

Air Quality and Greenhouse Gas

The Air Quality and Greenhouse Gas Element is a newer component of the General Plan. The City of San Ramon recognizes that this region continues to experience poor air quality on too many days each year and that the combined activities of the community and the region contribute to the generation of greenhouse gas emissions potentially linked to global climate change impacts. The Air Quality and Greenhouse Gas Element establishes a central place for policies to address the wide range of air quality issues facing the City of San Ramon and the region, including its role in reducing greenhouse gas emissions.

Global climate change is an issue that the State of California has determined to be of statewide concern that mandates local action throughout all of California. With the enactment of Assembly Bill 32 (AB 32), the California Global Warming Solutions Act of 2006, local governments are tasked with addressing greenhouse gas emission sources under their purview that potentially contribute to climate change. The General Plan provides an avenue for local government actions to reduce greenhouse gas emissions associated with new and existing development. The City is being proactive in addressing air quality and greenhouse gas emissions by preparing and implementing this General Plan Element and the related Climate Action Plan.

The Air Quality and Greenhouse Gas Element provides a platform within the General Plan for local action to address regional, State and federal air quality and climate change concerns. Local government will play a role in the successful implementation of AB 32. The California Air Resources Board (ARB) recognized the importance of local action and recommended a greenhouse gas reduction goal for local governments of 15 percent below 2009 levels by 2020. The proposed reduction will ensure that municipal and community-wide emissions are consistent with the State's reduction targets.

12.1 CONNECTIONS WITH OTHER GENERAL PLAN ELEMENTS

The Air Quality and Greenhouse Gas Element provides a bridge that inter-connects with other General Plan Elements. Air quality is impacted by many aspects of our built environment and the lifestyle choices we make. The impacts and interrelationships are characterized as the land use, transportation, air quality, economic development, and climate change connection.

This connection is based on the idea that the design, density, and pattern of land uses impact the transportation system that serves those land uses, and the transportation system, in turn, impacts the amount people drive and options for using less polluting and energy-consuming modes of transportation such as walking, bicycling, and transit. The policies of the Land Use Element with connections to air quality are those supporting compact development, density

near transit, pedestrian orientation, and design supportive of walking and bicycling. The Traffic and Circulation Element lays out the policies for developing the transportation system in a way that is consistent with and accommodates the growth planned in the Land Use Element. Traffic and Circulation Element policies, with air quality benefits, include those that promote the development of a multi-modal transportation system and prevent excessive traffic congestion. More specifically, policies in the Traffic and Circulation Element encourage “Complete Streets” designs that provide direct pedestrian connections, complete sidewalks, safe and comfortable bicycle paths, and routes connecting frequently accessed destinations with residences to help increase use of transit, walking, and bicycling. The Economic Development Element encourages Transportation Demand Management and transit as a means to solve workforce transportation issues that affect economic development, but also impacts air quality and the traffic circulation system. The Housing Element provides policies and programs that support energy conservation in new and renovated housing, which translates into greenhouse gas reductions. The Growth Management, Public Facilities and Utilities Elements contain policies that promote reduced pollutant and greenhouse gas emissions through energy savings related to water conservation and reclaimed water use.

12.2 HEALTH-BASED AIR QUALITY

AIR QUALITY ISSUES IN THE BAY AREA AND SAN RAMON

The following is an overview of air quality issues affecting this region. Air quality in San Ramon and the rest of the Bay Area has improved markedly since the regulation of air pollutant emissions began over 50 years ago. Although the air is cleaner, it still exceeds state and federal health-based standards on occasion for some pollutants. The federal health-based standards are called the National Ambient Air Quality Standards or (“federal standards”). State standards are called the California Ambient Air Quality Standards or (“California standards”). Information regarding the federal and state standards and the pollutants of concern in the Bay Area is provided below.

There are federal standards for six common air pollutants, called criteria air pollutants, which were identified in the federal Clean Air Act of 1970. The six criteria pollutants are:

- Ozone (O₃)
- Particulate matter (PM₁₀ and PM_{2.5})
- Nitrogen dioxide (NO₂)
- Carbon monoxide (CO)
- Lead
- Sulfur dioxide (SO₂)

The federal standards were set to protect public health, including the health of sensitive individuals; thus, the standards are revised as more medical research becomes available regarding the health effects of the criteria pollutants. The United States Environmental Protection Agency (EPA) is responsible for the federal standards.

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The California standards have been set for the 10 air pollutants designated in the California Clean Air Act. In addition to the pollutants listed above with federal standards, California has adopted standards for the following pollutants:

- Visibility-reducing particles
- Sulfates
- Hydrogen sulfide (H₂S)
- Vinyl chloride

Although California air quality standards are often more stringent than federal standards, the regulatory focus is often placed on achieving the federal standards. The primary reason for the focus on federal standards is that the federal Clean Air Act contains plan submittal and attainment deadlines that, if not met, result in sanctions and other federally enforceable requirements. The California Clean Air Act requires the implementation of all feasible controls and attainment of air quality standards at the earliest practicable date, but contains no penalties or sanctions. The Bay Area has attained all of the federal standards except for the new 8-hour ozone and PM_{2.5} standards, so its focus has turned to meeting the more stringent state mandates.

The agency with jurisdiction over air quality in this area is the Bay Area Air Quality Management District (BAAQMD). The BAAQMD is responsible for controlling and permitting industrial pollution sources and widespread, area-wide sources, and for adopting local air quality plans and rules. The BAAQMD adopted a number of plans to attain state and federal standards over the years. The 1999 and 2001 Ozone Attainment Plans were adopted to attain the one-hour federal ozone standard. The 1994 Clean Air Plan, and updates in 1997 and 2000 were adopted to attain the state one-hour ozone standard. The 2005 Ozone Strategy fulfills planning requirements for the state one-hour ozone standard and transport mitigation requirements. The BAAQMD recently adopted the 2010 Clean Air Plan that updates the 2005 Ozone Strategy and considers the impacts of ozone control measures on particulate matter (PM), air toxics, and greenhouse gases in a single, integrated plan. Although the Bay Area exceeds the new federal standards for fine particulate matter (PM_{2.5}) and 8-hour ozone, no new plans are currently required to demonstrate attainment of the standards.

As shown in Table 12-1, the Bay Area is designated “nonattainment” for the state 1-hour ozone standard, the state PM₁₀ standard, and the state PM_{2.5} standard. The Bay Area is also designated “nonattainment” for the federal 8-hour ozone standard and the federal 24-hour PM_{2.5} standard. This means that Bay Area residents experience unhealthy air quality at times.

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Table 12-1: Bay Area Air Basin Attainment Status

| <i>Pollutant</i> | <i>Averaging Time</i> | <i>State Status</i> | <i>Federal Status</i> |
|-------------------|-----------------------|---------------------|----------------------------------|
| Ozone | 1-hour | Nonattainment | Not Applicable ¹ |
| | 8-hour | Nonattainment | Nonattainment ² |
| Carbon monoxide | 1-hour and 8-hour | Attainment | Attainment ³ |
| Nitrogen dioxide | 1-hour | Attainment | Unclassified ⁴ |
| | Annual | No state standard | Attainment |
| Sulfur dioxide | 24-hour; 1-hour | Attainment | Attainment |
| PM ₁₀ | 24-hour | Nonattainment | Unclassified |
| | Annual | Nonattainment | No federal standard ⁵ |
| PM _{2.5} | 24-hour | No state standard | Nonattainment ⁶ |
| | Annual | Nonattainment | Attainment |

Notes:

¹ The national 1-hour ozone standard was revoked by EPA on June 15, 2005.

² Final designations effective July 20, 2012.

³ In April 1998, the Bay Area was redesignated to attainment for the national 8-hour carbon monoxide standard.

⁴ EPA set a new one-hour standard for nitrogen dioxide (NO₂) at a level of 100 parts per billion (ppb) on January 25, 2010, which will become effective April 12, 2010. EPA expects to identify or designate areas not meeting the new standard, based on the existing community-wide monitoring network, by January 2012.

⁵ EPA revoked the annual PM₁₀ standard on September 21, 2006.

⁶ EPA designated the Bay Area nonattainment of the 24-hour PM_{2.5} standard on December 22, 2008, and the designation will go into effect 90 days after publication in the Federal Register.

Source: Bay Area Air Quality Management District, Air Quality Standards and Attainment Status, 2014.

Air pollution readings are recorded at monitoring stations around the Bay Area to provide information to the public regarding the current air quality and to determine if violations of air quality standards have occurred. The closest monitoring station to San Ramon is located in Livermore approximately 11 miles to the east-southeast. While the data is not specific to the City of San Ramon, air quality conditions are expected to be similar for adjacent communities and may suggest local air quality concerns. The Livermore monitoring station stopped monitoring Particulate Matter 10 (PM₁₀) in 2008. No other stations close to San Ramon have the same meteorological conditions and would therefore not be representative of emissions in San Ramon. The maximum recorded concentrations at the Livermore monitoring station and the number of days that state and federal air quality standards were exceeded during 2011 through 2013 are provided in Table 12-2.

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Table 12-2: Ambient Air Monitoring Data (2011–2013)

| <i>Air Pollutant, Averaging Time (Units)</i> | <i>2011</i> | <i>2012</i> | <i>2013</i> |
|---|-------------|-------------|-------------|
| <i>Ozone (Livermore)</i> | | | |
| Max 1 Hour (ppm) | 0.115 | 0.102 | 0.096 |
| Days > CAAQS (0.09 ppm) | 3 | 2 | 3 |
| Max 8 Hour (ppm) | 0.084 | 0.090 | 0.077 |
| Days > CAAQS (0.07 ppm) | 2 | 3 | 1 |
| Days > NAAQS (0.08 ppm) | 9 | 4 | 2 |
| <i>Particulate Matter (PM_{2.5}) (Livermore)</i> | | | |
| Mean (µg/m ³) | 7.8 | 6.6 | 8.4 |
| 24 Hour (µg/m ³) | 45.4 | 31.1 | 40.1 |
| Days > NAAQS (35 µg/m ³) | 2 | 0 | 4 |

Abbreviations:

> = exceed ppm = parts per million µg/m³ = micrograms per cubic meter max = maximum

CAAQS = California Ambient Air Quality Standard

NAAQS = National Ambient Air Quality Mean = Annual Arithmetic Mean

Source: ARB Air Quality Data/Statistics/Top 4 Summary, 2013.

FEDERAL, STATE, REGIONAL, AND LOCAL RESPONSIBILITIES

The U.S. Environmental Protection Agency (EPA) is responsible for international, national, and interstate air pollution issues and policies. The EPA sets national vehicle and stationary source emission standards, oversees approval of all State Implementation Plans, and provides research and guidance in air pollution programs.

The California Air Resources Board (ARB) is the state agency with primary authority over State air quality regulation and is responsible for developing and periodically updating the California standards. The ARB is responsible for the California State Implementation Plan required to demonstrate attainment and continued compliance with federal standards. Because of California's severe air quality challenges, the federal Clean Air Act authorizes California to adopt mobile source emission standards that are more stringent than imposed by the EPA. The ARB regulates on-road and off-road mobile sources, consumer products, and fuels. Other responsibilities include air quality research on health effects, atmospheric chemistry, air quality modeling, monitoring and other implementation programs.

The BAAQMD is responsible for air quality regulations at the regional and local level and regulates stationary (industrial) air pollutant emission sources, area-wide sources, and certain transportation sources. The BAAQMD also operates grant and incentive programs, conducts air monitoring, and enforces its rules and regulations. The BAAQMD prepares plans to attain state and federal standards. The BAAQMD recently completed the 2010 Clean Air Plan to provide a comprehensive strategy to reduce emissions from stationary and mobile

emission sources. The plan addresses ozone, particulate matter, air toxics, and greenhouse gas emission in a single, integrated plan. The plan was adopted by the BAAQMD Board on September 15, 2010.

The City of San Ramon works cooperatively with the BAAQMD, the Association of Bay Area Governments (ABAG), and the Bay Area Metropolitan Transportation Commission (MTC) on air quality issues related to land use and transportation. Local government's control of development and its ability to condition new development, to impose mitigation measures, and to set development standards provide substantial opportunities to reduce air pollutant emissions.

TOXIC AIR CONTAMINANTS

Health and Safety Code Section 39655 defines toxic air contaminants as an air pollutant that the California Air Resources Board or the Department of Food and Agriculture finds "may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose present or potential hazard to human health."

When approving discretionary projects, the City has the ability to consider the location of potential sources of hazardous emissions to ensure appropriate distances from existing and planned sensitive land uses. Likewise, when considering the location of potentially sensitive land uses near stationary and mobile sources of toxic air contaminants, the City should exercise discretion to ensure that potential impacts are properly addressed and appropriately mitigated.

A toxic air contaminant (TAC) of concern for the City is Fine Particulate Matter ($PM_{2.5}$). $PM_{2.5}$ is a complex mixture of substances that includes elements such as carbon and metals; compounds such as nitrates, organics, and sulfates; and complex mixtures such as diesel exhaust and wood smoke. $PM_{2.5}$ can be emitted directly from manmade sources and can also be formed in the atmosphere through reactions among different pollutants; however, assessing local community risk and hazard impacts relates only to direct $PM_{2.5}$ emissions, not those formed in the atmosphere.

Evidence suggests that $PM_{2.5}$ is the most harmful air pollutant in the San Francisco Bay Area Air Basin in terms of the associated impact on public health. TAC and $PM_{2.5}$ fall within two broad categories, stationary sources and mobile sources. Common stationary source types of TAC and $PM_{2.5}$ emissions include gasoline stations, dry cleaners, and diesel backup generators. Stationary sources are regulated through BAAQMD permit requirements and are generally identified on local inventories and acknowledged and addressed through local environmental review.

Common mobile sources are on-road motor vehicles on freeways and roads such as trucks and cars, and off-road sources such as construction equipment. Mobile sources are prevalent in many communities based on regional roadway networks that carry higher levels of vehicle and truck traffic.

SITING OF SENSITIVE RECEPTORS

If a new project is likely to be a place where people live, play, or convalesce, it should be considered a receptor. A project or land use should also be considered a receptor if sensitive

individuals are likely to spend a significant amount of time at that location. Sensitive individuals refer to those segments of the population most susceptible to poor air quality: children, the elderly, and those with pre-existing serious health problems affected by air quality (ARB 2005). Examples of receptors include residences, schools and school yards, parks and play grounds, daycare centers, nursing homes, and medical facilities. Residences can include houses, apartments, and senior living complexes. Medical facilities can include hospitals, convalescent homes, and health clinics. Playgrounds could be play areas associated with parks or community centers.

Policy 12.5-I-1 addresses the location of sources of hazardous emissions as well as sensitive land uses in order to minimize or avoid potential health risks to people that might result from hazardous air pollutant emissions. When siting a new source or receptor, the existing or future proposed sources of TAC and/or PM_{2.5} emissions that would adversely affect individuals within the planned project should be examined. Stationary sources are typically known and are identified on existing inventories; however, mobile sources such as freeways and high traffic arterial roadways are more difficult to identify with certainty absent additional analysis.

To address the issue of mobile TAC and/or PM_{2.5} emissions associated with the local transportation network, Figure 12-1 delineates a 1,000 ft screening zone from identified potential mobile sources. The screening zones have been established based on the average daily trip on the roadway (over 10,000 average daily trips) and distance criteria (1000 feet) provided for in the BAAQMD CEQA guidelines. In addition, Policy 12.4-I-3 requires analysis of sensitive receptors and these screening zones will assist in identifying potential conflicts between air quality issues and land uses. The fact that a sensitive receptor land use is proposed on a property within the established screening zone does not exclude approval of such uses, but rather suggests that additional air quality and health screening should be considered based on the specific project characteristic and location to determine any potential health impacts and if mitigation measures may be necessary.

12.3 CLIMATE CHANGE AND GREENHOUSE GASES

The greenhouse effect results when shortwave solar radiation is readily transmitted through the atmosphere on the way in, but longer-wave infrared radiation is prevented from being transmitted out as it is absorbed by atmospheric gases often referred to as greenhouse gases. The greenhouse gases trap heat near the surface of the earth, resulting in heating of the atmosphere. Rising levels of greenhouse gases that result from human activities are of concern because of the potential to change the global climate in an adverse way. Although uncertainty regarding the cause of climate change exists, there is broad scientific consensus that actions should be taken to reduce greenhouse gas emissions as well as air quality criteria pollutants.

The State of California has taken action with the adoption of the California Global Warming Solutions Act of 2006 (AB 32). The legislative findings from AB 32 articulate California's position regarding why action is needed:

38501. The Legislature finds and declares all of the following:

Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the State from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

STATE REGULATIONS AND INITIATIVES

Assembly Bill 32

The California State Legislature adopted Assembly Bill 32, the California Global Warming Solutions Act of 2006 (AB 32), which charged the California Air Resources Board (ARB) to develop regulations on how the State would address global climate change. AB 32 focuses on reducing greenhouse gas emissions in California. Greenhouse gases, as defined under AB 32, include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur-hexafluoride (SF₆), hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs).

The ARB approved the 1990 greenhouse gas emissions level of 427 MMTCO₂e on December 6, 2007 (ARB 2007). Therefore, emissions generated in California in 2020 were required to be equal to or less than 427 MMTCO₂e. Emissions in 2020 in a “business as usual” scenario are estimated to be 596 MMTCO₂e, which did not account for reductions from AB 32 regulations (California Air Resources Board 2008). At that level, a 28 percent reduction was required to achieve the 427 million MTCO₂e 1990 inventory. In October 2010, ARB prepared an updated 2020 forecast to account for the recession and slower forecasted growth. The forecasted inventory without the benefits of adopted regulation is now estimated at 545 million MTCO₂e. Therefore, under the updated forecast, a 21.7 percent reduction from “business as usual” (BAU) is required to achieve 1990 levels (ARB 2010).

California Air Resources Board (ARB) Scoping Plan

The ARB’s Climate Change Scoping Plan (Scoping Plan) contains measures designed to reduce the State’s emissions to 1990 levels by the year 2020 to comply with AB 32 (ARB 2008). The Scoping Plan identifies recommended measures for multiple greenhouse gas emission sectors and the associated emission reductions needed to achieve the year 2020 emissions target—each sector has a different emission reduction target. Most of the measures target the transportation and electricity sectors.

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LEGEND

1,000 FT. SCREENING ZONE



Source: San Ramon Average Daily Traffic Map (2014)

POLITICAL BOUNDARIES *

- Urban Growth Boundary
- City Limits
- Sphere of Influence
- Planning Area Boundary
- County Boundary

* The locations of political boundaries are shown adjacent to each other for ease of identification. Actual political boundaries are coterminous when shown as contiguous, parallel, or overlap.



Figure 12-1
Mobile Source Air Quality Screening Zones

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The Scoping Plan differentiates between “capped” and “uncapped” strategies. Capped strategies are subject to the cap-and-trade program, which became effective January 1, 2012. The Scoping Plan states that the inclusion of these emissions within the cap-and-trade program will help ensure that the year 2020 emission targets are met despite some degree of uncertainty in the emission reduction estimates for any individual measure. Implementation of the capped strategies is calculated to achieve a sufficient amount of reductions by 2020 to achieve the emission target contained in AB 32. Uncapped strategies that will not be subject to the cap-and-trade emissions caps and requirements are provided as a margin of safety by accounting for additional greenhouse gas emission reductions.¹

ARB Scoping Plan Update

The ARB approved the First Update to the Scoping Plan (Update) on May 22, 2014. The Update identifies the next steps for California’s climate change strategy. The Update shows how California continues on its path to meet the near-term 2020 greenhouse gas limit, but also sets a path toward long-term, deep GHG emission reductions. The report establishes a broad framework for continued emission reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050. The Update identifies progress made to meet the near-term objectives of AB 32 and defines California’s climate change priorities and activities for the next several years. The Update does not set new targets for the State, but describes a path that would achieve the long term 2050 goal of Executive Order S-05-03 for emissions to decline to 80 percent below 1990 levels by 2050 (ARB 2014).

The ARB has no legislative mandate to set a target beyond the 2020 target from AB 32 or to adopt additional regulations to achieve a post-2020 target. The Update estimates that reductions averaging 5.2 percent per year would be required after 2020 to achieve the 2050 goal. With no estimate of future reduction commitments from the State, identifying a feasible strategy including plans and measures to be adopted by local agencies is not possible. Implementation of the City’s General Plan Update and CAP will help support both the short term and long term objectives of the Update. However, there is no way of determining whether the City would need to take additional actions beyond its existing programs and the land use and transportation strategies contained in the General Plan Update and CAP until such a time as new state targets and a new Scoping Plan with mandatory measures is adopted.

¹ On March 17, 2011, the San Francisco Superior Court issued a final decision in *Association of Irrigated Residents v. California Air Resources Board* (Case No. CPF-09-509562). While the Court upheld the validity of the ARB Scoping Plan for the implementation of AB 32, the Court enjoined the ARB from further rulemaking under AB 32 until the ARB amends its CEQA environmental review of the Scoping Plan to address the flaws identified by the Court. On May 23, 2011, ARB filed an appeal. On June 24, 2011, the Court of Appeal granted the ARB’s petition staying the trial court’s order pending consideration of the appeal. In the interest of informed decision-making, on June 13, 2011, the ARB released the expanded alternatives analysis in a draft Supplement to the AB 32 Scoping Plan Functional Equivalent Document. The ARB Board approved the Scoping Plan and the CEQA document on August 24, 2011.

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Senate Bill 375

State Senate Bill 375 (SB 375) was signed into law on September 30, 2008. This legislation addresses one facet of implementation of the AB 32. The bill assures that the decisions about how to achieve travel-related greenhouse gas emissions from cars and light trucks will remain in the hands of locally elected officials. SB 375 aligns what have been three separate planning processes—one for transportation, housing, and for reducing greenhouse gas emissions—into a single process. The legislation provides more certainty for General Plans and better coordination between state agencies.

SB 375 provides exemptions from the California Environmental Quality Act (CEQA) for residential projects that are consistent with the regional plan to achieve greenhouse gas reductions. The bill also amends the housing element law, extending the amount of time that the State has to review most local housing elements from five to eight years. It provides a foundation for a comprehensive approach to reducing greenhouse gas emissions from the land use and transportation sector. SB 375 seeks to harness funding and regulatory incentives to align transportation, housing and land use planning.

Especially important for local government are the regional Sustainable Communities Strategy (SCS) and the Alternative Planning Strategy (APS) requirements of the legislation. The ARB must certify that the region's SCS will achieve its greenhouse gas emission reduction targets. Projects outside the approved SCS would not qualify for federal transportation funding. If the ARB determines that a region's SCS will not achieve the greenhouse gas emission reduction targets, the Metropolitan Planning Organization must prepare an Alternative Planning Strategy, separate from the Regional Transportation Plan (RTP), identifying further measures needed to achieve the targets. Although these measures directly impact RTPs prepared by the Metropolitan Transportation Commission (MTC), the success of the Sustainable Communities Strategy/Alternative Planning Strategy depends on the land use decisions by local land use agencies. The ARB adopted final SB 375 regional targets on September 23, 2010.

The Association of Bay Area Governments (ABAG) adopted the Plan Bay Area that includes the 2040 Regional Transportation Plan (RTP) and Sustainable Communities Strategy (SCS) on July 18, 2013 (ABAG 2013). The RTP describes the strategy to achieve the SB 375 targets for the Bay Area. A technical evaluation of the strategy prepared by the ARB in April 2014 identifies a 4.1 percent reduction in emission per capita by 2020 and 8.7 percent per capita by 2035 (ARB 2014). The SCS includes a full range of land use and transportation strategies to guide future growth in the region in ways that reduce greenhouse gas emissions.

Senate Bill 743

Senate Bill 743 (Steinberg, 2013) made several changes to the California Environmental Quality Act (CEQA) for projects located in areas served by transit (i.e., transit-oriented development or TOD). Those changes direct the Governor's Office of Planning and Research to develop a new approach for analyzing the transportation impacts under CEQA. Candidate metrics include, but are not limited to Vehicle Miles Traveled, Automobile Miles Generated, Multi-modal Level of Service, Fuel Use and/or Vehicle Hours Traveled and which are all being considered as new measures to assess traffic impacts. Regardless of which methodology is ultimately adopted, the measure will likely be directly correlated to GHG

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reduction strategies contained in this Element and the CAP. As such, the quantification of GHG impacts associated with future project traffic will be easily measurable in the context of the CAP as opposed to the current LOS and delay based methodologies. LOS standards may still be used for local goals and objectives; however, once the new methodology is adopted, LOS standards will no longer be the tool for CEQA impact analysis.

GREENHOUSE GAS DESCRIPTIONS

The EPA describes the global warming potential as the potential of a gas or aerosol to trap heat in the atmosphere; Individual greenhouse gas compounds have varying properties, global warming potential and atmospheric lifetimes. To simplify the measurement and quantification of global warming potential (GWP) associated with greenhouse gas emissions, carbon dioxide has been established as the reference gas. Carbon dioxide has a global warming potential of 1, which easily allows other greenhouse gases to be converted to carbon dioxide equivalent (CO₂e) to simplify calculations. The calculation of the carbon dioxide equivalent is a consistent methodology for comparing greenhouse gas emissions, since it normalizes various greenhouse gas emissions to a consistent metric. Methane's warming potential of 21 indicates that methane has a 21 times greater warming effect than carbon dioxide on a molecule per molecule basis. A carbon dioxide equivalent is the mass emissions of an individual greenhouse gas multiplied by its GWP.

Table 12-3 provides a description of the characteristics of greenhouse gases that are regulated under AB 32.

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Table 12-3: Greenhouse Gas Descriptions

| <i>Greenhouse Gas</i> | <i>Description and Physical Properties</i> | <i>Sources</i> |
|-----------------------------------|---|--|
| Methane (CH ₄) | Methane is a flammable gas and is the main component of natural gas. Global Warming Potential (GWP) = 21. | Methane is extracted from geological deposits (natural gas fields). Other sources are from landfills, decay of organic matter, fermentation of manure, and cattle. |
| Nitrous oxide (N ₂ O) | Nitrous oxide is also known as laughing gas and is a colorless greenhouse gas. GWP = 310. | Microbial processes in soil and water, fuel combustion, and industrial processes. |
| Carbon dioxide (CO ₂) | Carbon dioxide is an odorless, colorless, natural greenhouse gas. GWP = 1. | Carbon dioxide is emitted from natural and anthropogenic sources. Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood. |
| Hydrofluorocarbons (HFCs) | The HFCs with the largest measured atmospheric concentrations are HFC-23 and HFC-134a (10 ppt), and HFC-152a (1 ppt). GWPs: HFC-23 = 11,700 HFC-134a = 1,300 HFC-152a = 140 | HFCs are synthetic chemicals that are used as a substitute for chlorofluorocarbons in applications such as automobile air conditioners and refrigerants. |
| Perfluorocarbons (PFCs) | PFCs have stable molecular structures and only break down by ultraviolet rays about 60 kilometers above Earth's surface. Because of this, PFCs have very long lifetimes, between 10,000 and 50,000 years. GWPs range from 6,500 to 9,200. | Two main sources of PFCs are primary aluminum production and semiconductor manufacturing. |
| Sulfur hexafluoride | Sulfur hexafluoride is an inorganic, odorless, colorless, and nontoxic, nonflammable gas. Concentrations in the 1990s were about 4 ppt. It has the highest GWP of any gas evaluated, 23,900. | This gas is man-made and used for insulation in electric power transmission equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas. |

Notes:

ppm = parts per million; ppt = parts per trillion (measure of concentration in the atmosphere); GWP = global warming potential.

Source: Compiled from a variety of sources, including EPA, Global Warming Potentials and Atmospheric Lifetimes, 2006 and Intergovernmental Panel on Climate Change, 2007.

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Table 12-4 and Figure 12-2 show the generation of California’s greenhouse gas emissions by major economic sector. The top three sectors are transportation, electric power generation, and industrial fuel use. These sectors are integral to our daily activities and so reducing emissions from these sectors is likely to affect many aspects of our lives.

Table 12-4: California Greenhouse Gas Emissions Inventory in 2012 by Economic Sector

| <i>Sector¹</i> | <i>2012 Emission (Millions of Metric Tons of CO₂ Equivalent/Year)</i> | <i>Percentage of Inventory</i> |
|--|--|------------------------------------|
| Transportation | 167.4 | 36.5 |
| Electric Power | 95.1 | 20.7 |
| Commercial and Residential Fuel Use | 42.3 | 9.2 |
| Industrial Fuel Use | 89.2 | 19.4 |
| Recycling and Waste | 8.3 | 1.9 |
| High Global Warming Potential Gases ² | 18.4 | 4.0 |
| Agriculture | 37.9 | 8.3 |
| Total Emissions | 458.7 | 100.0 |

Notes:

¹ Sequestration of emissions from forestry activities is not included. Emission categories are as defined in the ARB Scoping Plan.

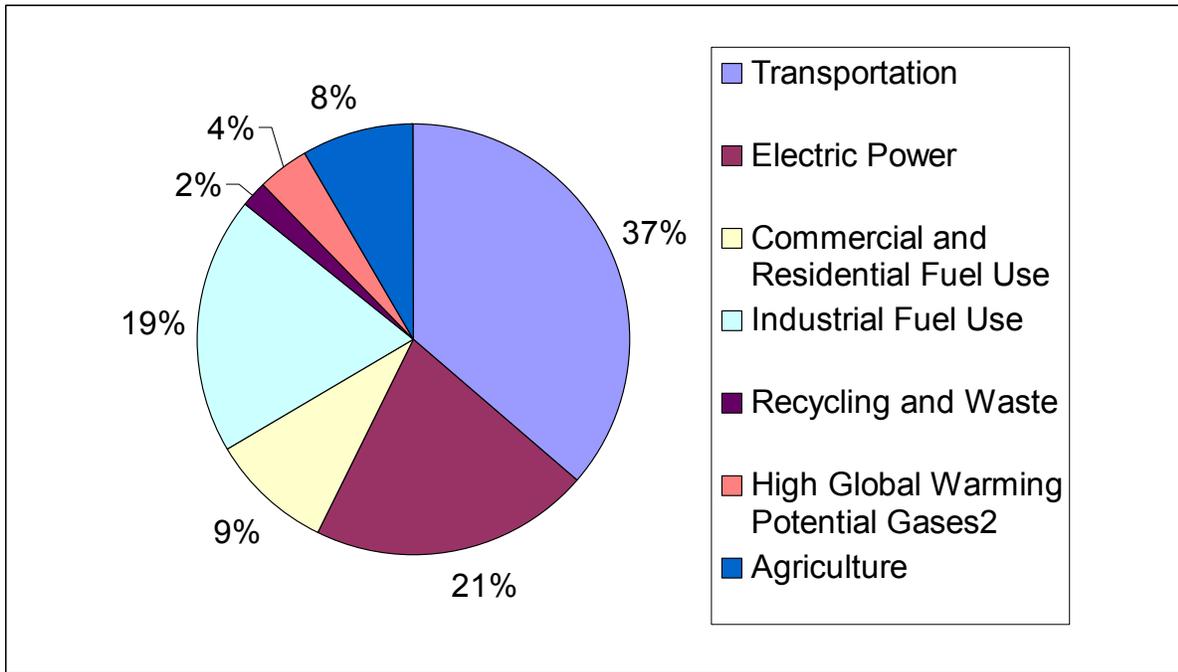
² High global warming potential gases persist in the atmosphere for tens to hundreds of years in the atmosphere, thus increasing their impact. High global warming potential gases are used as refrigerants, fire suppressants, and the manufacture of semiconductors and foam products.

Source: ARB 2014 California Greenhouse Gas Inventory for 2000-2012 by Category as Defined in the Scoping Plan, last updated May 2014.

It is instructive to consider greenhouse gas emissions at a smaller scale for perspective. The following examples are from emission estimates from the ARB and other sources:

- 1 kWh of electricity = approximately 1 lb. CO₂e
- 1 therm of natural gas = approximately 12 lbs. CO₂e
- 1 gallon of gasoline = approximately 20 lbs. CO₂e
- 1 mile of driving at 20 miles per gallon = 1 lb. CO₂e
- California 2012 per person emissions = 12.1 metric tons/year CO₂e

Figure 12-2: California Greenhouse Gas Emissions Inventory 2012



Source: California Air Resources Board Emissions Inventory 2014.

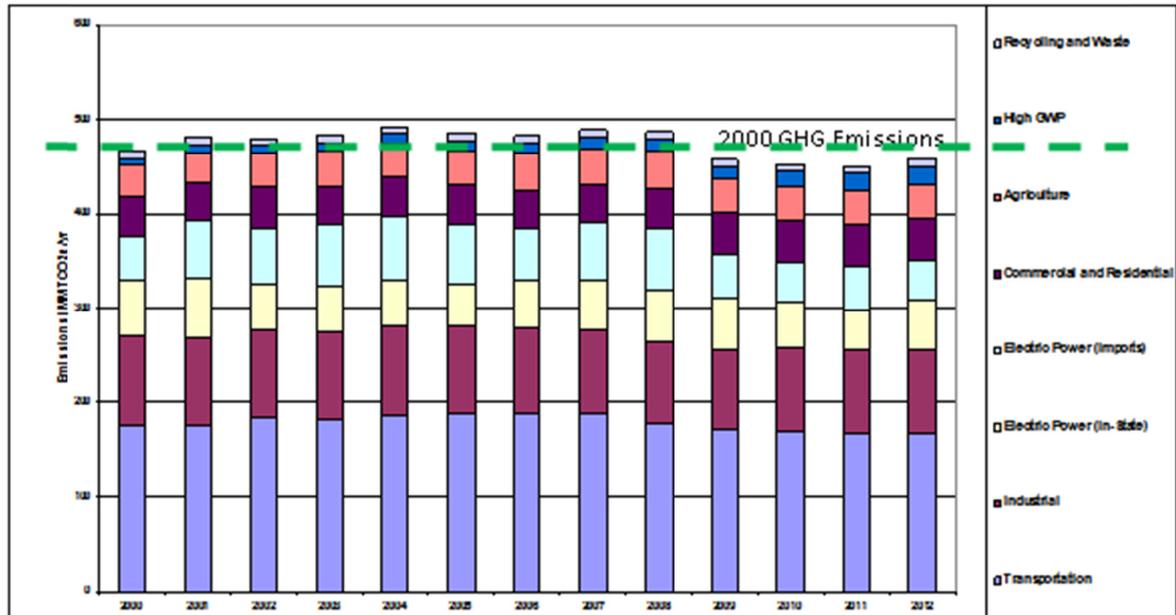
STATE TARGETS

The ARB Scoping Plan contains emission targets for the year 2020 of 427 million metric tons of CO₂e (MMTCO₂e) based on a goal of returning California’s emissions to 1990 levels. California’s 2006 emission inventory was 484 MMTCO₂e, but is projected to grow to 545 MMTCO₂e by 2020 if no action were taken to limit the cumulative increase in emissions related to population and economic growth. This was revised from 596 to 545 MMTCO₂e after updated data from the 2000-2010 inventory. Therefore, reaching the target level of 427 MMTCO₂e by 2020 requires reductions amounting to 118 MMTCO₂e or 21.7 percent below projected 2020 levels.

Figure 12-3 displays California’s greenhouse gas emission trends from 2000 to 2012. AB 32 requires California to reduce its emission inventory to 1990 levels by 2020. The State has made substantial progress toward meeting this goal. Additionally, the State has achieved the goal of Executive Order S-05-03 to reduce emissions to 2000 levels by 2010. A statewide emission reduction mandate beyond 2020 does not currently exist; however, Executive Order S-05-03 also includes an ultimate target of reducing emissions in 2050 to 80 percent below 1990 levels. Reductions of that magnitude would require the transformation of the State’s energy sources and the widespread implementation of zero emission technologies that are not currently developed or commercially available.

Air Quality and Greenhouse Gas

Figure 12-3: California Greenhouse Gas Emissions Trends 2000 to 2012



Source: ARB, 2014, GHG Update Report.

KEY ELEMENTS FOR ACHIEVING CALIFORNIA'S 2020 TARGET

The ARB Scoping Plan outlines the key elements of California's strategy for reducing its greenhouse gas emissions to 1990 levels by 2020 and includes:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewable energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing state laws and policies, including California's Clean Car standards, Goods Movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation.

The ARB Scoping Plan includes descriptions and anticipated emission reductions for each strategy proposed to achieve California's greenhouse gas reduction goals, and it includes a discussion of the role of local government in achieving these goals. The ARB encourages local governments to adopt a reduction goal for municipal operations emissions and move

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toward establishing similar goals for community emissions that parallels the State's commitment to reduce greenhouse gas emissions by 15 percent from 2008 levels by 2020.

SAN RAMON GREENHOUSE GAS EMISSIONS

Table 12-5 provides San Ramon's 2014 community greenhouse gas emissions (GHG) inventory. This is an updated inventory from the previous 2008 community GHG emissions inventory. The updated inventory was prepared as part of the San Ramon Climate Action Plan Greenhouse Gas Inventory Update Report (2014). The inventory provides a baseline to identify emission reduction opportunities and to model future year emission targets. The percentage contribution of each sector is also illustrated in Figure 12-4.

Table 12-5: City of San Ramon Community Greenhouse Gas Emissions in 2014 by Sector

| <i>Sector</i> | <i>Equivalent CO₂ (tons/year)</i> | <i>Equivalent CO₂ (%)</i> | <i>Energy (MMBtu)</i> |
|---|--|--|---------------------------|
| Motor Vehicles | 374,636 | 57 | — |
| Electricity (Residential, Commercial, Municipal, Water Transport) | 76,604 | 12 | — |
| Natural Gas (Residential, Commercial, Municipal) | 101,637 | 16 | 1,910,217.4 |
| Waste | 16,382 | 3 | — |
| Offroad equipment | 30,628 | 5 | — |
| ODS Substitutes | 45,709 | 7 | — |
| Total | 645,596 | 100.0 | 1,910,217.4 |

Notes:

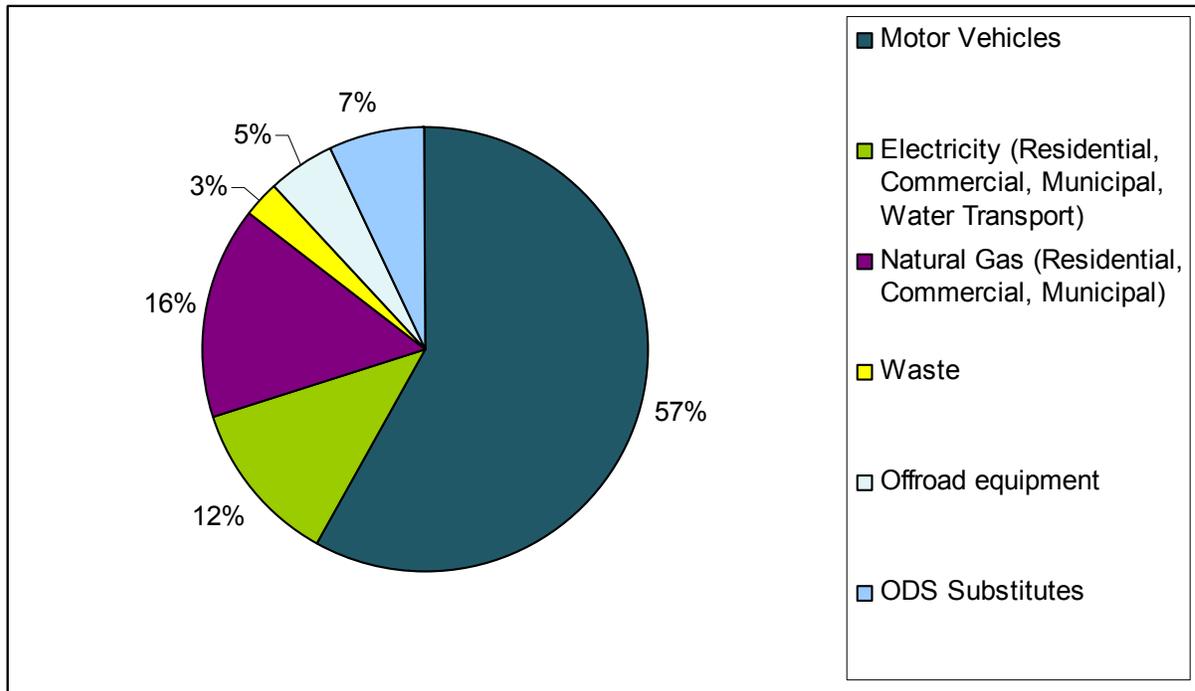
Generated for San Ramon using STAPPA/ALAPCO and ICLEI-Local Governments for Sustainability Clean Air and Climate Protection Software developed by Torrie Smith Associates, Inc.

Alternative Daily Cover is defined by the California Integrated Waste Management Board as materials other than soil used at a landfill on all surfaces of the fill where no additional solid waste will be deposited within 180 days.

Source: FirstCarbon Solutions, 2014.

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Figure 12-4: San Ramon Community Greenhouse Gas Emissions Inventory 2014



Source: FirstCarbon Solutions, 2014.

Ozone Depleting Substances (ODS). ODS include chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), halons, methyl bromide, carbon tetrachloride, hydrobromofluorocarbons, chlorobromomethane, and methyl chloroform. Substitutes are alternative to these compounds that have a lesser impact on GHG generation.

SAN RAMON STRATEGIES

San Ramon has committed to reducing local air pollutant and greenhouse gas emissions through actions under its purview. The City's influence over the density and design of land use projects and the local transportation system allow for potentially significant reductions in transportation-related emissions. The City also has substantial influence over the energy use from new development through conditions of approval based on proportional impacts and established regulation, CEQA mitigation measures, design standards, green building standards, and incentive programs. The City can reduce emissions from government operations by incorporating green building techniques, and energy efficiency into City capital improvement projects and purchasing decisions. To further this effort, the General Plan 2030 called for the formation of an a City Council appointed body to monitor the City's progress in implementation of the City's Climate Action Plan and other programs to achieve the reduction targets identified in AB 32. The General Plan 2035 continues the policies of monitoring and updating the CAP as necessary to achieve reduction targets.

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The Air Quality and Greenhouse Gas Element includes policies that support local actions, including:

- Cooperation with regional agencies and private companies on multi-jurisdictional strategies
- Encouraging smart growth
- Supporting transit oriented development
- Promoting multimodal transit and Complete Streets
- Supporting pedestrian-oriented development
- Providing facilities that encourage bicycling
- Requiring solar-ready roofs where feasible
- Establishing green building standards
- Promoting water conservation
- Encouraging Recycling and solid waste reduction
- Promoting energy conservation
- Supporting the use of renewable energy sources and low-carbon fuels including electric and fuel cell (hydrogen) vehicles.
- Encouraging Transportation Demand Management programs

CLIMATE ACTION PLAN (CAP)

The City has prepared a Climate Action Plan as the primary implementation strategy for its greenhouse gas policies. The City adopted the CAP concurrently with the General Plan 2030. The General Plan 2035 continues the CAP implementation strategy and the CAP document contains the following components:

- Baseline and future year emission inventories for the community and local government operations;
- Emission reduction estimates from potential reduction measures and strategies;
- Emission reduction targets for 2020 and 2035;
- Descriptions of strategies selected to achieve targets; and
- Implementation plan with mechanisms for monitoring and course corrections.

12.4 REGIONAL COORDINATION

Air quality is a truly regional concern. Air pollutants can travel long distances and do not recognize political boundaries. Regional travel is a substantial contributor to air quality impacts affecting the region and San Ramon. The City's participation in regional air quality and transportation programs and initiatives can help ensure consistency in implementation and best use of resources.

Air Quality and Greenhouse Gas

GUIDING POLICIES

- 12.4-G-1 Improve and protect San Ramon's air quality and promote improvements in subregional air quality.

IMPLEMENTING POLICIES

- 12.4-I-1 Cooperate with other local, regional, and state agencies to achieve and maintain air quality standards.

Effective governmental coordination and cooperation in on-going government programs requires proactive and sustained effort. The differing responsibilities and constituencies of cities and counties, along with those of state, federal and regional agencies, will require a commitment by all to reduce land use-based sources of air pollution that affect our public health and quality of life. Working together for a common interest can multiply the resources available to accomplish air quality goals.

- 12.4-I-2 Establish a City Council-appointed body or other similar entity to assist in monitoring the City's progress in meeting greenhouse gas emissions targets.

The appointed body will be responsible for overseeing the appropriate City department(s) who are responsible for implementing the City's Climate Action Plan. To coordinate efforts, a Climate Change Coordinator should be identified who will be a single point of contact to coordinate efforts to reduce the City's greenhouse gas emissions. These efforts may include expanded recycling programs, water conservation, review of maintenance practices, green building programs, fleet services, etc.

- 12.4-I-3 Analyze the air quality and climate change impacts of discretionary projects using applicable regulatory guidance; for example, the BAAQMD's CEQA Air Quality Guidelines.

Stationary and mobile TAC and/or PM_{2.5} emissions should be evaluated in the context of existing and planned sensitive receptors. Figure 12-1 identifies areas within the City, based on roadway traffic volumes may result in potential health concerns sensitive receptors absent project specific mitigation as a result of mobile TAC. New discretionary projects, classified as sensitive receptors, located within the established buffer zones should conduct additional air quality analysis and identify any necessary mitigation measures.

- 12.4-I-4 Use the City's environmental review process to impose appropriate mitigation measures on new development to reduce air quality and greenhouse gas emissions impacts.

Mitigation measures appropriate for the type of project and its physical location can reduce air quality and greenhouse emissions impacts through reduced energy use and motor vehicle use. The adoption of SB 743 will likely change the way traffic impacts are mitigated based on a vehicle or trip standard as opposed to a delay and level of service standard.

- 12.4-I-5 Work with the Bay Area Air Quality Management District (BAAQMD), the Metropolitan Transportation Commission (MTC), and transit providers to implement the regional Clean Air Plan.

The regional Clean Air Plan includes transportation control measures that reduce vehicle emissions by increasing transit use, carpooling, bicycling and walking. Many of these measures are reliant on local government action for implementation. The City works closely with the BAAQMD and the MTC to implement applicable measures in San Ramon.

- 12.4-I-6 Educate residents on the linkage between land use, transportation, water and energy use and air pollution. Efforts should include measures that can be taken and resources that are available to improve air quality and reduce potential climate change impacts.

Without the understanding and support of the general public, local air quality and climate change prevention programs cannot be expected to achieve the desired results. Illustrating the livability and other benefits of land use and transportation measures such as increased density near transit or reduced street widths and traffic calming can increase support for these measures. Educating the public on air quality issues is a vital component of a successful air quality program. For example, the BAAQMD's Spare the Air Program includes measures that encourage the public to reduce polluting activities on bad air days such as ridesharing, free transit passes, and fireplace use curtailment.

12.5 AIR QUALITY, LAND USE, AND TRANSPORTATION

GUIDING POLICIES

- 12.5-G-1 Improve air quality by integrating air quality, land use, and transportation planning that incorporates appropriate project location, design, and application of best available technologies.

IMPLEMENTING POLICIES

- 12.5-I-1 Minimize air quality and climate change impacts through project review, evaluation, and conditions of approval when planning the location and design of land use projects and transportation system projects needed to accommodate expected City population growth.
- 12.5-I-2 Support and encourage projects proposing infill, and mixed use development that creates walkable neighborhoods and communities and increases access to transit.

Strategies that reduce air quality impacts, such as mixed-use development, will encourage people to walk between home and business. Local emissions can also be reduced by incorporating such strategies as Complete Streets, trails and bicycle paths into site design, so that people will be able to use their cars less frequently. The City

encourages the use of best available technologies in terms of energy efficiency and air pollutant emissions that provide cost-effective emission reductions.

- 12.5-I-3 Work with regional and local transit agencies to assess development project impacts on long-range transit plans and transit facilities during the planning stages of land use projects and ensure that potential impacts are avoided.

Projects with higher density housing or employment centers that are close to high-quality transit service contribute to the success of the transit system through increased ridership. Conversely, low-density development near transit stations can reduce the effectiveness of the transit system. The City can identify areas along transit corridors or near existing or proposed transit facilities where new growth areas can be planned to maximize their potential for transit service. The City can coordinate and consult with the regional transit agencies on large projects.

12.6 HAZARDOUS EMISSIONS AND PUBLIC HEALTH

GUIDING POLICIES

- 12.6-G-1 Minimize exposure of the public to hazardous air pollutant emissions, particulates, and noxious odors from freeways, major arterial roadways, commercial and industrial uses with substantial truck trips, and other uses that produce toxic emissions through the use and handling of fuels and solvents.

IMPLEMENTING POLICIES

- 12.6-I-1 Locate sources of hazardous emissions at appropriate distances from existing and planned sensitive land uses in order to minimize or avoid potential health risks to people that might result from hazardous air pollutant emissions. Locate residential development projects and projects categorized as sensitive receptors at adequate distances from existing and potential sources of hazardous emissions.

Siting decisions for hazardous emission sources and sensitive receptors have the potential to create land use conflicts. Common hazardous emission sources include freeways and high traffic roads, distribution centers, dry cleaners, gasoline stations, diesel engines, and auto body shops. Providing appropriate locations and separation for incompatible land uses for all types of development can minimize conflicts and promote economic growth. The ARB's Air Quality and Land Use Handbook provides suggestions for appropriate distances between sensitive uses and sources of hazardous emissions. The Handbook recognizes that local conditions should be considered in application of the guidelines. In addition, the City requires health risk assessments for projects with potential for exposure to significant amounts of toxic and hazardous emissions. Figure 12-1 establishes mobile source screening zones for which additional air quality analysis should be conducted when locating sensitive receptors within these areas.

- 12.6-I-2 Evaluate potential handling, storage, and transport of hazardous materials in new commercial and industrial developments to minimize public exposure to hazardous air pollutants.

Development projects that will handle, store, and transport hazardous materials require special consideration and evaluation to ensure that potential accidental releases will not impact the public.

- 12.6-I-3 Require construction and grading activities to incorporate particulate emissions reduction measures.

Particulate emissions are generated during construction activities from diesel engines used for most off-road equipment and from soil disturbance during site grading. This implementing policy supports the Bay Area Air Quality Management District's Clean Air Plan. Best management practices for construction and grading such as site watering, and use of diesel particulate filters are often required as mitigation measures in environmental documents and as standard conditions for projects requiring a grading plan.

- 12.6-I-4 Require all new wood-burning stoves and fireplaces to comply with EPA- and BAAQMD-approved standards and provide informational handouts outlining low-emission alternatives to wood-burning fireplaces.

Many homes in San Ramon are equipped with fireplaces, which are an important source of localized air pollution. Wood smoke released from fireplaces and wood stoves contains carbon monoxide, nitrogen dioxide, volatile organic compounds, and inhalable particulate matter (PM₁₀). Wood burning should be encouraged only in stoves and fireplaces designed to minimize air pollutants. The City promotes the BAAQMD's Winter Spare the Air Program that prohibits wood burning on days when air quality is unhealthy. The program also encourages residents to burn as cleanly as possible throughout the winter by using seasoned wood and cleaner burning alternatives such as natural gas fireplaces, EPA-certified wood heaters, and pellet stoves, and manufactured logs. Pacific Gas & Electric and the Hearth Products Association have offered incentives in the past in the form of cash rebates to encourage replacement of old wood-burning appliances with more efficient fireplaces and stoves. These incentives are determined annually and are not necessarily offered each year.

12.7 TRANSPORTATION ENHANCEMENT

GUIDING POLICIES

- 12.7-G-1 Invest in more efficient and effective transportation infrastructure, City fleet management and support for trip reduction programs to reduce traffic congestion, vehicle trips and the need for costly new or expanded roadways.

IMPLEMENTING POLICIES

- 12.7-I-1 The City shall encourage participation in feasible, affordable, innovative and flexible employer-based trip reduction programs for their employees.

The City of San Ramon qualified for the “Best Workplace for Commuters” for 2006. This means that the City met the National Standard of Excellence for commuter benefits, thereby cutting traffic and air pollution and improving the overall health and quality of life. The City leads by example with early implementation and demonstration of trip reduction programs. Current programs include: Guaranteed Ride Home, Vanpool Subsidies, Carpool Incentives, Transit Incentives, Student Transit Ticket Program, and Spare the Air participation. City departments with regular business hours can consider telecommuting programs and flexible work schedules so long as customer service is not affected.

- 12.7-I-2 City fleet vehicle operators shall be encouraged to develop and maintain a fiscally sound inventory and priority schedule to replace or convert existing conventional fuel vehicles with clean fuel vehicles as new vehicles are purchased and existing vehicles are retired from service.

The City of San Ramon has an active program to upgrade its fleet vehicles. San Ramon has been adding alternative fuel vehicles to its fleet since 1999. The San Ramon Public Services Department utilizes a fleet of 16 compressed natural gas-(CNG-) powered pick-up trucks to assist in maintaining public parks, streets, drainage, signals, lights, facilities, and landscaping. In addition, nine of the 14 vehicles that the City’s franchised garbage hauler uses to collect residential and commercial garbage, recyclables, and yard trimmings in San Ramon are CNG-powered. Natural gas vehicle fuel creates lower emissions than gasoline and diesel, including a 25-percent reduction in greenhouse gases. In 2013, the City completed installation of two Electric Vehicle (EV) charging stations, one at City Hall and one at the City Permit Center that provide additional support infrastructure for alternative fuel vehicles.

- 12.7-I-3 Encourage the development of state-of-the-art telecommunications infrastructure within the City, including satellite and neighborhood work centers for telecommuting to reduce vehicular commute travel and related emissions.

Encouraging alternative work environments will help reduce travel by automobile, thus reducing air pollution and traffic congestion. Improvements in telecommunications technology have made telecommuting more viable for larger numbers of employees and have lowered the cost.

- 12.7-I-4 Provide information to encourage the use of transportation modes that minimize motor vehicle use and the resulting air pollution and greenhouse gas emissions.

Reducing the reliance on automobiles will minimize air pollution in the City. The Traffic and Circulation Element includes policies to encourage Complete Streets, public transit and non-motorized modes of travel and coordination of the City’s Transportation Demand Management (TDM) programs with regional plans that are aimed at reducing traffic congestion and improving air quality.

- 12.7-I-5 Construct and promote infrastructure and facilities that support and encourages the use of low-emission transportation and alternative modes of travel, including a safe and comprehensive bicycle and pedestrian system that connects all parts of the City.

The increased use of low-emission vehicles is a cornerstone of implementing the State's air quality goals and strategy to reduce vehicle emissions that contribute to climate change. Electric vehicle, CNG and fuel cell technology infrastructure development is critical to the expanded use and continued success of these low emission vehicles. The City is in the position to continue to promote the development of this infrastructure as part of the City's Capital Improvement Program for City facilities and for private property based on new regulations for new development. The City should continue to review and refine its Zoning Ordinance and development standards for residential and commercial properties to ensure that opportunities for low emission vehicle infrastructure are considered as part of the design process and pursued where appropriate. Pre-wiring for single-family development should be assessed based on the nature of the development and installation standards for EV charging stations and similar technologies should be considered for commercial office, retail and multifamily development.

Additionally, programs that encourage people to walk, bicycle, carpool, and use public transit are more successful when infrastructure and facilities are in place that increase convenience and safety of using those modes. San Ramon has developed a wide variety of facilities at locations around the City that fulfill this policy. Examples include the San Ramon Transit Center, park and ride lots, and bike racks and lockers at the Transit Center. Complete Streets, bicycling and walking are key elements of San Ramon's circulation system. The City has an extensive network of bikeways, sidewalks, and trails that enhance neighborhood accessibility and help to reduce reliance on the private automobile. All new development is required to consider the bicycle and pedestrian system in their design.

12.8 ENERGY EFFICIENCY AND CONSERVATION

GUIDING POLICIES

- 12.8-G-1 Minimize air emissions and potential climate change impacts related to energy consumption in government operations and the community.

IMPLEMENTING POLICIES

- 12.8-I-1 Increase the use of energy conservation features, renewable sources of energy and low-emission equipment in new and existing development projects within the City.

Natural gas-burning appliances used for space heating, water heating, and cooking are a sizable source of NO_x and CO₂ emissions. Consumption of electricity also causes pollutant emissions from the operation of power plants fueled by fossil fuels. Reduction in local energy demand will reduce overall energy demand, which decreases the expediency for power plant construction. Local efforts to reduce energy consumption can save consumers money and improve air quality. Simple and cost-effective designs, technologies, and methods are available to achieve energy savings and reduce air pollutant emissions.

Air Quality and Greenhouse Gas

- 12.8-I-2 Encourage the use of solar-ready roofs into residential and commercial development. New residential development should include proper solar orientation (south-facing roof area sloped at 20° to 55° from the horizontal), clear access on the south sloped roof (no chimneys, heating vents, plumbing vents, etc.), electrical conduit installed for solar electric system wiring, plumbing installed for solar hot water systems, and space provided for a solar hot water storage tank. Roofs for commercial development should be designed to maximize potential area available for solar panels and provide electrical conduit to support future installation.

Photovoltaic solar panels and solar hot water systems are key measures for reducing greenhouse gas emissions from electrical power generation and from natural gas combustion for heating. Most commercial buildings have large roofs with surface area available for solar panel installation. Careful residential subdivision design is required to maximize the solar orientation of houses. The City also encourages passive solar designs that reduce cooling and heating requirements through building design features such as window locations that minimize direct sunlight during the summer, but allow direct sunlight during the winter, roof overhangs for shading, and low emissivity windows and blinds. Even partial shading of solar panels can greatly reduce the power generation. The roof design should avoid locating items such as chimneys and vents on areas of the roof with the best solar potential. The location of heating, ventilation, and cooling systems is important for both commercial and residential projects.

- 12.8-I-3 Promote urban forestry projects that shade buildings, homes, streets, pedestrian walkways, and urban core areas to reduce surface and ambient temperatures and reduce energy required for cooling.

San Ramon's Community Forestry Program was adopted in recognition that trees abate noise and air pollution, favorably modify micro-climates, reduce soil erosion and runoff, protect against flood hazards and risk of landslides, enhance the visual environment, encourage quality development, and provide a source of community pride. San Ramon's Landscape Design Standards require landscaping plans for nearly all development. In parking lots, canopy trees are required to be provided throughout the parking area at the equivalent of one tree for every four spaces, to provide shade. One tree for each 30 linear foot is required adjacent to residential areas. Trees that shade building roofs can reduce the area available for installation of solar panels. The shading potential of trees, accounting for long-term growth potential, should be considered for all projects installing solar panels.

- 12.8-I-4 Initiate and sustain on-going efforts with local water agencies, utility providers and developers to establish and implement voluntary incentive-based programs to encourage the use of energy and water efficient designs and equipment in new and existing development projects within the City.

PG&E and East Bay Municipal Utility District (EBMUD) offer incentives, rebates, and technical assistance to residents and businesses wanting to improve energy efficiency and reduce water use.

- 12.8-I-5 Reduce water use and the related energy use for treating and conveying potable water by developing standards requiring the use of reclaimed water and non-potable water sources for landscaping and construction activities including, but not limited to street sweeping and fugitive dust control, The development standards shall require new development areas that will be served with recycled water to be plumbed with a “purple pipe” system to facilitate the future use of recycled water.

Implementation of this standard shall be through the adoption of development regulations and standards such as the Zoning Ordinance and Grading Manual and shall include applicability thresholds based on project size and a waiver process when application of these standards are not practicable in the context of the site conditions, state and federal regulations, water quality regulations, the project size and scope, project impacts or environmental concerns.

EBMUD and the Dublin San Ramon Services District (DSRSD) jointly provide and distribute recycled municipal water in San Ramon through the San Ramon Valley Recycled Water Program (DERWA). At least half of the City's parks are currently using recycled water for irrigation. When completed, the program will supply approximately 2 million gallons per day (mgd) to parts of San Ramon, Danville, and Blackhawk. Future plans identify a network of recycled water lines serving the Bishop Ranch office park. Specific project requirements for the use or future use of “purple pipe” and reclaimed water for construction purposes shall be incorporated into the project's development conditions and permit requirements.

- 12.8-I-6 Support ongoing efforts with the Green Affordable Housing Coalition (GAHC), building industry, water and utility districts and the BAAQMD to promote enhanced energy conservation and sustainable building standards for new construction.

The City of San Ramon encourages sustainable building practices by providing New Residential Construction Green Building Guidelines that were prepared for Contra Costa County communities. Programs such as LEED certification operated by the U.S. Green Building Council, the Energy Star operated by EPA and the U.S. Department of Energy, and others provide developers with recognition for going above and beyond current standards. City staff participates on the Green Affordable Housing Coalition that provides information and outreach on green building to the affordable housing community.

- 12.8-I-7 Work with local water and energy utilities and the building industry to develop or revise City design standards relating to solar orientation, water use, landscaping, use of cool paving surfaces, parking lot shading and such other measures oriented towards reducing energy demand.

Measures and practices that have been proven effective over time can be incorporated as City design standards to provide consistent implementation and guidance to developers. Solar orientation can provide benefits from passive design features to solar power generation. Water conserving landscaping and irrigation systems are effective in reducing water demand. Measures such as using cool paving materials with higher reflectivity and shading parking lots can reduce ambient temperatures and cooling loads.

Air Quality and Greenhouse Gas

- 12.8-I-8 Provide recycling programs for construction and demolition debris, and for commercial and/or community recycling of plastic, paper, green waste, and food waste to reduce energy consumption and greenhouse gas emissions.

Recycling has been expanded to cover more and more types of materials to meet state recycling and diversion mandates. In addition, to extending the life of the landfill, recycling and diversion results in energy savings related to manufacturing of new items, transport of the waste, and reduced methane production from the decomposition of organic waste. San Ramon has many programs in place, including Composting of Residential Yard Trimmings, Composting of Residential Food Scraps and Soiled Paper, Home Composting Program, Curbside Recycling Program, Multi-Family Dwelling Recycling Program, Commercial Recycling Program, and City Facilities, Events, and Venues Recycling Program. San Ramon Municipal Code, Division B6, Chapters XIII and II, requires projects to divert at least 50 percent of waste from construction/demolition/remodel activities.

12.9 CLIMATE CHANGE

GUIDING POLICIES

- 12.9-G-1 Reduce the City's proportionate contribution of greenhouse gas emissions and the potential impact that may result in climate change from internal governmental operations and land use activities within its authority.

IMPLEMENTING POLICIES

- 12.9-I-1 Strive to reduce greenhouse gas emissions from its internal governmental operations and land use activities within its authority by 15 percent below 2008 levels by the year 2020 pending adoption of revised targets for the City's Climate Action Plan. The City will also work with the MTC to ensure that the City receives its proportionate fair share reduction in greenhouse gas emissions as may be identified under the provisions of SB 375 (2008 Chapter 728) for any projects or activities requiring approval by MTC.

The California Air Resources Board (ARB) Scoping Plan suggests that cities strive to achieve a 15 percent emission reduction from government operations and the overall community by 2020. As part of SB 375 implementation, the SB 375 Regional Targets Advisory Committee recommended approaches to set greenhouse gas reduction targets to the ARB in September 2009. The ARB adopted final regional targets on September 23, 2010. The City will work with the MTC to determine the City's proportionate fair share reduction of the regional targets. The results of this process could require revision of the City's internal greenhouse gas targets.

- 12.9-I-2 Keep current and maintain the City's adopted Climate Action Plan (CAP) as an implementation strategy of the General Plan 2035.

The CAP shall include an inventory of greenhouse gas emissions within the City. The CAP shall set out specific policies and actions to be undertaken by the City to reduce greenhouse gas emissions under the control of the City. The CAP targets

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will be updated as necessary during periodic reviews of the CAP based upon the potential of available sources for control, the feasibility of control implementation, and potential for funding to pursue implementation.

- 12.9-I-3 Conduct regular reviews of progress towards greenhouse gas emission reduction targets established by the City's CAP, reporting progress and revising the plan as needed to achieve the plan's objectives.

The Annual Progress Reports required for the General Plan by Government Code Section 65400(a)(2) also provides a suitable forum to address progress on CAP implementation. Under adaptive management, measures would be assessed periodically for effectiveness and revised or replaced as needed to improve the program.

- 12.9-I-4 Work with other local and regional governments to assess federal and state programs and their impact on greenhouse gas emissions and mitigation efforts.

Federal and state programs to reduce greenhouse gases often affect the same emission sources that will be targeted for reductions by the City. Work with other local and regional governments to ensure that its efforts enhance state and federal programs and are not duplicative.

- 12.9-I-5 Utilize tiered significance thresholds, as available, for the evaluation of project greenhouse gas emissions impacts, the preparation of project level greenhouse gas emission inventories, and the identification and application of mitigation.

The 2010 BAAQMD's 2010 CEQA thresholds were set aside by the Courts. The Appellate Court reinstated the BAAQMD's "significance thresholds" for evaluating air quality and GHG impacts under CEQA. It is unclear if this decision will be appealed to the California Supreme Court, but in the interim project level analysis and consistency with the CAP will be required to address project impacts.

- 12.9-I-6 Require businesses to minimize emissions of ozone-depleting compounds.

The City has adopted regulations to reduce the release of chlorofluorocarbons (CFCs) into the atmosphere from activities within the City of San Ramon. Municipal Code Title B Regulations, Chapter III Ozone-Depletion Control regulates these compounds. Article 1 prohibits the use of CFC-processed food packaging, and Article 2 regulates the use and recycling of CFCs in refrigeration or air conditioning units in buildings and motor vehicles, fire extinguishers, and building insulation.