Sustainability leadership has long been a priority for San José, and for me personally. The launch of Climate Smart San José is fresh, new thinking on next generation urban sustainability.

We build on our decade-old Green Vision to now sharpen our focus and broaden our reach. Our Green Vision laid a solid foundation; we improved the environmental sustainability of City operations and greened our vehicle fleets. We know more, we learned, we have better data.

San José is already delivering success on sustainability. The San José metro area has the highest number of electric vehicles per capita of any metro area in the U.S. We faced a historic drought and were able to reduce water consumption by 28 percent. And, we recently passed San José Clean Energy – making San José the largest city with a community choice energy program in the United States.

We are also building for our growing city’s future. With infrastructure investments for a new urban quarter at Diridon Station and extensions to BART, we are building the infrastructure that will continue our sustainable growth.

With this plan, we are seeking to do three things:

1. Reimagine our aspirations for the “Good Life” in San José that also happens to be more sustainable.

2. Engage every resident, landlord, business, and regional government agency in the work of delivering on the promise of the Good Life in a climate- and water-smart way.

3. Live up to our obligations to future generations by making San José one of the first major American cities to reconfigure energy, water, mobility, and land use to deliver on our commitment to the Paris Climate Agreement.

This plan makes clear, time-bound commitments for the City to deliver against. And it also shows how the whole community can contribute to living well within the planet’s boundaries.

With Climate Smart San José, we set high expectations and make a commitment to transform San José into a model low-carbon economy. And, we will do so in a way that continues to welcome the new residents we are expecting to come to San José over the next 30 years.

Let’s leave our children with a planet and a legacy of stewardship that makes all of us proud.

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Mayor of San José
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Executive Summary
A Plan that Charts a Course for Our Next Generation

San José has a strong heritage of forward-planning for our residents and our children. Going back to the City’s inaugural General Plan over 40 years ago, San José developed and evolved in line with the best available evidence and resident priorities of the time. These have formed the city that we now live, work, and play in.

A decade ago, we made the first forays into articulating the issues of urban sustainability through the San José Green Vision. Through it, we outlined the issues that – as a City – we would focus on. These included switching our public vehicle fleets to alternative fuels, helping residents save energy, and growing clean technology jobs. The Green Vision laid an important foundation for further progress.

Climate Smart San José (The Plan) is the continuation and escalation of that vision, and will take San José into the next generation of urban sustainability. It articulates how every facet of our city – from buildings, to mobility, to how we grow our workforce – needs to transform in order to minimize our impact on the climate.

The transformation of our city requires multiple stakeholders to come together. City departments, related agencies, the private sector, and, ultimately, our residents and community groups. Thus, The Plan introduces a radical new framing that we call the Good Life 2.0 – one that gains traction by articulating the quality of life benefits of sustainability. By addressing benefits through resident priorities of an affordable home, time with their loved ones, and pleasant outdoor space for them and their families to enjoy in San José, The Plan generates excitement around tangible issues that matter to our community.

The Plan also recognizes that, with the U.S. withdrawal from the Paris Climate Agreement (Paris Agreement), many cities – including our own – are pledging to honor and uphold the Paris Agreement in lieu of Federal action. San José takes its role seriously and, in addition to our commitment, our plan uses the best data available to chart an economy-wide strategy that is aligned with the decarbonization goals of the Paris Agreement. We’ve crunched the numbers to understand that changes in some areas will have an effect on others, including the scaling of renewable energy, the electrification and sharing of vehicle fleets, investments in public infrastructure, and the role of local jobs in contributing to our sustainability.

The Plan focuses on three pillars and nine key strategies:

• A sustainable and climate smart city
• Transition to a renewable energy future
• Embrace our Californian climate
• A vibrant city of connected and focused growth
• Densify our city to accommodate our future neighbors
• Make homes efficient and affordable for our families
• Create clean, personalized mobility choices
• Develop integrated, accessible public transport infrastructure
• An economically inclusive city of opportunity
• Create local jobs in our city to reduce vehicle miles traveled (VMT)
• Improve our commercial building stock
• Make commercial goods movement clean and efficient
A Plan Grounded in the Good Life 2.0

The Plan is framed in such a way that helps deliver the aspirations and desires of our community. This is encapsulated by the Good Life 2.0, an inclusive and benefits driven approach to excite citizens to engage on climate issues.

Through these pillars and strategies, we will transform into a climate smart city that is substantially decarbonized and meeting requirements of Californian climate change laws – all the while growing our population by 40 percent.

The Plan calls for unlocking the resources of the private sector and residents by making the investment case for the Good Life 2.0 and the economic efficiency that many climate smart measures bring. This requires a significant change to how cities plan; it pivots from one that is City-centric into one that is people-focused. This means using the behavioral economics and lifestyles of residents to encourage the adoption of climate smart technologies and practices.

The scale of transformation will be significant and may require a commitment of 2.6 percent of our city gross domestic product (GDP) each year through 2050.

However, with climate action comes the economic benefits of energy independence, fossil fuel avoidance, and improved efficiency, resulting in a savings of 2.4 percent of our GDP.

The result is a city that is sustainable and climate smart, vibrant and connected, and economically inclusive.
The Nine Strategies of Climate Smart SAN JOSE

1.1 Embracing our Californian climate means creating an urban landscape, in our homes and public places, that is not just low water use, but attractive and enjoyable.

1.2 Transitioning to a renewable energy future provides clean electricity that supplies the entire city.

1.3 Densifying our city in focused growth areas increases walkability and cycling and makes our neighborhoods more vibrant, distinctive, and enjoyable.

2.1 New technology can enable clean, electric, and personalized mobility choices that make it convenient to move between any two points in the city.

2.2 Creating local jobs in our City makes it possible for our residents to work close to where they live, saving time, money, and gas spent commuting.

2.3 Making our homes energy efficient and fully electric can make them affordable for our families and more comfortable to live in.

2.4 Developing integrated, accessible public and active transport infrastructure reduces the dependency on the car to move within the city.

2.5 Moving commercial goods through our city more efficiently with new technology and fleet management practices.

3.1 Making our commercial buildings high-performance and siting them close to transit lowers water and energy use.

3.2 Moving commercial goods through our city more efficiently with new technology and fleet management practices.

3.3 Making our commercial buildings high-performance and siting them close to transit lowers water and energy use.
A Framework for Action: Nine Strategies in Three Pillars

PILLARS of what residents want

Pillar 1
A Sustainable & Climate Smart City

1.1 Transition to a renewable energy future
1.2 Embrace our Californian climate

Pillar 2
A Vibrant City of Connected & Focused Growth

2.1 Densify our city to accommodate our future neighbors
2.2 Make homes efficient and affordable for our families
2.3 Create clean, personalized mobility choices
2.4 Develop integrated, accessible public transport infrastructure

Pillar 3
An Economically Inclusive City of Opportunity

3.1 Create local jobs in our city to reduce vehicle miles traveled
3.2 Improve our commercial building stock
3.3 Make commercial goods movement clean and efficient

Technology enablers

Financial enablers

Tailored PLAYBOOKS for key audiences and stakeholders

The City's ACTION PLAN

The City's BOLD CAMPAIGNS

RENEWABLES AND ELECTRIFICATION
MEET OUR JOBS TO EMPLOYED RESIDENT RATIO TARGET
WORK TOWARD OUR FOCUSED GROWTH TARGET
REDUCE PER CAPITA VEHICLE MILES TRAVELED
REDUCE PER CAPITA WATER USAGE
Climate Smart
San José Sets Us on a Paris-Aligned Pathway

Meeting Paris Requirements

1.1 Transition to a renewable energy future

2.1 Densify our city to accommodate our future neighbors

2.2 Provide affordable, efficient homes for our families

2.3 Create clean, personalized mobility choices

2.4 Provide high-quality, accessible public transit infrastructure

3.1 Create local jobs in our city to reduce VMT

3.2 Improve our commercial building stock

3.3 Make commercial goods movement clean and efficient
Harnessing the Power of Community Networks

Getting San Joséans to drive action requires thinking about how we interact in the city through various networks and is an opportunity for businesses to get involved by helping us unlock the power of our people.
01 Introduction

1.1 Our Approach – Page 19
1.2 Key Framing & Inputs – Page 39
1.3 Our Call to Action to U.S. Cities – Page 51
1.1 Our Approach
A New Generation of Climate Action Plans

This strategy reflects the City of San José’s leadership and innovation in the area of progressive climate action policy. Four core principles guide this strategy, which is reflective of the next generation of climate action policies.

Chart a Paris-Aligned Pathway
Since December 2015, the Paris Agreement has been signed by 195 countries and been ratified by 172 parties. It provides a clear goal for the reduction in carbon dioxide emissions required by 2050 to keep the rise in average global temperature to below 2°C. While nearly 400 cities representing over 21 percent of the U.S. population have committed to this goal, Climate Smart San José (The Plan) is among the first to take the next step in charting a clear-eyed roadmap of the measures and progress needed to achieve compliance with the Paris Agreement.

The Plan’s Paris-aligned pathway is made possible through a robust analysis of San José’s current and projected carbon dioxide emissions. Using this as a baseline, we have developed a pathway by analyzing how specific measures – like electric cars and community solar – contribute to the Paris goal over time.

Align with and Operationalize the General Plan
The Envision San José 2040 General Plan (General Plan) provides a clear and compelling vision and set of values to guide the continued development of San José as a great city. The General Plan is a foundation for The Plan, especially in the areas of environmental stewardship and focused growth. In addition, the time frame of the City Action Plan (Section 5) aligns with the General Plan Four-Year Review process.

Enable the Good Life 2.0
The quality of life benefits related to the strategies in this plan are more important than any technical analysis. Framing The
Plan around the Good Life 2.0 concept is a critical enabler that links climate smart choices to a desire for improved quality of life for residents. Doing so drives the adoption of carbon-reducing technologies and behaviors from niche users to the mainstream. The innovations – like the products to make your home smarter, more affordable, and comfortable – outlined in this plan can serve as a resource for making life better.

Quantify the Costs and Benefits
A sound climate action plan should also include a cost benefit analysis. Understanding of the economic costs, avoided costs, and savings of a low-carbon pathway through the use of discounted cash flow-based extended cost-benefit analysis (eCBA) techniques allows The Plan to identify the measures that reduce the most carbon for the least cost. These measures are prioritized for the near term in order to generate quick wins over the next three years that build the momentum and capital needed to take on more ambitious measures.

“If you can see the invisible you can achieve the impossible.”
–Shiv Khera
Leveraging San José’s Strengths

San José will continue to play an important role in demonstrating to the rest of the world what is possible and in trying innovative approaches to solve the complex challenge of climate change.

Culture of Innovation
Silicon Valley has been synonymous with technological innovation for over 50 years, serving as a cradle for many startups, including companies leading the way in clean technology. San José continues to serve as the headquarters for a number of companies offering products and services that help to better the environment and provide a more sustainable future, including: SunPower, a leading North American manufacturer of solar panels; Cupertino Electric, one of the largest installers of commercial solar projects in the U.S.; and Lumileds, one of the world’s leading manufacturers of light-emitting diodes (LEDs).

The culture of innovation extends throughout San José to its residents and businesses who are early adopters of new technologies, including electric vehicles (EVs), solar panels, and green buildings.

San José will continue to play an important role in demonstrating to the rest of the world what is possible and in trying innovative approaches to solve the complex challenge of climate change.

Growth
San José’s population is expected to grow by around 319,000 by 2050. Achieving the goals of the Paris Agreement with that level of growth could seem impossible. It is, however, quite the opposite. San José is at an exciting inflection point as this growth provides the opportunity to move from a car-based land development model to one that focuses on creating an interconnected city of urban villages where jobs and the activities of daily life are in close proximity and easily accessible by walking, biking, and public transit. Densification of San José in a way that creates more affordable housing, more transit options, and a higher quality of life accelerates the reduction of absolute carbon dioxide emissions.

Sustainability Leadership
The City of San José has a proud history of driving progress on sustainability issues. In 2007, the City adopted its Green Vision that set forth goals for cleantech jobs, renewable energy, and green buildings. In May 2017, the City Council approved San José Clean Energy (SJCE), making San José the largest city in the U.S. with a community choice energy (CCE) program, which will accelerate the development of renewable energy for the people of San José.

San José also outperforms many other cities in its level of commitment to sustainability. It is among the top ten U.S. cities in:

- Number of hybrid and EVs in use
- Number of EV charging stations
- Megawatts of solar installed
- LEED® certified buildings per capita
- Amount of cleantech venture capital

San José greatly exceeded the national average in 2016 by diverting 69 percent of its waste from the landfill. In addition, San José already has one of the largest recycled water systems, through its South Bay Water Recycling program, delivering 12.2 million gallons of recycled water per day.
A National Leader in the Clean Economy

>$2 BILLION
Silicon Valley VC investment in cleantech since 2013

13,500 Vehicles
plug-in & electric

131 MW
of installed solar — enough to power 17,000 homes
## Alignment with the General Plan

The General Plan is the City’s expression of its ongoing commitment to outline and guide growth in a way that creates an innovation-based economy that is environmentally sustainable and promotes social equity for its diverse population. This page describes the areas and strengths of the links between the General Plan and Climate Smart San José.

### Climate Smart San José:

- ![Drives progress on this goal](image1)
- ![Enables progress on this goal](image2)
- ![Aligns with this goal](image3)
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  - Environmental Leadership Stewardship
  - Economic Development
  - Housing Development
Focused and integrated growth creates more sustainable neighborhoods.
The Significance of Focused & Integrated Growth in The Plan

*Climate Smart San José* builds on the General Plan by highlighting and interpreting those elements related to the community’s profile of carbon dioxide emissions and then providing additional analysis and recommendations.

A noteworthy area of the General Plan is the call for focused and integrated growth. This acknowledges that San José’s population will increase considerably by 2040, and that the most sustainable way of accommodating that growth is to focus new housing and workforce development in targeted areas of the city. These focused growth areas, including urban villages, Downtown, and North San José, call for higher-density, mixed-use, and transit-oriented development (TOD), making these neighborhoods economically diverse, walkable, and sustainable.

The carbon interpretation from this is that it reduces the demand for vehicle use per capita, compared with a scenario where the General Plan did not exist and focused growth did not occur. Focused and integrated growth creates more sustainable neighborhoods by making public transit options more viable and walking and cycling more feasible.

The General Plan, therefore, and specifically its call for focused and integrated growth, is the foundation for reaching our carbon dioxide emissions reduction goals. But, in order for San José to transition to a Paris-aligned, low-carbon pathway, we must do more.
The Good Life 1.0

Climate Smart San José starts with a simple question: “How can a great city also be good for you and for the environment?”

Origins of Living a Good Life
To answer that question, we investigated what it means to live a Good Life. The Good Life was an idea central to ancient western and eastern philosophers such as Aristotle and Confucius with the view that there were simple principles that enabled individuals to live a fulfilling life and build a thriving society. While they all had their own take, they shared themes of living in the present, connection to family and community, meaningful work, freedom, and acquiring knowledge and skills.

The Good Life 1.0
In the 1950s, following the deprivation and suffering of WWII, we as a society embraced a version of the Good Life that emphasized happiness through material abundance. Strong economic growth, fueled by the Baby Boom, enabled young families to afford what was once reserved for the wealthy: the comfort of a big home in the suburbs, the freedom to hit the road in an air-conditioned car, and the joy of cooking ribeye steaks on a barbecue grill. The material abundance available to the middle class was unprecedented and made life better for millions of Americans.

Today, this version of the Good Life has literally grown bigger.

The average home size, food portions, and cars per household have doubled. Our social status hinges on having the latest smartphone and gadgets. The message to consumers is clear: more is better.

Costs of the Good Life 1.0
This lifestyle would not have been possible without a heavy reliance on fossil fuels, water infrastructure, and natural resources that have now proven to be unsustainable. The Good Life 1.0 doesn’t appear to be making us any happier; in fact, it may even have the opposite effect. Research shows that despite America being one of the world’s wealthiest countries, it is not among the happiest (it ranks 14th). Additionally, money earned beyond the San José region median income ($110,000) does little to increase our levels of happiness. We end up paying for the Good Life 1.0 in other ways: longer working hours, higher levels of debt, and more time stuck in traffic which takes time away from our families and the things we love to do. The cost of the Good Life 1.0 is not on the price tag, but we pay it every day.

Good Life 1.0 in Post-WWII San José
Like many post-WWII American cities, San José’s growth was centered around the car, informed by a Good Life 1.0 ethos. For many years this created access to an extraordinary quality of life for middle class families. The ad below from the 1950s is for a new luxury housing development and had a list price equivalent to $160,000 in today’s dollars.
We spent time in community meetings and conducted an online survey, and learned that, among other things, the people of San José aspire to:

1. Spend more time with family and friends
2. Feel safe in their home and neighborhood
3. Access affordable housing and healthcare
4. Be active and in good health
5. Have financial independence
6. Have freedom to easily move, explore, and travel
7. Share great experiences
8. Have access to parks and nature

We designed The Plan to align with our community’s contemporary vision of the Good Life and put us on a path to establish the policies, incentives, and support that residents need to not just make this work, but to thrive.

As such, we set forth a vision and strategy (see Section 3) for achieving energy, water, and mobility goals, including what the City will do to scale innovations and catalyze adoption.

We also took one step further and created playbooks for our constituents – homeowners, developers, businesses – outlining not just what you can do, but how we believe these actions will help residents and families live well.

The Good Life Gets an Upgrade

The Sustainable Lifestyle
As a counter to the unsustainable use of resources in the Good Life 1.0, we are encouraged to adopt a sustainable lifestyle, yet these lifestyles have resonated with only a small number of very committed people. We’ve asked people to make sacrifices in terms of how they and their families live for the good of the planet. We’ve asked them to turn off the lights when leaving a room, take shorter and colder showers, buy small, underpowered economy cars, and use cleaning products that don’t work. In short, the sustainable lifestyle asks us to make do with less, which sure doesn’t feel like the Good Life we’ve been aspiring to.

The Good Life (Re)defined
Our residents – including their families and communities – deserve to live the Good Life 2.0, and The Plan is here to make that happen. We believe there are new sources of abundance in the contemporary Good Life that this plan can help residents tap into. We know that for this to work, it must continue to deliver an aspirational way of living sustainably.
The Good Life 2.0 at Home

Today, a number of trends are changing the idea of the suburban two-car garage home lifestyle as the ultimate aspiration.

Macro Housing Trends

The most potent image of the Good Life 1.0 is the single-family home. Since the 1950s, owning a home in the suburbs with a two-car garage and backyard was the fulfillment of the American dream.

Today, a number of trends are changing the idea of the single family home lifestyle as the ultimate aspiration. First is the Bay Area’s worsening housing crisis which, for most people, either puts this dream out of reach or puts their financial well-being at risk. Second, households are changing in size and structure. People are getting married later and, in many cases, delaying starting a family which has driven a significant rise in single-person households. Lastly, the type of housing being built is changing as 40 percent of all new home developers are building apartments, the highest share since World War II.

The result is the change in what people want their homes to do for them. Instead of a “dream home,” people are seeing home as a launchpad for what makes them truly happy. People want homes that provide safety, recharge the mind, body, and spirit, and provide a well-designed space to create memories with friends and families.
These evolving needs are showing themselves in the marketplace in four areas: the well-designed home, the well-placed home, the healthy home, and the smart home.

The Well-Designed Home
The acquisitive lifestyle of the Good Life 1.0 has created a clutter crisis that has become emotionally and physically stressful for families. Maria Kundo, best-selling author of *The Life-changing Magic of Tidying Up*, has taken this on by inspiring millions of people to declutter by offering a clear, simple process focused on keeping only the things that “create a spark of joy in the heart.”

IKEA is also offering solutions to simplify the home, a concept they call LAGOM, which is Swedish for “not too much, not too little.” It leverages their design expertise to provide simple, clutter-clearing designs that also help customers use less power and water, create less waste, and live well.

For people who live in apartments and small houses, a market has developed for maximizing the functionality of limited space, enabling them to convert a living room, into a dining room, into a bedroom in a matter of minutes.

The Well-Placed Home
Many people, especially millennials, prefer to live in denser, more human-scaled neighborhoods with easy access to grocery stores, schools, and jobs that offer a strong sense of community (Havas Prosumer Study 2016 - US Millennials). This level of access to the amenities of everyday life results in having more time to spend on the things that enhance happiness, such as being with friends and family, learning, and being productive at work. This type of development also provides a more affordable lifestyle with lower housing costs and alleviates the need for a car or maintaining a yard.

Urban infill developers are responding by building multi-family apartments and condos that integrate into the existing urban landscape. New
People are looking for ways to upgrade their homes to recharge and nourish their body, mind, and spirit.
developments are often multi-story with a retail space on the ground floor, and old buildings are being put to new use retaining the architectural history of a neighborhood.

For a growing number of people, it’s not necessarily a bigger home they want, it’s a home with space and in places designed for the way they want to live.

The Healthy Home
The profound connection between home and health is becoming better understood. Rating systems like The WELL Building Standard® provide a rating system focused exclusively on optimizing the home for the healthiest way to eat, sleep, exercise, work, and feel.

Healthy home products that were once primarily focused on indoor air quality – low-VOC paints, high-quality HVAC systems, cleaning products without harsh chemicals – have quickly grown with technological innovations that help better manage sleep, turn interior walls into gardens, and even deploy scents to improve your mood. Whirlpool, General Electric, and others are even working on kitchens that guide us in cooking healthier food in more sustainable ways.

People are also upgrading their homes in low-tech ways. Vegetable gardens have had a resurgence as people reconnect with the joy of working in the soil and the pride of growing healthy food for their families. Sleep has become a new status symbol and is driving a $32 billion market that aids people in getting a solid night’s rest, including lighting that matches circadian rhythms and good insulation to reduce outside noise.

People are looking for ways to upgrade their homes to recharge and nourish their body, mind, and spirit.

The Smart Home
According to tech maven Kevin Kelly, the next 10,000 startups are easy to forecast: take X and add AI. This means taking any object and adding artificial intelligence. His forecast is especially true of our homes as they are re-engineered to make us more comfortable, productive, and safe.

Our appliances, thermostats, lighting, security systems, garden irrigation, and even vacuuming are becoming more efficient, integrated, and automated. Many of these innovations, like LED lights, radically reduce our energy use and utility bills, but they also make our lives better. They offer cleaner air and water, more thermal comfort, insulate us from outdoor noises, and make our homes more pleasant for our family. They also provide resilience in the event of natural disasters.

Solar panels paired with batteries can be used as backup power. Gardens planted with our region’s beautiful native plants, such as the iconic California Poppy, and irrigated with web-enabled, weather-based sensors can flower even in times of drought.

Live a healthy, fulfilled Good Life in a home specifically designed to fit your climate smart needs.
The Good Life 2.0 on the Road

The automobile was the single greatest enabler of the Good Life. Times are changing.

Macro Trends in Mobility
In the 1950s, entire families would pack into their car and go for Sunday drives just to enjoy the freedom of exploring new places. While we still relish the freedom (and status) that a car can bring, it has become our own worst enemy as population growth, urban sprawl, and the increasing distance between jobs and homes has made traffic, air quality, and carbon dioxide emissions major issues.

Fortunately, mobility is undergoing a revolution that will not only reduce carbon dioxide emissions, but will dramatically improve our quality of life. San José is also embracing the challenge faced by many post-WWII American cities in shifting from a car-based suburban landscape to one that has more integrated transportation options.

Walkable Neighborhoods
People who live in walkable neighborhoods tend to be healthier and are 31 percent less likely to be overweight or obese (Klar S. Poster #0908-P; World Diabetes Congress, 2015). Living in these areas can also reduce transportation costs by ten percent, which can be up to a fourth of a family’s income.

Prospective buyers and renters can easily look up a home or building’s walkability score to assess the proximity to grocery stores and commuting options.

Electric Vehicles
The EV market has increased 160 percent every year for the last six years in the U.S., China, and Europe, and that adoption rate is expected to accelerate further. The primary reason is that consumers increasingly prefer EVs because they are more fun to drive, have lower fuel and operating costs, qualify for high-occupancy vehicle (HOV) lane stickers, and have more social status than their fossil fuel counterparts. This year has marked a turning point for EVs as more affordable mass-market cars have become available (McKinsey and Company, July 2017).

On-Demand Mobility
Rideshare apps are an innovation with many implications for the Good Life. Used as a carpool, rideshare provides a cheaper, faster, and fun way to get to work. Rideshare has resulted in the formation of friendships and even marriages. It is also an important part of the last mile problem in getting people to work or home from transit stations. Rideshare has become so reliable that many people have renounced car ownership, resulting in lower monthly transportation costs.

Telecommuting
Approximately 3.9 million people, or three percent of the total U.S. workforce, telecommutes at least half of the time. Surveys indicate that most telecommuters believe the flexibility enables them to live a healthier lifestyle with better eating habits, less stress, and more time for their friends and family. There is also an upside for employers with people reporting they are happier and more productive in their jobs. Technology enables us to work from wherever we want – home, the local café, or in shared workspaces.

Expanded Public Transit Infrastructure
A major enabler of San José’s mobility future is the major public transportation infrastructure projects that are underway. The Berryessa Bay Area Rapid Transit (BART) station will open in 2018 and another four BART stations are scheduled to open over the next 10 years. Diridon Station will be a major transit hub that will integrate Caltrain, BART, California...
(Left) Telecommuting brings a flexible, healthier lifestyle with better eating habits, less stress, and more time for yourself.

(Below) Ridesharing is often a more affordable, fun way to get to your favorite places.
High-Speed Rail, and others to dramatically increase access to the rest of the Bay Area and California. The Santa Clara Valley Transportation Authority (VTA) has begun running its Bus Rapid Transit (BRT) system that provides comfortable, fast, frequent, and reliable transit during peak commute times.

**Autonomous Vehicles (AVs)**

Driverless cars are already here. Tesla and Google, along with traditional car makers, are rapidly advancing the technology and integrating elements into cars that are on the market today. As this technology scales, the number of traffic fatalities will likely fall by 90 percent, resulting not only in lives saved, but $190 billion in savings from prevented property damage and medical costs. AVs also hold the promise of transforming our experience of getting to places and further accelerating shared vehicle trends, freeing up hands and minds to work, relax, or enjoy an eye-to-eye chat with friends.

**Unconventional Partnerships**

The need for massive innovation to stay competitive in the auto market is forging unusual partnerships. One reason is because people increasingly value the transport experience over vehicle design. This has led to partnerships, such as the one with Volvo, Ericsson, and Netflix, focused on building smarter streaming technologies that creates a customized list of media based on the length of the trip and provides enough cache to enable continuous streaming, even in dead zones.
(Left) AVs will transform the way we travel and go about our everyday lives.

(Below) Enjoy the experience of traveling and make memories along the way with continuous, customizable media that will keep your whole crew entertained for hours.
1.2 Key Framing & Inputs
Key Framing for Climate Smart San José

A Plan Centered Around Our People
Climate Smart San José is not the first urban sustainability or climate action plan. Many other cities in the U.S. have developed their own plans for addressing important sustainability issues. The Plan does too, but with a slightly different framing; it is centered around our people.

Some of the latest thinking indicates that residents tend to disengage from climate issues. It can feel intangible, not immediate, and unexciting. The Plan turns this on its head and frames climate action entirely around our people – the residents and workers of San José. We do this by introducing the concept of the Good Life 2.0, the idea that living sustainably makes us happier, healthier, and even puts a little change back into our pockets.

A Plan Informed by Data
We can’t major in minor things and expect great results. The Plan is grounded in quantitative evidence base of the sources and uses of fossil fuels and water in San José. It considers how patterns of consumption will change over time with population growth and technological improvement, and what effect state-level action relating to climate and water will impact on San José’s own profile.

The measures that make up this plan’s Paris-aligned pathway are modeled through economic analysis to provide a foundation for developing a coherent climate strategy. Designing The Plan from this starting position best reduces the major drivers of carbon dioxide emissions.

A Plan That is Inclusive
The Plan is guided by an inclusive spirit, seeking to improve quality of life throughout San José by connecting strategies and measures to the Good Life 2.0 and by making energy- and water-efficient technology and resources available to all residents, regardless of income or background.

It builds upon the City’s General Plan, which aims to facilitate the creation of economically, culturally, and demographically diverse and integrated communities where residents have ready access to transit, cultural and commercial amenities, and jobs.

A Plan That is Implementation-Ready
Insights from the technical analysis and community engagement were used to design a framework for San José’s climate and water action, structured around three pillars and nine strategies associated with metrics to measure progress over time. The strategies are designed to be integrated and interlocking with each other so that, when seen together, they provide a holistic suite of measures that all relevant groups in San José can contribute toward.

In order to successfully implement these strategies and associated metrics, The Plan includes funding opportunities, dashboard metrics, tangible actions that the City can undertake to establish momentum, and playbooks tailored for key audiences and stakeholders.
Key Inputs to Climate Smart San José

Council directed that The Plan focus on reducing carbon dioxide emissions, related to energy and mobility, and ensuring a sustainable water supply.

San José’s Community-Wide Greenhouse Gas Inventory and Forecast
Utilizing the City’s most recent 2014 greenhouse gas (GHG) emissions inventory and forecast, and adjusting for the purpose of developing a Paris-aligned emissions reduction pathway, this inventory identifies the main drivers of San José’s GHG profile as mobility and energy consumption, which The Plan strategies focus on addressing.

Community Technical Expert Engagement
Community and technical expert engagement was a key input into the development of The Plan (see Community Engagement section for details) in order to develop and vet strategies and metrics. It will continue to be a necessity to successfully implement and update The Plan over time.

Spatially Explicit Analysis
The Plan is built upon the General Plan, which utilized the City’s spatially explicit traffic model to inform its focused growth planning. The City’s forthcoming Transportation Analysis Policy would adopt vehicle miles travelled (VMT) as the California Environmental Quality Act (CEQA) metric in which to analyze transportation impacts of new development, consistent with state law. The change to a VMT-based metric is intended to facilitate new infill development that improves air quality.

The Plan will be able to create a community-wide carbon-smart pathway by 2050. It took into account various factors, relevant plans and policies, and carbon- and water-reducing measures to model the pathway against the baseline. This modeling enabled the prioritization and scheduling of initiatives (see Appendix A-1 Carbon Reduction Assumptions Connected with Focused Growth for more information on the carbon reduction assumptions connected with focused growth).

Time-Dependent Variables
The Plan includes time-dependent variables such as expected efficiency, utilization, and cost projections for various low-carbon measures (e.g., the cost and efficiency of EV batteries) in its data analysis process, leading to...
the final proposed climate smart pathway.

Alignment with Key Plans and Policies

The Plan has taken into account key plans and policies in the energy, mobility, and water sectors to ensure general alignment. This review included, for example, future Title 24 California building codes regarding Zero Net Energy (ZNE) homes, California Renewable Portfolio Standard (RPS) targets for 2020 and 2030, and UN Sustainable Development Goals (see Appendix A-2 for comparison against the UN goals).

Focused Carbon- and Water-Reducing Measures

The Plan includes carbon- and water-reducing measures that were evaluated based on how well they met the following criteria:

- Addresses a key supply/use node in the carbon dioxide fossil fuel use profile.

There are three mechanisms in how this occurs:

- Demand reduction: reducing VMT through denser neighborhoods and job locations
- Higher efficiency: improved efficiency to gasoline-powered vehicles or increases in bus capacity
- Fuel substitution: eventual transition to electrically-powered vehicles and buildings

- Is effective at reducing emissions at scale

Take advantage of the Good Life by embracing the world around you and making climate-conscious decisions.

- Would zero out carbon impact of additional population growth
- Has reasonable marginal abatement costs – defined as costs that could be supported by businesses, the community, and private sector to implement The Plan
- Is supported by community input during The Plan development
Community Engagement

Harnessing collective wisdom and knowledge through stakeholder engagement has been central to the development of The Plan. Continued community engagement and participation in the implementation will be vital to ensuring success.

General Public
The objectives of our community engagement were threefold. First, we wanted to create awareness of The Plan’s development. Second, we provided forums to listen and collect ideas. And third, we wanted to understand how people interpreted the idea of the Good Life 2.0 and its connection to sustainability.

We presented at 13 public meetings between May 2017 and February 2018. These meetings typically contained a short presentation and were followed with an opportunity for people to speak, write, and/or submit their thoughts and ideas. To reach a larger number of people, we conducted a survey that was distributed through traditional media, social media, and even at a San José Earthquakes soccer game. More than 2,200 people responded, with more than half taking time to write in specific suggestions and ideas to include in The Plan. The ideas and insights garnered through this process
were instrumental in helping design a plan that reflected the needs, aspirations, and culture of San José. San José staff also held a Spanish language focus group and promoted key meetings on trilingual (English, Spanish, Vietnamese) Facebook ads.

**Subject Matter Experts**
San José is fortunate to be surrounded by some leading institutions and experts in the areas of energy, water, mobility, and land use and open space. We invited many of them to help us better understand the challenges and solutions to climate change and water. These experts included people from business, non-governmental agencies, local and state government, and academia. In 2017, we reached out to more than 350 experts around the world through an online survey inviting them to submit their reflections on the best practices and innovations to include in *The Plan*. After shortlisting the more than 100 distinct ideas we gathered from the survey, we facilitated six technical workshops to get more in-depth guidance in specific areas.

Community Engagement by the Numbers

- 2,200 survey responses
- 1,800 ideas submitted
- 100 Bay Area technical experts
- 13 community meetings
City Council public study session to provide overview of The Plan’s scope and background on climate change in cities and the Good Life 2.0

Survey to experts to collect ideas, innovations, and solutions to energy, water, and mobility

Three workshops with experts in energy, water, and mobility to receive input on innovations and solutions

Survey to general public to collect ideas for The Plan and community meetings in districts

Spanish language focus group to receive feedback on The Plan

City Council public study session to provide update on The Plan draft

Youth Commission meeting to engage youth community

Neighborhood Commission meeting to receive feedback on the The Plan

Workshops with experts to review and provide feedback on The Plan draft

The Plan presented for City Council adoption

Town Hall for public comments on the The Plan draft
Topics for Future Consideration

Council directed that The Plan focus on reducing carbon dioxide emissions, related to energy and mobility, and ensuring a sustainable patterns of water use. While The Plan is able to provide the community with a clear pathway to meeting Paris Agreement goals with this approach, there are a number of areas that may be valuable to consider in future iterations as they can provide additional opportunities to reduce carbon dioxide emissions – potentially in alignment with Paris Agreement aspirations to keep the rise in average global temperature to below 1.5°C.

The Plan is a living document which will continue to evolve and incorporate the best available data and technologies. The City will update it in tandem with the four-year major General Plan update, allowing for significant future opportunities to make the The Plan more robust. The City looks forward to working with the community to identify and secure funding for further research, pilots, and programs to further enhance our climate smart pathway.

Accounting for Net Emissions
While not required to create a plan aligned with the Paris Agreement goals, including the following would refine and provide for a more comprehensive accounting of the net carbon dioxide emissions in San José:

- **Solid Waste, Wastewater, and Water Emissions**
  The baseline and forecasted emissions in The Plan were based on the City’s 2014 GHG Inventory and Forecast, which included three emissions categories that were omitted from The Plan: solid waste, wastewater treatment, and potable water. These categories represent less than nine percent of the community’s emissions.

- **Carbon Sequestration**
  Carbon sequestration from areas with Open Space, Parklands, Habitat, Agriculture, Open Hillside land use designations in the General Plan’s Natural and Working Lands (NWL), urban forestry, and technological interventions are not included in the GHG Inventory and Forecast. California’s recently adopted Climate Change Scoping Plan acknowledges the value of NWL in carbon sequestration. Significant efforts at state and local levels in California are underway to gain clearer, quantifiable data on the degree to which these can act as carbon sinks (i.e., measures that remove carbon). While, based on current data, carbon dioxide mitigation is a more effective approach (in terms of scale) to emissions reduction, compared to sequestration by NWL, these and other technological advances may present further climate smart opportunities as data and technology evolves. Once data is available, it can be considered for incorporation during the regularly scheduled updates to The Plan. The relevance of NWL to net carbon dioxide emissions, including avoided emissions, can be considered in a subsequent NWL analysis.

**Spatially-Explicit Analysis of NWL**
The City can partner with academia and other stakeholders to build upon research done by the state to quantify carbon dioxide emission impacts and benefits from NWL. This research could help further develop a spatially-explicit methodology to analyze potential uses of specific NWL and inform City decision-making and future updates to The Plan.

**Adaptation and Resiliency**
Adaptation and resiliency issues...
were omitted but, through inclusion in the City’s emergency planning efforts, would inform community direction in preparation for any future climate-related impacts, such as increased heat events, droughts, or sea level rise, and how they can be mitigated. For example, this exploration could help to inform the relevancy of NWL to the capture, storage, and control of water resources.

Additional Co-Benefits
While framed around inclusivity and quality of life benefits, The Plan does not explore the full array of co-benefits that are associated with climate smart measures. These may include health and well-being benefits associated with NWL and trees.

New Plans and Policies
Future iterations of The Plan will include review of the following plans and policies (and others that are adopted over time):

- Bay Area Greenprint tool, which assesses the benefits of natural and agricultural lands to inform land use decisions

- City of San José’s Greenprint (currently being updated) and Green Infrastructure Plan (to be completed by September 2019; framework approved in May 2017)

- California’s 2017 Climate Change Scoping Plan (adopted in December 2017)
1.3  Our Call to Action for Other U.S. Cities
Our Paris Agreement Call to Action for U.S. Cities

Climate change does not honor national boundaries; its impacts are indiscriminate.

Preventing climate change – by limiting the amount of carbon dioxide emissions we emit into the atmosphere – requires a sustained effort by all communities.

San José’s approach is to align with coordinated global action on climate change, articulated through the Paris Agreement. While not a silver bullet, it is an important framework for countries to do their part to limit global warming to less than 2°C – the point at which dangerous climatic impacts are triggered.

We also benefit from being in California, which has some of the most comprehensive climate change laws in the world. These will impact how our communities use energy and move in our cities. But we cannot be complacent. City-led action is critical to ensure that we can meet our state goals. As the third most populated city in California, and tenth in the U.S., we must strive to lead.

San José is not the first city to address this climate challenge or determine what it means for our economies and the quality of life of our communities. We stand on the shoulders of other cities in the U.S. that have been making progress on climate action and sustainability. And, we stand with 392 of those cities across the U.S. that have promised to honor and uphold the Paris Agreement.

Work is already underway around the country to design the next generation of climate action plans that will make a difference in reducing citywide carbon dioxide emissions. As one of the first U.S. cities to develop a Paris-aligned climate action plan and detailed pathway, our intent is to share the lessons learned and insights from that process to not just achieve our Paris commitments, but also deliver against the objectives – inclusive economic opportunities, livable neighborhoods, and a Good Life for our families.
In the U.S., 392 Cities Pledged to Honor and Uphold the Paris Agreement

Source: Climate Mayors, Dec 2017

(Left) Join the movement and make a difference in your local community and nationwide.
Cities Need to Plan Climate Action for 2020-30

Selected U.S. cities and stated emissions reductions targets (Source: Climate Mayors, Dec 2017)
Although it’s the capital of Silicon Valley and the tenth largest city in the U.S., San José is actually, in many ways, typical of hundreds of cities across the country. We are an example of post-WWII rapid growth with a pattern of development defined by the rise of the automobile, and a city of spacious single-family homes made for previous generations. We have seen rapid growth again in recent years because of new industries that boost our economy, but not always in an inclusive way. Hundreds of cities in the U.S. share this story. It has been the template for our country’s growth and development and has given rise to carbon dioxide emissions profile dominated by energy use in transportation and buildings.

A third of the country - 106 million Americans - share a pattern of urban development and therefore climate impact identical to San José’s.

The Plan has uncovered five key tenets for these communities to consider as they look to plan their own low-carbon futures:

1. Reframing sustainability as an aspiration for the Good Life 2.0 resonates with our community.
2. Effective, City-led climate policies are implemented when multiple City departments buy in and collaborate.
3. The City’s role is to convene and enable our communities to adopt change.
4. Creating local jobs in transit-accessible locations is a cost-effective strategy to reduce carbon dioxide emissions.
5. Implementing a community choice energy (CCE) program will give the City ownership of its electricity supply while supplying sustainable power for our future.
02 Climate Smart San José

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2.2 Pillars & Strategies – Page 71
2.3 Bold Campaigns – Page 115
2.1 Understanding Our Challenge
San José’s Growth Compounds Our Climate Challenge

A number of factors are at play that will shape San José’s future growth and sustainability profile.

Continued and Accelerated Growth of the Service Population
San José is forecast to see a significant amount of growth in both its resident and working population (collectively termed the Service Population), increasing by 38 percent between 2017 and 2040. This will place demands for various public services, infrastructure, and resources. On the other hand, with a new population that requires housing and infrastructure, San José has the potential to design and plan efficiently and sustainably from the outset.

Transportation Patterns and Densification
With San José’s population set to grow significantly, the Envision San José 2040 General Plan outlined a deliberate densification agenda. This sees the growth in San José’s population centered in urban villages and other focused growth areas. Compact development sees benefits such as lower cost of infrastructure provision, increased efficiency, reduced traffic congestion and transit times, and increased usage of forms of low-carbon transport.

Environmental and Climate Regulation
California is considered one of the leading subnational regions making progress on climate and sustainability. With considerable state-level support for tighter environmental regulation, California stands to aggressively decarbonize its economy with ambitious reductions codified in AB32 and SB32, working toward a target of 80 percent reduction (compared to 1990s levels) in carbon dioxide emissions by 2050. San José has responded in-kind, through the San José Green Vision (Green Vision), Bike Plan, and other policies to implement energy, transport, and water sustainability on a local scale.

Forward-Thinking Local Government and a Population Open to Innovation
With proximity to the considerable innovation potential of Silicon Valley, San José has a population open to innovation and positive change. This can be seen, for
example, by wide community support for community choice energy (CCE) and San José being named one of 20 electric vehicle (EV) capitals of the world.

Adopting, Honoring, and Implementing the Paris Agreement
In June 2017, Mayor Liccardo joined over 392 mayors from around the United States in adopting and honoring the Paris Agreement, which commits the planet to limit global warming to less than 2°C and, ultimately, 1.5°C. Although cities have signed up to the Paris Agreement, few cities have yet to figure out what this actually means. San José will be one of the first to translate the Paris Agreement into a pathway of specific actions necessary to limit carbon dioxide emissions.

In order to identify the focus areas of The Plan, it is first necessary to understand the unique profile of carbon dioxide emissions and water use in the city.
What Drives Our Carbon Dioxide Emissions Profile?

The profile of carbon dioxide emissions in San José is determined by two main patterns of use: energy consumption in buildings and energy consumption in transport.

Buildings are primarily dependent on natural gas for direct thermal energy uses (e.g., space heating and water heating) and generating electricity, while transportation requires significant use of gasoline and diesel fuel sources. By sector, San José’s residential, commercial, and industrial sectors use natural gas as their primary fuel type. The residential and commercial sectors are primarily responsible for energy consumption, using both electricity and natural gas, in San José.

Direct access is mostly due to commercial and industrial users purchasing electricity from private sources.

What This Means
Depicting the profile of fuel sources and energy uses allows us to understand the connections between emissions and activities that give rise to it. What can be seen from this profile (see figure on page 63) is that a number of opportunity areas exist:

1. Transitioning to renewable electricity
2. The electrification of natural gas uses in buildings
3. The electrification of transport
4. Reducing demand for energy across all sectors

The Plan focuses on developing strategies that respond to these opportunities.
Fuel Sources and Energy Uses in San José

- Gasoline: 44,292,335
- Diesel: 13,177,050
- Biodiesel: 19,390
- Propane: 819
- Natural Gas: 23,667,256
- Solar: 3,231,854
- Wind: 2,350,439
- Large Hydro: 3,484,784
- Nuclear: 4,956,138
- Unspecified (purchased): 2,936,069

- Eligible Renewable: 7,905,483
- Non-renewable and Large Hydro: 12,390,345
- Direct Access: 4,981,783
- Electricity: 23,231,896
- Commercial: 16,426,857
- Industrial: 3,608,281
- Other - Equipment and Boats: 5,044,224
- Heavy Duty Vehicles: 7,094,038
- Buses: 2,775,359
- Public Service Vehicles: 185,424
- Other - Trains: 338,377
- Motorcycles: 112,503
- Local Delivery: 9,651,428
- Large Pickups and Vans: 6,874,398
- SUVs: 9,544,783
- Passenger Cars: 16,486,403

Total MtCO2e: 6.9

- Residential: 17,305,176
- Commercial & Industrial Buildings: 1.4
- Transport: 4.0
- Other: 0.6
- Unquantified: 1.35

Additional Emissions (e.g., Working Lands)

Emission Sinks (e.g., Natural and Working Lands)
San José’s profile of emissions is driven primarily by the city’s use of fossil fuel-derived electricity and gasoline used for transportation. With the anticipated population increase in the city, this profile is expected to grow. The city will be emitting even more carbon than it does today. How does this baseline compare to what’s required?

The Plan defines a pathway that complies with both statewide and international climate goals.

State of California Emissions Reduction Targets
California has set aggressive requirements for reductions in carbon dioxide emissions. Executive Order S-3-05 sets targets for California to reduce emissions to 1990s levels by 2020, and then 80 percent below 1990s levels by 2050. Executive Order B-30-15 introduces an additional requirement to reduce emissions by 40 percent below 1990s levels by 2030.

Although these targets have been codified into California state law by the Global Warming Solutions Act of 2006 (Assembly Bill 32), Californian cities will need to translate these targets into climate action plans in order to contribute to this effort.

Achieving Paris-alignment with a 2°C Pathway
While delivering against the requirements of California state regulation, we know that our City has an additional responsibility to play its part in being stewards of our global climate. This is best expressed through the Paris Agreement, the framework through which 195 countries have committed to limit the global average temperature increase to 2°C - with a goal of 1.5°C - above pre-industrial levels.
We’ve cut back before... In 2008, San José’s emissions rapidly reduced in part because of the City’s Green Vision, the Global Financial Crisis, and a slight decrease in San José’s population.

San José’s Contribution to California & Paris Agreement Goals

- Reduce GHG emissions to 1990 levels by 2020
- Reduce GHG emissions 40% below 1990 levels by 2050
- Reduce GHG emissions 80% below 1990 levels by 2050

Pro-rated emissions targets for San José

San José baseline and projection
California AB32 and SB32 (EO-S-5-05 and EO-B-30-15) targets
Paris-compliant 2°C pathway (6.5% p.a. decarbonization rate)
San José benefits from being the third largest city in California and it’s mounting one of the most ambitious climate efforts. The state’s carbon reduction targets that have been set commit California to a radical transformation from a fossil fuel-dependent base to a future that is driven by efficiency and clean energy.

This means that San José will benefit from moves that will happen outside of its direct control. For example, the Renewable Portfolio Standard (RPS) is generally being transitioned to renewables and currently stands at 33 percent in 2017, with an expected transition to at least 50 percent by 2030. This statewide regulation is included in the baseline emissions.

**Envision San José 2040 General Plan**

In order to anticipate and plan for the city’s future, San José developed its General Plan as a framework for the city’s focused growth and development. While not explicitly a plan for sustainability, the General Plan outlines key strategies and goals such as improving the city’s jobs and housing balance, and building mixed-use, walkable Urban Villages to create vibrant neighborhoods close to transit, which is an environmentally sustainable development pattern. Through these initiatives, the General Plan looks to adjust San José’s “business as usual” to a lower-carbon pathway. However, the General Plan alone is not enough to meet the State’s carbon commitments, let alone align with the decarbonization rates implied by the Paris Agreement.

San José’s increase in population also affects the overall water demand. Although San José significantly cut back on its water consumption during the community’s most recent drought, a rebound is expected, and demand will continue to grow in the absence of long-term measures. It is in the community’s interest to curb its water use to reduce the strain on the water supply and be prepared for future droughts.

We’re on the path to a greener, happier life. Are you?
The General Plan’s Carbon-Reducing Actions Fall Short of California & Paris Goals

San José Water Use by Sector
We Know Better is Possible

There are a number of factors that contribute to the carbon dioxide emissions and water consumption profile in cities. However, these can be simplified to climate, electricity supply, and population density.

In many ways, San José is very similar to other large cities. It has been built primarily over the last six decades, its spatial layout has been designed around the car, and it’s relatively sprawling and low-density. For reference, we should compare San José with cities that either share a similar profile or are similar in size and economic terms.

There are a number of factors that contribute to the carbon dioxide emissions and water consumption profile in cities. However, these can be simplified to climate, electricity supply, and population density. Climate determines the availability and use of water, electricity supply determines the carbon content of power, and population density tells us about how people use energy and how they move around the city.

**Emissions**

When looking at the selected group of cities that disclose their citywide carbon dioxide emissions to the Carbon Disclosure Project (CDP), we see San José in the middle of the pack at 4.5 tCO2e per resident (6.3 tCO2e per resident and worker). Cities such as Atlanta, Houston, and Los Angeles, which are larger and more sprawling, have a higher footprint. Boston and Melbourne have higher footprints because of the continued use of fossil fuels (including coal) in their power grids, and, in the case of Boston, the use of natural gas for heating in homes. Denser cities, such as Barcelona and Vancouver, tend to achieve lower per capita emission footprints.

**Water**

There are cities in similar climatic contexts to San José that achieve sustainable patterns of water consumption. For example, Barcelona and Melbourne, typically with more arid climates than Northern California, have very low water consumption patterns.
Citywide Carbon Footprint (tCO2e per capita)

Source: Cities reporting to Carbon Disclosure Project (CDP)
*denotes C40 city

Aggregate Water Consumption (gallons per day)

Source: Team analysis, incl. SFPUC, USGS, SCVWD and others
2.2 Pillars & Strategies
A Strategic Overview of Climate Smart San José

The strategy section of Climate Smart San José outlines the size of the challenge required for San José to adopt a Paris-aligned climate action pathway.

What Does This Section Do, What Does It Not?
It structures these challenges into a logical model for understanding the interconnections between energy, water, mobility, and planning and how they all interact to collectively drive down emissions and water – our desired outcomes. The Strategy section of The Plan does not assign specific inputs or actions, targets or metrics to entities, groups or stakeholders; these are interpreted in the Implementation section through each of the playbooks developed. It does, however, outline the milestones necessary to deliver a Paris-aligned pathway.

Introducing The Logical Model Underpinning Climate Smart San José
Based on a deep consultation and engagement process, as well as a thorough analysis of the sustainability aspects of San José, The Plan includes nine key strategies that the City will need to plan for and facilitate implementation of in order to become a model for sustainability. These strategies have been grouped into three overarching pillars which share with each other a common set of principles and philosophies. Within each pillar, a combination of energy, water, planning, and mobility sector actions have been woven in to tangibly understand the impacts on emissions and water reduction.

The strategies and pillars alone are not sufficient to deliver a Climate Smart San José; implementation is also required. As such, the framework also introduces the concept of playbooks which are tailored for key audiences who will be empowered to deliver aspects of The Plan.

In addition to these playbooks, the framework includes a City Action Plan that outlines the near-term actions that City departments will undertake in order to build critical mass and momentum.

Finally, The Plan calls on five Bold Campaigns that activate different combinations of the strategies and builds the bridge for holistic, community-enabled climate action. Structuring the issues in this way is intended to provide a logical framework for thinking about sustainability issues as they relate to San José. It also allows The Plan to be aligned and interlocked with other planning priorities such as the Envision San José 2040 General Plan (General Plan) as well as departmental-level initiatives within the City.
CLIMATE SMART SAN JOSE | A PEOPLE-CENTERED PLAN FOR A LOW-Carbon CITY

PILLARS of what residents want

Climate and water STRATEGIES

Tailored PLAYBOOKS for key audiences and stakeholders

The City’s ACTION PLAN

THE ENABLING ROLE OF SAN JOSE CITY HALL

Pillar 1
A Sustainable & Climate Smart City

1.1 Transition to a renewable energy future

1.2 Embrace our Californian climate

Pillar 2
A Vibrant City of Connected & Focused Growth

2.1 Densify our city to accommodate our future neighbors

2.2 Make homes efficient and affordable for our families

2.3 Create clean, personalized mobility choices

2.4 Develop integrated, accessible public transport infrastructure

Pillar 3
An Economically Inclusive City of Opportunity

3.1 Create local jobs in our city to reduce vehicle miles traveled

3.2 Improve our commercial building stock

3.3 Make commercial goods movement clean and efficient

Businesses and industry

Property developers and owners

Residents

Our civic institutions

Regional agencies

Technology enablers

Financial enablers
San José is already at the forefront in terms of combating climate change. Following the *The Plan* pathway will make it a global leader, and a shining example of what’s possible to achieve in just a few decades. By 2050, San José could be a picturesque city that runs efficiently while optimizing the Good Life 2.0 for its residents across the three pillars of being a climate smart, connected, and economically inclusive city.

**A Sustainable and Climate Smart City**
The recent City Council approval of San José Clean Energy (SJCE) is a significant step toward controlling the city’s climate future. By 2050, SJCE and all of the residents who are included will be sourced with 100 percent renewable energy. Solar panels will be more prevalent and visible on the roofs of households, with some neighborhoods banding together to invest in community solar. Residents will be able to capture as much as they need for the night, fill their battery backups, and then sell their extra energy back to the grid. Not only will it be nice to have these opportunities to get some additional revenue, but it is also resilient to have the batteries as backups in case the grid experiences any kind of outage.

In addition to being powered by solar and other types of carbon-free renewable energy, San José will be much more efficient in the consumption of its resources. Appliances will use less water and electricity, and the few that are still on natural gas will consume much less of it. Those with lawns will have a natural, authentic, and scenic California landscape that will thrive on its own without irrigation. San José will be using its resources much more sustainably, and the resources it does use will be regenerative.

**A Vibrant City of Connected and Focused Growth**
One of the common elements throughout the Good Life 2.0 is time. Time to do more things that one cares about with the people they care about. Almost all San José residents can agree that they spend too much time in the car, in traffic, and trying to get to where they need to go.

One of the key levers of the pathway is densification in focused growth areas because it reduces the amount of miles a resident needs to travel. Making destinations such as home, work, or the grocery store closer together makes things more convenient. Rather than getting in a car, it will be easier for residents to walk or bike to the store.
(Left) Get back all that time you wish you had and do more of what brings you joy.

(Below) Get where you need to go with less stress and have a moment for yourself.
Another aspect of the Good Life 2.0 is optionality. Increased availability of public transit like buses, BART, Caltrain, and the High-Speed Rail, and transit-oriented development around their hubs provide more modes of travel. If residents are unable to live within walking distance of these stations, there are other options like sharing bicycles, rides in cars, or shuttle buses with other travelers going to similar destinations. Some of these destinations will be the transit stations, thus eliminating the first mile, last mile problem.

And for those times when public transit or a shared vehicle just will not cut it, many people will still retain access to personal passenger cars, most of them electric, which can be used to get to destinations. These personal and shared vehicles may even be autonomous, allowing the driver to relax and enjoy the ride. From the environmental perspective, even if these non-public forms of transportation are used, because they are also running on clean electricity, their carbon footprint is minimized.

**An Economically Inclusive City of Opportunity**

If focused densification is a key principle of the The Plan pathway, then creating local, decent jobs is another. Bringing in more jobs to better balance the jobs to employed resident (J/ER) ratio will benefit the city in many ways.

More income for more people will increase their financial independence and security. Jobs being accessible through various means provide lower-cost transportation and commute flexibility instead of being shackled to a car. Jobs that are targeted for a diversity of San José residents will ensure no one gets left behind during the city’s transformation. And the city’s climate transformation itself will generate new jobs in new low-carbon sectors.

The commercial sector will also be invested in going green. Not only will investing in efficient products or vehicles that consume less energy, water, or fuel be economically viable, it will be economically imperative to cut costs.

San José’s prominent location in Silicon Valley grants it exclusive access to the most innovative site in the world. Tapping into these innovations and economies of scale will drive down prices. When the commercial sector, like companies in Silicon Valley, becomes incentivized to go green, it creates sustainability multiplier effects for all sectors.

These are the sorts of changes San José will need to encourage in order to be Paris-aligned by 2050, and with Good Life 2.0 concepts such as more free time, convenience, and options, the community is incentivized for quality of life reasons as well.
The Nine Strategies of Climate Smart SAN JOSE

1. Embracing our Californian climate means creating an urban landscape, in our homes and public places, that is not just low water use, but attractive and enjoyable.

2. Transitioning to a renewable energy future provides clean electricity that supplies the entire city.

3. New technology can enable clean, electric, and personalized mobility choices that make it convenient to move between any two points in the city.

4. Creating local jobs in our city makes it possible for our residents to work close to where they live, saving time, money, and gas spent commuting.

5. Developing integrated, accessible public and active transport infrastructure reduces the dependency on the car to move within the city.

6. Making our commercial buildings high-performance and siting them close to transit lowers water and energy use.

7. Making our homes energy efficient and fully electric can make them affordable for our families and more comfortable to live in.

8. Densifying our city in focused growth areas increases walkability and cycling and also makes our neighborhoods more vibrant, distinctive, and enjoyable.

9. Moving commercial goods through our city more efficiently with new technology and fleet management practices.
Pillars group two or more strategies into one of the three integrated categories that shares similar philosophies.

Strategy describes our overarching goals and ambitions for this area.

Progress milestones indicate what would need to be met in order to reach the target.

Our strategy explains in more detail our objective for this area.

Good Life benefits describe the intangible benefits that contribute to quality of life, such as experience, health and well being, and time with family.

Our leadership to date outlines the progress that San José has already made toward addressing this issue, and how we are well-placed to continue.

Low-carbon growth indicators are broken down into the main categories relevant for each strategy. The leading indicator is related to emissions reduction (except for Strategy 1.2). This is supported by other relevant indicators, where applicable.

Sector tags indicate which sector (energy, water, land use, mobility, or economy) this strategy is primarily tagged to.
STRATEGY 1.1
Transition to a Renewable Energy Future

Whether it's electricity to power our buildings, natural gas to warm and cook in our homes, or gasoline to fuel our cars, San José depends on the use of energy derived from fossil fuel sources. Using these sources accounts for the majority of our carbon footprint.

While efforts on the demand side are important from a cost management point of view, transitioning our energy sources to renewables is the single most important move that we can make to reduce our emissions.

Why This is Important

We know that climate change brings with it contradictory extremes. San José has — in just the last three years — seen firsthand what this actually means, with a biting four-year drought and a flood that followed in 2017. These events exposed our dependence on, and vulnerability to, water. Achieving climate-resilience doesn’t mean punishing water use. It’s an opportunity for us to embrace and make the most of our Californian climate.

Pillar 1
A Sustainable & Climate Smart City

San José has all the ingredients to be a sustainable and climate smart city. It has abundant renewable resources, a skilled workforce, and a willingness to innovate. San José will become the model for what a truly Californian approach to being a sustainable and climate smart city looks like.

STRATEGY 1.2
Embrace Our Californian Climate

Strategies

- STRATEGY 1.1: Transition to a Renewable Energy Future
  - Reduce greenhouse gas emissions by transitioning energy sources to renewables.
- STRATEGY 1.2: Embrace Our Californian Climate
  - Adapt to and mitigate the effects of climate change.

Why This is Important

San José has all the ingredients to be a sustainable and climate smart city. It has abundant renewable resources, a skilled workforce, and a willingness to innovate. San José will become the model for what a truly Californian approach to being a sustainable and climate smart city looks like.
San José will create SJCE, a community choice energy (CCE) program that will make 100 percent carbon-free electricity available as a base offering to all users in the city by 2021.

**Good Life Benefits for Our City**

By creating its own electricity service provider in the form of SJCE, the people of San José will have direct control over how much they pay and where their energy comes from. Households generating energy through on-site solar panels will also stand to receive benefits from the sale of distributed energy through net energy metering.

**Our Leadership to Date**

In our 2007 San José Green Vision (Green Vision), we committed to receive 100 percent of our electrical power from clean, renewable sources. Ten years later, in May 2017, the City Council voted unanimously to establish SJCE, making San José the largest city with a CCE program in the country with the option to choose the level of renewable power. Combined with 131 MW of distributed solar generating capacity in the city, San José is well-placed to transition to a renewable energy future.

**Low-Carbon Growth Milestones**

<table>
<thead>
<tr>
<th>INDICATORS</th>
<th>CARBON REDUCTIONS</th>
<th>RENEWABLE ENERGY</th>
<th>LOCAL RENEWABLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>METRICS</td>
<td>Emissions reduction from this strategy</td>
<td>Share of eligible renewable energy generation provided by SJCE</td>
<td>Amount of renewable energy capacity installed in San José</td>
</tr>
<tr>
<td>PROGRESS MILESTONES</td>
<td>Thousands of tons of carbon reduced per year</td>
<td>Percentage of SJCE’s power mix</td>
<td>Installed capacity of local renewables (MW)</td>
</tr>
<tr>
<td>TODAY</td>
<td>–</td>
<td>–</td>
<td>131</td>
</tr>
<tr>
<td>2030</td>
<td>784</td>
<td>60%</td>
<td>668</td>
</tr>
<tr>
<td>2040</td>
<td>1,341</td>
<td>87%</td>
<td>1,113</td>
</tr>
<tr>
<td>2050</td>
<td>1,666</td>
<td>100%</td>
<td>1,430</td>
</tr>
</tbody>
</table>
California is a state abundant in renewable energy sources. We lead the nation in solar energy and are ranked third in the amount of wind power we produce, behind Texas and Iowa. Our state has seen the development and advancement of many technologies of the future including the solar photovoltaic (PV) cell and continues to be at the leading edge of renewable energy and storage development.

The State of California has already set ambitious goals toward the use of renewable energy, such as the Renewable Portfolio Standard which will require regular utility providers, like PG&E, to increase their share of renewables to 33 percent and 50 percent by 2020 and 2030, respectively. A further stretch goal for the state to be 100 percent renewable by 2045 is also being discussed in the California State Senate.

San José is uniquely placed to be the first major U.S. city to transition to a renewable energy future. SJCE is the game-changing step that makes this transition possible and allows our City to preempt and exceed the state-level targets expected of us.

**What is San José Clean Energy?**
SJCE is a program that enables San José to pool the electricity demand of the entire city and develop and/or bulk-purchase renewable power on behalf of the residents, businesses, and government electricity users within our jurisdiction.

Being a public entity, SJCE will be subject to the rules of transparency, open meetings, notices, and other protections provided by law.

SJCE will be completely ratepayer funded. This means that only those who use the service will pay for it, but it will make carbon-free electricity available to all users in San José.

Having direct ownership and control over our electrical power allows us to be the leading edge of California’s renewable energy transformation. From 2018, SJCE will allow us to have carbon-free electricity with a significant share of renewable energy – at least ten percent more than PG&E – combined with low-carbon sources such as large hydropower.

As our city grows, and we

---

**How Local Energy Aggregation Works**

**source**

CCE
Buying and building electricity supply

**delivery**

UTILITY
Delivering energy, maintaining lines, billing customers

**customer**

YOU
Benefitting from affordable rates, local control, cleaner energy
work toward electrifying other uses of energy (such as heating and transport), the demand for electricity will increase. SJCE allows us to be responsive to our local energy needs as well as aggregates our demand for the bulk purchase of renewable energy. As such, SJCE is critical toward transitioning to a renewable energy future.

San José’s Potential to be the World’s First One Gigawatt Solar City
San José is resplendent in solar energy; Google’s Project Sunroof estimates that 201,000 roofs – 94 percent of all roofs – in our city are suitable for solar electricity production. The National Renewable Energy Laboratory estimates that the total technical potential for rooftop solar in San José could be 3.4 gigawatts.

With the residents of San José now taking the production of electricity into their own hands through SJCE and with the decline in solar installation costs, San José can strive to create 1 gigawatt of rooftop solar in the city. This will mean that SJCE may need to consider a residential feed-in tariff to allow residents to sell solar generated from their roofs back to the grid. It could also stimulate the development of a stronger local industry for designing, manufacturing, installing, maintaining, and insuring residential solar systems.

Rooftop Space with Solar Energy Potential in San José

Indicates rooftop space with solar energy potential in San José (Source: Google Project Sunroof)
San José is uniquely placed to be the first major U.S. city to transition to a renewable energy future.
San José will effectively employ sustainable use practices of local water and green infrastructure to achieve a 30 percent reduction in residential water consumption to 42 gallons per day per capita by 2030.

### Good Life Benefits for Our City

Embracing our Californian climate means having an authentic relationship with our natural resources and curating our open spaces, both private and shared, to not just be low-water use, but also beautiful, enjoyable, and compatible with our climate.

### Our Leadership to Date

San José recently emerged from an unprecedented period of drought. During this time, we collectively reduced our water consumption by 28 percent. While we relax our water conservation efforts in the short-term, we know that through stewardship and efforts that learn from our programs such as Lawn Busters, a sustainable pattern of low water consumption is possible.

### Climate Smart Water Use Milestones

<table>
<thead>
<tr>
<th>INDICATORS</th>
<th>TOTAL WATER CONSUMPTION</th>
<th>RESIDENTIAL WATER USE</th>
<th>REUSED &amp; RECYCLED WATER SOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>METRICS</td>
<td>Total volume of water consumed in the city per day</td>
<td>Residential water use per capita per day</td>
<td>Percentage of water captured and reused or treated then recycled</td>
</tr>
<tr>
<td>PROGRESS MILESTONES</td>
<td>Million gallons of water per day</td>
<td>Gallons of water per capita per day</td>
<td>Percentage of demand met by reuse/recycling</td>
</tr>
<tr>
<td>TODAY</td>
<td>116</td>
<td>60</td>
<td>5%</td>
</tr>
<tr>
<td>2030</td>
<td>107</td>
<td>42</td>
<td>14%</td>
</tr>
<tr>
<td>2040</td>
<td>76</td>
<td>20</td>
<td>23%</td>
</tr>
</tbody>
</table>

Milestones extend only to 2040. This is the latest year available for baseline data from local urban water management plans.
Strategy 1.2: Embrace Our Californian Climate

In California, we enjoy diverse natural bounty, from deserts and plains to temperate forests and cool coastal regions. These diverse environments all interact to grow our food and supply our cities. Water from the melting snowpack in the Sierra Nevada meanders its way, over the course of months, through the Central Valley to be used in San José. It is a finely tuned and balanced system.

However, the growth of our population places pressures on this system. Our use of water in our homes and places of work to shower, wash our clothes and dishes, and maintain our green lawns all place pressure on the system. We felt this pressure between 2012 and 2016 when California experienced a four-year drought. Our community responded to this historic challenge by temporarily reducing our water consumption by 28 percent.

We know that a lower water-use paradigm is possible, but how do we make it attractive and sustainable for the long term?

Embracing our Californian climate is about taking forward the lessons of our response to the drought but doing this in a way that makes a low-water-use paradigm authentic, beautiful, and livable.

We’ve Created a Little Piece of Connecticut in California
As San Joséans, we take pride in our lawns; we spend time curating beautiful front yards and create lush backyards where our kids play, we invite our friends and family over for barbecues, and we make memories.

However, water used for irrigation and watering plants and lawns accounts for half of all residential water consumption.

Embracing our Californian climate means planting species that are particularly suited for low-water climates, creating greenery that provides cooling, and a space in which to unwind. These species, such as *Bouteloua gracilis* (Mosquito Grass) and *Fescue californica*, can use up to ten times less water than typical plants.

Moving from water-intensive green lawns does not mean moving to brown lawns or even to hardscaping; our yards need not become an extension of our driveways. Beautiful gravel gardens can be created that are permeable, allowing water to filter down and reach underground storage aquifers, recharging our local water supply while also creating climate-compatible spaces that we can enjoy.

Water Consumption
Embracing our Californian climate means adopting sustainable patterns of water use. This can be accomplished by adopting practices that reduce water demand, for example through passive infrared (PIR) sensors or timed switches that release water when needed, or aerated, low-flow and low-flush water-using amenities that provide the same cleaning functions at a fraction of the water needed.

This can also mean matching water needs to available water sources. While citywide “purple pipe” infrastructure may be costly, household-level systems to harvest rainwater or other recovered/recycled water to use for non-potable uses may be feasible.

Sustainable Water Supply and Storage
Increased variability in our climate, may cause San José to experience more periods of both drought and rain, distorting the pattern of our city’s water supply and placing stress on our stormwater infrastructure.

While efficiency of use is the cheapest form of water “supply”, we will also need to work with regional partners in the Bay Area to consider new reservoirs and dams to act as storage batteries.
during periods of water variability. Infrastructure such as expanded non-potable wastewater systems may also be necessary.

Our city experienced some of the worst flooding in 20 years in 2017. While the Coyote Creek flood taught us valuable lessons in resilience and disaster recovery, it also highlighted the role of nature-based solutions – so-called “green infrastructure” such as floodable plains and open spaces – to facilitate rainwater and stormwater re-entering the water cycle.

(Left) Use rainwater and other recycled water for gardening to promote sustainability and limit water consumption.

(Below) New reservoirs and dams will help store water in preparation for droughts.
Pillar 2
A Connected City of Vibrant & Focused Growth

San José is the capital of Silicon Valley. We use the best products and services, and know how to enhance our city to be compact, smart, and connected. We combine intelligent planning with seamless mobility, solving the problems of last-mile journeys and making travel clean, efficient, and convenient.

STRATEGY 2.1
Densify Our City to Accommodate Our Future Neighbors

STRATEGY 2.2
Make Homes Efficient & Affordable for Our Residents

STRATEGY 2.3
Create Clean, Personalized Mobility Choices

STRATEGY 2.4
Develop Integrated, Accessible Public Transport Infrastructure
San José will embrace an expected 319,000 additional residents by 2050 through managed, mixed-use densification around its planned growth areas.

**Good Life Benefits for Our City**

Densifying San José in anticipation of our city’s expected population growth is a means to lower our emissions footprint. It also brings significant Good Life benefits in terms of making our neighborhoods more vibrant, walkable, convenient, and enjoyable.

**Our Leadership to Date**

Our forward-looking General Plan anticipates our city’s projected population growth and outlines a plan of proactive densification clustered around focused growth areas. Efforts are underway to integrate these with future public transit infrastructure and secure anchor tenants to catalyze and activate these areas. In addition, we are working to improve the quality and safety of our streets to improve walking and cycling.

**Low-Carbon Growth Milestones**

<table>
<thead>
<tr>
<th>INDICATORS</th>
<th>CARBON REDUCTIONS</th>
<th>CITY DENSITY IN GROWTH AREAS</th>
<th>COMPLETE STREETS</th>
<th>TRANSIT-ORIENTED DEVELOPMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>METRICS</td>
<td>Emissions reduction from this strategy</td>
<td>Density of new residents in planned growth areas.</td>
<td>Percentage of primary streets in San José that meet CA Complete Streets Act standards</td>
<td>Commercial space located within 1/2 mile of transit</td>
</tr>
<tr>
<td>PROGRESS MILESTONES</td>
<td>Thousands of tons of carbon reduced per year</td>
<td>Resident population per square mile (new growth only)</td>
<td>Percentage of primary streets that are complete streets</td>
<td>Millions of square feet of commercial space</td>
</tr>
<tr>
<td>TODAY</td>
<td>–</td>
<td>2,372</td>
<td>40%</td>
<td>29</td>
</tr>
<tr>
<td>2030</td>
<td>288</td>
<td>5,224</td>
<td>100%</td>
<td>51</td>
</tr>
<tr>
<td>2040</td>
<td>493</td>
<td>7,015</td>
<td>100%</td>
<td>67</td>
</tr>
<tr>
<td>2050</td>
<td>607</td>
<td>8,727</td>
<td>100%</td>
<td>78</td>
</tr>
</tbody>
</table>
Strategy 2.1: Densify Our City to Accommodate Our Future Neighbors

San José is the tenth largest city in the United States, and our population is set to grow. With an expected 319,000 new residents by 2050, San José has an opportunity to proactively anticipate and manage this growth through careful densification of select areas and neighborhoods in the city.

Densification brings a number of benefits. It co-locates people in dense neighborhoods with the amenities required to support the community. Density allows people to walk or bicycle to grocery stores, their friends, their places of work, worship, and leisure. Walkable and bikeable streets reduce the need for passenger car journeys and encourages active forms of transport, public transport infrastructure, and personalized mobility solutions. This reduces vehicle miles traveled (VMT), a metric of vehicular use which can be a proxy for traffic collisions, and the emissions associated with car journeys.

From an economic perspective, densification concentrates demand for infrastructure, making the unit costs of utilities and transport cheaper and certain types of transport choices (such as ridesharing) viable.

Densification also adds an intangible benefit in adding to the cultural vibrancy of a city by creating areas of activity where experiences are shared and memories are formed. It adds to the feel of a city. Combined with local job creation and coordinated with public transit infrastructure, it creates vibrant, connected, economically diverse, and livable communities.

Focused Growth in the General Plan

The General Plan acknowledges and uses the tool of densification as a means to proactively and preemptively plan for new residents in the city while minimizing sprawl. Specifically, the General Plan identifies urban villages and other planned growth areas totaling 44 square miles, that will be home to 120,000 new dwelling units. The Downtown

San José’s Diridon Station - the “Grand Central Station of the West” - will be the seed for a new mixed-use, transit-oriented urban quarter that brings together commerce, housing, and place-making to create a vibrant community.
Density allows people to walk or bicycle to grocery stores, their friends, their places of work, worship, and leisure.
growth area is San José’s largest and most vibrant urban area, and is the only location in the South Bay that actively promotes high-rise development.

**Complete Streets**

Successfully planning for densification in focused areas can be achieved by creating the right conditions that encourage walkability and bicycling. This includes pedestrian-friendly streets, all-ages bicycle facilities, and limits on-street parking. These actions have been codified in California’s 2008 Complete Streets Act and are underway in San José. By combining educational programs to teach the next generation of bicyclists – such as Walk n’ Roll San José – and bicyclist-ready facilities in complexes with showers, secured parking, and changing facilities, complete streets can create significantly more accessible neighborhoods.

**Transit-Oriented Development**

Another way of achieving densification and focused growth is the explicit co-location of development with public transportation infrastructure – Transit-oriented Development (TOD).

TOD refers to the growth and support of public transit in areas within a close proximity (around half a mile) of a transit station. This support of public transit can consist of proper signage, increased walkability to the stations, bike parking, etc., and can increase the overall ridership. Recent trends are also exploring bike-share oriented development, expanding the definition of transit to also include bike-share as mass transit.

For instance, Berryessa will be home to a BART stop in 2018 and Diridon Station will become San José’s premier transit hub. More residential and commercial growth focused within walking distance of these stations, means fewer travelers would ever need to use a personal car to reach the rest of the Bay Area, reducing congestion on highways.

**Preserving Existing Single-Family Homes**

Densification and focused growth does not necessarily mean the construction of large-scale apartment blocks or the removal of established homes. Rather, it means developing a variety of building types and forms such as attractive townhomes, apartments, and even new models of single-family homes. It also means preserving those neighborhoods mainly comprised of single-family homes with a distinctive character.

Development, whether limited or significant, extends the Good Life to existing residents and businesses, allowing them to stay in their neighborhoods, avoiding their displacement, and preserving affordable residential and business opportunities in those areas. In this way, the whole community benefits from growth, and neighborhoods retain their unique characteristics.

**Place-Making**

While densification and focused growth may mean smaller backyards, residents in San José will still be able to enjoy the outdoors. We will be able walk our dogs, take a stroll at night, or take our children out into shared community spaces that are made enjoyable, attractive, and safe by characterful architecture, climate smart planting, high-quality amenities, and a healthy, eclectic dose of San José culture.

**Carbon Benefits and Multiplier Effects**

Overall, focused growth and densification net impacts will reduce VMT by cars which will reduce carbon dioxide emissions (as opposed to if growth had continued to sprawl). It will also reduce building energy and water consumption due to more people living in multi-family homes.

Ultimately, densification provides an opportunity for San José to remake itself. We have the opportunity to not just become a more walkable and bikeable city, but a vibrant, enjoyable, human-scaled one.
All new homes built in San José from 2020 will be Zero Net Energy (ZNE) and existing homes will be retrofitted to reduce their energy consumption and eliminate their use of natural gas.

**Good Life Benefits for Our City**

While San José’s electrical power infrastructure will be carbon-free, switching to efficient, entirely electric-powered homes will lower household energy use. Requiring that new homes be built with ZNE from the onset will eliminate household utility costs in net terms. Energy-efficient homes are often more comfortable with better temperature control, quieter due to better insulation, and have cleaner indoor air with the elimination of natural gas use.

**Our Leadership to Date**

The Do it Yourself Home Energy Savings Toolkit, provided through the City-led Silicon Valley Energy Watch program, allows residents to install efficient appliances in their homes such as LED light bulbs and weather-stripping. Residents learn energy savings tips and techniques, as well as use tools to lower energy bills. To date, there have been over 2,000 toolkits checked out to residents across the County.

**Low-Carbon Growth Milestones**

<table>
<thead>
<tr>
<th>INDICATORS</th>
<th>CARBON REDUCTIONS</th>
<th>ZNE HOMES</th>
<th>ALL-ELECTRIC HOMES</th>
<th>HOUSEHOLD ENERGY USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>METRICS</td>
<td>Emissions reduction from this strategy</td>
<td>Number of ZNE homes</td>
<td>Percentage of homes that are all-electric</td>
<td>Household energy use (gas and electricity)</td>
</tr>
<tr>
<td>PROGRESS MILESTONES</td>
<td>Thousands of tons of carbon reduced per year</td>
<td>Number of ZNE homes</td>
<td>Percentage of homes that are all-electric</td>
<td>Household energy consumption (kWhe and kWhth)</td>
</tr>
<tr>
<td>TODAY</td>
<td>–</td>
<td>&lt;100</td>
<td>0%</td>
<td>14,988</td>
</tr>
<tr>
<td>2030</td>
<td>389</td>
<td>37,975</td>
<td>47%</td>
<td>10,626</td>
</tr>
<tr>
<td>2040</td>
<td>663</td>
<td>71,800</td>
<td>95%</td>
<td>6,547</td>
</tr>
<tr>
<td>2050</td>
<td>701</td>
<td>90,650</td>
<td>100%</td>
<td>5,704</td>
</tr>
</tbody>
</table>
Driven by the growth of our economy, we know that San José is one of the most expensive cities to live in. We also know that not everyone reaps the dividends from the growth and success of our economy. There are families who struggle with staying in a home that is located near their place of work or their children’s schools. Some families struggle to pay bills. These pressures will only grow with the projected population growth of our city.

That is why achieving true sustainability in our city includes providing affordable, efficient homes to live in. The Plan seeks to make the case for doing this. Our approach is two-fold:

1. Making sure families who live in newly constructed homes will benefit from ZNE features from the outset.

2. Phasing in improvements in our existing stock of residential homes.

ZNE Homes from 2020
Title 24 of the California Code of Regulations, known as the California Building Standards Code or Title 24, establishes the regulations that govern the construction of buildings in California. Part 11 (CALGreen Code) of Title 24 contains the specific energy performance standards applicable to buildings throughout California.

The California Public Utility Commission’s (CPUC’s) ZNE Action Plan outlines an intent to upgrade Title 24 to promote ZNE residential buildings from 2020 onwards. This is a significant undertaking and will require concerted efforts from California regulators, San José planning and building agencies, and an ecosystem of product and service providers.

Fundamentally, this means optimizing building performance based on San José’s prevailing conditions.
temperate climate. ZNE buildings will optimize their thermal envelopes to manage heat inside buildings. It also means drastically reducing energy loads in the home through a combination of efficient, low-energy use appliances and smart sensors and meters that tailor energy demand. There are a range of products on the market already filling these needs. For example, smart thermostats can save between 12 and 15 percent in heating and cooling costs. Making newly-constructed homes net zero also means using on-site renewable energy technologies – typically rooftop solar – to offset the energy consumption within a home.

Retrofitting Existing Homes to be More Efficient
While San José needs to manage the expected population growth of the city in a way that reduces the impact on those who already live here, the City also needs to consider how it makes its existing infrastructure and asset base fit for the future. Retrofitting existing residential buildings will require a range of home improvement upgrades, including:

- Installing thermal insulation into loft spaces and wall cavities to reduce the costs of heating and cooling.
- Enhancing natural ventilation to reduce the need for air conditioning.
- Reducing the electrical load from home energy appliances with more efficient equipment or smart homes.

While making these home improvements may be economical in the long-run, they require higher upfront costs. These improvements will need to be overcome by phasing in new replacements at the end-of-life of current appliances (e.g., fridges), and making incentives available to bridge the cost premium of replacement.

Home Electrification
A significant contribution to carbon dioxide emissions in San José is indoor natural gas use due to water heating, space heating, and cooking. Households will need to transition to electric-powered alternatives or solar thermal for low-temperature thermal uses. This is easier said than done. Although substitutions do exist, they do not necessarily substitute the experience of cooking with a gas flame, for example. San José will need to call upon appliance manufacturers to not just create electric alternatives, but to create or substitute the experiential benefits that users get from natural gas appliances.
(Left) Installing solar panels to your home can offset your daily energy consumption.

(Bottom) Contribute to ZNE by trading in your gas-powered stove for a sleek, electric cooktop.
San José will work to develop clean, personalized, and shared mobility choices, reducing single-passenger, gasoline car use through a combination of bike- and ridesharing, passenger electric vehicles (EVs), and, in the future, autonomous vehicles (AVs).

**Good Life Benefits for Our City**

This strategy will help eliminate the dependence that many of us have on our car and the time we spend gridlocked on streets and highways. Creating clean, personalized mobility choices gives everyone who lives and works in our City their time back and makes the air cleaner and the streets safer.

**Our Leadership to Date**

San José has worked hard to improve our patterns of mobility. In 2007, we committed to ensuring that 100 percent of our public vehicles run on alternative fuels. We have helped increase EV use by installing 64 public charging stations. We’re expanding bike share at no cost to the City, and have embarked on creating one of the first AV pilot programs in the nation to prove the concept and understand its effects. Our work positions San José to be a leader of a new mobility paradigm that integrates these technologies in a manner beneficial to our community.

**Low-Carbon Growth Milestones**

San José will work to develop clean, personalized, and shared mobility choices, reducing single-passenger, gasoline car use through a combination of bike- and ridesharing, passenger electric vehicles (EVs), and, in the future, autonomous vehicles (AVs).

<table>
<thead>
<tr>
<th>INDICATORS</th>
<th>CARBON REDUCTIONS</th>
<th>ELECTRIC VEHICLES</th>
<th>REDUCED CAR DEPENDENCY</th>
<th>SINGLE-OCCUPANCY VEHICLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>METRICS</td>
<td>Emissions reduction from this strategy</td>
<td>Percentage of passenger vehicles (including SUVs) that are electric</td>
<td>Reduction in passenger cars and SUVs from public or shared mobility</td>
<td>Single-occupancy vehicle commute trips</td>
</tr>
<tr>
<td>PROGRESS MILESTONES</td>
<td>Thousands of tons of carbon reduced per year</td>
<td>Percentage of passenger vehicles that are electric</td>
<td>Equivalent number of cars taken off the roads</td>
<td>Percentage of single-occupancy vehicle commute trips</td>
</tr>
<tr>
<td><strong>TODAY</strong></td>
<td>–</td>
<td>6%</td>
<td>–</td>
<td>82%</td>
</tr>
<tr>
<td><strong>2030</strong></td>
<td>630</td>
<td>61%</td>
<td>34,400</td>
<td>46%</td>
</tr>
<tr>
<td><strong>2040</strong></td>
<td>1,142</td>
<td>78%</td>
<td>80,500</td>
<td>24%</td>
</tr>
<tr>
<td><strong>2050</strong></td>
<td>1,319</td>
<td>82%</td>
<td>1,114,400</td>
<td>12%</td>
</tr>
</tbody>
</table>
Our city’s pattern of mobility accounts for 58 percent of our carbon footprint. We have some of the most congested roads in the country. Our current patterns of mobility also mean that the average San José driver spends 144 hours each year sitting in traffic. Our air quality can be improved, but our roads still see far too many traffic accidents. As our city grows to accommodate an extra 319,000 residents by 2050, each of these impacts is likely to worsen. An alternative way is possible.

Creating clean, personalized mobility choices demand a multi-pronged approach to transforming the way we move about our city. This transformation requires three big innovations.

Vehicle Electrification

Of the 472,000 passenger vehicles in circulation in San José, 94 percent are powered by the burning of gasoline and diesel in internal combustion engines (ICE). For every 25 miles traveled by one of these vehicles, one gallon of gasoline is burned which releases 18 pounds of carbon dioxide (the mass difference is because most of the weight doesn’t come from the gasoline, but the oxygen in the air).

Efforts are underway to improve the performance of ICE through Corporate Average Fuel Economy (CAFE) standards, which requires that new passenger cars have a fuel economy of between 31 and 41 miles per gallon depending on vehicle size. However, these do not solve the root of the issue – that cars are still burning fossil fuels. Vehicle electrification, therefore, is one of the significant opportunities that San José can take advantage of.

When we developed the Green Vision in 2007, electric vehicles (EVs) were still relatively unproven and owned only by a small number of innovators and industry insiders. In the ten years since we developed the Green Vision, EVs have come a long way. We have seen early premium models achieve acceptance by their target markets, and new EV companies have emerged, and established automotive firms have invested significantly in EVs. In 2017, we are on the cusp of seeing a mass-market EV adoption.

San José is positioned at the leading edge of this next wave of transformation in mobility. If replaced on a one-to-one basis, EVs stands to drastically reduce the emissions footprint from personal car use. When we combine this with our efforts to make carbon-free electrical power available to all (see Strategy 1.1), we can almost eliminate carbon dioxide emissions from personal mobility.

This is not without difficulty. Significant challenges still lie ahead: creating an EV charging infrastructure, the battery storage needs to be improved to increase vehicle range, and consumers need to have more EV choices that meet not just their needs, but also their aspirations and budgets. Speed, power, and sex appeal have led automobile trends. EVs will need all three to ensure they are the next desired product for our people.

Ridesharing

The smartphone has empowered us all to be connected to each other. As a result, ridesharing has established itself as one of the key disruptors of conventional mobility, demonstrating the effectiveness of the sharing economy. It is now convenient to hail a vehicle to your specific location and take a
Creating clean, personalized mobility choices is a multi-pronged approach to transforming the way we move about our city.
journey to some specific location – possibly sharing your journey with other riders, picking them up and dropping them off along the way using ridesharing companies, such as Uber and Lyft.

On average, each rideshare vehicle has the potential to take up to nine regular vehicles off the road. This brings significant economic benefits in avoided costs. Ridesharing also offers benefits that mass transit infrastructure is not always best-suited to provide – it removes the need for additional infrastructure as it uses existing roads, and – crucially – it solves the first-mile, last-mile problems of public transit. Ridesharing also alleviates the maintenance of automobiles, which can be a big strain on lower-income households’ budgets.

**Autonomous Vehicles**

The next frontier of clean, personalized mobility is the possible game-changing disruption that AVs may bring. While at an early stage of development, autonomous features, such as adaptive cruise control and so-called parking pilots, have been slowly introduced into vehicles. There has been significant interest and investment in AVs with new models claiming to achieve a level of autonomy that requires little driver input (so-called Level 3). The impact on carbon dioxide emissions are uncertain. AVs may result in unforeseen patterns of use such as long-distance commutes into the city becoming a norm as the workload on drivers has been eliminated. It may also result in a higher utilization or more congestion as AVs may be deployed for ridesharing services once the journey by its primary owner has been made. As yet, these outcomes are unknown. What is likely, however, is that AVs stand to drastically reduce traffic crashes in the long-term and allow users a new window of relaxation or productivity on journeys.

A combination of these three innovations resulting in autonomous, shared EVs stands to bring a near-zero emissions, seamless, and congestion-free means of mobility.
San José will continue supporting public transit infrastructure as a means of getting around the city, particularly the integration of multiple transport modes and transit-oriented development (TOD) to reduce VMT.

### Good Life Benefits for Our City

Public transport in San José is an affordable way for people to move around our city each day. High-frequency, rapid transit can also be faster, more enjoyable, and more reliable than driving and being stuck in traffic. Supporting high-quality public transit infrastructure that is clean, interconnected with multiple modes, and located near to where we live and work will bring the benefits of accessibility, safety, and convenience to a larger population.

### Our Leadership to Date

San José has been part of numerous regional initiatives to support the expansion and enhancement of public transit infrastructure such as the Caltrain electrification project, Santa Clara Valley Transportation Authority (VTA), High Capacity Transit (HCT), and bringing BART to San José. Our involvement in these initiatives allows us to ensure the fruition of these projects and maximize the climate and Good Life benefits of those in our city.

### Low-Carbon Growth Milestones

#### INDICATORS

<table>
<thead>
<tr>
<th>PROGRESS MILESTONES</th>
<th>INDIATORS</th>
<th>CARBON REDUCTIONS</th>
<th>VMT REDUCTION</th>
<th>PUBLIC TRANSIT</th>
<th>ACCESSIBLE TRANSIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>TODAY</td>
<td></td>
<td></td>
<td></td>
<td>4%</td>
<td>17%</td>
</tr>
<tr>
<td>2030</td>
<td></td>
<td>332</td>
<td>21%</td>
<td>10%</td>
<td>27%</td>
</tr>
<tr>
<td>2040</td>
<td></td>
<td>471</td>
<td>43%</td>
<td>20%</td>
<td>36%</td>
</tr>
<tr>
<td>2050</td>
<td></td>
<td>535</td>
<td>57%</td>
<td>35%</td>
<td>50%</td>
</tr>
</tbody>
</table>
Strategy 2.4: Develop Integrated, Accessible Public Transport Infrastructure

Each year, 11.6 million trips are taken across San José’s network of bus and rail services. While a significant figure, this accounts for only one percent of all VMT in the city.

We can do more to use and enhance our transit infrastructure assets to drive down carbon dioxide emissions, while also making it a more attractive choice of transport for getting around our city.

There are three overarching priorities to make this happen from a climate and Good Life perspective: accessibility, reliability, and affordability.

Local Bus Improvements
San José’s network of buses, operated through the VTA, is the primary means of getting around the city for many of us. Approximately seven million local bus journeys within San José are taken each year. It connects our suburbs and low-density neighborhoods to each other and creates transport options that would otherwise need to be taken by a car.

This is important, especially for some of our key workers, such as nurses, teachers, and people working on shifts who rely on buses either early in the morning or late at night to get to their places of work. We also know that San Joséans on lower incomes disproportionately depend on the bus.

However, San José’s suburban density means that there is a low concentration of riders taking similar trips along a route. While a key strategy of The Plan is to densify our city (Strategy 2.1), this needs to go hand-in-hand with enhancing existing public transit options.

Increasing the frequency and route diversity of the buses serving San José’s focused-growth areas will be a critical step to ensuring that a denser population has convenient and accessible means to move around the city.

High Capacity Transit
The BRT, a variation of local buses in the VTA, will upgrade transit service along Santa Clara County’s three busiest transit corridors – all of which serve San José.

The BRT aims to bring metro-like frequency, speed, and amenities to the bus routes in these corridors. Buses would have dedicated lanes, bus stops will be elevated to allow step-free access, traffic signals will be intelligently
controlled to prioritize the BRT service, and buses would arrive every ten minutes during peak periods.

The benefit that BRT brings is the service qualities of a metro or subway-type system, but with a fraction of the infrastructure and operational costs.

VTA, along with San José and other Santa Clara County cities, will continue to evaluate HCT corridors – locations where BRT, Light Rail, and/or other upgrades to the transit system are needed.

Caltrain Electrification
The Bay Area secured a major win in May 2017 when the Federal Transit Administration approved funds for the Peninsula Corridor Electrification Project (or the electrification of Caltrain).

The project, when complete by 2021, will boost ridership by 21 percent through increased train frequency and deliver 176,000 tCO2 of carbon-saving cumulatively by 2040.

The effect will be to improve links between San José and the peninsula, leading to San Francisco, and reduce the need for private car trips.

BART Silicon Valley Program
The extension of the BART to Berryessa in Phase I of the BART Silicon Valley Program, and then extensions to Downtown San José and Diridon Station in Phase II will close the loop in the Bay Area in terms of connectivity around the Bay. 16 miles of new track and six new stations will connect San José to Milpitas and Fremont, providing a better way to get to Oakland, San Francisco, and other Bay Area cities.

California High-Speed Rail
Work is underway to connect San José to the rest of California, namely the Central Valley and Southern California, through the High-Speed Rail project currently under construction. This 520-mile (Phase I) mega-project, of which 20 miles will weave through San José, is due to be completed by 2029 and allow quick connections outside the Bay Area. This will go toward reducing the need for car journeys and certain intra-state flights.

Diridon Station
A key asset in this high-quality public transit infrastructure future is the investment being undertaken at Diridon Station. With the integration of 12 bus and rail transit modes, Diridon Station is set to be a world-class facility offering connections within San José, the Bay Area, and greater California.

Diridon Station has a unique opportunity to catalyze development that maximizes the number of residents and workers benefiting from the integration of multiple modes of public transit (Strategy 3.1).

Biking and Walking
It is important to also note the role of biking and walking in the city as a means of mobility (Strategy 2.1).
Creating local jobs in our city is not just a driver of economic development, it also brings sustainability benefits in allowing workers to live close to where they work and reduce time, money, and carbon dioxide emissions spent commuting.

**Why This is Important**
San José can offer productive, high-performance commercial real estate to businesses that reduce their energy costs and, in doing so, contribute to reduced energy demand.

**Why This is Important**
Commercial vehicle movements in the city, including logistics and freight, contribute to the city’s overall carbon footprint. Working with the commercial sector, San José can benefit from clean and efficient goods and logistics movement, contributing to sustainability.

**Why This is Important**
Economic development and sustainability are mutually reinforced in San José. Local job creation can lead to reduced carbon dioxide emissions, and high-performing logistics and real estate can be attractive to companies looking to do business in the city. Designing in economic development and the requirements of business will make attaining a sustainable city all the more feasible.

**Pillar 3**
**An Economically Inclusive City of Opportunity**

Economic development and sustainability are mutually reinforced in San José. Local job creation can lead to reduced carbon dioxide emissions, and high-performing logistics and real estate can be attractive to companies looking to do business in the city. Designing in economic development and the requirements of business will make attaining a sustainable city all the more feasible.
Good Life Benefits for Our City

Creating local jobs in our city makes it possible for our workforce to have economic opportunity, work close to where they live, and unlock the 144 hours they currently spend in congestion each year to do more productive and enjoyable things. Local jobs make it possible to walk, bicycle, take a bus or shared mobility vehicle to work, and is ultimately healthy for our economy and expands the tax base in San José.

Our Leadership to Date

San José’s vibrant economy is comprised of small-, medium-, and large-sized businesses across various sectors. As a City, we have been working to bring businesses and 50,200 jobs (since 2012) to San José at different income tiers in order to create inclusive and accessible middle income pathways for our residents. This includes programs such as the Bay Area Urban Manufacturing Initiative, our efforts to locate new commercial development, and 85 percent of new jobs, near transit modes.

Low-Carbon Growth Milestones

<table>
<thead>
<tr>
<th>INDICATORS</th>
<th>CARBON REDUCTIONS</th>
<th>JOBS : EMPLOYED RESIDENT RATIO</th>
<th>JOBS NEAR TRANSIT</th>
<th>COMMUTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>METRICS</td>
<td>Emissions reduction from this strategy</td>
<td>Jobs to Employed Resident Ratio (J/ER)</td>
<td>Jobs within ½ mile of rail and ¼ mile of high-capacity transit</td>
<td>Percentage of commute journeys by walking and bicycling</td>
</tr>
<tr>
<td>PROGRESS MILESTONES</td>
<td>Thousands of tons of carbon reduced per year</td>
<td>Jobs per San José employed resident</td>
<td>Jobs within ½ mile of rail and ¼ mile of high-capacity transit</td>
<td>Percentage of commute journeys by walking and bicycling</td>
</tr>
<tr>
<td>TODAY</td>
<td>—</td>
<td>.8</td>
<td>194,000</td>
<td>3.7%</td>
</tr>
<tr>
<td>2030</td>
<td>640</td>
<td>1.0</td>
<td>375,000</td>
<td>20%</td>
</tr>
<tr>
<td>2040</td>
<td>1,045</td>
<td>1.1</td>
<td>475,000</td>
<td>30%</td>
</tr>
<tr>
<td>2050</td>
<td>1,281</td>
<td>1.1</td>
<td>550,000</td>
<td>35%</td>
</tr>
</tbody>
</table>

San José will work to create an additional 332,000 local jobs in our city by 2040.
Strategy 3.1: Create Local Jobs in Our City to Reduce Vehicle Miles Traveled

Local Jobs
A lot of discussion exists as to the specific terminology of job creation; whether it ought to be decent (aligned with UN and International Labor Organization initiatives), equitable, middle income, or high-quality, to name a few. The Plan simply calls for the creation of local jobs in San José. Local jobs are jobs that our residents can be proud of, that give us the dignity of work, the security to look after our families, and the satisfaction of being a little more comfortable today than we were yesterday.

What Do Local Jobs Have to Do with Carbon and Sustainability?
Commuter trips in San José are dominated by use of the car and specifically, single-passenger car journeys. This results in congestion, lost time, carbon dioxide emissions, and air and stormwater pollution, as well as increases the likelihood of traffic collisions. Creating local jobs and providing co-located employment opportunities for people living in the city are important tools of economic sustainability in San José.

Creating local, transit-accessible jobs can reduce the need for commuter car journeys, totaling 122 million trips per year (79 percent of the total). This can be achieved by combining the efforts of The Plan with the City’s economic development activities to attract, retain, and expand business in the city. Job creation can be anchored by large commercial deals incentivized to access San José’s talented workforce and high quality infrastructure.

The impacts of creating local, accessible jobs are to increase the ability of residents of San José to walk, bicycle, or take public or personalized transit to their place of work. It also stimulates the creation of additional business activities to serve those jobs and each other, creating a multiplier effect of economic development. The result is the creation of an economic ecosystem or hub that spurs development and attracts workers, residents, and customers. Development of this ecosystem also has the potential to improve residents’ personal access when teamed with a targeted local job training strategy.

The Role of Equity
As the capital of Silicon Valley, many of our residents work in technology and related industries that offer some of the most lucrative incomes anywhere in the world. At the same time, there are some of us who are working hard and struggling to get by.

While The Plan is not designed to explicitly address the issue of equity in San José – the General Plan and other initiatives cover the topic comprehensively – it can make a contribution in two key ways:

- The low-carbon transition will require new skills, resources, and trades to design, build, and operate the new infrastructure, products, and services of our low-carbon and climate-smart future.
- Many low-carbon activities also deliver Good Life benefits, such as lower household utility and transportation costs, less time commuting, and more time with our loved ones.
Since 2004, the City-led Silicon Valley Energy Watch (SVEW) Program has helped businesses, municipalities, and schools achieve significant energy savings. From 2016 to 2017, SVEW helped 377 San José businesses save over seven million kWh. The City continues to be an enabler of energy efficiency by providing project management support, helping these entities understand their energy use profile, and promoting rebates and financing opportunities. The City is a national leader in energy efficiency as one of twenty national cities to participate in the City Energy Project (CEP). Through this grant, the City will create initiatives and policies that enable the commercial sector to invest in efficiency.

**Good Life Benefits for Our City**

Commercial building occupants in San José can drastically reduce a significant cost item in their overhead: electricity bills. Buildings designed to be climate smart can deliver greater levels of occupant and worker satisfaction, making commercial spaces more productive. Generating solar power combined with net energy metering may allow businesses to access additional revenue sources.

**Our Leadership to Date**

Since 2004, the City-led Silicon Valley Energy Watch (SVEW) Program has helped businesses, municipalities, and schools achieve significant energy savings. From 2016 to 2017, SVEW helped 377 San José businesses save over seven million kWh. The City continues to be an enabler of energy efficiency by providing project management support, helping these entities understand their energy use profile, and promoting rebates and financing opportunities. The City is a national leader in energy efficiency as one of twenty national cities to participate in the City Energy Project (CEP). Through this grant, the City will create initiatives and policies that enable the commercial sector to invest in efficiency.

**Low-Carbon Growth Milestones**

<table>
<thead>
<tr>
<th>INDICATORS</th>
<th>CARBON REDUCTIONS</th>
<th>ZNE COMMERCIAL BUILDINGS</th>
<th>DISTRIBUTED GENERATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>METRICS</td>
<td>Emissions reduction from this strategy</td>
<td>Gross Internal Floor Area of ZNE commercial buildings</td>
<td>Installed solar generation on commercial and industrial buildings</td>
</tr>
<tr>
<td>PROGRESS MILESTONES</td>
<td>Thousands of tons of carbon reduced per year</td>
<td>Area of ZNE commercial buildings (million square feet)</td>
<td>Commercial distributed solar generation capacity (MW)</td>
</tr>
<tr>
<td>TODAY</td>
<td>-</td>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>2030</td>
<td>309</td>
<td>70</td>
<td>231</td>
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<tr>
<td>2040</td>
<td>422</td>
<td>165</td>
<td>430</td>
</tr>
<tr>
<td>2050</td>
<td>420</td>
<td>266</td>
<td>636</td>
</tr>
</tbody>
</table>
San José is often considered a bedroom community, meaning one that is inhabited largely by people who live in the city but work elsewhere. The Plan is an opportunity to address this and offer productive, high-performance commercial real estate that attracts businesses to locate in the city.

**ZNE Commercial Buildings from 2030**

As with residential buildings, enhancements to Title 24 are being considered that would require commercial buildings constructed after 2030 to be ZNE.

This poses a significant challenge. If not managed and communicated well, the premiums of ZNE commercial buildings could force businesses to relocate out-of-state. In a city that is a net exporter of labor (in that most of our resident population works out of the city), this compounds the problem of generating local jobs.

San José has the opportunity to proactively demonstrate and scale the business models for ZNE commercial buildings ahead of the 2030 time frame in order to anticipate the real estate market and be a first mover. The experience of constructing a large number of residential ZNE units from 2020 should position San José to apply the knowledge, skills, and private sector experience to developing and providing commercial ZNE buildings.

The private sector will need to develop efficient and effective models for constructing ZNE buildings, including EV chargers at work sites, at minimal cost. This might include combinations of pre-fabrication, or building modularity, as well as economies of scale in being a hub for the ZNE construction industry.

Technical solutions will need to be found to some of the specific characteristics of commercial energy use in San José, such as data centers, server rooms, and

ZNE buildings like the Rosicrucian Egyptian Museum align with Paris goals while providing a fun afternoon for our people and visitors.
### The Business Case for Sustainability in Commercial Buildings

Commercial building developers and owners are using new economic analysis software to compare the costs and benefits of different approaches to sustainable design. Unlike expensive, one-time studies, available tools can automatically calculate the full lifecycle costs and the dollar values of the benefits that result from designs with different environmental and workplace impacts, including approaches that will save energy costs and improve employee productivity.

Automation has cut the cost to one percent of traditional custom studies, standardized the methodologies, and offer iteration and insight to architects, engineers, and community stakeholders from planning, to schematic design, to construction.
small power loads (such as laptops, printers, and other electronic and electrical devices). Solutions such as evaporative cooling, efficient appliances, and other building management systems will need to be taken advantage of.

In the near-future, commercial buildings will also need to incorporate EV charging stations to meet the needs of a growing electrified vehicle fleet.

Retrofitting San José’s Existing Commercial Building Stock
Presently, San José has a total of around 40 million square feet of commercial office space. Much of the space has been designed in large office-campus and business park layouts with large floor plans. This implies low-density, spatial layout in commercial buildings, which brings with it inefficient energy practices.

There are a number of options available to commercial buildings in order to reduce energy consumption. First, profiles of energy use in commercial buildings are predominantly driven by electricity, meaning that emissions due to natural gas is limited to space heating. Second, a significant driver of commercial building energy consumption is heating and cooling, both of which tend to be managed centrally. Improvements such as control adjustments can be made to optimize energy consumption. Third, landlords and commercial building managing agents can implement improved facilities and energy management services.
Good Life Benefits for Our City

Supporting our commercial and industrial sectors in becoming cleaner will enhance our economy’s efficiency and unit productivity, strengthening our attractiveness as a place to do business and demonstrating San José’s leadership as the capital of a more sustainable Silicon Valley.

Our Leadership to Date

With the Green Vision in 2007, the City of San José began to transition its vehicle fleet, including many service vehicles, to alternative fuels. In 2017, San José joined with 30 other U.S. cities through Climate Mayors to issue a Request for Information for 115,000 city-owned electric service vehicles, worth $10 billion, to aggregate demand and stimulate market transformation.

Low-Carbon Growth Milestones

<table>
<thead>
<tr>
<th>INDICATORS</th>
<th>CARBON REDUCTIONS</th>
<th>LOCAL DELIVERY VEHICLES</th>
<th>HEAVY DUTY VEHICLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>METRICS</td>
<td>Emissions reduction from this strategy</td>
<td>Percentage of electric local delivery vehicles</td>
<td>Percentage of alternative fuel heavy goods vehicles</td>
</tr>
<tr>
<td>PROGRESS MILESTONES</td>
<td>Thousands of tons of carbon reduced per year</td>
<td>Percentage of local delivery vehicles that are electric</td>
<td>Percentage of heavy goods vehicles that are alternative fuel</td>
</tr>
<tr>
<td>TODAY</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>2030</td>
<td>1,001</td>
<td>60%</td>
<td>46%</td>
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<tr>
<td>2040</td>
<td>1,938</td>
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<td>87%</td>
</tr>
<tr>
<td>2050</td>
<td>2,129</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

San José will support its commercial and industrial sectors in reducing the carbon impact from goods movement by transitioning to clean and efficient logistics.
San José is the beating heart of the economy of Silicon Valley. Our city provides the accommodation, institutions and infrastructure to support this region – one of the most highly innovative places anywhere in the world.

Whether directly working in the core technology sectors of Silicon Valley, or whether supporting a range of associated and auxiliary sectors to make sure the whole ecosystem works, our commercial and industrial sectors sustains our economy.

As a result, the movement of goods and freight in association with this economic activity accounts for 24 percent of our transport-sector related carbon dioxide emissions, and 14 percent of overall emissions.

Until recently, the costs required to improve carbon efficiency in commercial transport have been significant. Few economical solutions have existed that could be adopted by the private sector in order to reduce carbon dioxide emissions. However, a range of technologies suitable to commercial vehicle applications are likely to become available in the near future.

**Local Goods Delivery**
Partly driven by the growth in online shopping, the movement of local delivery vehicles in San José accounts for nearly seven percent of the city’s emissions footprint. Typically, the profile of use is focused at lower speeds over shorter ranges, with intermittent starts and stops. Local delivery vehicles also tend to be smaller heavy duty trucks (8,500-14,000 lb GVWR). This combination of factors lend local delivery vehicles as suitable candidates for vehicle electrification.

This brings considerable sustainability benefits. A typical Class 3 or Class 4 delivery vehicle will have an economy of approximately seven miles per gallon. With electrification, this fuel economy increases to approximately 30 miles per amount of electrical energy equivalent to that in a gallon of gasoline.

In the future, other technological innovations such as drone delivery may materialize, or new business models of collections from secured lockers in transit stations may become mainstream. These innovations could reduce the carbon dioxide emissions associated with goods movement.

**Heavy Duty Fuel Switching**
Heavy goods vehicles (Classes 5 to 8, 14,000-35,000 lb GVWR),
Hybrid heavy good vehicles exist, achieving the benefits of electric motors with internal combustion engines available.
although relatively few in number, cause a disproportionate carbon impact on San José. Recognizing the impact that freight has on emissions, a range of alternative fuel heavy goods vehicles are in the pipeline for development.

Electrification isn’t an automatic fit with current technology, given the utilization profile of heavy goods vehicles (large weight carried over extremely long distances). However, hybrid heavy good vehicles exist, achieving the benefits of electric motors with internal combustion engines available. In the next seven to ten years, fully-electric heavy duty vehicles, such as the Nikola, may become available. Combined with San José’s provision of 100 percent carbon-free electricity, this combination could reduce emissions drastically.

Compressed natural gas (CNG) and liquefied natural gas (LNG) vehicles are also available, although the uptake of these are limited by the availability of refueling infrastructure, which is especially important on longer cross-state and cross-country freight journeys.

**California Sustainable Freight Action Plan**

Governor Brown’s Executive Order B-32-15 set into motion an effort to clean up the way California handles logistics. Known as being “gas guzzlers,” the freighting industry accounts for a large portion of the state’s emissions.

Collaboration among many state agencies, including CalSTA, CARB, Caltrans, Go-Biz, and the Energy Commission, led to an Action Plan with a vision and a series of guiding principles and targets for 2030. These targets include increasing system efficiency by 25 percent, deploying 100,000 zero-emission vehicles, and determining a pathway for enhancing the state’s future economic growth.

The Action Plan then states potential funding sources in order to achieve those actions. It will take lots of investment in the freighting sector. Pilot projects and technology investments will be necessary in order to move forward. It is up to the state to find and allocate the funding toward these projects, but it also impacts San José, given the commercial sector and their emissions in the city. Part of San José’s potential success in achieving Paris compliance is also dependent on the success of the Sustainable Freight Action Plan.
2.3 Bold Campaigns
Strategies Alone Aren’t Enough

Climate Smart San José outlines nine strategies for the city to transition to a climate smart and sustainable future.

Each of the nine strategies are designed to address a particular component of San José’s emissions and water profile, from the impact that land use has on the need for vehicular transport, to energy supply and use in residential and commercial buildings. The strategies are integrated and mutually reinforcing. They are not meant to be implemented in isolation or without recognition for each other.

In order to stimulate progress for each of these strategies, The Plan outlines five cross-cutting Bold Campaigns that are designed to activate different combinations of the strategies. Doing this will forge the new connections and practices for addressing sustainability and climate action in a multidisciplinary and synergistic way.

Each of the Bold Campaigns have at least one corresponding Bold Goal which will be an outcome for a successfully executed campaign.

More time for planting flowers? Now that’s a bold campaign.
**PILLARS** of what residents want

**Climate and water STRATEGIES**

**Tailored PLAYBOOKS** for key audiences and stakeholders

**The City’s ACTION PLAN**

**The City’s BOLD CAMPAIGNS**

---

**Pillar 1**
A Sustainable & Climate Smart City

1.1 Transition to a renewable energy future

1.2 Embrace our Californian climate

**Pillar 2**
A Vibrant City of Connected & Focused Growth

2.1 Densify our city to accommodate our future neighbors

2.2 Make homes efficient and affordable for our families

2.3 Create clean, personalized mobility choices

2.4 Develop integrated, accessible public transport infrastructure

**Pillar 3**
An Economically Inclusive City of Opportunity

3.1 Create local jobs in our city to reduce vehicle miles traveled

3.2 Improve our commercial building stock

3.3 Make commercial goods movement clean and efficient

---

**RENEWABLES AND ELECTRIFICATION**

**MEET OUR JOBS TO EMPLOYED RESIDENT RATIO TARGET**

**WORK TOWARD OUR FOCUSED GROWTH TARGET**

**REDUCE PER CAPITA VEHICLE MILES TRAVELED**

**REDUCING PER CAPITA WATER USAGE**

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**THE ENABLING ROLE OF SAN JOSE CITY HALL**

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**Businesses and industry**

**Property developers and owners**

**Residents**

**Our civic institutions**

**Regional agencies**

---

**Technology enablers**

**Financial enablers**
Bold Campaigns to Activate Climate Smart San José

PARIS CLIMATE AGREEMENT
One of the First Paris-Aligned Pathways of Any U.S. City

MEET OUR JOBS TO EMPLOYED RESIDENT (J/ER) TARGET
5 By 2030, San José will create an additional 22 million square feet of commercial workspace located within a half mile of transit

RENEWABLES & ELECTRIFICATION
1 By 2021, San José Clean Energy (SJCE) will offer 100 percent greenhouse gas-free power as a base product
2 By 2040, San José will be the world’s first one GW solar city
3 By 2030, 60 percent of all passenger vehicles in the city will be electric, making us the electric car capital of the U.S.
4 From 2020, 100 percent of new homes will be Zero Net Energy (ZNE) and, by 2030, 25 percent of existing homes will be energy efficient and all-electric

WORK TOWARD OUR FOCUSED GROWTH TARGET
6 By 2030, San José will have developed 40,000 dwelling units in its urban villages and focused growth areas

REDUCE PER CAPITA VEHICLE MILES TRAVELED
7 By 2040, only four out of ten commute trips in San José will be taken in single-occupancy vehicles

REDUCE PER CAPITA WATER USE
8 By 2030, San José will reduce its per capita residential water consumption by 30 percent compared to 2009 levels
03 Getting it Done

3.1 Implementation of The Plan – Page 123
3.2 Funding The Plan – Page 137
3.3 City Action Plan – Page 147
3.4 Community Playbooks – Page 175
3.1 Implementation of The Plan
Implementation of The Plan

Achieving the Bold Goals will require a new approach to implementation. Traditionally, climate action plans have depended on city and government agencies to drive most of the action with some community engagement, which has led to pockets of success, but not scaled action.

What’s needed instead is a way to inspire action on a citywide scale by the entire San José community – individuals, developers, government, business – in order to combat climate change and make the Good Life 2.0 attainable.
**Network Activation**
Network Activation (Section 5.1) seeks to program content into social and real world networks to promote the Good Life 2.0 benefits that come from investing in technologies and ways of living that also happen to be climate smart.

**Playbooks**
Playbooks (Section 5.2) are the pragmatic, tactical actions you can use to upgrade to the Good Life 2.0 and without sacrifice, while helping to combat climate change.

**City Action Plan**
City Action Plan (Section 5.3) outlines how the City intends to enable the San José community to become climate smart.

**Financing**
Financing (Section 5.4) provides guidance on the sources and types of financing available to fund the infrastructure, technology, and community action needed to enable the Good Life 2.0 to make San José climate smart.
A Network Activation Approach

The Good Life 2.0 is about giving residents time back to spend with family and friends, time to learn a new skill or pursue a hobby, and time to foster deeper connections with the community.

Making the Transition From the Good Life 1.0 to 2.0

Since the dawn of mass consumer marketing in the 1950s, marketers have used massive ad budgets to promote a prescriptive and exclusive vision of the Good Life. They implied a promise that buying their product would make you look good, feel better, and win the admiration of your friends and family. Cadillac pitched prestige with copy like, “If you’re tired of the commonplace... drive a Cadillac.” Coke promised happiness and friendship with the iconic 1970s TV commercial “I’d like to buy the world a Coke.” Here in San José, Eichler Homes ran ads proclaiming, “Live better in a home of your own.”

What we now know is that the pursuit of ever greater consumption has not made us happier, but has put us at risk of climate change.

We heard from residents of San José that they are seeking an update on the Good Life. Good Life 2.0 is about giving residents time back to spend with family and friends, time to learn a new skill or pursue a hobby, and time to foster deeper connections with the community.

There is a great deal of evidence that many in San José are already pursuing the Good Life 2.0, but there remains a great deal of work to be done to help people reflect on their aspirations for a life well lived in San José, and to make smarter choices that will bring greater happiness without the need to project success to strangers by consuming even more.
(Left) Good Life 1.0 centered around buying the latest and greatest.

(Below) Good Life 2.0 focuses on giving residents time back to do what you love.
The Adoption Curve

“The future is already here. It’s just not evenly distributed yet.” – William Gibson

Achieving the Paris climate change goal will require a massive adoption of clean technologies over the next 30 years. Nearly all combustion engines will give way to electric, the majority of homes will go from net consumers of fossil fuel energy to net producers of renewable energy, and lawns will be replaced with beautiful Mediterranean-style gardens or possibly even vegetable gardens. While that may seem like fanciful thinking, massive adoption of technology at this scale is actually normal and follows a predictable arc called the adoption curve.

Consider the ubiquitous cell phone which 81 percent of Americans now own. Just 30 years ago the first cell phone was released. It was the size of a brick, had a battery that lasted half an hour, and the phone cost $4,000. As innovation occurs over time, technologies become better, more affordable, more available, and, therefore, accessible to more people. Technologies move through different groups of people as they scale, each with its own set of mindsets, motivations, and buying styles.

Technology is continuing to improve our lives – whether through simple phone calls or groundbreaking sustainability innovations.
2.5%  
**CUTTING EDGERS**
These pioneers are looking for bragging rights and make purchases to prove their higher social status. They are always on the lookout for the new, exclusive item not found in the usual consumer channels. These people bought a $4,000 brick cell phone in 1984 or a Tesla Roadster in 2006.

13.5%  
**EARLY ADOPTERS**
They love to pursue novelty as social currency by sharing their finds with their family and friends. They are on the lookout for gadgets that make their life easier and more fun, and are not price sensitive. Owners of the Tesla models S and X fit in this group, as do those paying $200 for the Nest thermostat.

34%  
**EARLY MAINSTREAMERS**
They are open to lifestyle enhancements and new ideas endorsed by people and institutions they trust. They evaluate the price based on their perception of the value and want some kind of deal. Mobile commerce (e.g., Amazon app) is at this stage as people discover its convenience and levels of security. LED lights’ high quality of life and low energy and operating costs have reached a 40 percent market share and growing.

34%  
**LATE MAINSTREAMERS**
They are the skeptics that accept only well-proven products that are effortless to use and are available at a discounted price. Household broadband internet and smartphones have reached this stage, as did CFL light bulbs before being eclipsed by LEDs.

16%  
**LAGGARDS**
They will reject even established technologies or purchase them if it’s unavoidable and part of a greater system. Smartphones are at this stage as laggards realize that access to thousands of services and products are not available without them. Clean technology products in this category are the ones where no other options are available because of regulation (e.g., Title 24 in California) or market forces. These include new, energy-efficient furnaces and low-flow toilets.
### Rates of Adoption for Climate Smart San José Strategies

<table>
<thead>
<tr>
<th>STRATEGIES</th>
<th>MEASURE</th>
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<tr>
<td>1.1</td>
<td>2017</td>
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<tr>
<td>2.2</td>
<td>Passenger Car EVs</td>
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<tr>
<td>2.3</td>
<td>Retrocommissioning</td>
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<tr>
<td>3.1</td>
<td>Heavy EVs</td>
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<tr>
<td>3.2</td>
<td>Refrigerators</td>
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<tr>
<td>3.3</td>
<td>Passenger Car EVs</td>
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<td>3.4</td>
<td>Retrocommissioning</td>
</tr>
<tr>
<td>3.5</td>
<td>Heavy EVs</td>
</tr>
</tbody>
</table>

**Legend:**
- **CUTTING EDGEERS:** First 2.5% of adopters
- **EARLY ADOPTERS:** Next 13.5% of adopters
- **EARLY MAINSTREAMERS:** Next 34% of adopters
- **LATE MAINSTREAMERS:** Next 34% of adopters
- **LAGGARDS:** Last 16% of adopters
(Left) Take advantage of all that San José can provide – fresh tech, fresh food, fresh perspective.

(Below) Get out and explore. Make memories. Enjoy the Good Life 2.0.
Relying on market forces alone to scale clean technologies is not fast enough for San José to meet the Paris goals. Accelerating the adoption cycle is critical so that more people benefit from technologies sooner. This will require shifting messaging relevant for early adopters to messaging relevant for the early mainstream at the right time.
The shift is beginning to happen in the EV market. Tesla’s 2013 Model S “Gallons of Light” commercial (above) depicted a wealthy family taking a road trip through a sun-drenched landscape, driving by an oil derrick, and refilling at a Tesla charging station. Early adopters were looking for a premium product that reflected their environmental values and their aspiration to show off the latest technology. Compare that to a new Chevy Bolt ad (top right, right) that features people using the car for everyday errands and having fun along the way. Affordable, pragmatic, and hip with very little reference to the environment.
While the messaging shift in EVs is encouraging, big corporate ad budgets are not enough to bring about the shift to the Good Life 2.0 at the pace we need if San José is to be on the pathway to Paris alignment. What we need is the network approach that relies on the massive interconnection of people and the influencers in their lives.

Today, we are surrounded by a series of networks, physical and virtual, that entertain, inform, inspire, and enable our everyday lives. We weave in and out of these networks everyday. There are networks for transportation, shopping, buying a home, renovating a home, school, work, and more, each with a different number of interactions and level of engagement. The messaging shift from the early adopters to the early mainstream needs to be programmed into these networks so it captures their attention and engages them on their own terms.

Intentionally programming across different networks creates more opportunities for people to be inspired and take action to upgrade the Good Life 2.0.

What we need is the network approach that relies on the massive interconnection of people and the influencers in their lives.
Network Activation Accelerates Climate Smart Home Adoption to Early Mainstreamers

1. CONNECTIONS
   People use social media to show off their #TGLHomes2.0, talk about Fixer Upper, and post YouTube videos about smart home upgrades; Mercury News profiles #TGLHome2.0

2. PLAY
   Sports, exercise

3. SHOPPING
   Food, goods, etc.

4. FINANCE
   Banks promote mortgages and HLCOS to finance climate smart renovations

5. REAL ESTATE
   Trulia and Zillow create smart home buying guides and ratings

6. HOME
   HGTV creates a San José edition of its popular show Fixer Upper with Chip and Joanna Gaines remodeling dilapidated homes into Good Life 2.0 homes in one of San José’s urban villages

7. RENOVATION
   Seeing potential demand develops promos for smart homes and landscaping; Home Depot

8. RITUALS
   Daily, seasonal, holidays

9. MOBILITY
   Commuting, leisure, transit

10. COMMUNITY
    Civic, school, politics

11. WORKPLACE
    Employers enroll in programs that provide employees discounted rates on solar panels
3.2 Funding The Plan
Climate Smart San José outlines the way in which San José can address its growth challenge while simultaneously reducing its carbon footprint in absolute terms.

The Economics of The Plan
Based on our analysis, we estimate that The Plan will cost approximately $264 billion between now and 2050. While this number will initially seem very large, it works out to approximately 2.6 percent of San José’s metropolitan gross domestic product (GDP), or $4,260 per resident and worker each year until 2050. That being said, The Plan can also unlock benefits and deliver avoided costs and savings to the city on the order of $269 billion – a net saving of $5 billion.

The economics of implementing The Plan means that the savings of avoided fossil fuel usage could be re-deployed into investing in the new climate smart, low-carbon infrastructure that will propel our city’s continued growth.

Funding The Plan
While the costs and avoided costs of The Plan essentially cancel each other out, there is still the question of how these very real costs are funded in the first place. It is infeasible for the City alone to bear this amount. It is also impractical. Many of the changes called for will require different groups in the city – such as residents and companies – to undertake different actions. This means that each group will need to consider the range of funding and financing options available to them.

The purpose of this section is to illustrate the types of models available to fund urban sustainability measures, and which of these may be worth further consideration.

Interpreting Costs and Savings
The costs and savings of The Plan will affect the economy in different ways. For example, costs include new energy and water infrastructure and retrofitting – electric vehicles (EVs), bike lanes, public transit fleets – and the operational running costs of each of those. Aligned with the City’s economic development activities, it is possible that some of these costs could be retained within San José’s economy through the attraction of new businesses to the city and the selection of local suppliers and contractors. The savings of The Plan include the avoided costs of not having to pay for certain fossil fuel-related infrastructure and dependent systems (e.g., internal combustion engine vehicles), and most significantly, the costs of fossil fuels used to condition our homes and workplaces and power our cars.
## Estimated Costs & Savings for Each Strategy of The Plan

<table>
<thead>
<tr>
<th>Pillars</th>
<th>Strategies</th>
<th>2021</th>
<th>2030</th>
<th>2040</th>
<th>2050</th>
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<tr>
<td><strong>Capital and Operational Costs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. A Sustainable and Climate-Resilient City</td>
<td>1.1 Transition to a renewable energy future</td>
<td>$0.49</td>
<td>$0.68</td>
<td>$0.73</td>
<td>$0.73</td>
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<tr>
<td></td>
<td>1.2 Embrace our Californian climate</td>
<td>$0.07</td>
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<td>2.1 Densify our city to accommodate future neighbors</td>
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<td>2.3 Create clean, personalized mobility choices</td>
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<td></td>
<td>3.3 Clean, efficient commercial logistics</td>
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<td><strong>Total Capital and Operational Costs</strong></td>
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<td>$1.83</td>
<td>$35.54</td>
</tr>
<tr>
<td></td>
<td>2.3 Create clean, personalized mobility choices</td>
<td>$0.29</td>
<td>$1.46</td>
<td>$1.93</td>
<td>$2.37</td>
<td>$48.97</td>
</tr>
<tr>
<td></td>
<td>2.4 High-quality, accessible transit infrastructure</td>
<td>$0.09</td>
<td>$0.16</td>
<td>$0.25</td>
<td>$0.32</td>
<td>$6.33</td>
</tr>
<tr>
<td></td>
<td>3.1 Create local, accessible jobs in our city</td>
<td>$0.07</td>
<td>$0.24</td>
<td>$0.40</td>
<td>$0.52</td>
<td>$9.49</td>
</tr>
<tr>
<td></td>
<td>3.2 Productive, high-performance commercial real estate</td>
<td>$0.40</td>
<td>$1.24</td>
<td>$1.72</td>
<td>$1.85</td>
<td>$41.73</td>
</tr>
<tr>
<td></td>
<td>3.3 Clean, efficient commercial logistics</td>
<td>$0.49</td>
<td>$1.42</td>
<td>$2.30</td>
<td>$2.51</td>
<td>$54.74</td>
</tr>
<tr>
<td><strong>Total Savings and Avoided Costs</strong></td>
<td></td>
<td>$2.97</td>
<td>$8.39</td>
<td>$10.88</td>
<td>$11.23</td>
<td>$268.95</td>
</tr>
<tr>
<td><strong>Total Savings and Avoided Costs as % of GDP</strong></td>
<td></td>
<td>1.13%</td>
<td>2.78%</td>
<td>3.18%</td>
<td>3.06%</td>
<td>2.60%</td>
</tr>
<tr>
<td><strong>Net Costs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Net Cost</strong></td>
<td></td>
<td>$0.81</td>
<td>$(0.07)</td>
<td>$(0.64)</td>
<td>$(0.88)</td>
<td>$(4.51)</td>
</tr>
<tr>
<td><strong>Net Cost as % GDP</strong></td>
<td></td>
<td>0.31%</td>
<td>(0.02%)</td>
<td>(0.19%)</td>
<td>(0.24%)</td>
<td>(0.04%)</td>
</tr>
</tbody>
</table>
Understanding Who Pays

Implementing The Plan will require a commitment equivalent to 2.6 percent of the city’s GDP each year out to 2050.

The graphic shown on the right illustrates a high-level breakdown of the estimated costs of implementation each year. The profile of costs vary over time. Regional agencies, for example, would shoulder a greater burden in earlier years with the development of the BART extension, California High-Speed Rail, etc. These systems will also increase as the city’s population grows. In addition, as the stock of low-carbon products and technologies increases, the systems will require greater ongoing operational costs.

While these costs will initially appear large, the realized costs—that is how much each group will actually pay—will be smaller because:

- This is a high-level representation, and a full allocation of costs to stakeholder groups has not been conducted.

- The way in which stakeholders structure funding to implement The Plan will mean that realized costs may not match those presented here.

City Hall

Against the context of the City’s annual budget of $3.2 billion, an average annual cost to the City of $437 million may seem high. It is worth noting that the majority of this annual cost to the City is due to San José Clean Energy (SJCE)*. Again, the economic costs have been attributed to the City, but in reality, electricity users will pay rates that will cover the financing costs of power purchase agreements and capital infrastructure.

Excluding the economic cost of SCJE, the costs attributable to the City will be for City staff facilitation and coordination activities.

That being said, there are a range of funding options available to the City for either its own use or to enable use by others in San José, such as residents, the private sector (through incentives), developers, and others. These are explored and discussed on the following pages.

*About 95 percent, or $415M, of the City’s cost is due to San José Clean Energy - the value of electricity purchases that gets recovered through energy sales to customers.
Citywide Savings ($ per service population)

Developer costs are closely linked to the city’s population growth.

AVERAGE ANNUAL COSTS OF THE PLAN (FY17)

<table>
<thead>
<tr>
<th>Group</th>
<th>Cost (FY17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residents</td>
<td>$2.576 billion</td>
</tr>
<tr>
<td>Private Sector</td>
<td>$3.118 billion</td>
</tr>
<tr>
<td>Developers</td>
<td>$1.536 billion</td>
</tr>
<tr>
<td>City Hall</td>
<td>$437 million</td>
</tr>
<tr>
<td>Regional Agencies</td>
<td>$0.346 billion</td>
</tr>
</tbody>
</table>
## Funding Models Available to San José

<table>
<thead>
<tr>
<th>FUNDING MECHANISM</th>
<th>DESCRIPTION</th>
<th>OPPORTUNITY</th>
<th>RESIDENTS</th>
<th>PRIVATE SECTOR</th>
<th>DEVELOPERS</th>
<th>CITY HALL</th>
<th>REGIONAL AGENCIES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LEASE REVENUE BONDS (LRB)</strong></td>
<td>A government bond secured by lease payments made by the party leasing the facilities that were financed by the bond issue. LRBs are used to finance facility construction (e.g., schools, office buildings) used by a state or municipality.</td>
<td>LRB and lease purchase financing address immediate needs for capital acquisitions while improving the management of cash flow. By reducing interest rates, the tax-exempt feature for these have proven to be attractive to both borrowers and investors.</td>
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<tr>
<td><strong>GENERAL OBLIGATION (GO)</strong></td>
<td>Municipalities (cities, counties, etc.) commonly issue bonds to investors with the promise to repay with a level of certainty (default risk) over a certain time period (5-30 yrs.) and with a certain return (coupon/yield). Requires voter approval.</td>
<td>Bonds bring immediate capital to build projects that will be repaid over the life of the project asset.</td>
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</tr>
<tr>
<td><strong>INFRASTRUCTURE BANK FINANCING</strong></td>
<td>Infrastructure Banking has broad authority to issue tax-exempt and taxable revenue bonds, provide financing to public agencies and credit enhancements, acquiring, or leasing facilities, and leverage state and federal funds.</td>
<td>Infrastructure and Economic Development Banks finance public infrastructure and economic development that promote a healthy climate for jobs, contribute to a strong economy, and improve the quality of life within their state.</td>
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<tr>
<td><strong>SOCIAL IMPACT BONDS (SIB)</strong></td>
<td>Private capital is used to address a current problem and repay that capital from the future program benefits (savings). It requires metrics or outcomes to structure the project, with independent verification and transparency to assess success level.</td>
<td>SIBs can be used to target social and environmental problems, and can potentially solve a variety of problems in innovative and creative ways.</td>
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<tr>
<td>FUNDING MECHANISM</td>
<td>DESCRIPTION</td>
<td>OPPORTUNITY</td>
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<tr>
<td>PUBLIC BENEFIT FUNDS (PBF)</td>
<td>PBFs are pools of funds created by small fees or surcharges on the utility</td>
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<tr>
<td></td>
<td>bill. PBFs aim to support renewable energy and energy efficiency programs.</td>
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<tr>
<td>FEE-BATES &amp; DENSITY BONUSES</td>
<td>A standard fee is charged to all units that is rebated if developed property</td>
<td>Will encourage developers to implement sustainable features into properties</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>meets a minimum standard.</td>
<td>currently in development.</td>
<td></td>
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</tr>
<tr>
<td>TRAFFIC CONGESTION</td>
<td>Fees assessed to automobile drivers in the way of parking fees and fees to</td>
<td>Will reduce traffic congestion in the inner city.</td>
<td></td>
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<td></td>
<td>vehicles traveling in or out of the inner city during business hours. City</td>
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<td>would require the appropriate authorization to impose tolls.</td>
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</tr>
<tr>
<td>DEVELOPER IMPACT FEE #1</td>
<td>Improvements and upgrades to existing infrastructure from new developments.</td>
<td>Fees can also serve to help implement new policies and plans for sustainable growth.</td>
<td></td>
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<tr>
<td></td>
<td>Tap fees can also be tied to water and sewer connections, sometimes as a one-time fee based on lot or building. Requires that a study and developer can only be charged the amount related to the proportional impact of the development.</td>
<td>Higher-income cities are increasingly using developer fees to impose affordable housing minimums.</td>
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<tr>
<td>DEVELOPER IMPACT FEE #2</td>
<td>Assessments to developer to offset impacts of development (e.g., externalities such as traffic congestion or lack of affordable housing). Requires that a study and developer can only be charged the amount related to the proportional impact of the development.</td>
<td>Fees can also serve to help implement new policies and plans for sustainable growth.</td>
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<tr>
<td>DEVELOPER IMPACT FEE #3</td>
<td>Hot real estate market cities use developer fees to fund service capacity requirements (affordable homes, new schools and roads, etc.), and impact fees for meeting green infrastructure policies, not for normal operations/programs. Requires that a study and developer can only be charged the amount related to the proportional impact of the development. Requires voter approval by a two to three margin if tax revenue is limited for sustainable projects.</td>
<td>Fees can also serve to help implement new policies and plans for sustainable growth.</td>
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<tr>
<td>CARBON TAX</td>
<td>Taxing the production of carbon-based energy and using the proceeds as a dividend or rebate to residents and taxpayers to accommodate for higher energy prices. Requires voter approval by two-thirds margin if tax revenues are limited to use on sustainable projects.</td>
<td>Seek to reduce emission and fossil fuel usages. Funds and proceeds can be directed toward the City, residents, or other organizations to fund sustainable projects.</td>
<td></td>
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</tr>
<tr>
<td>CAP &amp; TRADE</td>
<td>Determine a maximum amount of acceptable emissions from many sources in the production or use of carbon and let the market determine the price for being under or over the assigned emission level.</td>
<td>Seek to reduce emission and fossil fuel usages. Funds and proceeds can be directed toward the City, residents, or other organizations to fund sustainable projects.</td>
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<tr>
<td>FUNDING MECHANISM</td>
<td>DESCRIPTION</td>
<td>OPPORTUNITY</td>
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<tr>
<td><strong>VALUE CAPTURE TOOLS: SPECIAL ASSESSMENT</strong></td>
<td>Additional tax assessed depending on increase in the value of the community or district because of a public investment in infrastructure. May require voter approval.</td>
<td>Improve overall value of area and potentially implement smart/green infrastructure.</td>
<td></td>
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</tr>
<tr>
<td><strong>TAX INCREMENT FINANCING (TIF)</strong></td>
<td>Original property taxes before improvements paid to the City as normal. Incremental new taxes paid into a special fund that subsidizes portions of the new development or repayment of the debt.</td>
<td>Allows governments to directly fund smart/green infrastructure.</td>
<td></td>
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</tr>
<tr>
<td><strong>PARCEL TAX, MULTI-JURISDICTION</strong></td>
<td>Specific property tax based on a flat rate. Requires 2/3 vote approval.</td>
<td>Additional funding stream for reclamation or governmental sustainability projects.</td>
<td></td>
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</tr>
<tr>
<td><strong>PROPERTY ASSESSED CLEAN ENERGY (PACE) LOANS</strong></td>
<td>Allows property owners (residential or commercial) to finance sustainable energy investments over the property tax bill.</td>
<td>Municipalities promote/approve programs to help property owners improve their energy footprints with repayment terms that will stay with the property even if it changes ownership.</td>
<td></td>
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</tr>
<tr>
<td><strong>ON-BILL FINANCING</strong></td>
<td>The local utility can identify the upgrade packages and monitor the implementation, helping consumers reduce overall emissions with easy repayment options.</td>
<td>Tool used by utilities and encouraged by cities to help residents fund energy improvements through repayment on their utility bill.</td>
<td></td>
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</tr>
<tr>
<td><strong>LOAN LOSS RESERVE FUNDS (LRF)</strong></td>
<td>Can be set up to decrease the risk associated with making certain kinds of energy efficiency and retrofit loans to underbanked (higher-risk) borrowers.</td>
<td>These programs can reduce the interest rates for unsecured lending to commercial real estate owners, sometimes repaying via utility bills.</td>
<td></td>
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<tr>
<td><strong>INDUSTRIAL REVENUE BONDS</strong></td>
<td>Issued by a municipality to a private developer to promote economic development in the community with the private firm holding ultimate responsibility to repay the bondholders.</td>
<td>Providing funds to a private developer to provide some upgrade to the built environment (capital improvements, renewable and energy efficiency upgrades) for the community.</td>
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<tr>
<td><strong>ENERGY EFFICIENCY LOANS</strong></td>
<td>Generally come from state or federal funds (sometimes through an intermediary) to make low interest rate loans to individuals or small businesses.</td>
<td>Will help to improve energy efficiency in homes and workspaces through more efficient HVAC, windows and doors, insulation, etc.</td>
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<tr>
<td>FUNDING MECHANISM</td>
<td>DESCRIPTION</td>
<td>OPPORTUNITY</td>
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<tr>
<td><strong>GRANTS</strong></td>
<td>Cities can consider and apply for grants from family and community foundations for many sustainability projects. Green, affordable housing projects can attract grant monies from a variety of donors.</td>
<td>By developing relationships with mission-aligned organizations who seek to promote sustainability, community engagement can improve access to funding for innovative programs.</td>
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</tr>
<tr>
<td><strong>POWER PURCHASE AGREEMENTS</strong></td>
<td>A contract between the seller of electricity and the purchaser of electricity, defining all terms, operation, schedule, penalties, payment, and termination.</td>
<td>Allows government agencies to fund renewable projects with minimal upfront costs incurred.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PAY FOR SUCCESS (PFS), PAY FOR PERFORMANCE (PFP)</strong></td>
<td>A private party will typically execute a service (e.g., energy upgrade), and be compensated over time through the energy savings of that service.</td>
<td>Pay for Performance contracts can help a city make improvements with little to no upfront costs.</td>
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</tr>
<tr>
<td><strong>PUBLIC PRIVATE PARTNERSHIP (PPP)</strong></td>
<td>Agreements between the public and private sector for the delivery of services to the public and bring together the needs of the City with private market expertise and discipline to achieve a common goal.</td>
<td>Large-scale infrastructure developments can be kept on budget and on schedule with proper alignment of goals and oversight. Cities and their private partners can work together to develop broad-based community infrastructure that is highly dependent on private capital.</td>
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<tr>
<td><strong>GROUP PURCHASING</strong></td>
<td>Group purchasing renewable energy allows individuals, businesses, and municipalities to greatly reduce the cost of installing clean energy capacity through collective purchasing power.</td>
<td>Pooling collective energy demand lets many entities or individuals secure discounted pricing by buying in bulk. By integrating the group purchasing scheme with other emerging solar financing mechanisms (solar leases, PACE), group buyers can install solar at little to no upfront cost.</td>
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<tr>
<td><strong>COMMUNITY CHOICE Energy (CCE)</strong></td>
<td>A type of group purchasing organized by the local governmental authority with the local electric/gas utility, and usually with a particular focus on purchases of energy from renewable power sources. The City approved moving forward with the establishment of CCE in May 2017.</td>
<td>Combines the demand of all of its members of the community for better purchasing power (generally with the local electric/gas monopoly utility), and usually with a focus on purchases of energy from renewable power sources.</td>
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</tbody>
</table>
3.3 City Action Plan
The Enabling Role of the City

Climate Smart San José seeks to unlock the resources and efforts of others by positioning the City as an enabler and catalyst for driving change across multiple stakeholders.

Traditional thinking on climate has often shouldered the load onto City actions to drive emissions reductions. When City staff are already stretched in delivering critical housing, transportation, and environmental services, taking action on climate can seem a luxury.

The Plan seeks to unlock the resources and efforts of others by positioning the City as an enabler and catalyst for driving change across multiple stakeholders. These stakeholders include agencies, the business community, civic institutions – such as universities, colleges and community groups – as well as families and households.

Taking action on climate in this concerted way ensures that community-wide carbon dioxide emissions are tackled by those best able to effect change – the community.

However, taking action on climate is seen as expensive and difficult; its benefits are not well-understood and it is difficult to know where to start.

This is where the City comes in. It can engage with the various groups taking action, enhance their ability, and enable or empower them to effect change. When these roles are targeted against specific barriers in making climate solutions either available, accessible, or affordable, the City can remove the barriers and reduce the friction for the community to take action.

An example of this is already being seen with the City’s efforts to test, prove, and eventually make autonomous vehicles (AVs) available by enabling a pilot project in the city.

This can be a model for climate solutions such as electric vehicles (EVs), commercially-viable ridesharing, or home battery storage to test, prove, and scale each of these solutions and catalyze their adoption in the community.
2 What kind of role can the City play in accelerating adoption?

1 What kind of market adoption of climate solutions has been achieved already?

- Climate solutions are AVAILABLE
- Climate solutions are ACCESSIBLE
- Climate solutions are AFFORDABLE

City-Driven Action

<table>
<thead>
<tr>
<th>EXECUTE</th>
<th>ENFORCE</th>
<th>ENGAGE</th>
<th>ENHANCE</th>
<th>ENABLE</th>
<th>EMPOWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROVIDE AWARENESS</td>
<td>PILOT PROJECTS</td>
<td>AGGREGATE DEMAND</td>
<td>PROVIDE GUIDANCE AND AWARENESS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROVIDE INCENTIVES</td>
<td>DIRECTLY PROVIDE ACCESS</td>
<td>PROVIDE RESOURCES</td>
<td>SUBSIDIZE</td>
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</tr>
</tbody>
</table>

Community-Driven Action

San José’s City departments engage with groups to take action and empower change.
Climate Smart San José Monitoring Dashboard

Dashboard
The City will be responsible for maintaining a real-time dashboard that will monitor progress on The Plan to update City staff, Council, and other stakeholders. The dashboard will be made up of the key indicators across the nine strategies and used to assess the efficacy of current programs and strategies. The dashboard will be critical for tracking the progress of the City’s milestones while it implements The Plan. It will clearly denote areas of successes and failures to help illustrate which programs and policies have been effective.
## A Dashboard for Tracking Progress

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>METRIC</th>
<th>PROGRESS MILESTONES</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>TODAY</td>
<td>2030</td>
</tr>
<tr>
<td><strong>RENEWABLE ENERGY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share of eligible renewable energy generation in San José Clean Energy's (SJCE) portfolio</td>
<td>Percentage of SJCE’s generation mix</td>
<td>60%</td>
</tr>
<tr>
<td>Amount of renewable energy capacity installed in San José</td>
<td>Installed capacity of local renewables (MW)</td>
<td>131</td>
</tr>
<tr>
<td><strong>TOTAL WATER CONSUMPTION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total volume of water consumed in the city per day</td>
<td>Million gallons of water per day</td>
<td>116</td>
</tr>
<tr>
<td>Residential water use per capita per day</td>
<td>Gallons of water per capita per day</td>
<td>60</td>
</tr>
<tr>
<td>Water captured and reused or treated then recycled</td>
<td>Percentage of demand met by reuse/recycling</td>
<td>5%</td>
</tr>
<tr>
<td><strong>CITY DENSITY IN GROWTH AREAS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Density of new residents in planned growth areas</td>
<td>Resident population per square mile (new growth only)</td>
<td>2,372</td>
</tr>
<tr>
<td><strong>COMPLETE STREETS</strong></td>
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<tr>
<td>Percentage of primary streets in San José that meet California Complete Streets Act standards</td>
<td>Percentage of primary streets that are complete streets</td>
<td>40%</td>
</tr>
<tr>
<td><strong>TRANSIT-ORIENTED DEVELOPMENT (TOD)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial space located within 1/2 mile of transit</td>
<td>Millions of square feet of commercial space</td>
<td>29</td>
</tr>
<tr>
<td><strong>ZNE HOMES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Zero Net Energy (ZNE) homes</td>
<td>Number of ZNE homes</td>
<td>&lt;100</td>
</tr>
<tr>
<td><strong>ALL-ELECTRIC HOMES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of homes that are all-electric</td>
<td>Percentage of homes that are all-electric</td>
<td>0%</td>
</tr>
<tr>
<td><strong>HOUSEHOLD ENERGY USE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household energy use (gas and electricity)</td>
<td>Household energy consumption (kWhe and kWhh)</td>
<td>14,988</td>
</tr>
<tr>
<td><strong>ELECTRIC VEHICLES (EVs)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of passenger vehicles (including SUVs) that are electric</td>
<td>Percentage of passenger vehicles that are electric</td>
<td>6%</td>
</tr>
<tr>
<td>Reduction in passenger cars and SUVs from public or shared mobility</td>
<td>Equivalent numbers of cars taken off the roads</td>
<td>-</td>
</tr>
<tr>
<td><strong>SINGLE-OCCUPANCY VEHICLES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single-occupancy vehicle commute trips</td>
<td>Percentage of single-occupancy vehicle commute trips</td>
<td>82%</td>
</tr>
<tr>
<td><strong>VMT REDUCTION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicle miles traveled per capita per day reduction</td>
<td>VMT per service population per day reduction</td>
<td>-</td>
</tr>
<tr>
<td><strong>PUBLIC TRANSIT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of commute trips taken on public transit</td>
<td>Percentage of commute trips taken on public transit</td>
<td>5%</td>
</tr>
<tr>
<td><strong>ACCESSIBLE TRANSIT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of households within 1/2 mile of high frequency (less than 15 min) transit 7am to 10pm</td>
<td>Percentage of households near high frequency transit</td>
<td>17%</td>
</tr>
<tr>
<td><strong>JOBS TO EMPLOYED RESIDENT RATIO</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jobs to employed resident (J/ER) ratio</td>
<td>Jobs per San José employed resident</td>
<td>0.8</td>
</tr>
<tr>
<td><strong>TRANSIT-ACCESSIBLE JOBS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jobs within 1/2 mile of rail and 1/4 mile of High Capacity Transit (HCT)</td>
<td>Jobs within 1/2 mile of rail and 1/4 mile of HCT</td>
<td>194,000</td>
</tr>
<tr>
<td><strong>COMMUTING</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of commute journeys by walking and cycling</td>
<td>Percentage of commute journeys by walking and cycling</td>
<td>3.7%</td>
</tr>
<tr>
<td><strong>ZNE COMMERCIAL BUILDINGS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross Internal Floor Area of ZNE commercial buildings</td>
<td>Area of ZNE commercial buildings (million sq ft)</td>
<td>0</td>
</tr>
<tr>
<td><strong>DISTRIBUTED GENERATION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rooftop solar generation on commercial and industrial buildings</td>
<td>Commercial distributed solar generation capacity (MW)</td>
<td>30</td>
</tr>
<tr>
<td><strong>LOCAL DELIVERY VEHICLES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of electric local delivery vehicles</td>
<td>Percentage of local delivery vehicles that are electric</td>
<td>-</td>
</tr>
<tr>
<td><strong>HEAVY DUTY VEHICLES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of alternative fuel heavy goods vehicles</td>
<td>Percentage of heavy goods vehicles that are alternative fuel</td>
<td>-</td>
</tr>
</tbody>
</table>
Longer Term Actions to be Considered by the City

In addition to the actions in the City Action Plan, the City of San José will be considering additional measures to support implementation.

1. Continue to support Low-Carbon Solution Innovation Hubs like Prospect Silicon Valley to prove and scale the technologies needed for future climate action. These entities bring together innovators with venture capital to fund and scale climate-related technologies, services, products, and business models that will make them accessible to San José. Prospect Silicon Valley supports innovators across mobility, buildings, and energy.

2. Accelerate the development of climate smart urban villages by incorporating design guidelines and/or policies that deliver a clear climate benefit into Urban Village Plans. This could be piloted in some Horizon 1 urban villages before rolling it out to all villages.

3. Pass a broad-based carbon tax to raise revenue for climate action by levying a tax on carbon emitters. The City of Boulder, Colorado, has pioneered such a program.

4. Measure and report carbon dioxide emissions annually to Carbon Disclosure Project for Cities or International Council for Local Environmental Initiatives' (ICLEI) carbon Climate Registry (cCR).
(Left) Providing a healthy, sustainable life for your loved ones is our top priority.

(Below) Even the smallest of actions like planting flowers or growing some of your own food can make a difference.
City Action Plan
1.1 Transition to a Renewable Energy Future

Vision

San José will create SJCE, a community choice energy (CCE) program, that will make 100% carbon-free electricity available as a base offering to all users in the city by 2021.

Paris-Related Indicators
Carbon dioxide emissions reduction from this strategy:
- 2021: -0.50 MtCO2e
- 2030: -0.78 MtCO2e
- 2040: -1.34 MtCO2e
- 2050: -1.67 MtCO2e

Related Measures
- SJCE: -$33/tCO2e
- Net Energy Metering: +$355/tCO2e

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<tr>
<td><strong>SAN JOSÉ CLEAN ENERGY</strong></td>
<td>1.1-A: Run program under San José Department of Community Energy which will provide the community a choice in their electricity provider.</td>
<td>DCE</td>
</tr>
<tr>
<td></td>
<td>1.1-B: Support legislative and regulatory items that further the city’s transition to renewable energy.</td>
<td>DCE</td>
</tr>
<tr>
<td><strong>FINANCING</strong></td>
<td>1.1-C: Evaluate options such as performance-based electric rates and on-bill financing to incentivize fully-electric homes.</td>
<td>DCE</td>
</tr>
<tr>
<td></td>
<td>1.1-D: Evaluate feed-in tariff program options where SJCE pays for excess residential and/or commercial solar generation.</td>
<td>DCE</td>
</tr>
<tr>
<td><strong>COMMUNITY SOLAR &amp; VIRTUAL NET METERING</strong></td>
<td>1.1-E: Run program and explore community solar farm, enabling individuals, groups, or homeowners to develop utility scale-facilitated program and sell “shares” in the farm. An alternative for people in multi-family or with unsuitable rooftops.</td>
<td>DCE</td>
</tr>
<tr>
<td><strong>ACCESS TO LOW-INCOME COMMUNITIES</strong></td>
<td>1.1-F: Partner with organizations (e.g., Grid Alternatives) to expand accessibility of solar to low-income customers (e.g., tariffs, state financing).</td>
<td>ESD, HD</td>
</tr>
<tr>
<td><strong>BUILDING CODES &amp; PERMITTING</strong></td>
<td>1.1-G: Evaluate options to incentivize rooftop solar photovoltaic (PV) and/or solar hot water on new buildings and major retrofits.</td>
<td>PBCE</td>
</tr>
<tr>
<td><strong>LEAD BY EXAMPLE</strong></td>
<td>1.1-H: Lead by example and pilot and promote multiple energy storage projects, including battery storage at highly visible locations (e.g., City Hall, fire stations).</td>
<td>PW, DCE</td>
</tr>
<tr>
<td></td>
<td>1.1-I: Lead by example and evaluate feasibility for all municipal buildings and install solar where possible.</td>
<td>PW</td>
</tr>
<tr>
<td><strong>INTEGRATE ENERGY STORAGE WITH RENEWABLES</strong></td>
<td>1.1-J: Provide guidance on renewables paired with storage as an alternative to new fossil fuel generation for all scales of power plants and eventually ban new fossil fuel generation (SPUR Fossil Fuel Free).</td>
<td>DCE</td>
</tr>
<tr>
<td></td>
<td>1.1-K: Convene to explore best practices for energy storage in collaboration with other agencies/PG&amp;E on fire protection, permitting, and building codes (SPUR Fossil Fuel Free).</td>
<td>PBCE</td>
</tr>
</tbody>
</table>
City Action Plan
1.2 Embrace Our Californian Climate

Vision
San José will effectively employ sustainable use practices of local water and green infrastructure to achieve a 30 percent reduction in residential water consumption to 42 gallons per day per capita by 2030.

Paris-Related Indicators
Water consumption (gallons of water per capita per day):
- Today: 103
- 2021: 61
- 2030: 42
- 2040: 20

Related Measures
- Aerated commercial faucets: -$3.50/Gallon
- Drought-resilient plants: -$3.44/Gallon
- Low-flush commercial toilets: -$3.31/Gallon
- Fixing residential leaks: $9.56/Gallon
- Residential greywater systems: $9.92/Gallon
- Domestic rainwater storage: $10.75/Gallon

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<tr>
<td><strong>RESIDENTIAL WATER CONSERVATION</strong></td>
<td>1.2-A: Partner to continue to expand climate-compatible lawns program by providing a Bay-Friendly Landscapes rating system as a way to create social badging. Other ideas include providing a website homeowners can post their own photos and landscape designs to inspire their neighbors.</td>
<td>ESD</td>
</tr>
<tr>
<td></td>
<td>1.2-B: Provide guidance on where to find incentives for residential water retrofits (e.g., low-flow fixtures, high-efficiency dishwashers and washers).</td>
<td>ESD</td>
</tr>
<tr>
<td></td>
<td>1.2-C: Support legislative and regulatory items that further the City’s water conservation efforts.</td>
<td>ESD</td>
</tr>
<tr>
<td><strong>COMMERCIAL BUILDINGS</strong></td>
<td>1.2-D: Provide guidance on how to individually sub-meter existing non-residential and multi-family buildings.</td>
<td>ESD</td>
</tr>
<tr>
<td></td>
<td>1.2-E: Evaluate options to incentivize new developments to have outdoor water use separately sub-metered.</td>
<td>PBCE</td>
</tr>
<tr>
<td></td>
<td>1.2-F: Partner with leading engineer/developer/architect on a net-zero water concept in a project as a pilot and demonstration case.</td>
<td>ESD</td>
</tr>
<tr>
<td><strong>RESERVOIR CAPACITY</strong></td>
<td>1.2-G: Convene efforts on expansion of reservoir capacity in partnership with regional water agencies.</td>
<td>ESD</td>
</tr>
<tr>
<td><strong>RECYCLED WATER</strong></td>
<td>1.2-H: Convene to advance regional conversation on the strategic expansion of recycled water to increase supply and reduce reliance on imported water and improve water quality in San Francisco Bay.</td>
<td>ESD</td>
</tr>
<tr>
<td><strong>ACCESS TO LOW INCOME COMMUNITIES</strong></td>
<td>1.2-I: Partner with organizations to increase access to clean and affordable water for all residents.</td>
<td>ESD</td>
</tr>
<tr>
<td><strong>STORMWATER</strong></td>
<td>1.2-J: Convene to advance regional conversation to understand potential contribution of stormwater capture and reuse to region’s water supply portfolio. Current potential is relatively unknown but other dry cities have it as a significant piece of their portfolios (reference SPUR’s Future-Proof Water).</td>
<td>ESD</td>
</tr>
<tr>
<td></td>
<td>1.2-K: Partner with Santa Clara Valley Water District (SCVWD) and Open Space Authority on their coordinated study to quantify water resource and climate resilience benefits of green infrastructure investments in Coyote Creek watershed lands.</td>
<td>ESD</td>
</tr>
<tr>
<td></td>
<td>1.2-L: Run program to include green infrastructure (e.g., rain gardens) as part of complete streets requirements.</td>
<td>ESD</td>
</tr>
<tr>
<td><strong>RESEARCH &amp; ADVOCACY</strong></td>
<td>1.2-M: Convene to invest in additional climate change research to better understand projected magnitude of change on supply in order to know what to do. Cities and counties need to better understand rainfall and snowpack impacts as well as saltwater intrusion into aquifers (reference SPUR's Future-Proof Water).</td>
<td>ESD</td>
</tr>
<tr>
<td></td>
<td>1.2-N: Convene to advocate for reforming Proposition 218 which deters lifeline rates and tiered pricing. Work with the Water Foundation (reference SPUR’s Future-Proof Water).</td>
<td>ESD</td>
</tr>
</tbody>
</table>
City Action Plan
2.1 Densify Our City to Accommodate Our Future Neighbors

Vision

San José will embrace an expected 319,000 additional residents by 2050 through managed, mixed-use densification around its urban villages and other focused growth areas.

Paris-Related Indicators
Carbon dioxide emissions reduction from this strategy:
- 2021: -0.09 MtCO2e
- 2030: -0.29 MtCO2e
- 2040: -0.49 MtCO2e
- 2050: -0.61 MtCO2e

Related Measures
Bike Plan: -$142/tCO2e
Carbon abatement cost from city densification: -$94/tCO2e
Water reduction cost from city densification: -$16/Gallon

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</thead>
<tbody>
<tr>
<td><strong>ENCOURAGE MODE SHIFT</strong></td>
<td><strong>2.1-A:</strong> Update the 2020 Bike Plan with a focus on strategies to increase bike usage.</td>
<td>DOT</td>
</tr>
<tr>
<td></td>
<td><strong>2.1-B:</strong> Adopt the complete streets design standards that are smart, green, and multimodal.</td>
<td>DOT</td>
</tr>
<tr>
<td></td>
<td><strong>2.1-C:</strong> Evaluate options to incentivize new development (e.g., developments over 25,000 sf or 25 units) to include a GreenTrip score in their submittal.</td>
<td>PBCE</td>
</tr>
<tr>
<td></td>
<td><strong>2.1-D:</strong> Provide guidance with Vision Zero (<a href="http://www.sanjoseca.gov/VisionZero">www.sanjoseca.gov/VisionZero</a>) to make walking and cycling safer in San José.</td>
<td>DOT</td>
</tr>
<tr>
<td></td>
<td><strong>2.1-E:</strong> Provide guidance and update Urban Design Guidelines so they are transit-supportive and ensure new development supports mode shift and decarbonization.</td>
<td>PBCE</td>
</tr>
<tr>
<td></td>
<td><strong>2.1-F:</strong> Evaluate options (e.g., adopting vehicle trip caps) in megaproject developments to incentivize reduction in vehicle use.</td>
<td>PBCE, DOT</td>
</tr>
<tr>
<td></td>
<td><strong>2.1-G:</strong> Finalize and implement Greater Downtown Bicycle Network so that it is comfortable for people of all ages and abilities.</td>
<td>DOT</td>
</tr>
<tr>
<td></td>
<td><strong>2.1-H:</strong> Adopt transportation policy that shifts from Level of Service (LOS) to VMT under CEQA.</td>
<td>PBCE, DOT</td>
</tr>
<tr>
<td></td>
<td><strong>2.1-I:</strong> Evaluate options to incentivize developers to build ZNE buildings.</td>
<td>PBCE</td>
</tr>
<tr>
<td></td>
<td><strong>2.1-J:</strong> Evaluate zoning code for ways to incentivize high-density housing and jobs into priority development areas, especially within a quarter-mile of transit stations and stops, to promote walkability and reduce costs of housing plus transportation.</td>
<td>HD</td>
</tr>
<tr>
<td></td>
<td><strong>2.1-K:</strong> Consider minimum acceptable densities so that land resources are not locked in to low-density patterns of development.</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td><strong>2.1-L:</strong> Create policies and tools to prevent and mitigate displacement of local residents and small businesses</td>
<td>--</td>
</tr>
<tr>
<td><strong>ENCOURAGE DENSER DEVELOPMENT IN FOCUSED GROWTH AREAS</strong></td>
<td><strong>2.1-M:</strong> Evaluate changes to minimum and maximum parking requirements near transit to encourage increased use of public transit and allow for greater densities.</td>
<td>PBCE</td>
</tr>
<tr>
<td></td>
<td><strong>2.1-N:</strong> Evaluate options for demand-based pricing for city-owned parking garages to reduce congestion and encourage increased use of public transportation.</td>
<td>PBCE, DOT</td>
</tr>
<tr>
<td><strong>PARKING</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CLIMATE SMART SAN JOSE | A PEOPLE-CENTERED PLAN FOR A LOW-CARBON CITY
City Action Plan
2.2 Make Homes Efficient & Affordable for Our Residents

Vision

All new homes built in San José from 2020 will be ZNE and existing homes will be retrofitted to reduce their energy consumption and eliminate their use of natural gas.

Paris-Related Indicators
Carbon dioxide emissions reduction from this strategy:
2021: -0.10 MtCO₂e
2030: -0.39 MtCO₂e
2040: -0.66 MtCO₂e
2050: -0.70 MtCO₂e

Related Measures
Removing home electronic phantom loads: -$804/tCO₂e
Smart thermostats: -$257/tCO₂e
Ground source heat pumps: -$101/tCO₂e
Efficient fridges: -$80/tCO₂e
Electric water heaters: -$65/tCO₂e
Thermal retrofit: -$19/tCO₂e
Electric ranges: +$120/tCO₂e

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<tbody>
<tr>
<td>HOME RETROFITS</td>
<td>2.2-A: Evaluate options for publishing home energy use/benchmarking data upon property sale and encouraging follow-up property upgrades (e.g., through Energy Upgrade California).</td>
<td>ESD</td>
</tr>
<tr>
<td></td>
<td>2.2-B: Partner to create a PG&amp;E-style center that provides hands-on demonstrations and trainings for home and commercial users to understand more about retrofits and ZNE homes.</td>
<td>ESD</td>
</tr>
<tr>
<td></td>
<td>2.2-C: Partner with Property Assessed Clean Energy (PACE) organizations to refine the offerings to make it more effective.</td>
<td>ESD</td>
</tr>
<tr>
<td></td>
<td>2.2-D: Evaluate options such as removing fees, streamlining permitting, and training building department staff to incentivize the installation of electric end-use upgrades.</td>
<td>PBCE</td>
</tr>
<tr>
<td>MULTI-FAMILY HOMES RETROFIT</td>
<td>2.2-E: Partner to identify multi-family retrofit incentives and encourage participation with existing energy resources.</td>
<td>ESD</td>
</tr>
<tr>
<td>ACCELERATE DEVELOPMENT OF ZNE HOMES</td>
<td>2.2-F: Evaluate options such as fast track permitting to incentivize energy-efficient, ZNE homes.</td>
<td>PBCE</td>
</tr>
<tr>
<td></td>
<td>2.2-G: Partner with innovative organizations such as Prospect Silicon Valley and contractors/developers on ZNE single-family home retrofit projects to raise awareness and showcase technologies that make it possible.</td>
<td>ESD</td>
</tr>
<tr>
<td></td>
<td>2.2-H: Partner to raise awareness of ZNE homes tours and partner with AIA &amp; progressive developers.</td>
<td>ESD</td>
</tr>
<tr>
<td></td>
<td>2.2-I: Partner with developer to create ZNE buildings in an high profile location or an urban village.</td>
<td>PBCE</td>
</tr>
<tr>
<td></td>
<td>2.2-J: Provide guidance by training City staff in advance of state requirements to have all new homes be ZNE by 2020.</td>
<td>PBCE</td>
</tr>
<tr>
<td>ACCESS TO LOW-INCOME COMMUNITIES</td>
<td>2.2-K: Partner to make energy efficiency upgrades accessible to low-income communities.</td>
<td>HD</td>
</tr>
<tr>
<td></td>
<td>2.2-L: Support energy-efficient retrofits of existing affordable and rent-stabilized apartment buildings to lower energy costs and reduce housing costs for residents.</td>
<td>HD</td>
</tr>
<tr>
<td>NETWORK ACTIVATION</td>
<td>2.2-M: Develop multi-channel network activation approach to encourage adoption of energy and water efficiency products, services, and behaviors across residents.</td>
<td>ESD</td>
</tr>
<tr>
<td></td>
<td>2.2-N: Create open-access data portal for residents to understand their neighborhood and city-level patterns of energy and water consumption.</td>
<td>ESD</td>
</tr>
</tbody>
</table>
City Action Plan
2.3 Create Clean, Personalized Mobility Choices

Vision
San José will work to develop clean, personalized, and shared mobility choices, reducing single-passenger gasoline car use through a combination of bike and ridesharing, passenger vehicle electrification, and, in the future, AVs.

Paris-Related Indicators
Carbon dioxide emissions reduction from this strategy:
2021: -0.18 MtCO2e
2030: -0.63 MtCO2e
2040: -1.14 MtCO2e
2050: -1.32 MtCO2e

Related Measures
Autonomous 14-person ridesharing: -$1,350/tCO2e
4-person ridesharing: -$309/tCO2e
14-person ridesharing: -$210/tCO2e
Autonomous 4-person ridesharing: -$200/tCO2e
EV SUVs: -$45/tCO2e
EV cars: +$108/tCO2e
Autonomous EV cars: +$315/tCO2e
Autonomous EV SUVs: +$353/tCO2e

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<td><strong>VEHICLE ELECTRIFICATION</strong></td>
<td>2.3-A: Partner to strategically expand network of publicly available charging stations.</td>
<td>DOT</td>
</tr>
<tr>
<td></td>
<td>2.3-B: Participate in the California Public Utility Commission’s Vehicle-Grid-Integration working group, which is defining system requirements to ensure open and interoperable communication between vehicles, EV chargers, and grid operators.</td>
<td>DOT</td>
</tr>
<tr>
<td></td>
<td>2.3-C: Evaluate options to incentivize EV charging stations, or EV-readiness, in new commercial parking areas.</td>
<td>PBCE</td>
</tr>
<tr>
<td></td>
<td>2.3-D: Evaluate options such as taxi permitting incentives and discounted group EV purchasing to incentivize the use of EVs for taxis, car-sharing, and transportation network companies.</td>
<td>DOT</td>
</tr>
<tr>
<td></td>
<td>2.3-E: Lead by example by expanding the conversion of public vehicle fleets to electric as quickly as possible.</td>
<td>PW</td>
</tr>
<tr>
<td></td>
<td>2.3-F: Convene stakeholders to explore requirements for new buildings, including multi-family developments, that would facilitate EV charging.</td>
<td>PBCE, DOT</td>
</tr>
<tr>
<td></td>
<td>2.3-G: Evaluate options to streamline permitting process for all types of EV chargers to comply with AB1236.</td>
<td>PBCE</td>
</tr>
<tr>
<td></td>
<td>2.3-H: Partner with relevant organizations to provide data analytics insights for an autonomous, shared, and electric mobility strategy.</td>
<td>ESD, DOT</td>
</tr>
<tr>
<td></td>
<td>2.3-I: Identify an internal EV champion to work with public and private sectors to complete an EV strategy.</td>
<td>ESD, DOT</td>
</tr>
<tr>
<td><strong>AUTONOMOUS VEHICLES</strong></td>
<td>2.3-J: Provide guidance to understand implications of AVs on the City’s fleet.</td>
<td>DOT, PW</td>
</tr>
<tr>
<td></td>
<td>2.3-K: Regulate to get the most benefits from AVs by making driving alone in AVs more expensive and promoting mode shifts (SPUR Fossil Fuel Free).</td>
<td>DOT</td>
</tr>
<tr>
<td></td>
<td>2.3-L: Partner with innovative organizations (e.g., Prospect Silicon Valley) to better understand AVs and increase adoption.</td>
<td>DOT</td>
</tr>
<tr>
<td><strong>TRAVEL DATA</strong></td>
<td>2.3-M: Run program to explore technology and data systems that enhance our understanding of traffic and vehicle travel in the city.</td>
<td>DOT</td>
</tr>
<tr>
<td><strong>ACCESS TO LOW INCOME COMMUNITIES</strong></td>
<td>2.3-N: Partner to make electric and autonomous cars accessible and affordable to low income residents.</td>
<td>DOT</td>
</tr>
</tbody>
</table>
City Action Plan
2.4 Develop
Integrated, Accessible
Public Transport Infrastructure

Vision

San José will continue supporting public transit infrastructure as a means of getting around the city, particularly the integration of multiple transport modes at Diridon Station.

Paris-Related Indicators
Carbon dioxide emissions reduction from this strategy:
- 2021: -0.23 MtCO2e
- 2030: -0.33 MtCO2e
- 2040: -0.47 MtCO2e
- 2050: -0.55 MtCO2e

Related Measures
- Caltrain electrification: -$46/tCO2e
- VTA Next Network: -$0.29/tCO2e
- Bus Rapid Transit: +$683/tCO2e
- High-Speed Rail: +$2,784/tCO2e
- BART extension: +$4,176/tCO2e

KEY
- DCE: Department of Community Energy
- DOT: Department of Transportation
- ESD: Environmental Services Department
- HD: Housing Department
- OED: Office of Economic Development
- PBCE: Planning, Building, and Code Enforcement
- PW: Public Works Department
<table>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>TRAVEL DATA</strong></td>
<td><strong>2.4-A:</strong> Partner with transit and other agencies such as SPUR and MTC to unify the transit experience across operators with accessible maps and wayfinding, scheduling, fares, station design, and marketing. Also work toward investing in frequency, infrastructure, and reliability in the places that have the highest ridership and the potential to attract new riders.</td>
<td>DOT, OED</td>
</tr>
<tr>
<td></td>
<td><strong>2.4-B:</strong> Partner with regional agencies to create clear, consistent, and performance-based Transportation and Parking Demand Management (TDM) policies.</td>
<td>DOT</td>
</tr>
<tr>
<td></td>
<td><strong>2.4-C:</strong> Advance long-range transit projects that serve growth areas by developing plans and implementing in conjunction with the VTA and other cities to achieve VMT reductions.</td>
<td>DOT</td>
</tr>
<tr>
<td></td>
<td><strong>2.4-D:</strong> Strive for transit stations that are exceptionally designed and integrated into the urban and economic fabric of the city.</td>
<td>DOT, PBCE, OED</td>
</tr>
<tr>
<td><strong>ACCESS TO LOW-INCOME COMMUNITIES</strong></td>
<td><strong>2.4-E:</strong> Explore discounted or free transit for students, seniors, and lower income residents.</td>
<td>DOT</td>
</tr>
</tbody>
</table>

Our City’s future plans for public transit will go a long way in achieving Paris goals.
City Action Plan
3.1 Create Local Jobs in Our City to Reduce Vehicle Miles Traveled

Vision

San José will work to create an additional 332,000 local jobs in our city by 2040.

Paris-Related Indicators
Carbon dioxide emissions reduction from this strategy:
- 2021: -0.20 MtCO2e
- 2030: -0.64 MtCO2e
- 2040: -1.05 MtCO2e
- 2050: -1.28 MtCO2e

Related Measures
Creating local jobs: -$175/tCO2e

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### ECONOMIC & WORKFORCE DEVELOPMENT

**3.1-A:** Update Minimum Wage Ordinance to increase minimum wages across the city, getting to $15 per hour by 2019 and tying to consumer price index inflation thereafter.

**Lead Department:** OED

**3.1-B:** Continue San José Works youth summer internship program for young people from at-risk neighborhoods.

**Lead Department:** OED

**3.1-C:** Continue San José Promise program, providing free two-year community college and college readiness programs.

**Lead Department:** OED

**3.1-D:** Continue providing on-the-job training to residents in high-demand fields such as manufacturing.

**Lead Department:** OED

**3.1-E:** Continue providing workforce training cohorts in technical trades through partnerships with local community colleges.

**Lead Department:** OED

### TOD & PLANNING

**3.1-F:** Proactively support TOD through the General Plan and Urban Village plan.

**Lead Department:** OED
City Action Plan
3.2 Improve Our Commercial Building Stock

Vision

All new commercial buildings built in San Jose’ from 2030 will be ZNE, and existing commercial will be retrofitted to reduce their energy consumption and eliminate their use of natural gas.

Paris-Related Indicators
Carbon dioxide emissions reduction from this strategy:
2021: -0.20 MtCO2e
2030: -0.64 MtCO2e
2040: -1.05 MtCO2e
2050: -1.28 MtCO2e

Related Measures
Creating local jobs: -$175/tCO2e

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</tr>
</thead>
<tbody>
<tr>
<td><strong>NEW CONSTRUCTION</strong></td>
<td>3.2-A: Provide guidance and encourage new construction and retrofitting of buildings toward ZNE through trainings, demonstration, and other identified incentives.</td>
<td>ESD</td>
</tr>
<tr>
<td></td>
<td>3.2-B: Explore incentives to build ZNE buildings by making vacant City land available for developers with the most innovative designs.</td>
<td>OED, PBCE</td>
</tr>
<tr>
<td></td>
<td>3.2-C: Evaluate options for publishing large commercial building energy use/benchmarking data and encouraging follow-up property upgrades.</td>
<td>ESD</td>
</tr>
<tr>
<td><strong>RETROFITS</strong></td>
<td>3.2-D: Run program to achieve energy efficiency market transformation and outreach, and increase participation of audits, rebates, technical support, and other innovative programs.</td>
<td>ESD, DCE</td>
</tr>
<tr>
<td></td>
<td>3.2-E: Run program for SJCE to offer demand response to businesses.</td>
<td>DCE</td>
</tr>
<tr>
<td></td>
<td>3.2-F: Partner with innovative contractor/developer on a net gen ZNE nonresidential retrofit to raise awareness and showcase technologies that make it possible.</td>
<td>ESD</td>
</tr>
<tr>
<td></td>
<td>3.2-G: Partner to create a Better Building Challenge type program (LA and DoE program) to provide commercial owners guidance.</td>
<td>ESD</td>
</tr>
<tr>
<td></td>
<td>3.2-H: Evaluate options such as voluntary outcome-based building energy codes and/or priority permitting for buildings demonstrating high energy performance to incentivize ZNE buildings.</td>
<td>PBCE</td>
</tr>
<tr>
<td></td>
<td>3.2-I: Provide guidance for permitting office on ways to ensure new buildings and retrofits are built as required by the energy code.</td>
<td>ESD</td>
</tr>
<tr>
<td></td>
<td>3.2-J: Convene owners and property managers of the largest blocks of building types on how to accelerate meeting a ZNE goal for building retrofits.</td>
<td>ESD, PBCE</td>
</tr>
<tr>
<td><strong>FINANCING</strong></td>
<td>3.2-K: Evaluate options such as on-bill financing to incentivize energy efficiency upgrades.</td>
<td>DCE</td>
</tr>
<tr>
<td></td>
<td>3.2-L: Provide guidance on green leasing for building owners and tenants.</td>
<td>ESD</td>
</tr>
<tr>
<td></td>
<td>3.2-M: Provide guidance and explore improvements to energy efficiency financing options, especially for commercial businesses.</td>
<td>ESD</td>
</tr>
</tbody>
</table>
City Action Plan
3.3 Make Commercial Goods Movement Clean & Efficient

Vision
San José will support its commercial and industrial sectors in reducing the carbon impact from goods movement by transitioning to clean and efficient logistics.

Paris-Related Indicators
Carbon dioxide emissions reduction from this strategy:
2021: -0.18 MtCO2e
2030: -1.00 MtCO2e
2040: -1.94 MtCO2e
2050: -2.13 MtCO2e

Related Measures
Fuel efficiency standards improvement for HDVs: -$550/tCO2e
CNG heavy duty vehicle: -$161/tCO2e
Local Delivery ("UPS truck") EV: +$3/tCO2e
PIE heavy duty vehicle: +$140/tCO2e
Hybrid heavy duty vehicles: +$235/tCO2e

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### Options for Supporting City Actions

<table>
<thead>
<tr>
<th>Focus Area</th>
<th>Options for Supporting City Actions</th>
<th>Lead Departments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>California Sustainable Freight Action Plan</strong></td>
<td>3.3-A: Engage with regional transportation stakeholders to explore the City’s role in developing policies that support the California Sustainable Freight Action Plan.</td>
<td>DOT</td>
</tr>
<tr>
<td></td>
<td>3.3-B: Advance EV battery and storage options for goods vehicles.</td>
<td>DOT</td>
</tr>
<tr>
<td></td>
<td>3.3-C: Explore further market transformation activities with other cities seeking to electrify City vehicle fleets.</td>
<td>DOT, PW</td>
</tr>
<tr>
<td></td>
<td>3.3-D: Evaluate the potential for new logistics and commercial delivery models such as drone delivery, cargo bikes, and pickup lockers to reduce commercial vehicle use within the city.</td>
<td>DOT</td>
</tr>
<tr>
<td></td>
<td>3.3-E: Work with major commercial transport users in San José to explore fleet optimization best practices.</td>
<td>DOT</td>
</tr>
</tbody>
</table>
City Action Plan
Future Climate Smart
San José Updates

Vision

The Plan is a living document which will be updated in tandem with the four-year major General Plan update, allowing for significant future opportunities to make our strategies more robust.
<table>
<thead>
<tr>
<th>FOCUS AREA</th>
<th>OPTIONS FOR SUPPORTING CITY ACTIONS</th>
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</thead>
<tbody>
<tr>
<td><strong>CARBON SEQUESTRATION</strong></td>
<td>Explore opportunities to identify and secure funding for further research, pilots, and programs around creating a full net carbon emissions accounting (e.g., carbon sequestration from Natural and Working Lands [NWL] to further enhance our climate smart pathway).</td>
<td>ESD</td>
</tr>
<tr>
<td><strong>UPDATES TO THE PLAN</strong></td>
<td>Participate in State efforts to develop NWL Inventory and Implementation Plan.</td>
<td>ESD</td>
</tr>
<tr>
<td><strong>LEGISLATIVE &amp; REGULATORY ADVOCACY</strong></td>
<td>Review and update The Plan in tandem with the four-year major General Plan updates, including review of any new, relevant plans, policies, and data - such as data from the Bay Area Greenprint tool, California’s 2017 Climate Change Scoping Plan, and San José’s updated GreenPrint and new Green Infrastructure Plan.</td>
<td>ESD</td>
</tr>
<tr>
<td><strong>Support legislation and regulatory items that align with The Plan.</strong></td>
<td></td>
<td>ESD</td>
</tr>
</tbody>
</table>

We will continue investing in and looking for climate smart opportunities to better our city and people.
3.4 Community Playbooks
Resident Playbook on Energy

What will have the biggest impact in making your home more comfortable and reduce carbon? Replace your gas appliances for electric. Surprised? That’s because San José’s electricity is becoming cleaner. Natural gas, not so much. The following actions are the best improvements to make your home more comfortable, save you money and reduce carbon dioxide emissions.

**Use Smart Thermostats**

In an afternoon, you can install a smart thermostat which gives you the power to automate your home’s climate to make it more comfortable.

**Switch Out Your Gas Range with an Electric One**

Inductive cooktops are revolutionizing the way people cook. Compared to gas, they heat twice as fast, provide more temperature control, and have better air quality. Inexpensive portable units are easy to try, and even celebrity chefs are jumping on this trend.
On-Demand Electric Water Heaters

On-demand water heaters provide a continuous supply of hot water and are much smaller than gas-fired boilers.

Insulate Your Home

A well insulated home fosters well-being by making the temperature more consistent, eliminating drafts, and muffling outside noise to make it easier to focus, connect with your family, and get a good night’s sleep.

Consider Installing Solar on Your Roof or Choose Carbon-Free Electricity

Solar panels are becoming more efficient, beautiful, and less expensive. Many companies are offering “panels” that are embedded in the roofing material itself, complementing the architecture of your home. If your home is not suitable for a solar installation, you can still choose 100 percent carbon-free electricity from your electric service provider.

Install Heat Pumps

Heat pump systems operate as both a heater and an air conditioner and are generally more reliable and require less maintenance than conventional gas-fired furnaces.
Resident Playbook on Water

Water in California has always been a precious resource and increasingly so as our changing climate produces more droughts and floods. The good news is that being water-wise doesn’t mean you have to let your lawn turn brown. Whether there’s a drought or not, residents will need to continue to conserve water and use it more efficiently on an ongoing basis. Here are ways to address your home’s biggest uses of water in ways that enhance the Good Life.
Create an Awesome Californian Garden

Celebrate the diversity of plants that thrive in our climate. Whether for food or appeal, these types of gardens are easier to care for with the addition of drip irrigation and weather-based timers.

High-Efficiency Dishwashers

The average Energy Star rated dishwasher uses just 2.4 gallons per load, far less than doing them by hand. So let the dishwasher do the work for you, and enjoy entertaining your guests instead. If your dishwasher is more than eight years old, you might like to consider upgrading to a newer, water-efficient model.

Install Low-Flow Fixtures

Innovative companies are reimagining low-flow fixtures like the showerhead which aims to create a spa-like experience. Combined with on-demand hot water heaters, you can take regular, hot showers and still save.

High-Efficiency Clothes Washers

High-efficiency washers have proven to put less wear and tear on fabric than traditional washers because they have gentler spin cycles. They also can do more laundry per load and can be stacked on dryers to save floor space.
Resident Playbook on Mobility

Innovations in transportation are giving us more freedom to move than ever before. The alternatives to driving a gas-powered car in rush hour are becoming more enjoyable, reliable, and less expensive.

**Live Close to Where You Work**

Living close to where you work can radically improve the Good Life. Telecommuting, walking/biking to work, and access to good public transit mean less time stuck in traffic and more time for your friends, family, and the other things you love.

**Live in a Walkable Neighborhood**

Making your home in a neighborhood where the grocery store, parks, and schools are within walking or biking distance creates more connected communities and provides regular exercise.
Use Public Transit

Major upgrades* in San José’s transit system are making getting around more convenient and enjoyable. Public transit allows you to work and be productive on your commute, or just enjoy some much needed downtime.

Use an Electric Vehicle (EV)

EVs are quick, fun to drive, and, with an HOV sticker, allow you to breeze past traffic jams. Their low fuel and maintenance costs and government incentives make them very affordable and even less expensive than the operating cost of your current car.

Get a Good Broadband Package

If you work in a job that allows you to do so, living in a location with reliable broadband can allow you to telecommute.

Share Your Ride!

Carpooling with rideshare apps is a great way to share the journey, meet new friends, save time in the carpool lane, reduce stress, and save money.

*These upgrades include new BART stations, VTA’s Bus Rapid Transit, and California High-Speed Rail.
Developer Playbook for ZNE Residential

Zero Net Energy (ZNE) means the total annual energy use of a building equals the amount of renewable energy created onsite. California has set an ambitious goal that all new residential buildings will be ZNE by 2020. In San José, this new generation of buildings will be predominately multifamily and built in the city’s urban villages.

**Tight Building Envelope**

Thoughtful integration of a building’s site orientation, insulation, high-performance windows and heat recovery ventilators can deliver excellent thermal comfort, indoor air quality, sound mitigation, and natural daylight to create a tranquil and beautiful home.

**All-Electric**

Some developers are successfully going to all electric appliances, hot water, and heating systems, foregoing natural gas altogether. This includes inductive stove tops that cook faster and cleaner than natural gas.
Heat Pumps and Smart Thermostats

Provide occupants with easy management of their thermal comfort.

Walkable Neighborhoods

Increase a project’s marketability and provide for the Good Life 2.0 by selecting sites with high walk scores that are within biking distance to parks, grocery stores, employment centers, and transit.

Solar Panels

For building occupants, solar panels are often a source of pride because they’re less reliant on the grid for their power.

Charging Stations and Bike Storage

Future-proof buildings by providing EV chargers and areas for bike storage.
Building Owner Playbook for Retrofits

Retrofitting buildings is an opportunity to lock in a reliable source of cost savings, increase the comfort and well-being of occupants, future-proof by meeting current technological demand, and, in some cases, preserve the historical and cultural significance of the urban landscape.

### Rooftop Solar

Installing solar can lower operating costs, enhance marketability, and, paired with batteries, provide tenants with a continuous source of back-up power.

### HVAC Retrofit

Upgrading these systems can address one of the biggest uses of energy, improve indoor air quality, and enhance thermal comfort for your tenants.

### California Landscaping

Replacing lawns, particularly in business parks and campuses, with landscapes appropriate to our California climate can lower operating costs and enhance a property’s curb appeal.

### Thermal Retrofits

Upgrading your building’s thermal envelope can dramatically improve energy performance, thermal comfort, and sound mitigation.

---

**KG CO2 SAVED PER HOUSEHOLD**

- <50
- 50–99
- 100–499
- 500–999
- >1,000

**ESTIMATED UPFRONT COSTS**

- <$1,000
- $1,000–$2,999
- $3,000–$9,999
- >$10,000
Energy and Water Reporting and Disclosure

The State (AB 802) and many California cities encourage, and even require, the reporting of energy and water use to enable benchmarking. Many landlords already voluntarily submit reports to track and compare their building’s performance.

Retrocommissioning

An often overlooked and inexpensive source of value, retrocommissioning is a “tune-up” of a building’s complex systems to ensure they are running optimally.

Lighting

Switching to LED lights and fixtures provides quick paybacks due to their lower energy consumption, low maintenance costs, and high quality of light.
## Pillar 1: A Sustainable & Climate-Smart City

### 1.1 Transition to a Renewable Energy Future
San José will create San José Clean Energy (SJCE), a community choice aggregation, that will make 100 percent carbon-free electricity available as a base offering to all users in the city by 2021.

**CEC, PUC, PG&E, BayREN:** Partner on acceptance of small-scale feed-in tariffs for distributed solar.

**NGOs:** Support installation of solar for low-income communities.

### 1.2 Embrace Our Californian Climate
San José will effectively employ sustainable use practices of local water and green infrastructure to achieve a 30 percent reduction in residential water consumption to 42 gallons per day per capita by 2030.

**SCVWD:** Continue to invest in expanding incentives for conservation efforts and regional water storage.

**Water agencies and NGOs:** Connect people with resources, including training, to do climate-smart landscaping.

## Pillar 2: A Vibrant City of Connected & Focused Growth

### 2.1 Densify Our City to Accommodate Our Future Neighbors
San José will embrace its expected 319,000 additional residents through managed, mixed-use densification around its urban villages.

**NGO:** Support developers of dense housing and office projects in urban villages during entitlement process. Advocate for housing at all price points and safe, comfortable places to walk.

### 2.2 Make Homes Efficient and Affordable for Our Residents
All new homes built in San José from 2020 will be ZNE, and existing homes will be retrofitted to reduce their energy consumption and eliminate their use of natural gas.

**NGO:** Support cities and developers in being able to design and construct homes that meet or exceed Title 24 and CalGreen standards. Help make resources available for lower income communities to take advantage of the kind of retrofits needed.

**PG&E, BayREN, CEC:** Provide funding and resources for energy efficiency and potential energy storage.

### 2.3 Create Clean, Personalized Mobility Choices
San José will work to develop clean, personalized, and shared mobility choices, reducing single-passenger gasoline-car use through a combination of bike- and ridesharing, passenger vehicle electrification and, in the future, autonomous vehicles.

**CalTrans, MTA, CARB:** Create commercial transit policies that accelerate the development and adoption of clean, personal mobility technologies.

**Biking advocates:** Continue advocating for embedded and enhanced bike networks and teaching bike safety for adults and kids.

### 2.4 Develop Integrated, Accessible Public Transport Infrastructure
San José will continue supporting public transit infrastructure as a means of getting around the city, particularly the integration of multiple transport modes at Diridon Station.

**VTA:** Match growth of VTA network to the growth of urban villages.

**BART:** Focus growth on mixed-use development at sites near stations.

**BART, Caltrain, Cal High Speed Rail:** Enable efficient first-mile, last-mile connections.

**All Transit:** Increase transit frequency to make it more attractive and convenient for riders. Encourage jobs to be located on the transit infrastructure.
**PILLAR 3: AN ECONOMICALLY INCLUSIVE CITY OF OPPORTUNITY**

<table>
<thead>
<tr>
<th>3.1 CREATE LOCAL JOBS IN OUR CITY TO REDUCE VEHICLE MILES TRAVELED</th>
<th>Economic development departments and agencies: Encourage local job creation in urban villages for all skill levels at all incomes levels – making San José the city of choice to start a new business or to expand existing businesses.</th>
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<tbody>
<tr>
<td>San José will work to create 347,000 local and accessible jobs in our city by 2040.</td>
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<table>
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<tr>
<th>3.2 IMPROVE OUR COMMERCIAL BUILDING STOCK</th>
<th>Green Building community: Support cities and developers in being able to design and construct homes that meet or exceed Title 24 and CalGreen standards. NGOs: Connect people with resources to do energy efficiency and solar installations. CEC, PUC, PG&amp;E, BayREN: Partner on acceptance of small-scale, feed-in tariffs for distributed solar.</th>
</tr>
</thead>
<tbody>
<tr>
<td>All new commercial buildings built in San José from 2030 will be ZNE and existing commercial will be retrofitted to reduce their energy consumption and eliminate their use of natural gas.</td>
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<tr>
<th>3.3 MAKE COMMERCIAL GOODS MOVEMENT CLEAN &amp; EFFICIENT</th>
<th>CalTrans, MTA, CARB: Develop commercial transit policies that encourage investment in cleaner logistics systems such as the California Sustainable Freight Action Plan. Cities: Signal demand to auto makers for plug-in electric light duty trucks via EV request for proposals.</th>
</tr>
</thead>
<tbody>
<tr>
<td>San José will support its commercial and industrial sectors in reducing the carbon impact from goods movement by transitioning to clean and efficient logistics.</td>
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</table>

**ACROSS PILLARS**

| CARB: Work with Californian cities to interpret our statewide emissions reductions targets into climate action plans that mobilize communities. Scope a carbon pricing system that more fully factors in the true cost of carbon into the economy in a way that further encourages and finances technologies designed to reduce carbon production. |
| --- | --- |
San José’s business community is a leader in driving clean-tech innovation and in managing their corporate operations. One of many examples is Adobe. Their downtown campus was one of the first LEED platinum buildings under the U.S. Green Building Council’s Existing Building program and Adobe plans to build another LEED, Green-certified building to house an additional 3,000 employees. There are many actions that large and small businesses can take to make San José climate smart and improve the quality of life for its employees, customers, and the broader San José community.
Locate Your Office
Start an office in one of San José’s employment centers (e.g., Downtown and North San José) or urban villages which are near transit stops and local amenities. This can increase your competitiveness by lowering commute times and revitalizing the surrounding urban life for your employees, suppliers, and customers.

Develop a Climate Smart Strategy
Identify the goals and actions your company can uniquely take to address climate change. The most powerful strategies focus on actions that create business value and reduce carbon dioxide emissions. Many companies have dedicated sustainability (green) teams that work with the senior leaders to develop and implement the strategy.

Design, Build and Provide Good Life Products, Services and Skills
This is a call for Silicon Valley companies to continue to design and innovate products that enable the Good Life 2.0 and lower carbon dioxide emission and water use.

Reporting Carbon Dioxide Emissions and Water Use
Understanding your company’s carbon and water footprint is the first step to managing it. Climate Disclosure Project (CDP) is a non-profit that works with corporations to disclose their carbon dioxide and water footprint by providing a reporting framework and benchmarking against similar companies. The CEO Water Mandate provides corporate water use disclosure guidelines.
Telecommuting
The cost benefits of telecommuting include reducing real estate costs and commute times. Recent research also shows that the flexibility of working from home results in much higher levels of productivity and job satisfaction. Win, win.
Preferred Pricing on Residential Solar
Many leading Silicon Valley companies are part of programs that enable employees to purchase solar systems at discounted prices at no cost to the company.

EV Charging Stations
Installing a charging station can enable some employees to use and purchase an EV.

Discounted Transit Passes
Programs such as VTA’s Eco Pass provide deeply discounted transit passes to people through their employers.

SRI 401k Options
Expanding the selection of 401k plans to include green and Socially Responsible Investing (SRI) funds can enable employees to invest in companies with values that match their own and also support low-carbon sectors of the economy.
General Resources

- Envision San José 2040 General Plan
- San José Clean Energy
- 2020 Bike Plan
- Better Building Challenge
- Cottle Zero Energy Home
- California Sustainable Freight Action Plan
- San José Green Vision
- SPUR Fossil Fuel-Free
- SPUR Future Proof
- Santa Clara Valley Transportation Authority
## Resident Resources

<table>
<thead>
<tr>
<th>Resource</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>ENERGY</strong></td>
<td></td>
</tr>
<tr>
<td>GOOGLE PROJECT SUNROOF</td>
<td>Provides a detailed estimate of your solar savings by using your home’s roof size and shape, shaded roof areas, weather, local electricity rates, solar costs, and available government incentives. Financing options and recommended vendors are also listed. Just enter your address and Google takes care of the rest.</td>
</tr>
<tr>
<td>HOME ENERGY SAVER BY U.S. DEPT OF ENERGY</td>
<td>An online home energy audit tool. Enter your zip code and details about your home and it provides an estimate of how much money you can save by making energy upgrades.</td>
</tr>
<tr>
<td>HOME UPGRADE BY BAYREN</td>
<td>A local resource that connects you with a specially trained auditor who will help identify the most cost-effective energy upgrades. The website also provides guidance on government incentive programs.</td>
</tr>
<tr>
<td><strong>WATER</strong></td>
<td></td>
</tr>
<tr>
<td>HOME WATER WORKS BY ALLIANCE FOR WATER EFFICIENCY</td>
<td>Their Water Calculator spits out an estimate of the water your family uses and compares to the average US family and a highly efficient home. It’s a great place to understand how to get started and the resources available.</td>
</tr>
<tr>
<td>SANTA CLARA VALLEY WATER DISTRICT REBATES</td>
<td>Lists available rebates for various initiatives like installing submeters, connecting laundry greywater to landscape, and landscape conversions to get reimbursed for conserving water.</td>
</tr>
<tr>
<td>SOUTH BAY GREEN GARDENS</td>
<td>A local resource with free landscape design templates (planting palette, layout) you can use to inspire your own landscaping.</td>
</tr>
<tr>
<td><strong>MOBILITY</strong></td>
<td></td>
</tr>
<tr>
<td>ALL TRANSIT</td>
<td>Web app which displays transit data collected by the Center for Neighborhood Technology ranging from farmer markets near transit to bikeshare locations near transit.</td>
</tr>
<tr>
<td>CITYMAPPER</td>
<td>An app built for commuters that displays all transit options available at your current location. Citymapper can answer if it’s fastest to take the bus, a taxi, walk, or bike-share.</td>
</tr>
<tr>
<td>VEHICLE COST CALCULATOR</td>
<td>Compare the total cost of ownership across a wide range of vehicles. Want to quickly know how a 2012 Nissan Leaf compares to your current car? The answer is here.</td>
</tr>
<tr>
<td>WALK SCORE</td>
<td>A simple metric analyzing the number of restaurants, grocery stores, schools, and parks that are a 20 minute walk from your home. The site also provides the time, distance, and cost of different commuting options to your work.</td>
</tr>
</tbody>
</table>

For the most up-to-date resident and commercial resources please visit [www.sijenvironment.org/ClimateSmartSanJose](http://www.sijenvironment.org/ClimateSmartSanJose).
04 Technical Appendix

A-1 Carbon Reduction & Focused Growth – Page 199
A-2 Aligning with UN Global Goals – Page 203
A-3 Climate, Water & Mobility Pathways – Page 207
A-4 Technical Detail on Each Strategy – Page 219
A-5 Methodology – Page 255
A-1 Carbon Reduction & Focused Growth
Carbon Reduction Assumptions Connected with Focused Growth

City’s Envision 2040 General Plan, through its Urban Growth Boundary, planned growth areas, and the associated land use designations codifies the Natural and Working Lands (NWL), designated as Open Space, Parklands, Agriculture, Habitat, and Open Hillside, it plans to develop and conserve. The preservation of these spaces may provide carbon benefits related to carbon sequestration, and avoided VMT and energy consumption. The City anticipates that the focused growth in its General Plan also has associated carbon benefits related to reducing VMT. Below are details on assumptions in the Plan connected with focused growth.
## Climate Smart San José & Focused Growth

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Carbon Sequestration</th>
<th>Construction Emissions</th>
<th>Included?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Carbon Bennefitters from NWL Preservation</td>
<td>LOW</td>
<td>LOW</td>
<td>NO</td>
</tr>
<tr>
<td>2</td>
<td>Materiality to Carbon Footprint</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Reduced VMT &amp; Other Impacts from General Plan Implementation</td>
<td>HIGH</td>
<td></td>
<td>YES - SUBJECT TO FUTURE DATA AND ANALYSIS</td>
</tr>
</tbody>
</table>

### Carbon Sequestration

From the available information, the sequestration potential of NWL is in a range of 0.5-6.3 tCO2/ha, which is low compared to the city’s overall footprint and/or other viable measures. Possible inclusion in future iterations pending further analysis.

### Construction Emissions

Climate Smart San José does not include construction emissions. Given the limited time of these emissions outputs, they are anticipated to be low relative to the city’s overall footprint.

### Reduced VMT & Other Impacts from General Plan Implementation

The most significant impact from NWL preservation/focused growth in reducing emissions is the avoided operational energy use in buildings and transport.

### Sensitivity

<table>
<thead>
<tr>
<th>Sensitivity</th>
<th>VMT ↓</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing the Residential Density of the City by Compact Infill</td>
<td>10%</td>
<td>San José GHG Strategy (2011) City of San José</td>
</tr>
<tr>
<td>Creating Regionally Accessible Jobs</td>
<td>19%</td>
<td>A Framework for Projecting the Potential Statewide VMT Reduction from State-Level Strategies in California National Center for Sustainable Transportation</td>
</tr>
<tr>
<td>Urban Village Bonus</td>
<td>3.1</td>
<td>A multiplier devised by the The Plan project team to describe the idea that dense, walkable, mixed-use, and transit-oriented urban villages within the city are necessary to achieve Paris Climate Agreement alignment.</td>
</tr>
</tbody>
</table>
A-2 Aligning with UN Global Goals
The Plan’s Alignment with the United Nations Sustainable Development Goals

The UN’s Sustainable Development Goals (SDG) were developed as a global agenda for governments, civil society, business, and individuals to help protect the planet and ensure prosperity for all. Here is how Climate Smart San José aligns with the targets listed in the SDG.
Climate Smart San José and U.N. Sustainable Development Goals

<table>
<thead>
<tr>
<th>Goal</th>
<th>Description</th>
<th>Targets Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. NO POVERTY</strong></td>
<td>Access to owning property &amp; new technology. Accelerating adoption rate of clean technologies &amp; making homes more affordable.</td>
<td>1.1, 2.2</td>
</tr>
<tr>
<td><strong>2. ZERO HUNGER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3. GOOD HEALTH AND WELL-BEING</strong></td>
<td>Decrease death &amp; injuries from road traffic accidents. Greater access &amp; affordability of public transit &amp; personal mobility.</td>
<td>2.3, 2.4</td>
</tr>
<tr>
<td><strong>4. QUALITY EDUCATION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>5. GENDER EQUALITY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>6. CLEAN WATER &amp; SANITATION</strong></td>
<td>Address water efficiency, scarcity, &amp; integrated water management. Reduce total water use &amp; invest in green infrastructure.</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>7. AFFORDABLE &amp; CLEAN ENERGY</strong></td>
<td>Increase availability &amp; access to renewables &amp; energy efficiency. Transition to a renewable future.</td>
<td>1.1</td>
</tr>
<tr>
<td><strong>8. DECENT WORK AND ECONOMIC GROWTH</strong></td>
<td>Create decent jobs &amp; decouple economic growth from carbon. Encourage local jobs, rely on culture of innovation, &amp; use growth to reduce carbon.</td>
<td>3.1</td>
</tr>
<tr>
<td><strong>9. INNOVATION &amp; INFRASTRUCTURE</strong></td>
<td>Develop sustainable, reliable infrastructure. Enhancing San José's public &amp; private infrastructure to be climate smart.</td>
<td>ALL</td>
</tr>
<tr>
<td><strong>10. REDUCED INEQUALITIES</strong></td>
<td>Income growth for bottom 40%. Creation of more accessible local jobs through densification &amp; enhanced mobility.</td>
<td>2.1, 2.3, 2.4, 3.1</td>
</tr>
<tr>
<td><strong>11. SUSTAINABLE CITIES</strong></td>
<td>Affordable &amp; accessible housing, transit, &amp; public spaces. Entire plan is framed on creating a climate smart city.</td>
<td>ALL</td>
</tr>
<tr>
<td><strong>12. RESPONSIBLE CONSUMPTION</strong></td>
<td>Sustainable consumption in harmony with nature. Emphasis on resetting aspirations to the Good Life 2.0.</td>
<td>ALL</td>
</tr>
<tr>
<td><strong>13. CLIMATE ACTION</strong></td>
<td>Integrate climate change measures into policies &amp; planning. Scope of this plan.</td>
<td>ALL</td>
</tr>
<tr>
<td><strong>14. LIFE BELOW WATER</strong></td>
<td>Reduce degradation of natural habitats &amp; biodiversity. Increased densification will alleviate drivers of urban sprawl.</td>
<td>2.1</td>
</tr>
<tr>
<td><strong>15. LIFE ON LAND</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>16. PEACE, JUSTICE, &amp; STRONG INSTITUTIONS</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Climate Smart San José:**

- Directly addresses this goal
- Indirectly addresses this goal
- Aligns with this goal
- Does not actively consider this goal

Targets within this goal that The Plan addresses.

How it addresses those targets/relevant strategies.
A-3 Climate, Water, & Mobility Pathways
How Far Do These Actions Take Us Toward Paris?

Although the pathway tremendously reduces San José’s carbon dioxide emission profile, the big question is how it compares to AB32 or the Paris Climate Agreement (Paris Agreement). The objective of the Paris Agreement is to limit the amount of Global Warming to an increase of 2ºC by 2100 (and may need to be under 1.5ºC). Because of differences in economic and energy profiles as well as populations, there is no required emissions reduction that applies to everyone. Therefore, the Low Carbon Economy Index (LCEI) is used to estimate the emissions reduction needed. It calculates a total carbon budget for the world, meaning, the total number of tons of CO2e that can be emitted before global warming is raised two degrees.

PwC’s LCEI calculates that meeting the budget requires an average of a 6.5 percent global emissions reduction every year. If we emit more than our budgeted amount one year, that difference will need to be made up later on. This means that if we fall behind early, it will be harder to make the budget later on. If we, as a world, continue at business as usual, the budget runs out in 2036, well short of 2100. The difficulty in meeting this budget becomes especially apparent when realizing that although San José will be growing in population and jobs, their 2100 budget will stay the same. It’s therefore paramount to become more efficient now, and San José has the opportunity to pave the way for the U.S. and lead by example.

The U.S.’s previously submitted Intended Nationally Determined Contributions (INDC) aims to reduce emissions by 24-26 percent by 2025, which the pathway proves is possible. Past 2025, the pathway tends to track closely with AB32 until the 2040s as the grid continues to decarbonize and more and more electric vehicles (EVs) come online. It is in the 2040-2050 time period when the pathway dips below AB32 to actually become aligned with the Paris agreement. This is due to the switch to 100 percent renewable energy of SJCE in 2045, and the full rollout of electric commercial vehicles. These two initiatives start with California’s RPS and Sustainable Freight Action Plan, and show that they need to be taken to the next level in order for the state to succeed.
## Contribution of Climate Smart San José’s Strategies to Reduce Our Emissions Profile

<table>
<thead>
<tr>
<th>PILLARS</th>
<th>STRATEGIES</th>
<th>CITYWIDE EMISSIONS FOOTPRINT (MTCO2E)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2017</td>
</tr>
<tr>
<td>BASELINE</td>
<td></td>
<td>6.82</td>
</tr>
<tr>
<td>1. A SUSTAINABLE &amp; CLIMATE SMART CITY</td>
<td>1.1 Transition to a renewable energy future</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>1.2 Embrace our Californian climate</td>
<td>-</td>
</tr>
<tr>
<td>2. A VIBRANT CITY OF CONNECTED &amp; FOCUSED GROWTH</td>
<td>2.1 Densify our city to accommodate future neighbors</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2.2 Make homes efficient &amp; affordable for our families</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2.3 Create clean, personalized mobility choices</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2.4 Develop integrated, accessible public transit infrastructure</td>
<td>-</td>
</tr>
<tr>
<td>3. AN ECONOMICALLY VIBRANT CITY OF OPPORTUNITY</td>
<td>3.1 Create local, accessible jobs in our city to reduce VMT</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>3.2 Improve our commercial building stock</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>3.3 Make commercial goods movement clean &amp; efficient</td>
<td>-</td>
</tr>
</tbody>
</table>

**SAN JOSE PARIS-ALIGNED CLIMATE ACTION PATHWAY (MTCO2E)**

|  | 6.82  | 5.50  | 3.66  | 1.70  | 1.20  |

**SAN JOSE PARIS-ALIGNED EMISSIONS PER CAPITA (TCO2E)**

|  | 6.5   | 5.0   | 3.0   | 12    | 0.9   |

**CHANGE COMPARED TO 1990 BASELINE**

|  | 19%   | 4%    | 36%   | 70%   | 80%   |
Climate Smart
San José Sets Us on a People-Centered, Paris-Aligned Pathway

Meeting Paris Alignment Goals

1.1 Transition to a renewable energy future
2.1 Densify our city to accommodate our future neighbors
2.2 Provide affordable, efficient homes for our families
2.3 Create clean, personalized mobility choices
2.4 Provide high-quality, accessible public transit infrastructure
3.1 Create local jobs in our city to reduce VMT
3.2 Improve our commercial building stock
3.3 Make commercial goods movement clean & efficient
San José Carbon Marginal Abatement Cost Curve 2017-50

The Carbon Marginal Abatement Cost Curve (MACC) for San José compares the relative costs of each of the measures within the nine strategies. It indicates that many carbon-reducing measures will simultaneously deliver economic cost savings, such as local job creation, and San José Clean Energy (SJCE) (although costs of the initial infrastructure outlay may mean that financial costs are positive).
Combining all of the strategies leads to a pathway for San José. As evident in the Sankey diagram of energy consumption, the 2050 pathway has dramatically changed the energy profile of San José.

The original four focus areas from the baseline are:

1. Transitioning to renewable electricity
2. The electrification of natural gas uses in buildings
3. The electrification of transport
4. Reducing demand for energy across all sectors

These have all been addressed through the nine strategies of The Plan. Renewable energy is the dominant energy source of the city, powering most of our buildings and vehicles. On top of that, less energy is being consumed overall given the large increases in efficiency from expected technological improvements. An important aspect of this is the reduction in energy consumption from vehicles. EVs are significantly more energy efficient than gasoline ones, so not only are they cleaner sourced, but also use less energy overall.

This energy profile leads to the carbon dioxide emissions profile of the city. It becomes clear that the emissions from other sectors, such as waste and potable water, will also need to incur some reductions as they become the remaining primary source of emissions. It should be noted that other aspects of the mobility sector that were not modeled (e.g., boats, off-road equipment) were assumed to scale down in emissions by the same factor as the rest of the mobility sector. Waste and potable water were assumed to slightly reduce as well, but not as much without action being taken in their sectors.
Energy Consumption in San José

- Biomass and Waste: 1,645,722
- Geothermal: 2,057,152
  - Small Hydro: 411,430
- Solar: 23,962,887
- Natural Gas: 4,116,517
- Wind: 13,065,849
- Diesel: 315,057
  - Biodiesel: 29,137
- Propane: 7,232
- Gasoline: 3,737,162
- Eligible Renewable: 41,143,040
- Electricity: 41,143,039
- Direct Access: 7,664,224
- Residential: 7,709,073
- Commercial: 11,588,375
- Industrial: 5,443,478
- Other: 0.6
- Transport: 0.4
- Heavy Duty Vehicles: 4,450,162
- Passenger Cars: 1,784,233
  - SUVs: 914,153
  - Large Pickups and Vans: 782,805
  - Local Delivery: 1,432,954
  - Buses: 3,940,247
- Public Service Vehicles: 286,169
  - Other - Trains - Caltrain - Diridon: 1,327
  - Other - Trains - Caltrain - San Jose: 1,127
  - BART: 19,334
  - High Speed Rail: 13,966
  - Other - Trains - ACE - Diridon: 90,606
  - Other - Airport Equipment: 4,998
  - Other - Boating: 290,050
  - Motorcycles: 122,003
- Other - Offroad Equipment: 2,792,279

- Transitioning to renewable electricity
- The electrification of transport
- The electrification of natural gas uses in buildings
- Reducing demand for energy across all sectors
Mobility Pathway

As the major driver of mobility emissions, vehicle miles traveled (VMT) has been a primary concern for the San José for many years. Reducing the amount of miles driven by both residents and commercial vehicles will directly impact the current leading cause of emissions. Not only is this a priority from an environmental perspective, but it has a major co-benefit of limiting the amount of traffic congestion within the city. Less traffic equates to more time doing things we actually want to do, which enables the Good Life 2.0. Luckily, reducing the number of miles traveled can be accomplished via a variety of ways.

Accessible jobs that are suitable for the San José labor market is by far the most effective at reducing VMT. Placing jobs closer to residents or in locations more accessible by public transit will either allow residents to travel fewer miles to get to their occupation, or encourage mode shift to public transit, taking vehicles off the road. Other measures that have the ability to encourage mode shift are typically related to infrastructure or transit improvements like the Bike Plan, BART stations, the Santa Clara Valley Transportation Authority (VTA) Next Network, etc.

In contrast to taking vehicles off the road to reduce VMT, residential density makes destinations closer together, thereby decreasing the VMT. It is the second most effective extended cost business analysis (eCBA) for reducing VMT next to accessible jobs.

Altogether, this leads to a reduced overall VMT for the city, even with the service population increasing over time, which also leads to a lower VMT per capita. It is assumed that everyone will be taking the same number of trips day to day, but the length of those trips, or the mode of choice for those trips greatly affects VMT. Accomplishing these reductions will decrease emissions while improving quality of life.
Baseline Reductions by eCBA (VMT)

EVs initially increase VMT over gasoline equivalents

Accessible jobs most effective at reducing VMT

Residential Density also effective at reducing VMT

Public transit eCBAs contribute to VMT reduction

Millions of tons of CO2e (MtCO2e)
San José VMT Marginal Abatement Cost Curve 2017-50

The VMT Marginal Abatement Cost Curve for San José compares the relative costs of each of the measures within the nine strategies. It indicates that many VMT-reducing measures will simultaneously deliver economic cost savings, such as local job creation (although costs of the initial infrastructure outlay may mean that financial costs are positive). Accessible local jobs and residential density are the most effective measures for reducing VMT. It is also important to note that although they are costly, the California High-Speed Rail and the BART extension are the most effective public transit measures of reducing VMT.
San José VMT Marginal Abatement Cost Curve 2017-2050

- $271/000 VMT | SUV EVs
- $156/000 VMT | Ridesharing (4 Pax Autonomous EVs)
- $102/000 VMT | Ridesharing (14 Pax EV Shuttle)
- $10/-000 VMT | Caltrain Electrification
- $59/000 VMT | Local Jobs
- $240/000 VMT | Ridesharing (4 Pax EV)
- $134/000 VMT | Ridesharing (4 Pax Autonomous EV Shuttle)

Total: $606/000 VMT | BART Extension

$32/000 VMT | Bus Rapid Transit

$473/000 VMT | High-Speed Rail

$473/000 VMT | VTA Next Network & Local Buses

$3.7/000 VMT | VTA Next Network & Local Buses

$473/000 VMT | High-Speed Rail

$32/000 VMT | Bus Rapid Transit

$606/000 VMT | BART Extension
A-4 Technical Detail on Each Strategy
Embracing a renewable energy future is the first strategy of The Plan as it focuses on the energy sources of San José and their renewable energy and carbon-dioxide-free makeup. Transitioning from fossil fuels to electricity has a reduced effect if the electricity comes from dirty sources itself. By the same train of thought, cleaning up the supply of electricity enhances the effect of this conversion. Transitioning to a renewable energy future makes the other strategies more effective. This transition will predominantly occur in San José through two channels: San José Clean Energy (SJCE) and local renewable generation.

The City Council recently approved SJCE, the City’s community choice energy (CCE) program, which allows the City to determine the renewable energy mix that supplies its power. It is assumed that SJCE will have a renewable energy mix at least ten percent above PG&E which would mean 60 percent renewably sourced at 2030, and an eventual increase to 100 percent renewable by 2045. This power mix affects the grid intensity of SJCE and leads to a lower emissions factor than that of PG&E.

The renewable energy makeup will consist of some biomass and waste, geothermal, and small hydro, however, the majority of the energy (and the majority of the growth) will be focused in solar and wind energy.

This is due to the ability of solar and wind to more easily scale up to utility level. In addition, it is also assumed that any non-renewable energy used by SJCE will be carbon-dioxide-free, such as nuclear or large hydro. Given the upcoming closure of Diablo Canyon Nuclear Power Plant, the energy mix from large hydro will need to increase to maintain the 100 percent carbon-dioxide-free goal while experiencing the gradual reduction of nuclear power until 2025.

However, the reliance on large hydro itself will be decreasing as San José continues to become more renewable. One important
aspect of this renewable conversion is from local sources such as net energy metering and off-grid generation.

Net energy metering, the process of installing energy generation in homes or communities with the potential for selling the energy back to the grid, can help incentivize installing renewable energy panels by providing more means of funding. Similar to net energy metering, off-grid generation includes building solar panels at the household level, however, all energy generated by these solar panels stays within the system (i.e., energy is not sold back to the grid).

The Climate Action Pathway assumes that the vast majority of local renewable generation will occur from solar panels on the rooftops of homes, office buildings, parking lots, etc. These systems will be connected to the grid in order to ensure that no generated energy is wasted.

Storage devices like the Tesla Powerwall will be necessary to include in these local generation systems in order to retain energy and more effectively deal with California’s duck curve of power generation. The first part of the duck curve is formed due to the major solar energy generation during the daytime which results in a low net load on the grid. The second half of the curve comes later in the day, while the sun wanes and solar energy

<table>
<thead>
<tr>
<th>ENERGY SOURCES</th>
<th>LEVELIZED COST OF ELECTRICITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOMASS AND WASTE</td>
<td>$46/MWh</td>
</tr>
<tr>
<td>GEOTHERMAL</td>
<td>$100/MWh</td>
</tr>
<tr>
<td>SMALL HYDRO</td>
<td>$47.2/MWh</td>
</tr>
<tr>
<td>SOLAR</td>
<td>$46/MWh</td>
</tr>
<tr>
<td>WIND</td>
<td>$46/MWh</td>
</tr>
<tr>
<td>LARGE HYDRO</td>
<td>$47.2/MWh</td>
</tr>
<tr>
<td>NATURAL GAS</td>
<td>$45.7/MWh</td>
</tr>
<tr>
<td>NUCLEAR</td>
<td>$47.2/MWh</td>
</tr>
<tr>
<td>UNSPECIFIED (PURCHASED)</td>
<td>$47.2/MWh</td>
</tr>
</tbody>
</table>
generation is lower, as people come back from work and start expending much more electricity than an empty household. The net load on the grid drastically increases, and strains the system as a whole. Building and designing around the duck curve will be an important challenge to overcome for this strategy to be successful.

Strategy 1.1 is important because it makes many of the other extended cost business analyses (eCBAs) more effective. By making electricity greener, it becomes even more worth it to invest in electricity or natural gas for ovens and HVAC, among other appliances. The calculated emission rate from SJCE is included in all of the eCBAs that would potentially be supplied by it or via net energy metering, and is used to calculate their carbon dioxide emissions. The other eCBAs, like those in buildings or transportation, also impact SJCE by being included as part of its overall load. As those sectors are further electrified, the load on SJCE increases.

The primary costs associated with transitioning to a renewable energy future are largely based on the levelized cost of energy for each of the energy sources. These figures are in dollars per megawatt-hour and roughly determine the capital and operating cost of the energy source over its lifetime. Although it may currently be costly to invest in renewable energy, it is imperative for San José to achieve its climate goals.

Electricity Demand Breakdown by Buildings or Vehicles

![Electricity Demand Breakdown by Buildings or Vehicles](image_url)
## Strategy 1.2: Embrace Our Californian Climate

### Extended Cost Benefit Analysis of Water Reduction Data

<table>
<thead>
<tr>
<th>eCBAs</th>
<th>RESIDENTIAL/COMMERCIAL</th>
<th>ABATEMENTS</th>
<th>MACC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISHWASHERS</td>
<td>RESIDENTIAL</td>
<td>1.86 MG 0.03m tCO2e</td>
<td>$1.62/Gallon $360/tCO2e</td>
</tr>
<tr>
<td>CLOTHES WASHERS</td>
<td>RESIDENTIAL</td>
<td>9.28 MG 0.02m tCO2e</td>
<td>$0.38/Gallon $680/tCO2e</td>
</tr>
<tr>
<td>TOILETS</td>
<td>RESIDENTIAL</td>
<td>11.93 MG</td>
<td>-$1.07/Gallon</td>
</tr>
<tr>
<td>SHOWERS</td>
<td>RESIDENTIAL</td>
<td>36.44 MG</td>
<td>-$3.05/Gallon</td>
</tr>
<tr>
<td>SWITCHING FROM BATHS</td>
<td>RESIDENTIAL</td>
<td>22.50 MG</td>
<td>-$2.89/Gallon</td>
</tr>
<tr>
<td>FAUCETS</td>
<td>RESIDENTIAL</td>
<td>13.59 MG</td>
<td>-$2.95/Gallon</td>
</tr>
<tr>
<td>LEAKS</td>
<td>RESIDENTIAL</td>
<td>0.69 MG</td>
<td>$9.56/Gallon</td>
</tr>
<tr>
<td>GREYWATER SYSTEMS</td>
<td>RESIDENTIAL</td>
<td>2.75 MG</td>
<td>$9.92/Gallon</td>
</tr>
<tr>
<td>DOMESTIC RAINWATER STORAGE</td>
<td>RESIDENTIAL</td>
<td>4.39 MG</td>
<td>$10.75/Gallon</td>
</tr>
<tr>
<td>DRIPT Irrigation</td>
<td>RESIDENTIAL</td>
<td>4.88 MG</td>
<td>$2.68/Gallon</td>
</tr>
<tr>
<td>DROUGHT-RESILIENT PLANTS</td>
<td>RESIDENTIAL</td>
<td>55.93 MG</td>
<td>-$3.44/Gallon</td>
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<tr>
<td>FAUCETS</td>
<td>COMMERCIAL</td>
<td>48.30 MG</td>
<td>-$3.50/Gallon</td>
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<td>TOILETS</td>
<td>COMMERCIAL</td>
<td>9.28 MG</td>
<td>-$3.33/Gallon</td>
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<tr>
<td>GREYWATER SYSTEMS</td>
<td>COMMERCIAL</td>
<td>14.01 MG</td>
<td>-$2.61/Gallon</td>
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</tbody>
</table>
Embracing our Californian climate focuses on the water aspect of The Plan, and encourages the entire city to realize how precious water is all the time – not just during a drought. Events like a multi-year drought demonstrate the difficulty in controlling and increasing the water supply. Therefore, resisting the effects of a potential drought must come from somewhere else. Reductions in the demand side of the water cycle can increase San José’s resiliency to a drought as well as decrease its dependence on imported water simply because less of it is being consumed. These demand-side reductions can be split by sector (e.g., residential, commercial) and also by use (indoor/outdoor). Strategy 1.2 breaks out each of these segments in order to more holistically reduce demand.

Indoor water consumption makes up about 50 percent of water consumption for the residential sector and 80 percent for commercial. Upgrading appliances like toilets, faucets, and clothes washers to be more efficient, both at home and at work, can greatly reduce water consumption by 2040. The upgrades for each of these appliances typically revolve around consuming less water to perform each of the actions. For example, gallons per flush is the metric for toilets, while gallons per minute is the one for faucets. There is clearly a behavioral aspect to this as well since it does not matter how efficient an appliance is if it is always running. A ten minute

**Domestic Daily Water Consumption**

![Graph showing domestic daily water consumption from 2010 to 2040 with a 62% reduction from 2010 to 2021.](image-url)
A twenty-five minute shower can have major impacts on the overall water consumption of a household. It is then important to note that changing habits, such as taking showers instead of baths, can have as much of an impact as upgrading an appliance.

Although there are several ways of upgrading water-consuming appliances throughout a household, the major opportunity for San José's water reduction lies in outdoor water consumption which uses about 50 percent of all residential water and 20 percent of commercial water. Most of that outdoor water use goes toward landscaping and keeping lawns green. Water evaporation and overwatering of plants lead to a low water efficiency rate. The pathway uses a variety of methods to crack down on this water consumption sector. Xeriscaping eliminates the need for watering altogether as the replaced foliage are all native to California. Drip irrigation, domestic rainwater storage, and greywater systems are all potential alternatives to keeping that lawn while reducing the burden on the water supply.

Drip irrigation is a much more effective means of watering plants because it waters the roots of the plant instead of filtering from the top. Domestic rainwater storage involves homeowners capturing and storing rainwater, typically from their rooftops. There are several challenges to it however, since rainfall may not be consistent. In California especially, winter is the prime rainy season, but the summer is the time of more water consumption due to hungry lawns, which creates a timing imbalance between supply and demand.

Greywater systems are of particular interest to the City since they allow the reuse of several types of waste water which is the basis for one of the San José Green Vision (Green Vision) goals. These systems collect the water from faucets, showers, baths, dishwashers, and clothes washers and repurposes them for landscaping. This means that if enough people switch to more efficient showerheads, the amount of water that can be reused from showers will lessen. Similarly, if a household has drip irrigation, it becomes slightly less worth it to invest in drought-resilient plants.

Embracing our Californian climate is a call to action. It is up to each and every resident of San José to treat water as a valuable resource and use it responsibly. The city performed admirably during the drought, succeeding in each of its water conservation goals. It is important as a city to maintain those ideals and that urgency during the drought to continue paving a way forward for a more water-efficient society.
San José Water Marginal Abatement Cost Curve 2017-2040

The Water Marginal Abatement Cost Curve (MACC) for San José compares the relative costs of each of the measures within the nine strategies. It indicates that many water consumption-reducing measures will deliver economic cost savings, such as densification and commercial aerated faucets. Two of the top three measures in reducing water consumption (two of the top three widest bars) target outdoor water consumption, which is a priority area for San José.
Densifying our city to accommodate our future neighbors is an important strategy for San José. Residential density is a major component of the Envision San José 2040 General Plan (General Plan), and carries many benefits. It increases walking and biking vehicle miles traveled (VMT), while also decreasing auto VMT, and reduces building energy and water consumption. It will also increase biking and walking trips while working in tandem with San José’s 2020 Bike Plan (Bike Plan) and upcoming update which works to achieve this mode shift through building a biking network of at least 500 miles.

Densifying is practically an inevitability for San José with its projected population growth. If about 300,000 people are going to move into San José over the next thirty years, the city will need to adjust its current infrastructure and promote compact infill in order to fit all of the new populace while enhancing quality of life. Compact infill refers to the efficient development or redevelopment of lands that are already within the capacity of urban services and have existing infrastructure in place. It is one of the many potential policies San José can implement while preparing for its growth spurt. Another is mixed-use development which combines the residential and commercial sectors into cohesive building units. Urban villages embody this concept with their designs that blend housing, office space, and retail.

Another concept that can be included during densification is transit-oriented development (TOD), which focuses development around transit hubs like Diridon and the upcoming Berryessa BART station. These stations will become more accessible, particularly for nearby walkers and bikers, and increase their ridership. However, the biggest potential value add from residential density is its effect on VMT. Passenger cars and smaller commercial vehicles will travel fewer miles per trip because each destination is in close proximity. People’s travel becomes more resilient with multiple ways to get around (e.g., public transit, ridesharing, bicycling).

The VMT per capita per day will decrease, which will have huge impacts on the overall carbon dioxide emissions of the

<table>
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<th>RESIDENTIAL DENSIFICATION</th>
<th>10.60m tCO2e</th>
<th>-$94/tCO2E</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>39.73 MG</td>
<td>-$9/Gallon</td>
</tr>
</tbody>
</table>

| BIKE PLAN | 0.74m tCO2e | -$142/tCO2e |
Envision San José 2040 General Plan Planned Growth Areas Diagram

Vehicle Miles Traveled

VMT per Capita per Day
city because transportation is the primary contributor to carbon dioxide emissions. In addition to its effect on VMT, residential density also impacts building energy and water consumption as more multi-family housing is used. The Plan assumes that residential building energy and water consumption would be cut in half for each resident living in a dense environment (CARB Residential Energy Use and GHG Emissions Impact of Compact Land Use Types [2014], and CA DWR California Water Plan Update Volume II Chapter 20 [2005]). Therefore, San José must be strategic during its population growth and ensure that densification occurs in order to minimize the overall impact of each additional resident.

The other aspect of densification is the Bike Plan which is currently being updated to represent current progress and future goals. In its quest to become less of an automobile-dominated city, the Bike Plan has been a major priority for San José since 2008. The goal to create a comprehensive biking network of 500 miles is complex, however, the City is well on its way to completing this. These miles will be biking and pedestrian friendly – meaning safe, well lit, for all ages and abilities, and with proper signage that promotes Vision Zero. There is a lot of infrastructure that needs to be put in place in order to influence behaviors, and the Bike Plan will focus on culture and low-stress bikeways.

As a resident considering biking to work, not only does there need to be a path to get to the office, there also needs to be available bike parking both at home and at work, lighting along the route for the commute back home, and potentially showers at work to avoid being sweaty in the office for longer trips. This would allow residents to skip the gym and build in exercise, enjoy time outside, and avoid traffic that causes stress.

The Bike Plan and residential density need to work hand in hand in order for the densification of San José to be most effective. Increases in San José’s public transit use, walking, and biking, and any reductions in VMT, energy, and water consumption impact other strategies. The VMT reductions reduce the benefits of electrifying vehicles and appliances, but slightly enhance the effects of public transit. Densification goes a long way in helping the City of San José achieve many of its goals.
Extended Cost Benefit Analysis of Carbon Reduction Data

<table>
<thead>
<tr>
<th>eCBAs</th>
<th>ABATEMENTS tCO2e</th>
<th>MACC $/tCO2e</th>
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<tr>
<td>LIGHTS</td>
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<td>HOME ELECTRONICS</td>
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</tr>
<tr>
<td>REFRIGERATORS</td>
<td>0.05</td>
<td>-$80</td>
</tr>
<tr>
<td>OVENS</td>
<td>0.98</td>
<td>$120</td>
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<tr>
<td>WATER HEATERS</td>
<td>6.86</td>
<td>-$65</td>
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<tr>
<td>CENTRAL AC</td>
<td>0.00</td>
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<tr>
<td>GROUND-SOURCE HEAT PUMPS</td>
<td>5.55</td>
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<td>AIR-SOURCE HEAT PUMPS</td>
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<td>SMART THERMOSTATS</td>
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<td>INSULATION</td>
<td>0.00</td>
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<td>THERMAL ENVELOPE RETROFITS</td>
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<td>-$19</td>
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<tr>
<td>THERMAL ENVELOPE NEW CONSTRUCTION</td>
<td>0.19</td>
<td>$833</td>
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</table>

Providing affordable and efficient homes for our families means going above and beyond simply replacing old appliances with Energy Star equivalents. It really means enabling and empowering households to invest in the cleaner and more efficient options for their homes that will show up as savings on their energy bills down the line. Appliances like lights, refrigerators, and ovens are considered, as well as home electronic energy consumption like TVs, phone chargers, and home office equipment which have phantom loads that consume energy even if not in use.

The major factors are heating and cooling costs which make up about 50 percent of a home’s total energy consumption. Multiple eCBAs are focused on lowering these costs. Strategy 2.2 can be broken down into two major components: using less energy overall and converting from natural gas to electricity.

There are many energy-inefficient devices that a homeowner can replace. The array of options can actually be confusing from a homeowner’s perspective because there are so many, but everyone’s budget is different. Lights make up about 22 percent
of total residential consumption, and LED replacements can cut into that consumption. Power strips that facilitate turning off electronics when they are not in use are simple enablers to a good habit. On the HVAC side, energy-efficient ACs, smart thermostats like Nest, insulation, and thermal envelopes can drastically cut down on these costs. These eCBAs all have the common goal of maintaining the house at the desired temperature with as little energy as possible. All of these help make the residential energy consumption bar smaller.

The other aspect of this strategy is the electrification of the home, which minimizes the contribution from natural gas and expands the contribution of electricity to home energy consumption. Residents can accomplish this in a variety of ways. Electric ranges mitigate natural gas use in the kitchen, but the major use of natural gas is in heating. Electric, tankless water heaters save energy by reducing natural gas use and avoiding the need to keep water preheated. An additional bonus is that they remove the limit of hot water, whereas people used to be capped to the size of the tank. For air heating and cooling, a single ground or air heat pump can serve a home’s HVAC needs while being much more efficient than furnaces or AC units and are completely electric. All of these appliances that rely on electricity instead of natural gas are essential for San José to comply with the residential Zero Net Energy (ZNE) regulation starting in 2020.
### Household Energy Consumption

- **Pre-2010 House with 2010 Reference Units**: 11,488 kWh
- **Newly Built 2016 House**: 8,266 kWh
- **2020 Full Retrofit in 2020**: 2,739 kWh
- **2020 New Construction in 2020**: 2,639 kWh

### Commercial Energy Consumption

- **Number of Newly Constructed ZNE Homes**
- **Number of Retrofitted ZNE-Ready Homes**
As a whole, this strategy of providing affordable, efficient homes for our families complements Strategy 1.1 since SJCE will be serving the vast majority of San José residents. As SJCE continues to be greener sourced, residents will be reducing their electricity consumption, thus making a large impact on residential building energy from both the supply and demand sides.

ZNE homes consume less energy than they generate. ZNE-ready homes would reach ZNE if they had sufficient on-site power generation. The state requirement that all newly constructed homes in California be ZNE will have an incredible impact on future home design. What the legislation does not address is the challenge of retrofitting homes built pre-2020 to be ZNE or ZNE-ready. The retrofits represent the major opportunity for ZNE homes in San José and will require many local contractors well-versed in energy retrofits.

Another challenge facing this strategy is the high upfront cost to invest in these cleaner alternatives. The 2020 ZNE regulation will help alleviate the issue since items like tight thermal envelopes and all-electric appliances will be the norm. As they reach economies of scale, prices for everything energy efficient will drop as well.
Strategy 2.3: Create Clean, Personalized Mobility Choices

Extended Cost Benefit Analysis of Carbon Reduction Data

<table>
<thead>
<tr>
<th>eCBAs</th>
<th>ABATEMENTS</th>
<th>MACC</th>
</tr>
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<tbody>
<tr>
<td>PASSENGER CAR EVS</td>
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<td>$108/tCO2e</td>
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<tr>
<td>SUV EVS</td>
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<tr>
<td>SHARED PASSENGER CARS</td>
<td>7.05 tCO2e</td>
<td>-$309/tCO2e</td>
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<tr>
<td>SHARED SHUTTLES</td>
<td>0.77 tCO2e</td>
<td>-$210/tCO2e</td>
</tr>
<tr>
<td>PERSONAL PASSENGER AVS</td>
<td>1.58 tCO2e</td>
<td>$315/tCO2e</td>
</tr>
<tr>
<td>PERSONAL SUV AVS</td>
<td>1.41 tCO2e</td>
<td>$353/tCO2e</td>
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<tr>
<td>SHARED PASSENGER AVS</td>
<td>0.34 tCO2e</td>
<td>-$200/tCO2e</td>
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<tr>
<td>SHARED AUTONOMOUS SHUTTLES</td>
<td>0.12 tCO2e</td>
<td>-$1,350/tCO2e</td>
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</tbody>
</table>

Tesla’s all-electric environmentally-friendly Model S was the first of its kind. As more and more electric vehicles (EVs) enter the market, especially at capital cost that can compete with gasoline or diesel equivalents, EVs will become the norm. This strategy not only includes this electrification of the private vehicle fleet, but also the other innovations and potential disruptors that will arise over the next 30 years. The effects of potential disruptors like shared mobility and autonomous vehicles (AVs) are still being researched, but the The Plan pathway recognizes them as potentially greener alternatives to traditional gasoline personal.

Passenger car EVs, one of the first things people associate with sustainability, are already in the market, and San José leads the U.S. in EV purchases. SUV EVs are also starting to enter the market which is a major advancement since some automobile owners will not be satisfied with a passenger car alone. These vehicles are priorities for California in order to comply with the Clean Car Standards and Zero-emission Vehicle goals.

Historically, the two main challenges facing passenger car EVs has been the premium for since their inception, personal vehicles have been a status symbol in society. Speed, power, and aesthetic have been the driving forces behind automobile trends.
an EV over a gasoline equivalent and the potential lack of charging infrastructure in place to support a saturated market. There is an expected electric battery drop in the early 2020s which will help mitigate the premium, and the City of San José has made EVs a priority, building 57 public charging stations. Continued advances in cutting costs and improving infrastructure will lead to EVs eventually dominating the market.

The Climate Action Pathway considers shared mobility an interesting opportunity to drive down emissions. When talking about shared mobility, The Plan refers to ridesharing. The City has seen real interest in shared everything (bikes, ebikes, escooters, etc.). The Plan envisions cars that can be accessed by anyone and
1. The technology has not yet been fully developed.

2. Once the technology is created, it will take time for an economy of scale to kick in and have the proper infrastructure set in place to make it viable.

3. The regulation for AVs is still very much in its infancy stages.

4. Until the market is fully saturated with AVs, it is difficult to determine the exact effects AVs will have when there are non-AVs in play.

These are some of the major challenges that will need to get addressed before AVs can fully enter the everyday passenger market. All that said, the concept of electric, shared AVs perfectly embodies this strategy of smart, personalized mobility choices.
Strategy 2.4: Develop Integrated, Accessible Public Transport Infrastructure

<table>
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<td>CALTRAIN</td>
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<td>BART</td>
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<td>$4,176/tCO2e</td>
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<td>HIGH-SPEED RAIL</td>
<td>0.66 tCO2e</td>
<td>$2,784/tCO2e</td>
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<tr>
<td>BUS RAPID TRANSIT (BRT)</td>
<td>0.27 tCO2e</td>
<td>$683/tCO2e</td>
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<tr>
<td>NEXT NETWORK</td>
<td>9.56 tCO2e</td>
<td>-$0.29/tCO2e</td>
</tr>
</tbody>
</table>

This strategy presents another avenue for San José residents to travel without entering their personal gasoline vehicle. Public transportation has the potential to reduce the need to drive, and is much more efficient than personal vehicles because they move so many people at one time. It is clear that San José will be heavily advancing its public infrastructure over the next decade with updates to Caltrain, its local bus network, and the exciting rollouts of BART, BRT, and the California High-Speed Rail. This next generation of public infrastructure can be broken up into the trains and buses. Updates to both San José’s train and bus system are important in order to cover the local and long distance needs of the residents.

Trains typically require more infrastructure, but once built, can move many people at any given time. They also connect to other cities which allows long distance commuters to more easily come in and out of the city. For example, Caltrain has been connecting San José to San Francisco via the Peninsula Corridor Diridon and Tamien stations for years. They are in the middle of an electrification project, thereby converting their diesel trains into electric ones. This change will increase the commuter rail’s operational efficiency, and more frequent trains will lead to increased ridership. The BART Silicon Valley Extension will bring another train system to San José with the first station being at Berryessa and another three in Alum Rock, Downtown San José, and Diridon. Other stations that are part of the extension include Milipitas and Santa Clara. The BART extension will provide San José residents another vital means of public transit to navigate around the Bay.

Lastly, the California’s High-Speed Rail project will allow rapid transportation throughout the state. It’s a multi-decade project with its initial phase one rollout from Diridon to north of Bakersfield being released in 2025 and the full phase one from San Francisco to Anaheim in 2029. By 2040, the project will extend up to Sacramento and down to San Diego. These line additions present an incredible opportunity for San José residents as they will be able to travel to almost anywhere in the state with ease.
In contrast with trains, buses, with their generally lower capital costs, are more flexible in their routes, and generally focused on local travel. The Santa Clara Valley Transportation's (VTA) opening of three BRT lines (Alum Rock, Stevens Creek, and El Camino) will continue to add to San José's burgeoning public transit system. What makes BRT special is the separation of bus-only lanes. This separation can be physical via construction but increases the costs. These buses will have more frequent service than normal buses, leading to more passengers, and will be hybrid-electric as
opposed to the traditional diesel. The other exciting bus project is VTA’s Next Network Program which contains an increased focus on ridership. VTA, with public input, has decided on an 83/17 split between ridership and coverage. This prioritization on ridership (used to be 70/30 split) combined with a shift to hybrid-electric buses will ultimately make buses more effective in converting drive-alone commuters, and the hybrid-electric aspect will make the mode shift even more beneficial. The Climate Action Pathway assumes that this bus network will continue to increase in capacity well past 2030 in order to accommodate the increase in residents.

The key to this strategy in ensuring that these developments are successful and high-quality will depend on the development around the stations. Diridon will become a major transit center with connections to almost every transit network. The other stations downtown, at Berryessa, at Alum Rock, or the plethora of bus stops, are also very important as not everyone in the city will not be able to fit within a half mile of Diridon. These other stations represent other access points to San José’s soon to be rich, public infrastructure, so it is important that they are not forgotten. Although they may be negatively affected by more shared vehicles from Strategy 2.3, this public infrastructure strategy combined with the TOD from the densification strategy will work hand in hand to maximize their success. In addition, Good Life 2.0 benefits include space efficiency for urban areas where people are in close proximity to each other and interaction with people who are different from us and who sleep, read, or work while en route.
Strategy 3.1: Create Local, Transit-Oriented Jobs to Reduce VMT

Creating accessible jobs and San José’s Jobs to Employed Resident ratio (J/ER) are key components of the General Plan. Accessible jobs are local jobs within San José that can be easily commuted to via transit, auto, walking, or biking. The J/ER is the number of jobs in the city compared to the number of residents who are employed. San José’s J/ER was 0.80 in 2015, meaning there was less than one job in the city for every employed resident. A J/ER of less than one means that there are not enough jobs within the city to sufficiently provide for the populace. It’s also possible that there are enough jobs for the population, but those jobs are not well-suited for the population, and therefore, the local population does not have them. The goal of the General Plan is to achieve a J/ER of 1.1 which will aim to satisfy the local populace while also incentivizing out-of-towners into the city.

Currently, more people leave San José than come in, which can wreak havoc on traffic as well as the local economy. Accessible jobs reduce carbon by eliminating the need for San José commuters to leave the city for work, or making it easier to commute by using alternative forms of transit. As the city grows in population, it will need to maintain that increased focus on job growth, particularly ones for San José residents.

San José’s plans for urban villages take accessible jobs into account. These communities are meant to be pedestrian-friendly residences while also providing local jobs. In a sense, these villages will be self-sustaining which will

<table>
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<tr>
<td><strong>ACCESSIBLE JOBS</strong></td>
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<tr>
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<tr>
<td>ABATEMENTS</td>
</tr>
<tr>
<td>MACC</td>
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<tr>
<td>24.66 tCO2e</td>
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<td>-$175/tCO2e</td>
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</table>
reduce the need for residents to drive to work. That mode shift from driving to potentially walking or biking can have a huge impact on emissions because of the gasoline substitution for a completely carbon-free alternative. Similarly to residential density, it is assumed that the deployment of accessible jobs will work hand in hand with the Bike Plan to ensure maximum effectiveness on both fronts.

In addition to its effect on VMT, The Plan also assumes that TOD will occur with the deployment of jobs within the Urban Growth Boundary. This will increase the ridership of local transit hubs such as Diridon and the upcoming Berryessa BART station, and those coming into San José will be able to more easily travel to their jobs via public transit. Increases in San José’s public transit use, walking, biking, and any reductions in VMT were integrated into the public transit eCBAs from Strategy 2.4 which increases their effectiveness.

Accessible jobs carry these great potential benefits, but it is important to emphasize the need for jobs that are suitable for the San José population. To fully realize these benefits, new jobs brought into the city should meet the varied skill set of San José residents. Improving the city’s jobs and housing balance will be challenging, but it has a lot of potential for the city both economically as well as environmentally.
Strategy 3.2: Productive, High-Performance Commercial Real Estate

Similarly to the residential sector, commercial buildings have the potential to drastically cut energy costs and reduce carbon. The focus on productivity and high-performance in this strategy is necessary as energy innovations will need to be cost-effective in order to gain sway with the commercial sector. It will be important to incentivize businesses to invest in clean energy products and practices in order to minimize emissions from the city as a whole.

As with homes, measures for commercial buildings can be segmented into the two major components: using less energy overall and converting from natural gas to electricity. Shrinking the total amount of energy that is consumed by a growing commercial sector requires several energy efficiency upgrades. Office lights are on for many hours of the day, which makes the replacement of lights with LEDs instead of fluorescents even more important. Another important energy consumer

<table>
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<tr>
<td>OFFICE EQUIPMENT</td>
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Within commercial buildings, office equipment such as servers. Upgrading office equipment to Energy Star rated models provides another avenue of energy reduction. However, as with the residential sector, the major opportunities lie in the HVAC of the buildings. Tighter thermal envelopes will reduce the amount of thermal loss. Finding and sealing air leaks is a good first step to reduce heating and cooling costs. HVAC systems are now more effective, making it easier for them to keep the room a comfortable temperature.

Another key measure for commercial buildings to reduce their heating and cooling bills is through frequent retrocommissioning, which is the process of investigating the HVAC system of a building and ensuring that the systems are working seamlessly with each other. Optimizing the systems can drastically improve the overall efficiency while costing less than investing in a full upgrade. Retrocommissioning for each building is recommended every five years to keep things working at top shape.

The other component of this strategy is the conversion from natural gas to electricity. It is assumed that the vast majority of natural gas consumed in commercial buildings is for HVAC purposes. Therefore, replacing these HVAC systems with all-electric systems is incredibly important. The Climate Action Pathway assumes that commercial HVAC systems will be replaced with all-electric, air-source heat pump equivalents. They will be much more efficient than their central AC and furnace equivalents, while also consuming no therms. This measure will greatly electrify the commercial sector, and help the strategy achieve its goal.

Once all of these measures are combined, ZNE-ready commercial buildings will then become more standard. Clearly, the key to maximizing the number of ZNE-ready commercial buildings will be through focusing on HVAC. Net energy metering will be required in order to push these buildings to the full ZNE label, but using all of these measures will minimize the amount of locally generated energy required to achieve ZNE status. It is already common to see LEED certified buildings around the Bay Area. ZNE certifications are much rarer, but encouragement in the private sector to continue to go green will help incentivize progress. The commercial sector emits more tCO2e than even the residential sector which means that they must be included in the conversation in order to be Paris-aligned as a city.
Strategy 3.3: Make Commercial Transport & Logistics Clean & Efficient

Extended Cost Benefit Analysis of Carbon Reduction Data

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<th>eCBAs</th>
<th>ABATEMENTS</th>
<th>MACC</th>
</tr>
</thead>
<tbody>
<tr>
<td>LARGE PICKUP &amp; VAN EVS</td>
<td></td>
<td>$66/tCO2e</td>
</tr>
<tr>
<td>LOCAL DELIVERY VAN EVS</td>
<td>15.76 tCO2e</td>
<td>$3/tCO2e</td>
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<tr>
<td>HEAVY DUTY HYBRID EVS</td>
<td>1.83 tCO2e</td>
<td>$235/tCO2e</td>
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<tr>
<td>HEAVY DUTY COMPRESSED NATURAL</td>
<td>0.28 tCO2e</td>
<td>-$161/tCO2e</td>
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<tr>
<td>GAS VEHICLES</td>
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<tr>
<td>HEAVY DUTY FUEL-EFFICIENT VEHICLES</td>
<td>0.80 tCO2e</td>
<td>-$550/tCO2e</td>
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<tr>
<td>HEAVY DUTY ALL-ELECTRIC VEHICLES</td>
<td>14.49 tCO2e</td>
<td>$140/tCO2e</td>
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</table>

Clean and efficient commercial logistics can change the way business is done. Electrified fleets that are more efficient than their gasoline or diesel equivalents will vastly increase the number of charging stations needed. For example, large pickups and vans are common commercial vehicles, but have a relatively undeveloped market for EVs.

However, change is on its way with multiple upcoming EV prototypes from Tesla and others. Similarly, hybrid-electrics models of local delivery vans and heavy duty vehicles exist, they are just too expensive to fully enter the market. Once those costs go down and the efficiency increases, it is very possible to imagine a world where all commercial vehicles are electric.

Large pickups, vans, and local delivery trucks represent local commercial transport services. Many businesses use pickups and vans as their company vehicles, while local delivery trucks are as common as mail carriers. There
exists an opportunity to electrify both vans and trucks, thereby electrifying the majority of local commercial transport. Charging stations will need to be put in place at their respective work locations, which would allow the vehicles to be in use throughout the day while being able to charge overnight. Having charging stations at work will overcome one of the major hurdles with EVs. Once battery lives prove that they can last an entire work day at a reasonable cost, these vehicles will become more prevalent in the market.

Lastly, the California’s High-Speed Rail project will allow rapid transportation throughout the state. It’s a multi-decade project with its initial phase one rollout from Diridon to north of Bakersfield being released in 2025 and the full phase one from San Francisco to Anaheim in 2029. By 2040, the project will extend up to Sacramento and down to San Diego. These line additions present an incredible opportunity for San José residents as they will be able to travel to almost anywhere in the state with ease.

In contrast to the more local commercial vehicles, heavy-duty vehicles tend to travel long distances. They also represent a major portion of emissions due to their infamy for being gas guzzlers. Therefore, they have been prioritized in California through the Sustainable Freight
Action Plan to identify ways of making these vehicles greener. These vehicles have already been subject to federal standards, and are making gains in reducing their carbon dioxide emissions by increasing their efficiency. Compressed natural gas heavy duty vehicles are already in the market, but their premium in cost over diesel equivalents, in addition to lack of refueling infrastructure, make them insufficient in the long term.

Hybrid-electric options are beginning to enter the market, but will also carry a high premium. Both of these alternative fuels represent stop gaps between fossil fuels and all-electrics. Although there are no all-electric, heavy duty vehicles currently in the market, it is safe to assume that there eventually will be. They will be able to leverage public charging stations as they make their way throughout the country. Advances in charging infrastructure and electric batteries will propel all-electric, heavy duty vehicles, and the Climate Action Pathway projects them to be the future of freight.

Businesses will not immediately convert their fleets to electric as soon as the technology is unveiled. It will take years, regulations, and probably incentives before electric fleets become viable. However, these fleets can raise uptake by being more cost effective or more efficient. Once there is a clear value add from investing in these vehicles from a business perspective, uptake will occur.
A-5 Methodologies
Methodology: Integration To Develop Pathways

Each of the 53 energy, water, and mobility measures are integrated in order to understand the synergistic effects of climate action. For example, the carbon savings for an EV differs depending on whether the EV is connected to a fossil fuel-based grid or a low-carbon grid, or the ridership of transit changes depending on whether distances are walkable because of denser neighborhoods. The interactions among these 53 measures have been considered and modeled. The box below outlines the basis of these relationships.

1. SJCE will power electricity for the city and determine its emission factor. Each measure’s load is included as part of SJCE.

2. A proportion of SJCE – the city’s community choice energy aggregation – will be met with distributed solar on ZNE buildings.

3. Densification makes destinations closer together, thus reducing the VMT by passenger cars as well as local commercial vehicles.

4. Densification also reduces the energy consumption of residential buildings by lowering the heating and cooling costs of the home.

5. Tighter thermal envelopes from retrofits and new construction reduce the energy required to heat or cool a building which impacts the ZNE packages.

6. Shared vehicles provide a potential alternative to public transportation thereby lowering the number of passengers.

7. Densification and accessible jobs help public transit with transit-oriented development (TOD) which increases the number of passengers.

8. Electric charging station distribution used by personal EVs carries over to the shared vehicle eCBAs.

9. Efficiency of personal autonomous vehicles (AVs) carries over to shared AVs.

10. Collection of water used by faucets, showers, baths, clothes washers, and dishwashers.

11. Drip irrigation systems limit the benefits of switching out a lawn for drought resilient plants.
Methodology: Extended Cost Benefit Analysis

The analytical approach used to determine the pathway was designed to establish the economic rationale for each of the nine strategies, incorporating sector modeling, engineering design, and economic appraisal informed by stakeholder and community outreach – to give a true depiction of the feasibility of carbon and water reduction measures. This analysis is custom to San José – the datasets are based on those for San José, with any unknown variables sourced from consultation with expert stakeholders.

Central to the analytical process was the use of a sophisticated model that analyzed the effectiveness of carbon and water reduction measures in step with a triple bottom line methodology. The model takes core datasets and datasets for each implementation measure and uses those to establish a baseline and conduct extended cost benefit analyses (eCBAs).

The eCBA is a methodology that employs an engineering-economic discounted cash flow approach to calculate the carbon cost effectiveness of sustainability measures. It determines the marginal cost by comparing the cost of sustainability measures to what would have otherwise been done. Examples include using an electric vehicle (EV) instead of a gasoline car or an electric oven instead of a gas oven.

The eCBAs also incorporate stock models to understand the year-by-year profile of the measure, critical to designing a carbon reductions pathway. These stock models segmented the underlying emissions drivers by age, usage, efficiency, utilization, fuel type and others. For example, building retrofits need to factor in logical assumptions about the time taken to implement such a measure; the timeframe of rolling out a retrofit program would be limited by the availability of skills, budget, and organizational ability and may take 30 years. The lifetime of a building retrofit, for the sake of example, might be 15 years. This would mean that after 15 years from the start of the measure’s implementation, the abatement potential would have to factor in buildings being retrofitted for the first time as well as second generation retrofits.

Using both the stock models and the discounted cash flows, the eCBAs analyze the engineering variables contributing to an
emissions and water reduction (such as the efficiency of fuel use), and then monetizes capital, operational, and fixed recurring costs to calculate a marginal abatement cost (MAC). This MAC is expressed in real-term dollar per tCO2 or dollar per gallon relative to a baseline.

The MACs for each of the eCBAs are combined with their respective total abatements in order to form a Marginal Abatement Cost Curve (MACC). The MAC value is the height of each of the bars while the total abatements are the widths. MACCs were created for carbon dioxide emissions, water, and vehicle miles traveled (VMT). These MACCs were useful in determining the relative value provided by each of the measures modeled in eCBAs, as well as their potential for reducing emissions, water use, or VMT.
## Extended Cost Benefit Analysis: 53 Measures Analyzed

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<thead>
<tr>
<th>ENERGY</th>
<th>MOBILITY</th>
<th>LAND USE</th>
<th>WATER</th>
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<tr>
<td>San José Clean Energy</td>
<td>Residential Building Thermal Envelope New-Build</td>
<td>Passenger Car Electric Vehicle (EV)</td>
<td>Creating Local Jobs</td>
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<td>Distributed Solar Generation</td>
<td>Commercial Building Thermal Envelope Retrofit</td>
<td>Hybrid Heavy Goods Vehicles (HGVs)</td>
<td>Drought-Resilient Landscaping</td>
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<td>LED Lighting Retrofit</td>
<td>Commercial Building Thermal Envelope New-Build</td>
<td>SUV EV</td>
<td>Densification/Focused Growth</td>
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<td>Energy-Efficient Refrigerators</td>
<td>Commercial Building HVAC Retro-commissioning</td>
<td>CNG HGVs</td>
<td>Aerated Faucets in Homes</td>
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<tr>
<td>Gas to Electric Stove Replacement</td>
<td>Commercial Building LED Lighting</td>
<td>SUV Autonomous EV</td>
<td>Residential Greywater</td>
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<tr>
<td>Gas to Electric Water Heater Replacement</td>
<td>Commercial Building Data Center Energy Efficiency</td>
<td>Efficient HGVs</td>
<td>Aerated Faucets in Commercial Buildings</td>
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<td>Gas to Electric Ground Source Heat Pumps</td>
<td>Residential Dishwasher Efficiency</td>
<td>Caltrain Electrification</td>
<td>Low-Flow Showers</td>
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<td>Smart Thermostats</td>
<td>Residential Clothes Washer Efficiency</td>
<td>Ridesharing Cars</td>
<td>California High-Speed Rail</td>
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<tr>
<td>Residential Building Thermal Envelope Retrofit</td>
<td>Large Pickup EVs</td>
<td>Ridesharing Autonomous Shuttles</td>
<td>VTA Bus Rapid Transit &amp; Light Rail</td>
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