue to purchase 100% renewable energy through programs such as MCE Deep Green.



ENERGY EFFICIENCY

18% of potential reductions

Increasing the efficiency of buildings is often the most cost-effective approach for reducing greenhouse gas emissions. Energy efficiency upgrades, such as adding insulation and sealing heating ducts, have demonstrated energy savings of up to 20 percent, while more aggressive “whole house” retrofits can result in even greater energy savings. Many “low-hanging fruit” improvements can be made inexpensively and without remodeling yet can be extremely cost-efficient, such as swapping out incandescent bulbs to LED bulbs, sealing air leaks, and installing a programmable thermostat. Energy Star-certified appliances and office equipment, high-efficiency heating and air conditioning systems, and high-efficiency windows not only save energy but reduce operating costs in the long run. Nonetheless, some upgrades can be expensive, particularly for low-income households, so the City participates in programs that provide rebates, free energy audits, and financing options for residents and businesses.

New construction techniques and building materials, known collectively as “green building,” can significantly reduce the use of resources and energy in homes and commercial buildings. Green construction methods can be integrated into buildings at any stage, from design and construction to renovation and deconstruction. The State of California requires green building energy-efficiency through the Title 24 Building codes. The State updates these codes approximately every three years, with increasing energy efficiency requirements since 2001. The State’s energy efficiency goals are to have all new residential and commercial construction to be zero net energy by 2030. Local governments can accelerate this target by adopting energy efficiency standards for new construction and remodels that exceed existing State mandates, or by providing incentives, technical assistance, and streamlined permit processes to enable quicker adoption.

The City will take the following actions to reduce emissions in the built environment.

Things You Can Do

- #1 Replace indoor and outdoor lights with LED bulbs, and turn them off when not in use.
- #2 Have an energy assessment done for your home or business.
- #3 Upgrade insulation, seal leaks, and install a programmable thermostat.
- #4 Purchase Energy Star appliances and equipment.
- #5 Unplug electronic appliances when not in use and set the thermostat to use less heat and air conditioning.

TABLE 9: ENERGY EFFICIENCY MEASURES TO REDUCE COMMUNITY EMISSIONS

ID	Measure	GHG Reduction by 2030 (MTCO ₂ e)	Share of Reductions
EE-C1	Energy Efficiency Programs	3,183	97%
EE-C2	Energy Audits	61	2%
EE-C3	Cool Pavement and Roofs	32	1%
EE-C4	Green Building Reach Code	n/a	n/a
EE-C5	Streamline Permit Process and Provide Technical Assistance	n/a	n/a
TOTAL		3,275	100%

Note: Emissions reductions from a Green Building Reach Code are included in Measure RE-C3.

EE-C1: Energy Efficiency Programs

Promote and expand participation in residential and commercial energy efficiency programs.

- a. Work with organizations and agencies such as the Marin Energy Watch Partnership, the Bay Area Regional Network, Resilient Neighborhoods, and the Marin Climate & Energy Partnership to promote and implement energy efficiency programs and actions.
- b. Continue and expand participation in energy efficiency programs such as Energy Upgrade California, California Energy Youth Services, and Smart Lights.
- c. Promote utility, state, and federal rebate and incentive programs.
- d. Participate and promote financing and loan programs for residential and non-residential projects such as Property Assessed Clean Energy (PACE) programs, PG&E on-bill repayment, and California Hub for Energy Efficiency Financing (CHEEF) programs.

EE-C2: Energy Audits

Investigate requiring energy audits for residential and commercial buildings prior to completion of sale, including identification of cost savings from energy efficiency measures and potential rebates and financing options.

EE-C3: Cool Pavement and Roofs

Use reflective, high albedo material for roadways, parking lots, sidewalks, and cool roofs to reduce the urban heat island effect and save energy.

- a. Evaluate the use of high albedo pavements when resurfacing City streets or re-roofing City facilities.
- b. Adopt mandatory building code measures to require new development to use high albedo material for driveways, parking lots, walkways, and patios, and cool roofing.

EE-C4: Green Building Reach Code

- a. Continue to adopt green building requirements for new and remodeled commercial and residential projects above the State building code.
- b. Consider adopting low embodied-carbon concrete standards similar to those adopted by the County of Marin.

EE-C5: Streamline Permit Process and Provide Technical Assistance

Analyze current green building permit and inspection process to eliminate barriers and provide technical assistance to ensure successful implementation of green building requirements. Coordinate with other Marin County agencies to adopt consistent application requirements, where practicable. Work county-wide to identify incentives and make it easier for contractors and building counter staff to expedite.

TABLE 10: ENERGY EFFICIENCY MEASURES TO REDUCE GOVERNMENT OPERATIONS EMISSIONS

ID	Measure	GHG Reduction by 2030 (MTCO ₂ e)	Share of Reductions
EE-M1	Streetlights	n/a	n/a
EE-M2	Energy Efficiency Audit and Retrofits	2	64%
EE-M3	Energy Conservation	1	36%
TOTAL		3	100%

Note: There are no GHG savings attributed to measures reducing electricity consumption because the City was purchasing 100% renewable electricity in 2018.

EE-M1: Streetlights

Replace inefficient street, parking lot and other outdoor lighting with LED fixtures. Consider design options for new fixtures that retain the historic character of Downtown Historic District.

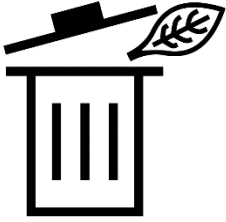
EE-M2: Energy Efficiency Audit and Retrofits

Work with the Marin Energy Management Team to identify and implement energy efficiency projects in municipal buildings and facilities and electrification of existing building systems and equipment that use natural gas.

EE-M3: Energy Conservation

Reduce energy consumption through behavioral and operational changes.

- a. Establish energy efficiency protocols for building custodial and cleaning services and other employees, including efficient use of facilities, such as turning off lights and computers, thermostat use, etc.
- b. Incorporate energy management software, electricity monitors, or other methods to monitor energy use in municipal buildings, where feasible.
- c. Investigate 9/80 work schedule and remote work opportunities for employees to reduce use of City facilities and to shut down City facilities entirely where feasible.



WASTE REDUCTION

14% of potential reductions

The things we buy, consume, and throw away generate a lot of greenhouse gas emissions during manufacturing, transport, distribution, and disposal. The best way to reduce emissions is to purchase and consume less in the first place and attempt to gift or donate items to someone who can reuse whatever you no longer need before considering recycling or disposal.

Due to the way we account for community emissions, our Climate Change Action Plan does not take credit for reducing upstream emissions. Instead, our GHG accounting is directly concerned with emissions that are created from the anaerobic decomposition of organic waste in the landfill. The decomposition process creates methane, which is 28 times more potent as a greenhouse gas than carbon dioxide. Landfills capture most of the methane, and some (like Redwood Landfill) use that methane to create biogas or electricity. However, about one-quarter of it escapes into the atmosphere.

Diverting organic material from the landfill is a clear and viable option for reducing these emissions. Paper and cardboard can be recycled. Food scraps, some paper (like napkins and paper towels), and yard waste can be composted, either at home or at the landfill. Surplus food can be donated to non-profits that distribute it to those in need. The measures below are designed to maximize diversion of organic waste from the landfill by 2030, starting with encouraging residents and businesses to recycle and compost organic waste. To meet our diversion target, the City will consider adopting an ordinance that mandates recycling and, as a last resort, setting trash collection fees that enable the waste haulers to invest in machinery that can sort trash and recover all compostable and recyclable materials before they are sent to the landfill.

These local measures also support state legislation to significantly reduce emissions from organic waste disposal. [Senate Bill \(SB\) 1383](#) establishes targets to achieve a 50% reduction in statewide for waste disposal from the 2014 level by 2020 and a 75% reduction by 2025. The law also establishes a target that not less than 20% of currently disposed edible food is recovered for human consumption by 2025. In 2022, CalRecycle may begin to issue penalties for non-compliance. On January 1, 2024, the regulations may require local jurisdictions to impose penalties for non-compliance on regulated entities subject to their authority.

In addition, [Assembly Bill \(AB\) 1826](#) requires businesses to recycle their organic waste, depending on the amount of waste they generate per week. The law phases in mandatory recycling of commercial

Things You Can Do

- #1 Buy only as much as you need.
- #2 Buy locally grown food and eat less meat.
- #3 Put your food scraps in the green can and/or compost them at home.
- #4 Donate extra food and used clothing and housewares.
- #5 Do not be a “wishful” recycler. Be scrupulous about how you sort your recyclables.

organics over time. As of January 2019, businesses that generate 4 or more cubic yards of commercial solid waste per week are required to arrange for organic waste recycling services. If statewide disposal targets are not met by 2020, the law will be extended to cover businesses that generate 2 cubic yards or more of commercial solid waste.

The City will take the following actions to reduce emissions from waste.

TABLE 11: WASTE REDUCTION MEASURES TO REDUCE COMMUNITY EMISSIONS

ID	Measure	GHG Reduction by 2030 (MTCO ₂ e)	Share of Reductions
WR-C1	Commercial Organic Waste	408	16%
WR-C2	Residential Organic Waste	470	19%
WR-C3	C&D and Self-Haul Waste	18	1%
WR-C4	Mandatory Waste Diversion	554	22%
WR-C5	Waste Processing Infrastructure	1,038	42%
WR-C6	Extended Producer Responsibility	n/a	n/a
WR-C7	Inorganic Waste	n/a	n/a
TOTAL		2,489	100%

WR-C1: Commercial Organic Waste

Work with Zero Waste Marin, Marin Sanitary Service, and non-profits such as Extra Food to divert commercial organic waste from the landfill through recycling, composting, and participation in waste-to-energy and food recovery programs.

- a. Conduct outreach and education to businesses subject to State organic waste recycling mandates (AB 1826 and SB 1383) and encourage or enforce compliance with the law.
- b. Refer new and major remodel commercial and multi-family residential project proposals to the City's waste hauler for review and comment and require projects to provide adequate waste and recycling facilities and access as feasible.
- c. Encourage and facilitate commercial and multi-family property owners to require responsible use of on-site recycling facilities in lease and rental agreements and to train and regularly evaluate janitorial, landscape, and other property management services.
- d. Assess capacity of existing food recovery programs, expand existing food recovery infrastructure if needed, monitor commercial generators for compliance, and conduct education and outreach.

WR-C2: Residential Organic Waste

Work with Zero Waste Marin, Marin Sanitary Service, and other organizations to educate and motivate residents to utilize curbside collection services and home composting for food waste.

WR-C3: Construction & Demolition Debris and Self-Haul Waste

Require all loads of construction & demolition debris and self-haul waste to be processed for recovery of materials as feasible. Investigate creation of an ordinance requiring deconstruction of buildings

proposed for demolition or remodeling when materials of significant historical, cultural, aesthetic, functional or reuse value can be salvaged.

WR-C4: Mandatory Waste Diversion

In compliance with SB 1383, adopt an ordinance requiring mandatory subscription to and participation in waste diversion activities, including recycling and organics collection provided by Marin Sanitary Service. Consider including phased implementation of the ordinance, penalties, and practical enforcement mechanisms.

WR-C5: Waste Processing Infrastructure

- a. Review and revise the City’s franchise agreement with Marin Sanitary Service to ensure waste reduction and diversion targets are met.
- b. Ensure organic waste collection service (including green waste, food waste, fibers, and manure) that complies with SB 1383 regulations is provided to all residents and businesses.
- c. Conduct a feasibility study and consider investing in new solid waste processing infrastructure to remove recoverable materials (recycling and organics) from the waste stream and reduce contamination.
- d. Require regular residential and commercial waste audits and waste characterization studies to identify opportunities for increased diversion and to track progress in meeting targets.

WR-C6: Extended Producer Responsibility.

- a. Encourage the State to regulate the production and packaging of consumer goods and take-back programs.
- b. Encourage on-demand product and food delivery services to reduce packaging waste and investigate requirements and incentives for same through ordinance and/or engagement campaigns.

WR-C7: Inorganic Waste.

- a. Promote reuse, repair, and recycling of inorganic materials, and encourage reduced use of packaging and single use items through engagement campaigns.
- b. Investigate supporting a local building material reuse center.
- c. Consider adopting a Reusable Foodware Ordinance.

TABLE 12: WASTE REDUCTION MEASURES TO REDUCE GOVERNMENT OPERATIONS EMISSIONS

ID	Measure	GHG Reduction by 2030 (MTCO _{2e})	Share of Reductions
WR-M1	Waste from Public Containers and City Operations	93	100%

WR-M1: Waste from Public Containers and City Operations

- a. Embark on an educational and social marketing-based campaign to increase recycling, composting, reuse, and waste reduction within municipal operations at public facilities.
- b. Conduct periodic waste audits of City facilities to understand where opportunities for increased diversion lie and to track progress.



WATER CONSERVATION

<1% of potential reductions

Larkspur is no stranger to periodic droughts and the need to conserve water, and the community has responded by reducing per capita water use by about 25%, from 152 gallons per person per day (gpcd) in 2005 to 114 gpcd in 2016. In addition to installing low-flow fixtures (showerheads, faucets, and toilets) and water-efficient appliances (clothes washers and dishwashers), residents and businesses are planting native, drought-tolerant species and even replacing lawns with attractive, low-water use gardens. Good thing, because as temperatures continue to rise, we will experience more droughts and more intense heat waves than before.

Our Greenhouse Gas Inventory counts emissions that are generated from the energy used to pump, treat, and convey water from the water source to Larkspur water users. Far more emissions are created from the energy that is used to heat water, but those emissions are counted in the residential and commercial sectors. Therefore, the water sector comprises a much smaller share of community emissions than one might expect.

The water agencies that supply Larkspur’s water are committed to using 100% renewable energy in their operations. Marin Municipal Water District (MMWD) began purchasing Deep Green electricity from MCE in 2017, and Sonoma County Water Agency, which provides 20-25% of MMWD’s water, started purchasing 100% renewable electricity in 2015. As a result, emissions from the water sector are nearly zero. However, the overall contribution to community emissions reduction is small.

The City will take the following actions to reduce emissions from water use.

Things You Can Do

- #1 Replace your lawn with a drought-tolerant garden.
- #2 Install a drip irrigation system and check it regularly for leaks.
- #3 Install low water flow faucets, showerheads, and toilets.
- #4 Buy water-efficient dishwashers and clothes washers when it is time to replace them.

TABLE 13: WATER CONSERVATION MEASURES TO REDUCE COMMUNITY EMISSIONS

ID	Measure	GHG Reduction by 2030 (MTCO ₂ e)	Share of Reductions
WC-C1	Community Water Use	2	100%

WC-C1: Community Water Use

Reduce indoor and outdoor water use in residential and commercial buildings and landscaping.

- a. Work with Marin Municipal Water District (MMWD) and other organizations to promote water conservation programs and incentives.
- b. Educate residents and businesses about local and State laws requiring retrofit of non-compliant plumbing fixtures during remodeling and at resale.

- c. Ensure all projects requiring building permits, plan check, or design review use water-efficient landscaping in compliance with State and MMWD regulations.
- d. Encourage the installation of greywater and rainwater collection systems and the use of recycled water where available through ordinance or engagement campaigns.

TABLE 14: WATER CONSERVATION MEASURES TO REDUCE GOVERNMENT OPERATIONS EMISSIONS

ID	Measure	GHG Reduction by 2030 (MTCO ₂ e)	Share of Reductions
WC-M1	Municipal Water Use	<1	100%

WC-M1: Municipal Water Use

Reduce indoor and outdoor water use in municipal facilities and operations.

- a. Replace high water use plants and inefficient irrigation systems with water-efficient landscaping.
- b. Replace inefficient plumbing fixtures with high-efficiency fixtures.
- c. Use recycled water as available and practicable for parks and outdoor landscaping.



SEQUESTRATION AND ADAPTATION

California is already experiencing the effects of climate change. Every year, it seems like the news gets grimmer: more wildfires, more heat waves, longer droughts, more intense storms, less snowpack, and less fresh water. Annual average air temperatures have already increased by about 1.8 °F in California, and that number will likely double even if the world can reduce emissions 80% by 2050. Larkspur needs to be prepared for the likely impacts of climate change, including flooding from more intense storms and sea level rise, health impacts from heat exposure and poor air quality, and safety risks from the increased likelihood of wildfires and landslides.

Sea level rise is a particular concern to Larkspur, where many homes, businesses, and industrial and recreational facilities are at risk for flooding. Sea level has already risen 8” in San Francisco Bay and is expected to rise another 10 inches by 2040. Within this short period, residential development along Corte Madera Creek and canals, including 60 single family homes and six multi-family buildings, could experience tidal flooding.

Storm surges coupled with a 10” sea level rise could flood a greater area – up to 10% of Larkspur’s land area. By the end of the century, sea level is projected to rise 2.4 to 3.4 feet, and possibly as much as 5 feet. At the higher end, more than 800 buildings, or 19% of all Larkspur’s buildings, could face some level of tidal flooding. A comprehensive assessment of Larkspur’s vulnerable assets was completed in 2017. For more information, see the [Marin Shoreline Sea Level Rise Assessment](#). While the Climate Action Plan contains some measures that address adaptation, a more complete set of goals, policies and programs are contained in the Larkspur Local Hazard Mitigation Plan.

In addition to adaptation strategies, this section contains measures to sequester carbon dioxide through planting and preservation of trees and other vegetation and the development of carbon-rich soils. Carbon offsets are often used to fund these types of carbon sequestration projects and can be purchased to offset emissions that are difficult to otherwise mitigate, such as airplane flights. We have not credited emission reductions for these actions because we do not count sequestered carbon in the community greenhouse gas inventory, but we recognize that sequestration is a critical component to meeting our carbon reduction goals.

The City will take the following actions to sequester carbon dioxide and adapt to climate change.

What You Can Do

#1 Plant trees appropriate to your situation.

#2 Add compost to your soil.

#3 Purchase carbon offsets for airplane flights and other emissions that are difficult to mitigate.

#4 Find out if your home or business is vulnerable to sea level rise at [Our Coast Our Future](#).

TABLE 15: SEQUESTRATION AND ADAPTATION MEASURES TO REDUCE COMMUNITY EMISSIONS

ID	Measure
SA-C1	Urban Forest
SA-C2	Carbon Sequestration
SA-C3	Carbon Offsets
SA-C4	Climate Change and Sea Level Rise Adaptation

SA-C1: Urban Forest

Increase carbon sequestration through the expansion and enhancement of green spaces and planting of trees wherever feasible.

- a. Plant additional trees on City-owned land, including public parks, open space, medians, and rights of way, where feasible.
- b. Review parking lot landscape standards to maximize tree cover, size, growth, and sequestration potential.
- c. Continue to regulate and minimize removal of large (heritage) trees and require planting of replacement trees and/or fees to support mitigation planting in Larkspur Parks and open space areas.
- d. Require that the site planning, construction, and maintenance of new development preserve existing healthy trees and native vegetation on site to the maximum extent feasible. Replace trees and vegetation not able to be saved.
- e. Encourage community members to plant trees on private land. Consider creating a tree giveaway event or providing lower-cost trees to the public through a bulk purchasing program.
- f. Encourage the creation of community gardens on public and private lands by community groups.
- g. Provide information to the public, including landscape companies, gardeners, and nurseries, on carbon sequestration rates, drought tolerance, and fire resistance of different tree species.
- h. Collaborate with fire agencies, including Marin Wildfire Protection Authority, and Marin County Open Space District, Marin Municipal Water District, and private property owners, to manage fire-prone trees and invasive species in the open space for forest health and reduction of fuel load.
- i. Continue to require new development, redevelopment, and infrastructure projects to implement best management practices as feasible, including low-impact development techniques, the minimal use of non-pervious surfaces in landscape design, and the integration of natural features into the project design, to naturally filter and biodegrade contaminants and to minimize surface runoff into drainage systems and creeks.
- j. Consider greenification practices while maintaining and expanding accessibility and resilience.

SA-C2: Carbon Sequestration

Increase carbon sequestration in the built environment, developed landscapes, and natural areas.

- a. Where appropriate, encourage the use of building materials that store carbon through agency partnerships and engagement campaigns.

- b. Encourage and support composting to develop healthy, carbon-rich soils.
- c. Manage parks and open spaces to steadily increase carbon in vegetation and soil.
- d. Increase the extent and carbon sequestration potential of bay wetlands, through improvements such as horizontal levees.

SA-C3: Carbon Offsets

Reduce the impact of greenhouse gas emissions through the purchase of carbon offsets.

- a. Encourage community members to purchase carbon offsets to reduce their carbon footprint through engagement campaigns.
- b. Consider partnering with a local non-profit organization to promote an effective carbon offset program.
- c. Focus on offsetting emissions that are difficult to mitigate otherwise, such as airplane travel.

SA-C4: Climate Change and Sea Level Rise Adaptation

Prepare for and adapt to a rising sea level.

- a. Support and integrate Climate Action Planning and implementation with the ongoing adaptation efforts of BayWAVE.
- b. Coordinate and integrate climate adaptation planning consistently throughout related City plans, including but not limited to the General Plan and its Safety Element, Local Hazard Mitigation Plan (LHMP), sea level rise adaptation plans, Community Wildfire Protection Plan, and emergency and capital improvement plans.
- c. Ensure fair and robust inclusion of lower-income households and diverse communities in the planning and response to climate change impacts, including sea level rise, wildfire, public health, and emergency preparedness.
- d. Collaborate with Marin cities and towns, the County of Marin, special districts, and regional bodies such as the Transportation Authority of Marin to coordinate and integrate planning.
- e. Adopt a comprehensive climate change adaptation plan that prepares for and responds to the expected impacts of climate change.



COMMUNITY ENGAGEMENT

The Climate Action Plan contains actions that the City can undertake to reduce its own emissions by about 240 MTCO₂e, bringing the emissions from municipal operations down to 42% below 2005 levels. However, since emissions from governmental operations make up less than 1% of community-wide emissions, that is just a drop in the bucket.

Our residents, businesses, workers, and visitors will have to do their part to ensure we meet our reduction targets. The City can compel some of these actions by adopting ordinances and building regulations, but much of the success of our plan will depend on informing our community members and encouraging them to act on their own. This section details the ways in which the City will seek public engagement and work with local businesses and community groups to achieve the emissions reductions identified for measures in other sections of the Plan.

The City has been promoting [Resilient Neighborhoods](#) since 2009 to educate Larkspur residents on ways they can reduce their carbon footprint. The program organizes Climate Action Teams that meet five times over two months to learn about strategies and resources to improve home energy efficiency, shift to renewable energy, use low-carbon transportation, conserve water, reduce waste, and adapt to a changing climate. To start, participants calculate their household carbon footprint and then take actions to reduce their greenhouse gas emissions by at least 5,000 pounds or 25%. Over 49 Larkspur residents have participated in the program.

Things You Can Do

- #1 Sign up for Resilient Neighborhoods and join a Climate Action Team.
- #2 Commit to reducing your carbon footprint by taking the actions identified in this Plan.
- #3. Spread the word - advocate to your neighbors, employees, co-workers, etc.

The City will take the following actions to engage the community to reduce emissions.

TABLE 16: COMMUNITY ENGAGEMENT MEASURES TO REDUCE COMMUNITY EMISSIONS

ID	Measure
CE-C1	Community Education
CE-C2	Community Engagement
CE-C3	Advocacy
CE-C4	Innovation and Economic Development
CE-C5	Green Businesses

CE-C1: Community Education

Work with community-based outreach organizations, such as Resilient Neighborhoods, to educate and motivate community members on ways to reduce greenhouse gas emissions in their homes, businesses, transportation modes, and other activities.

CE-C2: Community Engagement

Implement a communitywide public outreach and behavior change campaign to engage residents, businesses, and consumers around the impacts of climate change and the ways individuals and organizations can reduce their GHG emissions and create a more sustainable, resilient, and healthier community. Create an overarching theme to articulate a long-term goal, motivate community members, and brand a comprehensive suite of GHG-reduction programs. Prioritize promotion of programs that have the greatest greenhouse gas reduction potential while utilizing the best practices for public outreach and education. Emphasize and encourage citizens' involvement in reaching the community's climate goals, including innovative means of tracking milestones and comparing Larkspur's performance with other communities and with state, national and global benchmarks.

- a. Conduct outreach to a wide variety of neighborhood, business, educational, faith, service, and social organizations.
- b. Inform the public about the benefits of installing energy and water-efficient appliances and fixtures, electrifying their homes and commercial buildings, installing solar energy systems, and purchasing 100% renewable electricity.
- c. Inform the public about the benefits of using carbon-free and low-carbon transportation modes, such as driving electric vehicles, walking, bicycling, taking public transportation, and ridesharing.
- d. Utilize and tailor existing marketing materials when available.
- e. Work with Marin County health and environmental services and other Marin agencies to promote the environmental (and health) benefits of a more plant-based diet, including growing food at home and purchasing locally produced food.
- f. Partner with MCE, PG&E, MMWD, Marin Sanitary Service, Transportation Authority of Marin, Marin Transit, Golden Gate Transit, SMART, and other entities to provide and promote equitable financing, audits, rebates, incentives, and services to the Larkspur community.
- g. Utilize the City's website, newsletters, social media, bill inserts, public service announcements and advertisements, recognition programs, and other forms of public outreach.
- h. Create stories and "shareable content" that can be used by residents, businesses, non-profits, in both the social media and the traditional media context.
- i. Use creative methods to engage the public, such as games, giveaways, prizes, contests, simple surveys, digital tools, and "pop-up" events.
- j. Develop pilot programs using community-based social marketing and other community outreach and incentive programs to encourage positive changes in local consumer habits.
- k. Participate in countywide outreach and education efforts, such as Drawdown: Marin.

CE-C3: Advocacy

Advocate at the regional, state, and federal levels for policies and actions that support the rapid transition to GHG-free energy sources, electrification of buildings and the transportation fleet, and other impactful measures to rapidly reduce greenhouse gas emissions.

CE-C5: Green Businesses

Encourage local businesses to participate in the Marin County Green Business Program through partnerships with the County, Chamber, and other business groups.



IMPLEMENTATION AND MONITORING

Plans are only effective if they are implemented, and results are carefully evaluated. The City will prepare an annual assessment of the progress it is making on implementing the measures contained in this Climate Action Plan and continue to quantify community and greenhouse gas emissions to determine if we are on track to meet our reduction targets.

The City will take the following actions to implement and monitor the Climate Action Plan.

Things You Can Do

#1 Get involved! Attend City Council meetings, Climate Action Plan implementation forums, and other public forums to voice your support for actions contained in this Plan.

TABLE 17: IMPLEMENTATION AND MONITORING MEASURES TO REDUCE COMMUNITY EMISSIONS

ID	Measure
IM-C1	Annual Monitoring
IM-C2	Update GHG Emissions Inventories
IM-C3	Funding Sources
IM-C4	Update the Climate Change Action Plan

IM-C1: Annual Monitoring

Monitor, report, and publicize on the City’s progress annually. Create an annual priorities list for implementation.

IM-C2: Update GHG Emissions Inventories

Update and report the greenhouse gas emissions inventory for community emissions annually and every five years for government operations.

IM-C3: Funding Sources

Identify funding sources for recommended actions, and pursue local, regional, State, and federal grants as appropriate. Investigate creation of a local carbon fund or other permanent source of revenue to implement the Climate Action Plan.

IM-C4: Update the Climate Action Plan

Update the Climate Action Plan regularly to incorporate new long-term reduction targets and strategies to meet those targets.

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Appendix A: Program Calculations

GHG EMISSIONS REDUCTION SUMMARY City of Larkspur		
	Measure	2030 GHG Emissions Reductions (MTCO ₂ e/yr)
Local Actions		
LCT-C1	Zero Emission Vehicles	-6,808
LCT-C2	Bicycling	-175
LCT-C2A	Bicycle Racks & Lockers	-21
LCT-C3	Walking	-21
LCT-C4	Safe Routes to School	-68
LCT-C5	Public Transit	-183
LCT-C6	SMART	-549
LCT-C7	Employee Trip Reduction	-77
LCT-C8	Parking Requirements	-23
LCT-C9	Traffic System Management and Vehicle Idling	-460
LCT-C10	Electric Landscape Equipment	-85
LCT-M1	Low Emission City Vehicles	-17
LCT-M2	Low Carbon Fuels	-57
LCT-M3	City Employee Commute	-8
LCT-M4	Municipal Small Off-Road Equipment	-6
RE-C1	Renewable Energy Generation	-397
RE-C2	GHG-Free Electricity	-2,160
RE-C3	Building and Appliance Electrification	-1,795
RE-M1	Solar Energy Systems for Municipal Buildings	0
EE-C1	Energy Efficiency Programs	-3,183
EE-C2	Energy Audits	-61
EE-C3	Cool Pavement and Roofs	-32
EE-M1	Streetlights	0
EE-M2	Energy Efficiency Audit and Retrofits	-2
EE-M3	Energy Conservation	-1
WR-C1	Commercial Organic Waste	-408
WR-C2	Residential Organic Waste	-470
WR-C3	C&D and Self-Haul Waste	-18
WR-C4	Mandatory Waste Diversion	-554
WR-C5	Waste Processing Infrastructure	-1,038

WR-M1	Public Waste Facilities	-93
WC-C1	Community Water Use	-2
WC-M1	Municipal Water Use	0
TOTAL - LOCAL ACTIONS		-18,770
<i>State Actions</i>		
RPS		-740
TITLE 24		-431
Light and Heavy Duty Fleet Regulations		-6,565
TOTAL - STATE ACTIONS		-7,736
<i>Projected Emissions</i>		
Projected BAU Community GHG Emissions		73,600
Emissions Reduction from Local and State Actions		-26,506
Projected Community Emissions with Local and State Actions Implemented		47,094
2030 GHG Target to Meet State Goals		47,227
<i>Reduction from 2005 Baseline Emissions</i>		
2005 Community GHG Emissions		92,602
Community Emissions with Local and State Actions Implemented		47,094
% Reduction from 2005 Emissions		49%
<i>Reduction from Estimated 1990 Emissions</i>		
Estimated 1990 GHG Level		78,712
% Below 1990 Levels		40%
Emissions per Service Population (population + employees)		2.22
Emissions per Population		3.47

ZERO EMISSION VEHICLES <i>LCT-C1</i>	
Reductions (MTCO ₂ e) -6,808	2030
Targets	33% of passenger vehicles in Marin are ZEVs in 2030 (approximately 66,000 ZEVs). 20% annual growth rate of registered ZEVs in Marin.
Methodology and Assumptions	<p>Marin has approximately 1.5% of all ZEVs in California (DMV, 1-1-19) and 197,609 automobiles registered in the County (DMV, 2019). CARB's proposed strategy is to put 4.2 million ZEVs on the road by 2030, which is approximately 14% of light duty vehicles in California in 2030. In January 2018, Governor Jerry Brown issued Executive Order B-48-18 set a new goal of having a total of 5 million ZEVs in California in 2030. In September 2020, Governor Gavin Newsom issued Executive Order N-79-20 which sets a goal for 100 percent of in-state sales of new passenger cars and light trucks to be zero-emission by 2035.</p> <p>In January 2019, DMV reports there were 4,309 battery EVs, 2,747 plug-in hybrid EVs, and 60 fuel cell vehicles, for a total of 7,116 ZEVs. In January 2020, there were 5,454 battery EVs, 3,081 PHEVs, and 61 fuel cell vehicles, for a total of 8,596 ZEVs, an annual growth rate of 20,8%. We conservatively assume the same percentage of EVs in 2030 as in 2020: 64% battery EVs and 36% plug-in hybrids.</p> <p>In October 2018, DMV reports there were 130 battery EVs and 95 plug-in hybrid EVs registered to Larkspur residents.</p> <p>74% of the distance PHEVs drive is electric (Smart et al, 2014).</p> <p>EV kWh/mile is 0.32 (US Dept of Energy).</p> <p>Assuming the same share of ZEV ownership in 2030 as in 2019 (1.5%) means there would be approximately 75,000 ZEVs registered in Marin by 2030, or approximately 37% of existing automobile registrations. We assume 65,717 ZEVs in Marin in 2030, or 33% of ZEVs registered in Marin. This would require an average annual growth rate of 20%. Electric vehicle sales in California grew by 20% in 2016, followed by 29% growth in 2017 (ICCT, 2018). The number of ZEVs grew 33% in Marin between 2018 and 2019, and 20% between 2019 and 2020. This data suggests that an annual growth rate of 20% is reasonable, especially as the number of models expands and battery technology and charging improves.</p> <p>Passenger VMT is adjusted to reflect the fact that approximately 35% of countywide commute VMT originates from workers who live outside Marin County (TAM). Measure does not apply to VMT generated by Larkspur workers and visitors who do not live in Marin.</p> <p>According to the Department of Energy, towns (population 2,500 to 50,000) need 54 public EV plugs per 1,000 PEVs, which would equal about 3,549 public EV plugs countywide for 65,717 ZEVs. The analysis assumes 88% of EV charging is done at home.</p>

Sources	<p>California Air Resources Board, 2017 Scoping Plan.</p> <p>Smart, J., Bradley, T., and Salisbury, S., "Actual Versus Estimated Utility Factor of a Large Set of Privately Owned Chevrolet Volts," SAE Int. J. Alt. Power. 3(1):2014, doi:10.4271/2014-01-1803.</p> <p>U.S. Department of Energy, Alternative Fuels Data Center, https://www.afdc.energy.gov/vehicles/electric_emissions_sources.html. Sales weighted average of 2016 model year vehicles with sales in 2015: 2015 sales from "U.S. Plug-in Electric Vehicle Sales by Model" (https://www.afdc.energy.gov/data/vehicles.html); MPGs from 2016 Fuel Economy Guide (https://www.fueleconomy.gov/feg/)</p> <p>The International Council on Clean Transportation, "California's continued electric vehicle market development," May 2018, https://www.theicct.org/sites/default/files/publications/CA-cityEV-Briefing-20180507.pdf.</p> <p>US Department of Energy, "National Plug-In Electric Vehicle Infrastructure Analysis," September 2017. https://www.nrel.gov/docs/fy17osti/69031.pdf</p> <p>Bay Area Air Quality Management District, Vehicle Miles Dataportal, http://capvmt.us-west-2.elasticbeanstalk.com/, accessed 3/21/19.</p> <p>California Department of Transportation, "California County-Level Economic Forecast 2018-2050," September 2018.</p> <p>California Department of Motor Vehicles, Estimated Vehicles Registered by County for the Period January 1 through December 31, 2018" and "Fuel Type by County as of 1/1/2019."</p> <p>Personal communication with Derek McGill, Planning Manager, Transportation Authority of Marin, dmcgill@tam.ca.gov, August 22, 2018.</p>
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Calculation

	2030
Number of registered Marin ZEVs in January 2019	7,116
Projected number of registered passenger vehicles in Marin	199,141
Percent of Marin ZEVs in target year	33%
Number of Marin ZEVs in target year	65,717
Increase in ZEVs	58,601
Additional ZEVs as a percent of Marin vehicles	29.4%
Larkspur passenger VMT	100,765,020 miles
VMT from non-Marin workers and visitors	22,140,122 miles
Larkspur passenger VMT from Marin-based vehicles	78,624,898 miles
VMT from additional ZEVs	23,136,676 miles
VMT driven with electricity	20,971,083 miles
Emissions without EV program	8,004 MTCO _{2e}
Tailpipe emissions reduction with EV program	7,254 MTCO _{2e}
Electricity used by ZEVs	6,710,746 kWh
Electricity emissions from ZEVs	447 MTCO _{2e}
Emissions reduction	6,808 MTCO _{2e}

BICYCLING <i>LCT-C2</i>	
Reductions (MTCO ₂ e) -175	2030
Targets	2.32 miles of Class I/II bike facilities constructed between by 2030. Increase commute-by-bicycle mode share from 5% to 10% by 2030.
Methodology and Assumptions	Studies cited by CAPCOA show each additional mile of bike lanes per square mile increases the share of workers commuting by bicycle by 1% (CAPCOA SDT-5). We have applied this to the following population segments: <ul style="list-style-type: none"> • Live in/work in area • Live in/work out of area • Live in area/non-worker • Live out of area/work in area Analysis assumes projects 4, 5, 6, 8 and 10 in the City's Bicycle and Pedestrian Master Plan (Table 6) will be completed by 2030.
Sources	Larkspur Bicycle and Pedestrian Master Plan, 2017. Bay Area Air Quality Management District Vehicle Miles Traveled Dataportal, http://capvmt.us-west-2.elasticbeanstalk.com/data . U.S. Census American Community Survey 5-Year Estimates, Table S0801, 2019. California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010.

Calculation

	2030
VMT generated by targeted population segments	65,930,140 VMT
Additional Class I/II facilities	2.32 miles
New bike facilities/sq. mile	0.8
Reduction in local VMT	506,483 VMT
Emissions reductions	175 MTCO ₂ e

BICYCLE RACKS AND LOCKERS <i>LCT-C2A</i>	
Reductions (MTCO ₂ e) -21	2030
Targets	25 bike racks (6-bike capacity) installed by 2030.
Methodology and Assumptions	BAAQMD Transportation Fund for Clean Air guidance indicates reduction based on the following: <ul style="list-style-type: none"> • Capacity of lockers x 2 trips per day • Capacity of cages x 0.75 trips per day • Capacity of racks x 0.5 trips per day (assumed 6 bicycle capacity each) • 240 days of use • 3 miles per trip
Sources	BAAQMD Transportation Fund for Clean Air Guidance FYE 2018.

Calculation

	2030
Number of racks	30
Number of bike cages	3
Reduction in local VMT	60,480 VMT
Emissions reductions	21 MTCO ₂ e

WALKING <i>LCT-C3</i>	
Reductions (MTCO ₂ e) -21	2030
Targets	2% reduction in VMT for vehicle trips that start and end in Larkspur by 2030
Methodology and Assumptions	Studies cited by CAPCOA show pedestrian network improvements can reduce VMT 1-2% (CAPCOA SDT-1). We apply this to passenger vehicle trips that start and end Larkspur and assume a 2% for 2030.
Sources	California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010. Bay Area Air Quality Management District Vehicle Miles Traveled Data Portal, http://capvmt.us-west-2.elasticbeanstalk.com/data

Calculation

	2030
Passenger vehicle trips starting and ending in Larkspur	3,000,050 VMT
% decrease in VMT due to pedestrian improvements	2.0%
Annual decrease in VMT	60,001 VMT
GHG emissions reductions	21 MTCO ₂ e

SAFE ROUTES TO SCHOOL <i>LCT-C4</i>	
Reductions (MTCO ₂ e) -68	2030
Targets	Reduce school trips in family vehicle by 29%, from an average of 45% to 32%.
Methodology and Assumptions	<p>To demonstrate the benefits of providing Safe Routes to Schools, the Marin County Bicycle Coalition recruited nine pilot schools in four different geographic locations. Initial surveys reported that 62% of the students were arriving by car, with only 14% walking, 7% biking to school, 11% carpool, and 6% arriving by bus. Every school in the pilot program held periodic Walk and Bike to School Days and participated in the Frequent Rider Miles contest, which rewarded children who came to school walking, biking, by carpool or bus. At the end of the pilot program, the participating schools experienced a 57% increase in the number of children walking and biking and a 29% decrease in the number of children arriving alone in a car.</p> <p>We assume an elementary school (K-5) age population of 617 with an average trip length of 1.7 mile, a middle school (6-8) population of 652 with an average trip length of 1.7 miles, a high school (9-12) population of 487 with an average trip length of 2.3 miles, 180 school days, and an existing share of school trips completed in a family vehicle of 53% according to Safe Routes to School surveys taken at participating schools serving the Corte Madera-Larkspur area in Fall 2017.</p>
Sources	<p>US Census Bureau, American Community Survey 5-Year Estimates 2013-2017, Table B14001.</p> <p>Safe Routes to School Marin County, http://www.saferoutestoschools.org/sr2s_larkspur_cortemadera.html</p> <p>Safe Routes to School Marin County, http://www.saferoutestoschools.org/history.html#success</p>

Calculation

	2030
School population miles travelled	1,273,781 miles
Percent of miles driven in a family vehicle	53%
Potential percent decrease in students driving to school	29 %
VMT avoided	195,780 VMT
Emissions reductions	68 MTCO ₂ e

PUBLIC TRANSIT <i>LCT-C5</i>	
GHG Reductions (MTCO _{2e})	-183
Targets	2030 33% of Marin Transit and Golden Gate Transit buses will be electric by 2030 and the remaining use renewable diesel.
Methodology and Assumptions	<p>Marin Transit reports 3,674,440 revenue miles in FY 18/19 and 3.9% of those miles within Larkspur. Golden Gate Transit reports 3,467,056 revenue miles in FY 18/19 and 6.8% of those miles in Larkspur. Marin Transit's Draft Fixed Route Vehicle Replacement Plan indicates 3% of its fleet will be comprised of zero emission buses in 2020 and 33% of its fleet will be zero emission by 2030. In 2019, 72% of its buses were using renewable diesel and 3% of the fixed route buses were zero emission. Marin Transit and Golden Gate Transit have been using renewable diesel since 2016. We assume 100% of VMT will be driven by buses using renewable diesel in 2020 and 33% will be driven by electric buses utilizing MCE electricity by 2030.</p> <p>CARB adopted the Innovative Clean Transit (ICT) Rule in December 2018. This rule outlines a transition of California transit agencies to a zero emission fleet by 2040. 100% of transit agencies' bus purchases must be zero emission beginning in 2029. Marin Transit's Draft Fixed Route Vehicle Replacement Plan (2019) identifies purchases that will achieve the ICT zero emission fleet mandate in 2040. As of October 2019, Golden Gate Transit had not yet developed a transition plan.</p>
Sources	<p>Marin Transit Board of Directors Staff Report, April 1, 2019</p> <p>Personal communication with Keith Nunn, Director of Maintenance, Golden Gate Transit, Oct. 22, 2019.</p> <p>Personal communication with Anna Penoyar, Senior Capital Analyst, Marin Transit, Oct. 22, 2019.</p>

Calculation

	2030
Larkspur's share of passenger revenue miles	380,684 miles
Emissions, BAU	432 MTCO _{2e}
Renewable diesel VMT	67%
Electric bus VMT	33%
Emissions	249 MTCO _{2e}
GHG emissions reductions	183 MTCO _{2e}

SMART LCT-C6	
GHG Reductions (MTCO ₂ e) -549	2030
Targets	384 boardings and alightings at the Larkspur SMART station.
Methodology and Assumptions	<p>SMART is currently constructing approximately 2 miles of passenger rail service from the Downtown San Rafael Station to a new Larkspur Station, which will provide a major regional connection to the Golden Gate Ferry. (SMART EIR, 2019). We estimate 0.4 miles of the railway will be located in Larkspur.</p> <p>SMART trains use diesel multiple units (DMUs), which are rail cars that contain their own propulsion units, with each car served by a diesel engine below the passenger compartment. SMART reports that the DMU's fuel efficiency is 3 miles per gallon of diesel. We assume 440 weekly rail cars based on the 2019 schedule (2 cars per train and 22 weekday trips per day; 3 cars per train and 12 weekday trips per day; and 2 cars per train and 10 weekend trips per day). SMART had 342,300 transit passenger trips for the first half of 2019. Each train car has capacity for approximately 150 riders, indicating a total capacity of 1,716,000 riders for the first half of 2019 (150 x 440 x 26) and a ridership rate of approximately 19.9%.</p> <p>The 2005 Travel Demand Forecasting Report forecasted 192 boardings and 192 alightings per day at the Larkspur station in 2025. If all transit trips avoided a passenger vehicle trip, there would be 140,160 avoided passenger vehicle trips per year. SMART reports that the average passenger trip is 24 miles. Similar to the way we allocate VMT for trips that either start or end in Larkspur, we allocate one half of the avoided trip length to Larkspur.</p>
Sources	<p>SMART Downtown San Rafael to Larkspur Extension EIR, December 2019 https://sonomamarintrain.org/sites/default/files/Document%20Library/SMART_EA_Dec19_508c_0.pdf</p> <p>SMART DMU MPG from Ken Hendricks, SMART Procurement Coordinator, khendricks@sonomamarintrain.org</p> <p>SMART Green Commute Fact Sheet, http://sonomamarintrain.org/sites/default/files/Document%20Library/Green-Commute-Fact-Sheet-with-video.pdf</p> <p>American Public Transportation Association, Commuter Rail Transit Ridership Report, Second Quarter 2019, https://www.apta.com/wp-content/uploads/2019-Q2-Ridership-APTA.pdf</p> <p>Travel Demand Forecasting Report prepared for Sonoma-Marin Area Rail Transit District, Parsons Brinckerhoff, Appendix I, September 2005 https://srcity.org/DocumentCenter/View/3668/Sonoma-Marin-Rail-Transit-Appendix-I---Travel-Forecasting-Report--PDF</p>

Calculation

	2030
Rail miles within Larkspur's boundary	0.4 miles
Number of rail cars in operation each week	460
Average MPG (diesel)	3.00 MPG
Emissions	33 MTCO ₂ e
Annual Larkspur SMART train boardings and alightings	140,160
Average VMT avoided per person trip	12.0
Annual VMT avoided	1,681,920 miles
Avoided VMT emissions	582 MTCO ₂ e
GHG emissions reductions	549 MTCO ₂ e

EMPLOYEE TRIP REDUCTION <i>LCT-C7</i>	
Reductions (MTCO ₂ e) -77	2030
Targets	100% of covered employers provide an employee trip reduction program.
Methodology and Assumptions	<p>CAPCOA TRT-1 indicates VMT reduction of 5.4% for suburban center location. Employer programs include: carpooling, ride matching, preferential carpool parking, flexible work schedules for carpools, a half-time transportation coordinator, vanpool assistance, bicycle parking, showers, and locker facilities. This measure assumes voluntary employee participation.</p> <p>BAAQMD Transportation Fund for Clean Air guidance indicates a reduction of 0.2% of commute VMT for Guaranteed Ride Home Programs.</p> <p>MTC identifies 42 businesses with 50 or more employees in Larkspur with a total of 1,498 employees. We assume 75% of these employers participate in the program by 2020 and all participate by 2030. We assume 240 work days per year.</p>
Sources	<p>California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures,"</p> <p>BAAQMD Transportation Fund for Clean Air Guidance FYE 2018.</p> <p>Personal communication with Corey Dodge, Program Coordinator, Bay Area Metro, cdodge@bayareametro.gov, 10/2/19.</p>

Calculation

	2030
Number of employees working in companies with 50 or more employees	1,498
Number of employees targeted for program	1,498
Average daily VMT for Larkspur worker	11.1
Estimated annual VMT	3,999,481
VMT reduction	5.6%
Annual decrease in VMT	223,971
GHG emissions reductions	77

PARKING REQUIREMENTS <i>LCT-C8</i>	
Reductions (MTCO ₂ e) -23	2030
Targets	50 parking spaces eliminated/avoided by 2030.
Methodology and Assumptions	CAPCOA Measure PDT-1 indicates a VMT reduction range of 2.5% to 12.5%, depending upon the reduction in parking requirement, with 2.5% for a 5% reduction in parking spaces and 12.5% for a 25% reduction in spaces. We assume a 12.5% reduction in VMT for a 30% reduction in parking spaces. 7.5 miles of daily per capita VMT is allocated to Larkspur's community emissions in 2030. Consistent with the GHG inventory methodology, we apply a PeMS factor of 353.9 to determine annual VMT.
Sources	California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010. Bay Area Air Quality Management District, Vehicle Miles Traveled Dataportal, http://capvmt.us-west-2.elasticbeanstalk.com/data , accessed 3/21/19.

Calculation

	2030
Annual VMT per resident, as attributed in GHG Inventory	2,647 VMT
Number of parking spaces subject to program	200 spaces
Number of parking spaces reduced through program	60 spaces
VMT generated by project	529,468 VMT
VMT reduced by program	66,184 VMT
Total emissions reductions	23 MTCO ₂ e

TRAFFIC SYSTEM MANAGEMENT AND VEHICLE IDLING
LCT-C9

Reductions (MTCO _{2e}) -460	2030
Methodology and Assumptions	<p>Larkspur completed a signal synchronization project on Sir Francis Drake Boulevard from Larkspur Landing to Elm Avenue in Kentfield in 2019 that is estimated to reduce fuel consumption by 114,986 gallons in the first year. Larkspur and the County are installing infrastructure to make the system adaptive. We assume continued adjustments in synchronization will retain original fuel savings through 2030.</p> <p>TAM's Origin-Destination Data Collection Report documents that 45% of vehicle trips on Sir Francis Drake Boulevard east and west of Hwy 101 start and/or end in Larkspur. We apply this percentage to the total fuel consumption savings identified in the PASS project.</p>
Sources	<p>DKS, "Final - Deliverable 4B Final Project Report: Metropolitan Transportation Commission Program for Arterial System Synchronization (PASS) FY 18/19," prepared for Marin County, City of Larkspur, and Caltrans</p> <p>Fehr & Peers for Transportation of Marin, "TAM Origin-Destination Data Collection Draft Report," March 14, 2017</p>

Calculation

	2030
Gasoline fuel savings	114,986 gallons
% of trips starting and/or ending in Larkspur	45%
Total emissions reductions	460 MTCO _{2e}

ELECTRIC LANDSCAPE EQUIPMENT <i>LCT-C10</i>	
Reductions (MTCO ₂ e) -85	2030
Targets	50% of landscape equipment is electric by 2020.
Methodology and Assumptions	CARB is currently considering regulating small off-road engines (SORE) that will reduce smog-pollutant emissions from mobile sources by 80% in 2031 through a combination of regulatory and incentive approaches. SORE are spark-ignition engines rated at or below 19 kilowatts. Engines in this category are primarily used for lawn, garden, and other outdoor power equipment. CARB's goal is to require all new sales to be zero emissions equipment by 2028. For this action, portable landscape equipment includes lawn mowers, leaf blowers/vacuums, trimmers/edgers/brush cutters. This equipment consumed 332,153 gallons of gasoline in 2018 (OFFROAD2007). Similar to the off-road emissions inventory, we assume 5.8% of emissions are attributable to the Larkspur based on its share of countywide households in 2018. We assume a 50% reduction in 2030 due to the City's action to encourage the use of electric portable landscape equipment.
Sources	OFFROAD2007

Calculation

	2030
Portable landscape equipment gasoline consumption, BAU	19,111 gallons
Emissions from portable landscape equipment, BAU	169 MTCO ₂ e
Reduction target	50%
Emissions reductions	85 MTCO ₂ e

ZERO AND LOW EMISSION CITY VEHICLES <i>LCT-M1</i>	
Reductions (MTCO ₂ e) -17	2030
Targets	50% improvement in fuel efficiency of City vehicles that use gasoline by 2030.
Methodology and Assumptions	As vehicles are replaced, there will be opportunities to purchase/lease electric vehicles or improve vehicle fuel efficiency with similar models. For City electric vehicles, we assume EVs are replacing vehicles with an average 22 MPG, and .32 kWh/mile and that the City continues to purchase 100% GHG-free electricity for municipal operations.
Sources	City of Larkspur 2015 Greenhouse Gas Inventory for Government Operations

Calculation

	2030
City vehicle fleet tailpipe emissions, 2016 (gasoline)	34 MTCO ₂ e
Fuel efficiency improvement for fleet	50 %
Electricity for EVs	13,249 kWh
Electricity emissions	0 MTCO ₂ e
Emissions reductions	17 MTCO ₂ e

LOW CARBON FUELS <i>LCT-M2</i>	
Reductions (MTCO ₂ e) -57	2030
Targets	100% of diesel use is replaced with renewable diesel by 2030.
Methodology and Assumptions	Emission factor for renewable diesel derived from data from Nexgen Fuel.
Sources	City of Larkspur 2015 Greenhouse Gas Emissions Inventory for Government Operations http://www.nexgenfuel.com/fleets-commercial-use/

Calculation

	2030
Diesel use, BAU	9,282 gallons
Renewable diesel percentage	100%
Emissions from diesel fuel	96 MTCO ₂ e
Emissions from renewable diesel fuel	39 MTCO ₂ e
Emissions reductions	57 MTCO ₂ e

CITY EMPLOYEE COMMUTE <i>LCT-M3</i>	
Reductions (MTCO _{2e}) -8	2030
Targets	5.6% reduction in employee commute VMT by 2030.
Methodology and Assumptions	CAPCOA Measure TRT-1. VMT reduction is 5.4% for a suburban center location. BAAQMD Transportation Fund for Clean Air guidance indicates a reduction of 0.2% of commute VMT for Guaranteed Ride Home Programs.
Sources	California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010. BAAQMD Transportation Fund for Clean Air Guidance FYE 2018.

Calculation

	2030
Employee commute VMT, BAU	408,063 VMT
Reduction in VMT	5.6%
VMT avoided	22,852 VMT
Emissions reduction	8 MTCO _{2e}

MUNICIPAL ELECTRIC LANDSCAPE EQUIPMENT	
<i>LCT-M4</i>	
Reductions (MTCO ₂ e) -6	2030
Methodology and Assumptions	CARB is currently considering regulating small off-road engines (SORE) that will reduce smog-pollutant emissions from mobile sources by 80% in 2031 through a combination of regulatory and incentive approaches. SORE are spark-ignition engines rated at or below 25 horsepower or 19 kilowatts. Engines in this category are primarily used for lawn, garden, and other outdoor power equipment including generators, power washers, and utility carts. Construction and agricultural equipment are regulated by the federal government and not subject to CARB regulation. CARB's goal is to require all new sales of regulated equipment to be zero emissions equipment by 2028.
Sources	CARB Small Engine Fact Sheet, https://ww3.arb.ca.gov/msprog/offroad/sore/sm_en_fs.pdf?_ga=2.15457782.1959742507.1598026042-1995196326.1515467224 CARB List to Determine Preempt Off-Road Applications, https://ww3.arb.ca.gov/msprog/offroad/preempt.htm City of Larkspur, Department of Public Works

Calculation

	2030
Fuel used for small off-road engines	589 gallons
Emissions reductions	6 MTCO ₂ e

RENEWABLE ENERGY GENERATION AND STORAGE

RE-C1

Reductions (MTCO ₂ e)	-397	2030
Targets	Solar energy installations continue to grow by an average of 4,748 KW DC each year through 2030.	
Methodology and Assumptions	<p>According to Project Sunroof, 86% of Larkspur buildings have roofs that are solar-viable. These 2,800 roofs have the capacity for 56.4 MW DC and could generate 79,400,000 kWh per year, which is more than the 68,600,000 kWh consumed in Larkspur in 2017. Project Sunroof estimates there are 264 existing solar installations in Larkspur.</p> <p>By 2018, approximately 2,202 KW of solar capacity had been installed in Larkspur and 357 KW had been installed in 2019.</p> <p>The analysis assumes new distributed solar capacity will be added at annual rate of rate of 263 KW DC each year (2016-2019 average).</p>	
Sources	<p>Project Sunroof, https://www.google.com/get/sunroof/data-explorer/place/ChIJRf47R3CahYARV2ndbPAFwMk/, accessed October 4, 2019.</p> <p>California Distributed Generation Statistics, "NEM Currently Interconnected Data Set," https://www.californiadgstats.ca.gov/downloads/, April 2020.</p>	

Calculation

	2030
Solar capacity added 2019 within City limits	357 KW DC
Additional solar through 2030	3,251 KW DC
kWh generated by 1 KW solar energy system	1,450 kWh
Additional electricity produced by distributed PV	4,713,279 kWh
GHG emissions reductions	397 MTCO ₂ e

GHG-FREE ELECTRICITY <i>RE-C2</i>	
Reductions (MTCO ₂ e) -2,160	2030
Targets	MCE electricity is 100% GHG-free by 2030.
Methodology and Assumptions	The MCE 2019 Resource Integration Plan states that MCE electricity is projected to be 100% GHG-free by 2022. MCE supplied 63.9% of the total electricity load in Larkspur in 2018. The analysis assumes same percentage of Deep Green electricity as in 2018.
Sources	MCE 2019 Integrated Resource Plan (November 2018). https://www.mcecleanenergy.org/wp-content/uploads/2019/01/MCE-2019-Integrated-Resource-Plan_11-8-2018_V_12-21-18.pdf Personal communication, Justin Kudo, MCE Manager of Account Services, jkudo@marinenergyauthority.org , July 14 and 15, 2016.

Calculation

	2030
Electricity use, BAU, inc. grid loss	72,386,241 kWh
Electricity saved through State actions, inc. grid loss	819,822 kWh
Less electricity saved through local energy efficiency and renewable energy actions, inc. grid loss	8,936,424 kWh
Net electricity use	62,629,995 kWh
Projected MCE electricity use (63.9% of total)	40,000,195 kWh
Electricity emissions w/MCE BAU	2,160 MTCO ₂ e
Electricity emissions w/MCE	0 MTCO ₂ e
GHG emission reductions	2,160 MTCO ₂ e

BUILDING AND APPLIANCE ELECTRIFICATION

RE-C3.a

Reductions (MTCO ₂ e) -38	2030
Targets	9 cooktops, 14 water heaters and 28 heating systems are replaced with electric versions by 2030 through a Building Decarbonization incentive program.
Methodology and Assumptions	Potential number of appliance replacements is based on a Marin County grant application for a Building Decarbonization Pilot Program, which proposes to provide cash rebates for natural gas appliance swap-outs. The pilot program application estimates the following number of replacements during the pilot program period: stoves and cooktops, 20; water heaters, 30; and furnaces and heating systems, 60. We assume 4.8% of the replacements will take place in Larkspur homes based on Larkspur's share of countywide households in 2017. We assume the program can grow at an annual rate of 25% with continued rebates and program implementation.
Sources	2009 California Residential Appliance Saturation Study, Volume 2, Page 23. http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-V2.PDF County of Marin, Marin County Building Decarbonization Pilot Program for BAAQMD Climate Protection Grant Application, May 8, 2018.

Calculation

	2030
Estimated annual natural gas use for stoves and cooktops	31 therms
Estimated annual natural gas use for water heaters	188 therms
Estimated annual natural gas use for space heating and	213 therms
Estimated annual electricity use for stoves and cooktops	71 kWh
Estimated annual electricity use for water heaters	1,382 kWh
Estimated annual electricity use for space heating and cooling	3,096 kWh
% share of county-wide replacements	4.8%
Number of units stoves and cooktops replaced	9 units
Number of units water heaters replaced	13 units
Number of furnaces and heating systems replaced	27 units
Natural gas savings	8,474 therms
Electricity consumption	102,197 kWh
GHG emissions reduction	38 MTCO ₂ e

BUILDING AND APPLIANCE ELECTRIFICATION

RE-C3.b

Targets	24% of residential water heaters, 19% of residential cooktops, and 12% of residential dryers are replaced with high efficiency electric appliances.
Reductions (MTCO ₂ e) -1,443.4	2030
Methodology and Assumptions	We assume the ordinance applies to water heaters, stoves, cooktops, and clothes dryers in January 2025. We assume the high end of average life expectancies for these appliances. We further assume one-third of potential water heater replacements will be deemed infeasible due to interior location of the water heater.
Sources	2009 California Residential Appliance Saturation Study, Volume 2, Table 2-8 (PG&E for dryer), Table 2-24 (PG&E for dryer), and Table 2-26 (Forecast Zone 5 for water heater and range). http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-V2.PDF California Department of Finance, E-5 Population and Housing Estimates for 2010-2020 with 2010 Census Benchmark

Calculation

	2030
Number of housing units in Larkspur in 2020	6,484 units
Estimated annual natural gas use for stove or cooktop	28 therms
Estimated annual electricity use for induction stove or cooktop	71 kWh
% stoves and cooktops replaced	19%
Estimated annual natural gas use for water heater	163 therms
Estimated annual electricity use for heat pump water heater	1,382 kWh
% water heaters replaced	24%
Estimated natural gas use for clothes dryer	22 therms
Estimated electricity use for clothes dryer	648 kWh
% clothes dryers replaced	12%
Natural gas use eliminated	307,524 therms
Additional electricity use	2,887,780 kWh
GHG emissions reductions	1,443.4 MTCO ₂ e

BUILDING AND APPLIANCE ELECTRIFICATION

RE-C3.c

Action	Prohibit the use of natural gas end uses in new residential buildings in the City's green building ordinance that aligns with the 2022 California Building Standards code update. Extend the same prohibition to new nonresidential buildings in the 2025 code cycle.
Reductions (MTCO ₂ e) -313.7	2030
Methodology and Assumptions	<p>We assume adoption of an ordinance in that bans natural gas use in new residential buildings beginning in 2023 and new non-residential buildings in 2026.</p> <p>Replacing residential space heating systems in Climate Forecast Zone 5 that use natural gas with systems that use heat pumps and electricity reduces emissions by an average of approximately 89% (derived from CRASS, Tables 2-9 and 2-26). We assume the same emissions reduction for electrifying non-residential space heating systems.</p> <p>An estimated 88% of new homes use natural gas for ranges and ovens and 58% use natural gas for dryers (CRASS, Table 2-22). We assume the ordinance reduces these numbers 100%.</p> <p>We assume all new homes use natural gas for primary space heating and water heating (CRASS, Table 2-25). We assume the ordinance reduces these numbers by 100%. Electricity used to power these systems is regulated under Title 24, which requires solar energy to supply energy requirements.</p> <p>We assume a total of 175 new housing units between 2023 and 2030.</p>
Sources	<p>2009 California Residential Appliance Saturation Study, Volume 2, Table 2-8 (PG&E for dryer and heat pump), Table 2-24 (PG&E for dryer), and Table 2-26 (Forecast Zone 5 for water heater and range). http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-V2.PDF</p> <p>California Energy Commission, California Commercial End-Use Survey (March 2006), https://ww2.energy.ca.gov/2006publications/CEC-400-2006-005/CEC-400-2006-005.PDF</p> <p>California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010.</p>

Calculation

Residential	2030
New housing units, 2023-2030	175 units
Estimated natural gas use for space heating, per housing unit	306 therms
Estimated natural gas use for water heating, per housing unit	163 therms
Natural gas reduced beyond Title 24 requirements for heating systems	41,038 therms
Estimated annual natural gas use for cooktop and range	28 therms
Estimated natural gas use for clothes dryer	22 therms
Total natural gas reduced for appliances	6,545 therms
Estimated electricity use for cooktop and range	71 kWh
Estimated electricity use for clothes dryer	648 kWh
Total electricity used for electrified appliances	76,706 kWh
GHG emissions reductions	258.2 MTCO ₂ e

Commercial	2030
Natural gas reduced beyond Title 24 requirements	10,431 therms
GHG emissions reductions	55.5 MTCO ₂ e

SOLAR ENERGY SYSTEMS FOR MUNICIPAL BUILDINGS	
<i>RE-M1</i>	
Reductions (MTCO ₂ e) 0	2030
Targets	Install solar PV systems on municipal buildings by 2030.
Methodology and Assumptions	<p>Install solar PV systems on municipal buildings as follows:</p> <p>City Hall, 26 kW DC Fire Station #1, 11 kW DC Fire Station #2, 22 kW DC</p> <p>There are no GHG savings attributed to this measure because the City was purchasing 100% renewable electricity in 2018.</p>
Sources	City of Larkspur Climate Action Plan, April 2010.

Calculation

Projected electricity generated by PV systems	82,466 kWh
GHG emissions reduction	0.0 MTCO ₂ e

ENERGY EFFICIENCY PROGRAMS	
<i>EE-C1</i>	
Reductions (MTCO ₂ e) -3,183	2030
Targets	Electricity and natural gas consumption is reduced an average of 1% per year between 2018 and 2030.
Methodology and Assumptions	<p>We are forecasting an annual electricity savings of 1% and an annual natural gas savings of 1% based on the following:</p> <p>The National Action Plan for Energy Efficiency states among its key findings "consistently funded, well-designed programs are cutting annual savings for a given program year of 0.15 to 1 percent of energy sales."</p> <p>The American Council for an Energy-Efficiency Economy (ACEE) reports for states already operating substantial energy efficiency programs, energy efficiency goals of one percent, as a percentage of energy sales, is a reasonable level to target.</p> <p>MCE Clean Energy's Implementation Plan states "MCE's goal is to increase annual savings through energy efficiency programs to two percent (combined MCE and PG&E programs) of annualized electric sales...by the end of 2018."</p> <p>Electricity consumption declined an average of 1.3% per year in Tiburon between 2005 and 2016. Natural gas consumption declined an average of 1.0% per year between 2005 and 2016.</p>
Sources	<p>Marin Clean Energy Revised Community Choice Aggregation Implementation Plan and Statement of Intent, July 18, 2014.</p> <p>National Action Plan for Energy Efficiency, July 2006, Section 6: Energy Efficiency Program Best Practices (pages 5-6).</p> <p>Energy Efficiency Resource Standards: Experience and Recommendations, Steve Nadel, March 2006 ACEEE Report E063 (pages 28-30).</p>

Calculation

	2030
Residential and commercial electricity use, 2018	69,776,188 kWh
Electricity savings	8,373,143 kWh
Residential and commercial natural gas use, 2018	3,882,944 therms
Natural gas savings	465,953 therms
GHG emissions reductions	3,183 MTCO ₂ e

ENERGY AUDITS <i>EE-C2</i>	
Reductions (MTCO ₂ e) -61	2030
Targets	68 housing units implement energy efficiency projects between 2020 and 2030 due to ordinance requiring energy audits at time of sale.
Methodology and Assumptions	Assumes program will be implemented in 2020 and program will require audits at time of sale but energy efficiency projects will be voluntary. Assumes 5% of audited housing units will implement energy efficiency upgrades based on findings from the City of Berkeley's Building Energy Saving Ordinance. Assume 31% Btu energy use reduction based on demonstrated Energy Upgrade California projects completed in Marin County between June 2010 and May 2012. 149 housing units sold annually, based on 2005-2018 average (Marin County Assessor).
Sources	Marin County Assessor, http://www.marincounty.org/depts/ar/divisions/assessor/sales City of Berkeley, "Building Energy Savings Ordinance (BESO) Findings through Nov. 2016," December 7, 2016, https://www.cityofberkeley.info/uploadedFiles/Planning_and_Development/Level_3_-_Energy_and_Sustainable_Development/Energy%20Commission%20Presentation%20Berkeley.pdf Marin County Energy Watch Partnership, Dana Armanino, Sustainability Planner, County of Marin, darmanino@marincounty.org

Calculation

	2030
Average household electricity use, 2018	5,507 kWh
Average household natural gas use, 2018	428 therms
Number of housing units sold annually	149 units
Number of housing units provided energy audits	1,488 units
Percent of participating housing units	5%
Number of housing units implementing energy efficiency projects	74 units
Electricity reduction	31%
Natural gas reduction	31%
Annual electricity savings	126,995 kWh
Natural gas savings	9,872 therms
Electricity emissions reduction	8 MTCO ₂ e
Natural gas emissions reduction	53 MTCO ₂ e
Total GHG emissions reduction	61 MTCO ₂ e

COOL PAVEMENT AND ROOFS <i>EE-C3</i>	
Reductions (MTCO ₂ e) -32	2030
Targets	10% of paved surfaces converted to high-albedo surfaces by 2030.
Methodology and Assumptions	On average, for metropolitan areas studied, vegetation covers about 29-41% of the area, roofs 19-25%, and paved surfaces 29-39% (Akbari, 2008). For Larkspur, assumed paved surfaces cover 29%. Assume 10% will be replaced with high albedo content by 2030. Pavement has a potential for a 0.15 to 0.25 increase in albedo (Akbari, 2008); we have conservatively assumed a 0.15 change in albedo. $0.29 * 0.15 * 0.15 =$ Net change of 0.006525 for 2020. <ul style="list-style-type: none"> - a 10K decrease in temperature for a 0.25 increase in albedo (Akbari) - 10 Kelvin = 10 Celsius - Electricity demand in cities increases by 2–4% for each 1 degree Celsius increase. Assume 3% for Tiburon.
Sources	Akbari, Hashem and Rose, Leanna Shea, "Urban Surfaces and Heat Island Mitigation Potentials," Journal of the Human-Environmental System, Vol. 11; No. 2: 85-101, 2008.

Calculation

	2030
Percent of city covered in pavement	29%
Percent of paved area with high albedo	10%
Albedo change	0.004
Temperature decrease	0.174 Celsius
Reduction in electricity use	377,856 kWh
Reduction in emissions	32 MTCO ₂ e

PUBLIC LIGHTING <i>EE-M1</i>	
Reductions (MTCO _{2e})	0 2030
Targets	Convert ALL streetlights to LED by 2030.
Methodology and Assumptions	The City had not converted any of its 764 streetlights by 2018. The action assumes the City will convert all streetlights by 2030. We assume a 46% reduction in electricity use based on an analysis prepared for the 2010 CAP. There are no GHG savings attributed to this measure because the City was purchasing 100% renewable electricity in 2018.
Sources	City of Larkspur Public Works Department

Calculation

	2030
Electricity use, 2018	357,274 kWh
Electricity savings	163,092 kWh
GHG emissions reduction	0.0 MTCO _{2e}

ENERGY CONSERVATION <i>EE-M3</i>	
Reductions (MTCO ₂ e)	-1 2030
Targets	Reduce energy use in municipal buildings by 5%.
Methodology and Assumptions	Energy management software is proven to reduce energy consumption by 10% through identifying inefficiencies within operations. A 5% reduction in energy use for miscellaneous behavioral changes by staff and mechanical operations, and upgrading to Energy Star equipment were assumed. There are no GHG savings attributed to electricity savings in this measure because the City was purchasing 100% renewable electricity in 2018.
Sources	Larkspur 2015 GHG Inventory for Government Operations

Calculation

	2030
Electricity consumption in municipal buildings, 2018	169,834 kWh
Electricity use in municipal buildings	5 MTCO ₂ e
Natural gas use in municipal buildings	19 MTCO ₂ e
Percent reduction in energy use	5%
Reduction in electricity consumption	8,492 kWh
GHG emissions reductions	1 MTCO ₂ e

ENERGY EFFICIENCY AUDIT AND RETROFITS

EE-M2

Reductions (MTCO _{2e})	-2	2030
Targets	Complete all energy efficiency projects by 2030.	
Methodology and Assumptions	<p>Projects to be completed are as follows:</p> <ol style="list-style-type: none"> 1) Enclose under-story of City Hall and install under-story insulation 2) Replace windows in Fire Station No. 1 and City Hall <p>There are no GHG savings attributed to electricity savings in this measure because the City was purchasing 100% renewable electricity in 2018.</p>	
Sources	Marin Energy Management reports for the City of Larkspur, August 12, 2005 and December 20, 2005.	

Calculation

Project	Annual Electricity Savings (kWh)	Annual Natural Gas Savings (therms)
Under-story enclosure and insulation - City Hall	2,521	63
Window replacement - Fire Station No. 1 and City Hall	10,381	261
Total savings	12,902	324
Emissions reductions (MTCO _{2e})	0.0	2

COMMERCIAL ORGANIC WASTE <i>WR-C1</i>	
Reductions (MTCO ₂ e) -408	2030
Targets	Outreach to covered businesses. 30% are compliant.
Methodology and Assumptions	<p>Passed in 2014, AB 1826 requires businesses to recycle their organic waste, depending on the amount of waste they generate per week. Organic waste means food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste. The law phases in mandatory recycling of commercial organics over time. In 2017, businesses that generate 4 cubic yards of organic waste per week must arrange for organic waste recycling services and divert all organic waste they produce. In 2019, the law extends to businesses that generate 4 cubic yards or more of commercial solid waste. The State law is intended to reduce statewide disposal of organic waste by 50% by 2020. If that target is not met, the law will be extended to cover businesses that generate 2 cubic yards or more of commercial solid waste.</p> <p>The City can assist Zero Waste Marin (a.k.a., the Marin Hazardous and Solid Waste Joint Powers Authority) and Marin Sanitary Service by conducting outreach, maintaining a registry of all businesses (including self-haulers) to track compliance with AB 1826, and hiring additional MSS or City dedicated to these efforts.</p> <p>According to CalRecycle, 55% of franchised commercial waste is recoverable for compost and mulch and paper recycling.</p> <p>This measure makes the following assumptions: 53% of landfilled waste is generated by commercial uses (based on electricity consumption split in the community); 60% of commercial waste will be subject to AB 1826 by 2020; and 90% of commercial waste will be subject to AB 1826 by 2030. Based on current compliance rates, this measure assumes 30% of all businesses that meet the 2019 threshold will be compliant by 2020 and 30% of all business that meet the post-2020 threshold will be compliant by 2030.</p>
Sources	<p>Personal communication with Kim Schiebly, Marin Sanitary Service, Kim.Scheibly@marinsanitary.com</p> <p>CalRecycle, 2014 Disposal-Facility-Based Characterization of Solid Waste in California: Significant Tables and Figures, https://www2.calrecycle.ca.gov/WasteCharacterization/PubExtracts/2014/SigTableFig.pdf</p>

Calculation

	2030
Estimated commercial waste as a percentage of total landfilled waste	52%
Commercial landfilled waste (excluding self-haul, sludge and municipal waste)	5,957 tons
Waste generated by covered businesses	5,362 tons
Recoverable organic waste generated by covered businesses (55%)	2,949 tons
Percent diverted from landfill	30%
Tons diverted from landfill	885 tons
GHG emissions reduction	408 MTCO ₂ e

RESIDENTIAL ORGANIC WASTE <i>WR-C2</i>	
Reductions (MTCO ₂ e) -470	2030
Targets	50% diversion of residential organic waste by 2030.
Methodology and Assumptions	This measure continues and expands activities already occurring, including quarterly mailings by Marin Sanitary Service, tabling at community events, a marketing campaign by Zero Waste Marin, and community education by Resilient Neighborhoods. Under this measure, the Town will utilize its website, communication tools, and social media to promote these activities and expand their reach, and encourage Marin Sanitary Service to increase and expand their outreach through other channels such as on-bill and email response messaging. A 2014 Marin Sanitary Service (MSS) waste characterization study found that 38% of residential solid waste sent to the landfill was compostable organic waste (30% food scraps, 4% food-soiled paper, and 4% plant debris). MSS estimates that approximately 1% of food waste is currently collected and composted. Curbside collection of food waste is available in Larkspur with weekly service for co-collection of plant debris and food scraps. Based on MSS's experience, this measure assumes an additional 5% of residential organic waste will be diverted by 2020 due to education and outreach activities. Based on the current residential waste diversion rate of 72%, we assume 50% of residential organic waste can be diverted by 2030.
Sources	Personal communication with Kim Schiebly, Marin Sanitary Service, Kim.Scheibly@marinsanitary.com

Calculation

	2030
Residential waste as a percent of total landfilled waste	48%
Residential landfilled waste (excluding self-haul, sludge and municipal waste)	5,499.2 tons
Compostable organic waste generated by residents	2,089.7 tons
Percent diverted from landfill	50%
Tons diverted from landfill	1,045 tons
GHG emissions reduction	470 MTCO ₂ e

CONSTRUCTION AND DEMOLITION DEBRIS AND SELF-HAUL WASTE	
<i>WR-C3</i>	
Reductions (MTCO ₂ e) -18	2030
Targets	75% diversion of C&D waste by 2030.
Methodology and Assumptions	<p>Larkspur currently complies with the State's Green Building Code (CALGreen) by requiring development projects to direct all construction and demolition (C&D) materials to a certified facility that diverts at least 65% of nonhazardous C&D debris to recycle or salvage. However, recoverable material is still deposited in the landfill, primarily due to self-haul activity (clean-up and loads that are generated from projects not covered by CALGreen), and C&D loads that contain low percentages of recoverable material. The Town can help to maximize the amount of recoverable material by providing outreach and education to waste generators, and by working with the County and CalRecycle to require processing of all loads for recoverable materials at the landfill or processing facility.</p> <p>According to Zero Waste Marin, 219.05 tons of self-haul and debris box waste originating in Larkspur was landfilled in 2016. According to statewide solid waste characterizations studies, self-haul waste contains approximately 28% lumber, 3% paper, and 10% green waste, all of which could be diverted from the landfill. The measure assumes that 75% of this waste can be diverted by 2030 based on State mandates (SB 1383).</p>
Sources	<p>Personal communication with Garth Schultz, R3 Consulting Group, gschultz@r3cgi.com</p> <p>Personal communication with Judith Silver, Zero Waste Marin, jsilver@marincounty.org</p> <p>CalRecycle, "2014 Disposal-Facility-Based Characterization of Solid Waste in California: Significant Tables and Figures," October 6, 2015.</p>

Calculation

	2030
Self-haul landfilled waste	233.1 tons
Recoverable organic waste (26.4%)	61.5 tons
Percent organic material diverted from landfill	75%
Tons diverted from landfill	46 tons
GHG emissions reduction	18 MTCO ₂ e

MANDATORY WASTE DIVERSION	
<i>WR-C4</i>	
Reductions (MTCO ₂ e) -554	2030
Targets	Increase commercial AB1826 compliance rate to 50% and increase residential organic waste diversion rate to 80% by 2030.
Methodology and Assumptions	<p>This measure assumes Larkspur will adopt a mandatory waste diversion ordinance similar to the one adopted by the City of Palo Alto in January 2016 (Palo Alto Municipal Code Chapter 5.20). Palo Alto requires all residents, visitors, and businesses to place their discards in the appropriate container – recycle, compost, or garbage. There are four steps to compliance: 1) subscribe to recycle, compost, and garbage service from the city’s contract hauler; 2) set-up color-coded and labeled containers in convenient locations for patrons, employees, and residents; 3) train and educate tenants, residents, contractors and janitors about how to properly sort their waste and to ensure requirements are met; and 4) sort waste into proper containers.</p> <p>This measure assumes a similar ordinance would require all commercial accounts and multifamily buildings with 5 or more units to comply by 2020. We assume that a mandatory diversion ordinance could increase the AB 1826 compliance rate to 50% by 2030. Assuming that the ordinance is expanded to require residents to comply, we estimate an overall 80% compliance rate for residential compostable organic waste by 2030.</p>
Sources	<p>City of Palo Alto, http://www.cityofpaloalto.org/gov/depts/pwd/zerowaste/projects/ordinance.asp CalRecycle, "2014 Disposal-Facility-Based Characterization of Solid Waste in California: Significant Tables and Figures," October 6, 2015.</p>

Calculation

	2030
Additional commercial organic waste diverted	589.8 tons
Additional residential organic waste diverted	626.9 tons
GHG emissions reduction	554 MTCO ₂ e

WASTE PROCESSING INFRASTRUCTURE	
<i>WR-C5</i>	
Reductions (MTCO ₂ e) -1,038	2030
Targets	Increase diversion rate of recoverable organic waste to 95% by 2030.
Methodology and Assumptions	This measure assumes that new solid waste processing infrastructure is procured by 2030, but not 2020. Waste processing infrastructure could ultimately ensure that 95% of all recoverable organic waste collected by the franchised waste hauler is diverted from the landfill by 2030.
Sources	Personal communication with Kim Schiebly, Marin Sanitary Service, Kim Scheibly, Kim.Scheibly@marinsanitary.com CalRecycle, 2014 Disposal-Facility-Based Characterization of Solid Waste in California: Significant Tables and Figures, https://www2.calrecycle.ca.gov/WasteCharacterization/PubExtracts/2014/SigTableFig.pdf

Calculation

	2030
Landfilled waste, excluding self-haul and sludge	12,016 tons
Tons diverted by other measures	3,356 tons
Diversions target (95% for 2030)	5,707 tons
Remaining tons to be diverted	2,352 tons
Recoverable organic waste (50% of total)	6,008 tons
GHG emissions reduction	1,038 MTCO ₂ e

WASTE FROM PUBLIC CONTAINERS AND CITY OPERATIONS	
<i>WR-M1</i>	
Reductions (MTCO _{2e}) -93	2030
Target	75% of recoverable organic waste currently landfilled is diverted by 2030.
Methodology and Assumptions	This measure assumes 75% of recoverable organic waste currently landfilled could be diverted by 2030.
Sources	Personal communication with Charlie Wicke, Marin Sanitary Service, Charlie.Wicke@marinsanitary.com

Calculation

	2030
Waste collected in public containers	559 tons
Recoverable organic waste (50%)	280 tons
Percent of organic waste diverted from landfill	75%
Tons organic waste diverted from landfill	210 tons
GHG emissions reduction	93 MTCO _{2e}

COMMUNITY WATER USE

WC-C1

Reductions (MTCO ₂ e) -2	2030
Targets	1% annual water consumption reduction.
Methodology and Assumptions	<p>District-wide Marin Municipal Water District (MMWD) water consumption fell 23.1% between 2005 and 2017, or approximately 1.9% per year. We conservatively assume water consumption will continue to fall an average of 1% per year based on the following legislation and water conservation programs:</p> <ul style="list-style-type: none"> -The City has adopted CALGreen Tier 1 for residential buildings, which requires additional water conservation actions above the base code. -MMWD's regulations meet or exceed State law that requires single family homes and commercial and multi-family buildings to replace all non-compliant plumbing fixtures when remodeling and upon resale (resale requirement for commercial and multi-family buildings will be in effect on January 1, 2019). -MMWD provides rebates for water-efficient toilets, clothes washers, hot water recirculation systems, turf replacement, pool covers, mulch, graywater systems, and rain barrels. -MMWD provides residential and commercial building and landscape water audits and free-water saving devices (faucet aerators, showerheads, toilet leak test dye tablets, hose nozzles, etc.). -MMWD provides residential and commercial building and landscape water audits and free-water saving devices (faucet aerators, showerheads, toilet leak test dye tablets, hose nozzles, etc.). -MMWD has adopted a landscape water conservation ordinance which applies to all new construction and rehabilitated landscape projects requiring a building permit, plan check, or design review. Irrigation controllers are required under CALGreen. -New commercial and multi-family construction is required to meet CALGreen code. MMWD requires all plumbing installed, replaced, or moved on any new or existing service to have high efficiency fixtures and meet minimum requirements. -MMWD has adopted a Water Waste Ordinance and requires drinking water and linen washing upon request at restaurants and hotels. -MMWD requires applicants for new water service and applicants requesting an enlarged water service for substantial residential or commercial remodels to install a graywater recycling system to reuse the maximum practicable amount of graywater on site. -MMWD conducts outreach and provides water conservation information to water users on its website. -MMWD provides virtual water-friendly garden tours on its website.

	<p>GHG reduction calculations are based upon the following:</p> <ul style="list-style-type: none"> -The California Energy Commission estimates that it takes 3,500 kWh of electricity per million gallons to convey, treat and distribute water from the water source to the customer in northern California. -MMWD began purchasing 100% renewable electricity in 2017 and Sonoma County Water agency, which provides approximately 25% of water, began purchasing 100% renewable electricity in 2015. We assume the water agencies will continue this practice.
Sources	<p>Personal communication with Carrie Pollard, Sonoma Marin Water Saving Partnership</p> <p>The Climate Registry for Sonoma County Water Agency emission factors</p> <p>Refining Estimates of Water-Related Energy Use in California, California Energy Commission, Dec. 2006</p>

Calculation

	2030
Water consumption, BAU	535 MG
Annual water consumption reduction	1 %
Potential annual water savings	70 MG
GHG emissions reduction from water conservation	2 MTCO ₂ e
GHG emissions reduction	2 MTCO ₂ e

MUNICIPAL WATER USE <i>WC-M1</i>	
Reductions (MTCO ₂ e) 0.0	2030
Targets	20% reduction in electricity used for irrigation and pumping.
Methodology and Assumptions	We assume electricity used for irrigation and pumping systems will be reduced 20% due to water-efficient landscaping and efficiency upgrades. We assume the City continues to purchase Deep Green electricity for all municipal operations.
Sources	PG&E

Calculation

	2030
Electricity used for irrigation and pumps	24,312 kWh
Reduction in electricity use (20%)	4,862 kWh
GHG emissions reduction	0.0 MTCO ₂ e

LIGHT AND HEAVY DUTY FLEET REGULATIONS

State Action

Program Description	<p>Current federal and State regulations and standards will reduce transportation emissions from the light and heavy duty fleet. These include:</p> <ol style="list-style-type: none"> 1. Pavley Standards which increase fuel economy standards for light-duty vehicles for 2009-2016 model years. 2. Advanced Clean Cars Program which will reduce greenhouse gas and smog emissions for light-duty vehicles sold between 2017 and 2025. New automobiles will emit 34 percent fewer GHG emissions and 75 percent fewer smog-forming emissions. 3. ARB Tractor -Trailer Greenhouse Gas Regulations which accelerate the use of low rolling resistance tires and aerodynamic fairing to reduce GHG emissions in the heavy-duty truck fleet. 4. Heavy Duty GHG Emissions Standards (Phase One) which establish GHG and fuel efficiency standards for medium duty and heavy duty engines and vehicles for 2014-2018 model years.
Reductions (MTCO ₂ e) -6,600	2030
Methodology and Assumptions	<p>Transportation emissions estimated using EMFAC 2017. Emission factors have been adjusted to account for the SAFE Vehicle Rule Part One and the Final SAFE Rule. In order to be consistent with the methodology used in the Greenhouse Gas Inventory, results are adjusted to reflect the global warming potential of methane and nitrous oxide as reported in the IPCC Fifth Assessment Report.</p> <p>Bus VMT excludes bust VMT reduced through Measure LCT-C5.</p>
Sources	<p>California Air Resources Board, EMFAC2017 v.1.0.2.</p> <p>California Air Resources Board, EMFAC2014 Volume III - Technical Documentation, v1.0.7, May 12, 2015</p> <p>California Air Resources Board, "EMFAC Off-Model Adjustment Factors for Carbon Dioxide (CO₂) Emissions to Account for the SAFE Vehicle Rule Part One and the Final SAFE Rule," June 26, 2020, https://ww3.arb.ca.gov/msei/emfac_off_model_co2_adjustment_factors_06262020-final.pdf?utm_medium=email&utm_source=govdelivery</p>

Calculation

	2030
Passenger VMT BAU	100,765,020 VMT
Passenger VMT, net reductions from other measures	75,266,222 VMT
Commercial VMT BAU	4,791,966 VMT
Bus VMT BAU	380,684 VMT
Emissions, BAU	31,971 MTCO ₂ e
Emissions with regulations	25,371 MTCO ₂ e
Reduction in emissions	6,600 MTCO ₂ e

RENEWABLE PORTFOLIO STANDARD <i>State Action</i>	
Program Description	Established in 2002 in Senate Bill 1078, the Renewable Portfolio Standard program requires electricity providers to increase the portion of energy that comes from eligible renewable sources, including solar, wind, small hydroelectric, geothermal, biomass and biowaste, to 20 percent by 2010 and to 33 percent by 2020. Senate Bill 350, passed in September of 2015, increases the renewable requirement to 50 percent by the end of 2030. Senate Bill 100, passed in September 2018, accelerated the RPS standard to 60 percent by 2030 and zero-carbon by 2045.
Reductions (MTCO ₂ e) -740	2030
Methodology and Assumptions	<p>This State Action assumes PG&E and Direct Access entities will meet the Renewable Portfolio Standard requirements and that these entities will carry the same share of the community's electricity load as in 2016. GHG reductions related to MCE's GHG reduction policies are quantified separately as a local action.</p> <p>California Public Utilities Code Section 454.52 requires each load-serving entity to procure at least 50 percent eligible renewable energy resources by 2030 and to meet the economywide reductions of 40% below 1990 levels by 2030.</p> <p>For 2030, the CPUC has set electric sector GHG reductions at a level that represents a 50% reduction from 2015 levels. We therefore apply a 50% reduction to PG&E and DA 2015 CO₂ emission factors to forecast 2030 emission factors. CH₄ and N₂O factors are kept constant at 2018 levels.</p>
Sources	<p>GHG Calculator, version 3c_Oct2010. https://ethree.com/public_projects/cpuc2.php</p> <p>PG&E, "Greenhouse Gas Emission Factors: Guidance for PG&E Customers," November 2015, https://www.pge.com/includes/docs/pdfs/shared/environment/calculator/pge_ghg_emission_factor_info_sheet.pdf</p> <p>California Public Utilities Commission "CPUC Adopts Groundbreaking Path to Reduce Greenhouse Gases in Electric Sector," Press Release Docket #: R.16-02-007, Feb. 8, 2018.</p>

Calculation

	2030
Electricity use, BAU, inc. grid loss	72,386,241 kWh
Electricity saved through other State actions, inc. grid loss	819,822 kWh
Electricity saved through local actions, inc. grid	8,936,424 kWh
Net electricity use (PG&E)	15,236,052 kWh
Net electricity use (DA)	7,393,749 kWh
Electricity emissions, BAU	3,111 MTCO ₂ e
Electricity emissions w/RPS	2,372 MTCO ₂ e
GHG emission reductions	740 MTCO ₂ e

TITLE 24 ENERGY EFFICIENCY STANDARDS

State Action

Program Description	The California Energy Commission (CEC) promotes energy efficiency and conservation by setting the State's building efficiency standards. Title 24 of the California Code of Regulations consists of regulations that cover the structural, electrical, mechanical, and plumbing system of every building constructed or altered after 1978. The building energy efficiency standards are updated on an approximate three-year cycle, and each cycle imposes increasingly higher demands on energy efficiency and conservation. The California Energy Commission's 2007 Integrated Policy Report established the goal that new building standards achieve "net zero energy" levels by 2020 for residences and by 2030 for commercial buildings.
Reductions (MTCO ₂ e) -431	2030
Methodology	<p>Estimated residential energy use assumes homes use natural gas for primary space heating and water heating. The analysis assumes all new homes install central air conditioning and outdoor lighting. Only end uses covered by Title 24 are included in the analysis. Housing development projections provided by Larkspur staff.</p> <p>Estimated energy reductions for the 2016 and 2019 building codes based on information provided by the California Energy Commission. CAPCOA Measure BE-1 used for estimating building energy savings. The analysis assumes all residential electricity use subject to Title 24 is offset by mandatory solar installation beginning with the 2019 building code.</p>
Sources	<p>California Energy Commission, 2016 Energy Standards Overview (June 15, 2016), https://www.lgc.org/wordpress/wp-content/uploads/2016/02/2016-Energy-Standards-Overview-California-Energy-Commission.pdf</p> <p>California Energy Commission, https://ww2.energy.ca.gov/title24/2019standards/documents/2018_Title_24_2019_Building_Standards_FAQ.pdf</p> <p>California Energy Commission, California Commercial End-Use Survey (March 2006), https://ww2.energy.ca.gov/2006publications/CEC-400-2006-005/CEC-400-2006-005.PDF</p> <p>2009 California Residential Appliance Saturation Study (CRASS), Volume 2. http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-V2.PDF</p> <p>California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010.</p> <p>Personal communication with Neal Toft, Planning and Building Director, City of Larkspur, Oct. 20, 2019.</p>

Calculation

Reductions from Title 24 Upgrades	2016 Reductions from 2013 Standards (assumed for development after 2017)	Energy Savings for 2019 Code (assumed for development 2020-2022)		Projected average reduction 2023-2030 from 2017 baseline	
		Natural Gas Savings	Natural Gas Savings	Electricity Savings	Natural Gas Savings
	Energy Savings				
Residential New Construction	28.00%	100.00%	7%	100%	50%
Non-residential New Construction	5.00%	30%	30%	50%	50%

Projected Residential Development with Title 24 Energy Reductions

	2018-2019	2020-2022	2023-2030	TOTAL through 2030	GHG Reductions through 2030
New Residential (units)	4	75	175	254	
Electricity Use BAU, subject	160	71,325	963,675	1,035,160	
Electricity Use Savings	2	71,325	67,457	138,784	9
Natural Gas Use BAU	1,876	35,175	82,075	119,126	
Natural Gas Use Savings	478	2,462	41,038	43,978	234

Projected Non-Residential Development with Title 24 Energy Reductions

	2018-2020	2020-2022	2023-2030	TOTAL through 2030	GHG Reductions through 2030
Electricity Use BAU, subject	0	438,742	1,023,732	1,462,474	
Electricity Use Savings	0	131,623	511,866	643,489	66
Natural Gas Use BAU	0	15,647	36,509	52,156	
Natural Gas Use Savings	0	4,694	18,254	22,948	122

Appendix B: Implementation Table

The work plan in Table B-1 contains information to support staff and community implementation of the measures to effectively integrate them into budgets, the capital improvement program, and other programs

and projects. The headings included in Table B-1 are defined as follows:

Code: The abbreviation that is used to refer to the strategy in the CAP.

Strategy/Action: The strategy language used to guide actions and the specific actions that will be used to implement the strategy.

Lead Department: The lead City department, division, or office responsible for implementing the measure. Note: Some actions may require involvement and collaboration by more than one department, division, or office. The City Manager may assign or re-assign responsibilities, as necessary.

- ADMIN (City Manager / Finance / Public Information)
- PLN (Planning Division)
- BLD (Building Division)
- DPW (Public Works / Engineering)
- TBD (To Be Determined as Assigned by City Manager)

Time Frame: The year by which a measure should be effective by year's end. For a measure to be effective, the necessary programs and efforts should be active, and any infrastructure or other capital improvements should be in place. Once effective, many measures will continue through 2030, so they do not have end dates. Time frames for effectively setting up the measures are described as follows:

- Ongoing (continuation of an action that has been implemented)
- Near-Term (by 2023)
- Mid-Term (by 2025)
- Long-Term (by 2030)

City Staff Time: The estimated cost to the City (in staff hours) to complete implementation of the measure, identified as follows:

- Low (less than 80 hours)
- Medium (80–500 hours)
- High (more than 500 hours)

GHG Reductions (MTCO₂e): Amount of GHG emissions reduced by 2030. If no amount is identified, either additional information is needed to quantify a GHG reduction amount or the action is supportive of another action, as described in the CAP.

Key Metrics: Targets and datapoints that the City will use to track progress and measure success.

TABLE B-1: IMPLEMENTATION TABLE

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	CITY STAFF TIME	GHG REDUCTION (MTCO ₂ e)	KEY METRICS
LOW CARBON TRANSPORTATION						
LCT-C1	<p>Zero Emission Vehicles. Develop a Zero Emission Vehicle Plan that will result in at least 33% of passenger vehicles in Larkspur to be zero emission vehicles (ZEVs), including plug-in electric vehicles (EVs) and hydrogen fuel cell electric vehicles, by 2030. Consider incorporating the following actions in the plan:</p>				6,808	Rate of ZEV adoption in Larkspur and Marin County. Target is 33%.
	<p>a. Where there is paid parking restricted parking, provide free parking for ZEVs at City parking lots and parking spaces and other measures that incentivize use of ZEV.</p>	DPW	Mid-Term	Medium		
	<p>b. Provide wayfinding signage to public EV chargers.</p>	DPW	Mid-Term	Medium		
	<p>c. Work with MCE, PG&E and other entities to identify multi-family and workplace charging sites appropriate for available incentive programs, such as EV Charge Network.</p>	PLN/DPW	Near-Term	Low		
	<p>d. Participate in a countywide effort by MCE, PG&E, and others to provide rebates for new or used electric vehicles and/or charging stations.</p>	ADMIN/PLN/DPW	Near-Term	Low		

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	CITY STAFF TIME	GHG REDUCTION (MTCO _{2e})	KEY METRICS
	e. Pursue opportunities to expand the City's EV charging network through innovative programs, such as installing chargers at existing streetlight locations.	PLN/DPW	Near-Term	Low		
	f. Require new and remodeled commercial and multi-family projects to install a minimum number of electric vehicle chargers for use by employees, customers, and/or residents.	PLN/BLD	Near-Term	Low		
	g. Accommodate new electric vehicle charging stations in existing commercial parking lots.	PLN	Ongoing	Medium		
	h. Require new and remodeled single-family and multi-family projects to install electrical service and conduits for potential electric vehicle use.	PLN/BLD	Near-Term	Medium		
	i. Consider requiring new and remodeled gas stations to provide EV fast chargers and hydrogen fueling stations. j. Participate in regional efforts and grant programs to encourage widespread availability of EV charging stations.	PLN	Near-Term	Low		

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	CITY STAFF TIME	GHG REDUCTION (MTCO ₂ e)	KEY METRICS
	<p>k. Target policies to support ZEV adoption, including used vehicles, in low income and disadvantaged communities.</p> <p>l. Participate in programs to promote EV adoption, including "Drive an EV" events and other media and outreach campaigns.</p> <p>m. Encourage or require, as practicable, ride hailing and delivery service companies to utilize zero emission vehicles</p>	ADMIN / PLN	Mid-Term	Medium		
LCT-C2	<i>Bicycling and Micromobility</i>				196	<p>Complete projects identified in the City's General Plan and Bicycle and Pedestrian Master Plan. 2.32 miles of Class I/II bike facilities constructed between by 2030. 25 bike racks (6-bike capacity) installed by 2030.</p>
	a. Encourage bicycling and micromobility as an alternative to vehicular travel. Promote safe bicycling and micromobility, including e-bikes, electric scooters, and electric skateboards, through outreach channels and partner agencies.	PLN / DPW	Near-Term	Medium		
	b. Establish and maintain a system of bicycle facilities that are consistent with the City's Bicycle and Pedestrian Master Plan and Complete Streets policies.	DPW	Long-Term	High		
	c. Implement the City's Bicycle and Pedestrian Master Plan's recommendations to support	DPW	Long-Term	High		

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	CITY STAFF TIME	GHG REDUCTION (MTCO ₂ e)	KEY METRICS
	and expand bicycling and micromobility.					
	d. Update the Capital Improvement Program to maintain and improve the system of multiuse pathways and bicycling facilities that are consistent with the City's Bicycle and Pedestrian Master Plan and Complete Streets policies.	DPW	Long-Term	High		
	e. Support regional efforts to establish a bike and/or scooter share program.	DPW	Near-Term	Medium		
LCT-C3	Walking. Encourage walking as an alternative to vehicular travel. Establish and maintain a system of pedestrian facilities that are consistent with the City's General Plan and Bicycle and Pedestrian Master Plan.	DPW	Long-Term	High	21	Complete projects identified in the City's General Plan and Bicycle and Pedestrian Master Plan.
LCT-C4	Safe Routes to School. Continue to support the Safe Routes to School Program and strive to increase bicycling, walking, carpooling, and taking public transit to school.				68	Reduce school trips in family vehicle by 29%, from an average of 45% to 32%.
	c. Work with school districts, the Transportation Authority of Marin (TAM) and other organizations to promote school and student participation.	ADMIN / DPW	Short-Term	Low		
	d. Identify issues associated with unsafe bicycle and pedestrian	DPW	Long-Term	High		

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	CITY STAFF TIME	GHG REDUCTION (MTCO ₂ e)	KEY METRICS
	facilities between neighborhoods and schools, apply for Safe Routes to School grants, and execute plans to improve pedestrian and bicycle facilities.					
LTC-C5	Public Transit. Support and promote public transit by taking the following actions:				183	33% of Marin Transit and Golden Gate Transit buses will be electric by 2030 and the remaining use renewable diesel.
	a. Work with Marin Transit and Golden Gate Transit to maximize ridership through expansion and/or improvement of transit routes, schedules, and bus shelters.	ADMIN / DPW	Mid-Term	Medium		
	b. Work with TAM, employers, and others to provide first and last mile programs to maximize utilization of public transit.	ADMIN / DPW	Near-Term	Low		
	c. Provide safe routes to the ferry landing and other transit facilities that encourage bicycle and pedestrian connections.	DPW	Long-Term	High		
	d. Encourage school districts to restore a “Yellow School Bus” program and student use of regular transit to reduce school traffic.	ADMIN / DPW	Near-Term	Low		
	e. Encourage transit providers, including school buses, to use renewable diesel as a transition	ADMIN	Near-Term	Low		

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	CITY STAFF TIME	GHG REDUCTION (MTCO _{2e})	KEY METRICS
	fuel and to purchase electric buses whenever replacing existing buses.					
	f. Encourage Golden Gate Transit District to provide secure bicycle parking at the Larkspur ferry landing.	ADMIN	Near-Term	Low		
LCT-C6	SMART Train. Encourage residents, commuters, and employees to take the SMART train. Work with Sonoma-Marín Area Rail Transit, TAM, and local employers to promote ridership and provide shuttles and first and last mile programs. Provide safe bicycle and pedestrian connections to the SMART station.	ADMIN / DPW	Mid-Term	High	549	384 boardings and alightings at the Larkspur SMART station.
LCT-C7	Employee Trip Reduction. Reduce vehicle miles traveled commuting to work through the following actions:				77	Number and % of employers subject to requirement that are providing transportation demand programs to employees. Target is 100%.
	a. Work with Transportation Authority of Marin (TAM), the Metropolitan Transportation Commission (MTC), and the Bay Area Air Quality Management District (BAAQMD) to promote transportation demand programs to local employers, such as rideshare matching programs, vanpool incentive programs, emergency ride home programs, telecommuting, transit use discounts and subsidies, showers and changing facilities, bicycle racks	ADMIN / PLN	Near-Term	Low		

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	CITY STAFF TIME	GHG REDUCTION (MTCO _{2e})	KEY METRICS
	and lockers, and other incentives to use transportation other than single occupant vehicles.					
	b. Update the City's Trip Reduction Ordinance to reflect the most recent BAAQMD regulations.	PLN	Near-Term	Medium		
	c. Work with MTC to identify and notify non-compliant businesses in Larkspur and encourage their participation in providing transportation demand management programs.	ADMIN / PLN	Near-Term	Medium		
	d. Work with TAM on developing a county-wide Transportation Demand Management Program to encourage trip reduction throughout County.	ADMIN / PLN	Near-Term	Low		
LTC-C8	Parking Requirements. Promote a walkable city by reducing parking requirements where feasible. Apply minimum parking requirements in commercial areas to encourage residential development and community-serving uses in those areas near neighborhoods and transit. Elsewhere, apply minimum parking requirements based on implementation of robust transportation demand programs and proximity and frequency of transit services. Encourage unbundling of parking costs (e.g., separating the cost of renting a parking space from the cost of renting an apartment).	PLN	Mid-Term	Medium	23	50 parking spaces eliminated/avoided by 2030.

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	CITY STAFF TIME	GHG REDUCTION (MTCO ₂ e)	KEY METRICS
LTC-C9	Traffic System Management and Vehicle Idling.				460	SFD project is completed
	e. Implement signal synchronization to minimize wait times at traffic lights and to reduce congestion through increased traffic flow.	DPW	Ongoing			
	f. Utilize intelligent traffic management systems to improve traffic flow and guide vehicles to available parking.	DPW	Ongoing			
	g. Encourage drivers and autonomous vehicles to limit vehicle idling through public outreach and engagement campaigns.	ADMIN / DPW	Near-Term	Medium		
	h. Investigate adopting policies for public employees to minimize idling of city vehicles.	ADMIN / DPW	Near-Term	Medium		
LCT-C10	Smart Growth Development. Promote land use and development policies that prioritize infill housing and mixed-use development near commercial services and transit facilities, as opposed to development in peripheral areas that require use of vehicles to access transit and services.	PLN	Near-Term	High	n/a	Updated housing element
LCT-C11	Electric Landscape Equipment. Encourage the use of electric landscape equipment instead of gasoline-powered equipment through engagement campaigns and local ordinances.	ADMIN	Mid-Term	Medium	85	50% of landscape equipment is electric by 2020.
LCT-M1	Zero and Low Emission City Vehicles. Purchase or lease zero-emission vehicles for the City fleet whenever feasible, and when not, the most fuel-efficient models	ADMIN / DPW	Long-Term	Medium	17	50% improvement in fuel efficiency of City vehicles that use gasoline by 2030.

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	CITY STAFF TIME	GHG REDUCTION (MTCO ₂ e)	KEY METRICS
	available. Promote City adoption and procurement of zero-emission vehicles and electric vehicle charging infrastructure to the public.					
LCT-M2	Low Carbon Fuels. Use low-carbon fuel such as renewable diesel as a transition fuel in the City's fleet and encourage the City's service providers and joint powers agencies to do the same, until vehicles are replaced with zero-emissions vehicles.	ADMIN / DPW	Near-Term	Low	57	100% of diesel use is replaced with renewable diesel by 2030.
LCT-M3	City Employee Commute. Continue to provide City employees with incentives and/or reduce barriers to use alternatives to single occupant auto commuting, such as transit use discounts and subsidies, bicycle facilities, showers and changing facilities, ridesharing services, vanpools, emergency ride home service, flexible schedules, and telecommuting when practicable.	ADMIN / DPW	Near-Term	Low	8	5.6% reduction in employee commute VMT by 2030.
LCT-M4	Municipal Small Off-Road Equipment. Replace portable generators, leaf blowers and other landscape equipment with zero emission equipment.	DPW	Long-Term	Medium	6	Replace all small off-road equipment with electric versions by 2030.
RE-C1	Renewable Energy Generation and Storage. Accelerate installation of residential and commercial solar and energy storage systems.				397	Solar energy installations continue to grow by an average of 4,748 KW DC each year through 2030.
	<ul style="list-style-type: none"> a. Provide permit streamlining and reduce or eliminate fees, as feasible. b. Update building codes, development codes, design guidelines, and zoning ordinances, as necessary, to further facilitate small, medium, and large- 	PLN/BLD	Near-Term	Low		

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	CITY STAFF TIME	GHG REDUCTION (MTCO ₂ e)	KEY METRICS
	scale installations, where appropriate.					
	c. Encourage installation of solar panels over parking areas on commercial projects and large-scale residential developments through ordinance, engagement campaigns, or agency incentives.	PLN/BLD	Mid-Term	Medium		
	d. Identify and promote financing and loan programs for residential and non-residential projects.	PLN/BLD	Near-Term	Low		
	e. Encourage battery storage in conjunction with renewable energy generation projects through engagement campaigns and partner agency incentive.	ADMIN/DPW	Mid-Term	Medium		
RE-C2	GHG-Free Electricity. Encourage residents and businesses to switch to 100 percent renewable electricity (MCE Deep Green, MCE Local Sol, and PG&E Solar Choice) through engagement campaigns and partner agency incentives and work with MCE Clean Energy to assure that it reaches its goal to provide electricity that is 100 percent GHG-free by 2022.	ADMIN / PLN	Near-Term	Low	2,160	MCE electricity is 100% GHG-free by 2030.
RE-C3	Building and Appliance Electrification. Accelerate electrification of building systems and appliances that currently use natural gas, including heating systems, hot water heaters, stoves, and clothes dryers.					
	a. Promote available rebate programs such as Electrify Marin.	ADMIN /BLD	Near-Term	Low	38	9 cooktops, 14 water heaters and 28 heating systems are replaced

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	CITY STAFF TIME	GHG REDUCTION (MTCO ₂ e)	KEY METRICS
						with electric versions by 2030.
	b. Consider adopting an ordinance in 2024 that requires homeowners to replace natural gas appliances, such as water heaters, stoves, cooktops, clothes dryers, and heating systems with high-efficiency electric appliances at time of replacement, where feasible.	PLN/BLD	Mid-Term	Medium	1,443	24% of residential water heaters, 19% of residential cooktops, and 12% of residential dryers are replaced with high efficiency electric appliances.
	c. Prohibit the use of natural gas end uses in new residential buildings in the City's green building ordinance that aligns with the 2022 California Building Standards code update. Extend the same prohibition to new nonresidential buildings in the 2025 code cycle.	PLN/BLD	Near and Mid-Term	Medium	314	Ordinance adopted.
RE-C4	Innovative Technologies. Investigate and pursue innovative technologies such as micro-grids, battery storage, and demand-response programs that will improve the electric grid's resiliency and help to balance demand and renewable energy production	ADMIN / PLN / BLD & DPW	Mid-Term	Low	n/a	Projects identified.
RE-M1	Solar Energy Systems for Municipal Buildings. Install solar energy systems at municipal buildings and facilities where feasible and investigate and pursue innovative technologies such as battery storage and demand response programs.	DPW	Ongoing	Medium	0	Projects installed.
RE-M2	Municipal Deep Green Electricity.	ADMIN	Ongoing	Low	0	Actions taken.

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	CITY STAFF TIME	GHG REDUCTION (MTCO ₂ e)	KEY METRICS
	Continue to purchase 100% renewable energy through programs such as MCE Deep Green.					
EE-C1	Energy Efficiency Programs. Promote and expand participation in residential and commercial energy efficiency programs.				3,183	Electricity and natural gas consumption is reduced an average of 1% per year between 2018 and 2030.
	<ul style="list-style-type: none"> e. Work with organizations and agencies such as the Marin Energy Watch Partnership, the Bay Area Regional Network, Resilient Neighborhoods, and the Marin Climate & Energy Partnership to promote and implement energy efficiency programs and actions. f. Continue and expand participation in energy efficiency programs such as Energy Upgrade California, California Energy Youth Services, and Smart Lights. g. Promote utility, state, and federal rebate and incentive programs. h. Participate and promote financing and loan programs for residential and non-residential projects such as Property Assessed Clean Energy (PACE) programs, PG&E on-bill repayment, and California Hub for Energy Efficiency Financing (CHEEF) programs. 	ADMIN /BLD	Ongoing	Medium		
EE-C2	Energy Audits. Investigate requiring energy audits for residential and commercial buildings prior to completion	BLD	Near-Term	Medium	61	68 housing units implement energy efficiency projects

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	CITY STAFF TIME	GHG REDUCTION (MTCO ₂ e)	KEY METRICS
	of sale, including identification of cost savings from energy efficiency measures and potential rebates and financing options.					between 2020 and 2030 due to ordinance requiring energy audits at time of sale.
EE-C3	Cool Pavement and Roofs. Use reflective, high albedo material for roadways, parking lots, sidewalks, and cool roofs to reduce the urban heat island effect and save energy.				32	10% of paved surfaces converted to high-albedo surfaces by 2030.
	c. Evaluate the use of high albedo pavements when resurfacing City streets or re-roofing City facilities.	DPW	Ongoing	Medium		
	d. Adopt mandatory building code measures to require new development to use high albedo material for driveways, parking lots, walkways, and patios, and cool roofing.	BLD	Near-Term	Low		
EE-C4	Green Building Reach Code. c. Continue to adopt green building requirements for new and remodeled commercial and residential projects above the State building code. d. Consider adopting low embodied-carbon concrete standards similar to those adopted by the County of Marin.	BLD	Near and Mid-Term	Medium	n/a	Code amendments adopted.
EE-C5	Streamline Permit Process and Provide Technical Assistance. Analyze current green building permit and inspection process to eliminate barriers and provide technical assistance to ensure successful implementation of green building requirements. Coordinate with other	BLD	Near-Term	Medium	n/a	Actions taken,

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	CITY STAFF TIME	GHG REDUCTION (MTCO ₂ e)	KEY METRICS
	Marin County agencies to adopt consistent application requirements, where practicable. Work county-wide to identify incentives and make it easier for contractors and building counter staff to expedite.					
EE-M1	Streetlights. Replace inefficient street, parking lot and other outdoor lighting with LED fixtures. Consider design options for new fixtures that retain the historic character of Downtown Historic District.	DPW	Long-Term	High	0	Convert 764 streetlights to LED by 2030.
EE-M2	Energy Efficiency Audit and Retrofits. Work with the Marin Energy Management Team to identify and implement energy efficiency projects in municipal buildings and facilities and electrification of existing building systems and equipment that use natural gas.	ADMIN / DPW	Near-Term	Medium	2	Complete energy efficiency projects by 2030: 1) Enclose under-story of City Hall and install under-story insulation 2) Replace windows in Fire Station No. 1 and City Hall
EE-M3	Energy Conservation. Reduce energy consumption through behavioral and operational changes. d. Establish energy efficiency protocols for building custodial and cleaning services and other employees, including efficient use of facilities, such as turning off lights and computers, thermostat use, etc.	ADMIN / DPW	Near-Term	Low	1	Reduce energy use in municipal buildings by 5%.

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	CITY STAFF TIME	GHG REDUCTION (MTCO ₂ e)	KEY METRICS
	<p>e. Incorporate energy management software, electricity monitors, or other methods to monitor energy use in municipal buildings, where feasible.</p> <p>f. Investigate 9/80 work schedule and remote work opportunities for employees to reduce use of City facilities and to shut down City facilities entirely where feasible.</p>					
WR-C1	<p>Commercial Organic Waste. Work with Zero Waste Marin, Marin Sanitary Service, and non-profits such as Extra Food to divert commercial organic waste from the landfill through recycling, composting, and participation in waste-to-energy and food recovery programs.</p>				408	Outreach to covered businesses. 30% are compliant.
	<p>e. Conduct outreach and education to businesses subject to State organic waste recycling mandates (AB 1826 and SB 1383) and encourage or enforce compliance with the law.</p>	ADMIN	Near-Term	Medium		
	<p>f. Refer new and major remodel commercial and multi-family residential project proposals to the City's waste hauler for review and comment and require projects to provide adequate waste and recycling facilities and access as feasible.</p>	PLN / BLD	Near-Term	Low		
	<p>g. Encourage and facilitate commercial and multi-family property owners to require responsible use of on-site recycling facilities in lease and rental agreements and to train and regularly</p>	ADMIN	Near-Term	Low		

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	CITY STAFF TIME	GHG REDUCTION (MTCO ₂ e)	KEY METRICS
	evaluate janitorial, landscape, and other property management services. h. Assess capacity of existing food recovery programs, expand existing food recovery infrastructure if needed, monitor commercial generators for compliance, and conduct education and outreach.	ADMIN / DPW	Near-Term	Medium		
WR-C2	Residential Organic Waste. Work with Zero Waste Marin, Marin Sanitary Service, and other organizations to educate and motivate residents to utilize curbside collection services and home composting for food waste.	ADMIN	Near-Term	Medium	470	50% diversion of residential organic waste.
WR-C3	Construction & Demolition Debris and Self-Haul Waste. Require all loads of construction & demolition debris and self-haul waste to be processed for recovery of materials as feasible. Investigate creation of an ordinance requiring deconstruction of buildings proposed for demolition or remodeling when materials of significant historical, cultural, aesthetic, functional or reuse value can be salvaged.	BLD	Ongoing	Medium	18	75% diversion of C&D waste.
WR-C4	Mandatory Waste Diversion. In compliance with SB 1383, adopt an ordinance requiring mandatory subscription to and participation in waste diversion activities, including recycling and organics collection provided by Marin Sanitary Service. Consider	ADMIN	Near-Term	Medium	554	Increase commercial AB1826 compliance rate to 50% and increase residential organic waste diversion rate to 80% by 2030.

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	CITY STAFF TIME	GHG REDUCTION (MTCO ₂ e)	KEY METRICS
	including phased implementation of the ordinance, penalties, and practical enforcement mechanisms.					
WR-C5	<p>Waste Processing Infrastructure.</p> <p>e. Review and revise the City’s franchise agreement with Marin Sanitary Service to ensure waste reduction and diversion targets are met.</p> <p>f. Ensure organic waste collection service (including green waste, food waste, fibers, and manure) that complies with SB 1383 regulations is provided to all residents and businesses.</p> <p>g. Conduct a feasibility study and consider investing in new solid waste processing infrastructure to remove recoverable materials (recycling and organics) from the waste stream and reduce contamination.</p> <p>h. Require regular residential and commercial waste audits and waste characterization studies to identify opportunities for increased diversion and to track progress in meeting targets.</p>	ADMIN	Long-Term	Medium	1,038	Increase diversion rate of recoverable organic waste to 95% by 2030.
WR-C6	<p>Extended Producer Responsibility.</p> <p>c. Encourage the State to regulate the production and packaging of consumer goods and take-back programs.</p> <p>d. Encourage on-demand product and food delivery services to reduce</p>	ADMIN	Medium-Term	Low	n/a	Actions taken.

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	packaging waste and investigate requirements and incentives for same through ordinance and/or engagement campaigns.					
WR-C7	<i>Inorganic Waste.</i>				n/a	Actions taken.
	d. Promote reuse, repair, and recycling of inorganic materials, and encourage reduced use of packaging and single use items through engagement campaigns.	ADMIN	Near-Term	Low		
	e. Investigate supporting a local building material reuse center.	PLN/BLD	Mid-Term	Low		
	f. Consider adopting a Reusable Foodware Ordinance.	PLN/BLD	Near-Term	Medium		
WR-M1	<i>Waste from Public Containers and City Operations.</i> c. Embark on an educational and social marketing-based campaign to increase recycling, composting, reuse, and waste reduction within municipal operations at public facilities. d. Conduct periodic waste audits of City facilities to understand where opportunities for increased diversion lie and to track progress.	ADMIN/DPW	Near-Term	Medium	93	75% of recoverable organic waste currently landfilled is diverted by 2030.
WC-C1	<i>Community Water Use.</i> Reduce indoor and outdoor water use in residential and commercial buildings and landscaping.	PLN/BLD	Ongoing	Low	2	1% annual water consumption reduction.

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	<ul style="list-style-type: none"> e. Work with Marin Municipal Water District (MMWD) and other organizations to promote water conservation programs and incentives. f. Educate residents and businesses about local and State laws requiring retrofit of non-compliant plumbing fixtures during remodeling and at resale. g. Ensure all projects requiring building permits, plan check, or design review use water-efficient landscaping in compliance with State and MMWD regulations. h. Encourage the installation of greywater and rainwater collection systems and the use of recycled water where available through ordinance or engagement campaigns. 					
WC-M1	<p>Municipal Water Use. Reduce indoor and outdoor water use in municipal facilities and operations.</p> <ul style="list-style-type: none"> d. Replace high water use plants and inefficient irrigation systems with water-efficient landscaping. e. Replace inefficient plumbing fixtures with high-efficiency fixtures. 	DPW	Ongoing	Med	0	20% reduction in electricity used for irrigation and pumping.
	<ul style="list-style-type: none"> f. Use recycled water as available and practicable for parks and outdoor landscaping. 	DPW	Long-Term	High		
SA-C1	Urban Forest. Increase carbon sequestration and improve air quality				n/a	Action taken.

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	and natural cooling through increasing tree cover in Larkspur.					
	k. Plant additional trees on City-owned land, including public parks, open space, medians, and rights of way, where feasible.	DPW	Long-Term	Medium		
	l. Review parking lot landscape standards to maximize tree cover, size, growth, and sequestration potential. m. Continue to regulate and minimize removal of large (heritage) trees and require planting of replacement trees and/or fees to support mitigation planting in Larkspur Parks and open space areas.	PLN/DPW	Near-Term	Low		
	a. Require that the site planning, construction, and maintenance of new development preserve existing healthy trees and native vegetation on site to the maximum extent feasible. Replace trees and vegetation not able to be saved.	PLN/BLD	Ongoing	Medium		
	n. Encourage community members to plant trees on private land. Consider creating a tree giveaway event or providing lower-cost trees to the public through a bulk purchasing program.	ADMIN/PLN	Mid-Term	Medium		
	o. Encourage the creation of community gardens on public and private lands by community groups. p. Provide information to the public, including landscape companies, gardeners, and nurseries, on carbon	ADMIN/PLN/DPW	Mid-Term	Medium		

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	sequestration rates, drought tolerance, and fire resistance of different tree species.					
	q. Collaborate with fire agencies and Marin County Open Space District, Marin Municipal Water District, and private property owners, to manage fire-prone trees and invasive species in the open space for forest health and reduction of fuel load.	ADMIN/PLN	Near-Term	Medium		
	r. Continue to require new development, redevelopment, and infrastructure projects to implement best management practices as feasible, including low-impact development techniques, the minimal use of non-pervious surfaces in landscape design, and the integration of natural features into the project design, to naturally filter and biodegrade contaminants and to minimize surface runoff into drainage systems and creeks.	PLN/BLD	Ongoing	Low		
SA-C2	Carbon Sequestration. Increase carbon sequestration in the built environment, developed landscapes, and natural areas.				n/a	Actions taken.
	e. Where appropriate, encourage the use of building materials that store carbon through agency partnerships and engagement campaigns.	PLN / BLD & ADMIN	Mid-Term	Medium		
	f. Encourage and support composting to develop healthy, carbon-rich soils.		Near-Term	Low		

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	<ul style="list-style-type: none"> g. Manage parks and open spaces to steadily increase carbon in vegetation and soil. h. Increase the extent and carbon sequestration potential of bay wetlands, through improvements such as horizontal levees. 	DPW / PLN	Long-Term	High		
SA-C3	<p>Carbon Offsets. Reduce the impact of greenhouse gas emissions through the purchase of carbon offsets.</p> <ul style="list-style-type: none"> d. Encourage community members to purchase carbon offsets to reduce their carbon footprint through engagement campaigns. e. Consider partnering with a local non-profit organization to promote an effective carbon offset program. f. Focus on offsetting emissions that are difficult to mitigate otherwise, such as airplane travel. 	ADMIN/PLN	Mid-Term	Medium	n/a	Actions taken.
SA-C4	<p>Climate Change and Sea Level Rise Adaptation. Prepare for and adapt to a rising sea level.</p>				n/a	Actions taken.
	<ul style="list-style-type: none"> f. Support and integrate Climate Action Planning and implementation with the ongoing adaptation efforts of BayWAVE. g. Coordinate and integrate climate adaptation planning consistently throughout related City plans, including but not limited to the General Plan and its Safety Element, 	PLN/BLD/DPW	Ongoing	Medium		

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	<p>Local Hazard Mitigation Plan (LHMP), sea level rise adaptation plans, Community Wildfire Protection Plan, and emergency and capital improvement plans.</p> <p>h. Ensure fair and robust inclusion of lower-income households and diverse communities in the planning and response to climate change impacts, including sea level rise, wildfire, public health, and emergency preparedness.</p> <p>i. Collaborate with Marin cities and towns, the County of Marin, special districts, and regional bodies such as the Transportation Authority of Marin to coordinate and integrate planning.</p>					
	<p>j. Adopt a comprehensive climate change adaptation plan that prepares for and responds to the expected impacts of climate change.</p>	PLN/DPW	Med-Term	High		
CE-C1	Community Education. Work with community-based outreach organizations, such as Resilient Neighborhoods, to educate and motivate community members on ways to reduce greenhouse gas emissions in their homes, businesses, transportation modes, and other activities.	ADMIN / PLN	Near-Term	Low	n/a	Actions taken.
CE-C2	Community Engagement. Implement a communitywide public outreach and	ADMIN / PLN	Mid-Term	Medium	n/a	Actions taken.

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	<p>behavior change campaign to engage residents, businesses, and consumers around the impacts of climate change and the ways individuals and organizations can reduce their GHG emissions and create a more sustainable, resilient, and healthier community. Create an overarching theme to articulate a long-term goal, motivate community members, and brand a comprehensive suite of GHG-reduction programs. Prioritize promotion of programs that have the greatest greenhouse gas reduction potential while utilizing the best practices for public outreach and education. Emphasize and encourage citizens' involvement in reaching the community's climate goals, including innovative means of tracking milestones and comparing Larkspur's performance with other communities and with state, national and global benchmarks.</p>					
	<p>i. Conduct outreach to a wide variety of neighborhood, business, educational, faith, service, and social organizations.</p> <p>m. Inform the public about the benefits of installing energy and water-efficient appliances and fixtures, electrifying their homes and</p>	ADMIN/PLN/BLD/ DPW	Ongoing	Medium		

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	<p>commercial buildings, installing solar energy systems, and purchasing 100% renewable electricity.</p> <ul style="list-style-type: none"> n. Inform the public about the benefits of using carbon-free and low-carbon transportation modes, such as driving electric vehicles, walking, bicycling, taking public transportation, and ridesharing. o. Utilize and tailor existing marketing materials when available. a. Work with Marin County health and environmental services and other Marin agencies to promote the environmental (and health) benefits of a more plant-based diet, including growing food at home and purchasing locally produced food. b. Partner with MCE, PG&E, MMWD, Marin Sanitary Service, Transportation Authority of Marin, Marin Transit, Golden Gate Transit, SMART, and other entities to provide and promote equitable financing, audits, rebates, incentives, and services to the Larkspur community. c. Utilize the City's website, newsletters, social media, bill inserts, public service announcements and advertisements, recognition programs, and other forms of public outreach. d. Create stories and “shareable content” that can be used by residents, businesses, non-profits, in 					

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	<p>both the social media and the traditional media context.</p> <p>e. Use creative methods to engage the public, such as games, giveaways, prizes, contests, simple surveys, digital tools, and “pop-up” events.</p> <p>f. Develop pilot programs using community-based social marketing and other community outreach and incentive programs to encourage positive changes in local consumer habits.</p> <p>g. Participate in countywide outreach and education efforts, such as Drawdown: Marin.</p>					
CE-C3	Advocacy. Advocate at the regional, state, and federal levels for policies and actions that support the rapid transition to GHG-free energy sources, electrification of buildings and the transportation fleet, and other impactful measures to rapidly reduce greenhouse gas emissions.	ADMIN	Long-Term	Low	n/a	Actions taken.
CE-C5	Green Businesses. Encourage local businesses to participate in the Marin County Green Business Program through partnerships with the County, Chamber, and other business groups.	ADMIN	Near-Term	Low	n/a	Number of participating Larkspur businesses.
IM-C1	Annual Monitoring. Monitor and report on the City’s progress annually. Create an annual priorities list for implementation.	PLN	Near-Term/ annually	Medium	n/a	Progress reports and priorities list.

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IM-C2	Update GHG Emissions Inventories. Update and report the greenhouse gas emissions inventory for community emissions annually and every five years for government operations.	PLN	Near-Term/ annually	Low	n/a	GHG emissions inventory reports.
IM-C3	Funding Sources. Identify funding sources for recommended actions, and pursue local, regional, State, and federal grants as appropriate. Investigate creation of a local carbon fund or other permanent source of revenue to implement the Climate Action Plan.	ADMIN / PLN / DPW	Long-Term	High	n/a	Funds secured.
IM-C4	Update the Climate Action Plan. Update the Climate Action Plan regularly to incorporate new long-term reduction targets and strategies to meet those targets.	PLN	Long-Term	Medium	n/a	Updated plan.