City of Santa Monica

15x15

CLIMATE ACTION PLAN

15 Measures to Reduce Emissions 15% by 2015

Final Report

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Santa Monica developed the 15x15 Climate Action Plan to reach the goal of reducing community greenhouse gas emissions 15 % below 1990 levels by 2015. We hit 20%!

EXECUTIVE SUMMARY

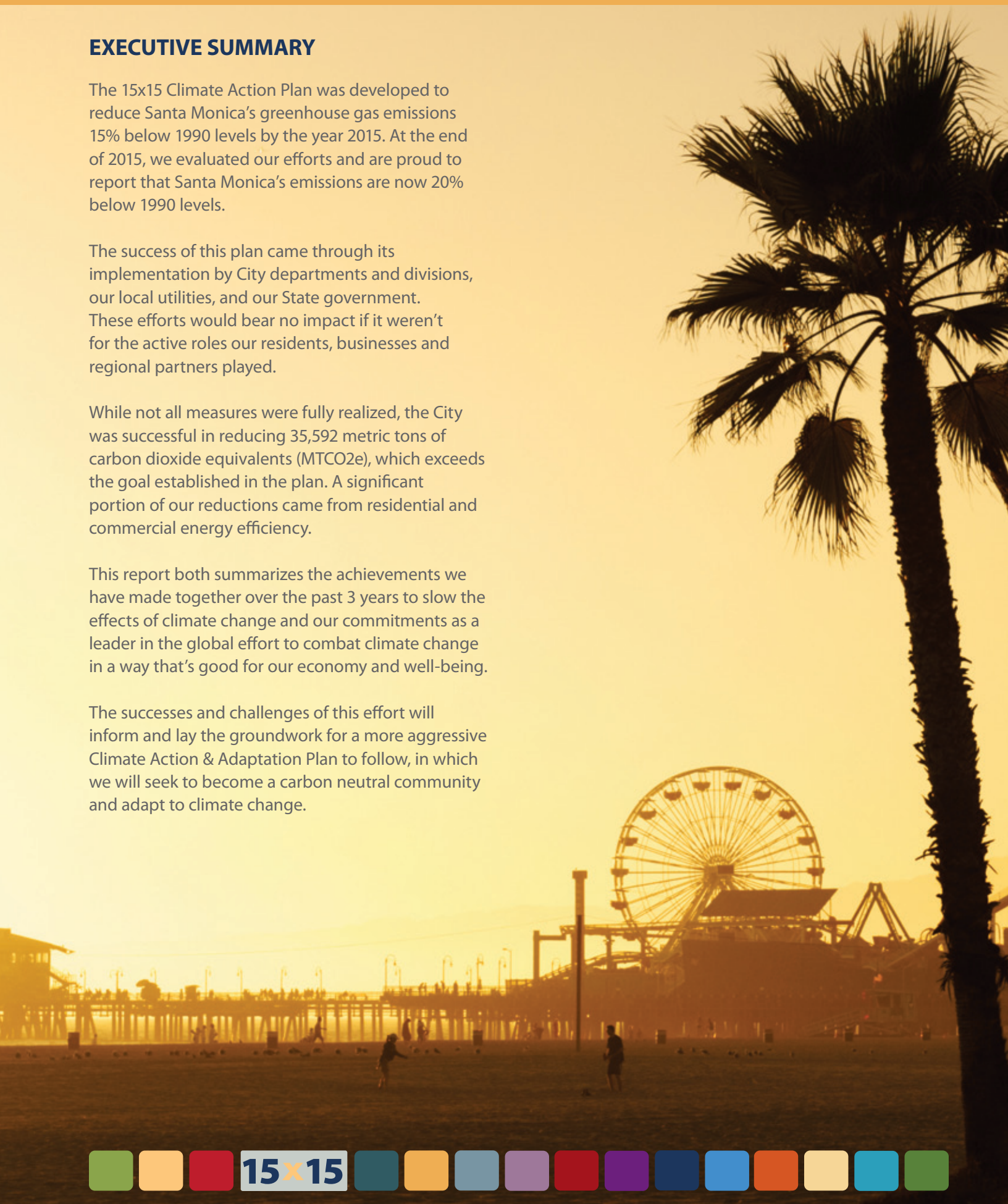
The 15x15 Climate Action Plan was developed to reduce Santa Monica's greenhouse gas emissions 15% below 1990 levels by the year 2015. At the end of 2015, we evaluated our efforts and are proud to report that Santa Monica's emissions are now 20% below 1990 levels.

The success of this plan came through its implementation by City departments and divisions, our local utilities, and our State government. These efforts would bear no impact if it weren't for the active roles our residents, businesses and regional partners played.

While not all measures were fully realized, the City was successful in reducing 35,592 metric tons of carbon dioxide equivalents (MTCO2e), which exceeds the goal established in the plan. A significant portion of our reductions came from residential and commercial energy efficiency.

This report both summarizes the achievements we have made together over the past 3 years to slow the effects of climate change and our commitments as a leader in the global effort to combat climate change in a way that's good for our economy and well-being.

The successes and challenges of this effort will inform and lay the groundwork for a more aggressive Climate Action & Adaptation Plan to follow, in which we will seek to become a carbon neutral community and adapt to climate change.



CLIMATE ACTION *highlights*

Santa Monica adopted mandatory solar ordinance in April 2016.

25 energy and water projects used Property Assessed Clean Energy (PACE) program, saving an annual 279,106 kWh.

Locally installed solar surpassed 5 MW capacity.

705,631 sq ft new construction approved with requirements for LEED solar, EV charging and over 1,000 bike parking spaces.

Over 1,000 tons of bulky items collected through Bulky Item Collection and Move-in/Move-out Program.

Textile Recycling, Junk Mail Opt-Out, HHW collection reduced or diverted over 100,000 lbs annually from landfills.

First bike share system launched in Southern California.

105 miles of bike lanes, sharrows and routes created.

20% reduction in water use citywide.

Increased local water production to 70% of water demand, reducing imported water needs.

Planted 586 trees from Expo and Esplanade projects.

Big Blue Bus reduced emissions by over 60% using renewable natural gas from landfill Methane.

Over 1 million kWh saved through municipal energy efficiency projects.

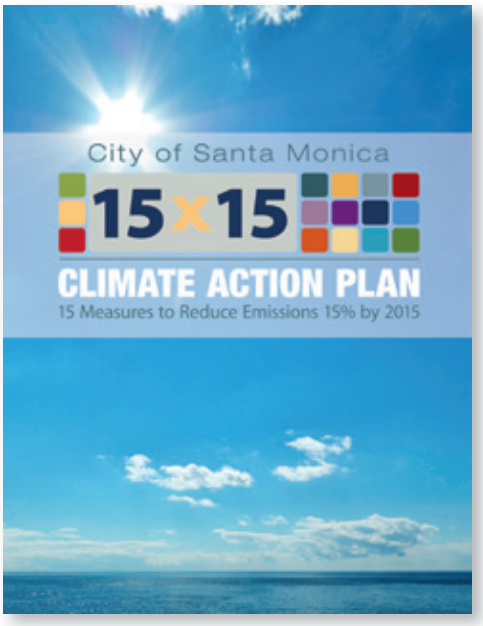
INTRODUCTION

In 2013, Council adopted the 15x15 Climate Action Plan (15x15 CAP) to ensure that the City would meet its community greenhouse gas (GHG) emissions reduction targets, established in the Sustainable City Plan 2006 Update (SCP). Santa Monica's targets for emissions reduction were 15 percent below 1990 levels by 2015.

When the 15x15 CAP was prepared, the City conducted a greenhouse gas inventory from community sources for the year 2011. This inventory revealed that emissions had dropped 14% below 1990 levels. Based on increased economic activity and population, emissions were projected to increase by 2015. This increase would leave approximately 29,000 metric tons of carbon dioxide equivalents, or MTCO2e, to be reduced or mitigated by 2015 in order to effectively meet the goals outlined in the SCP.

It is important to note that not all actions actually result in direct emissions reductions or are evident in typical greenhouse gas emissions inventories. Some actions and policies set the foundation for greater emission-reducing activity in the future.

The actions were monitored by tracking performance indicators and reviewing data provided by various City departments and divisions. Emissions factors for each appropriate action were then applied, generating a value for reduced or avoided emissions. Emissions factors are provided by the US Environmental Protection Agency (EPA), Local Governments for Sustainability (ICLEI)'s ClearPath Tool, a nationally recognized tool for climate action planning, Santa Monica's service utilities, and other industry standards.



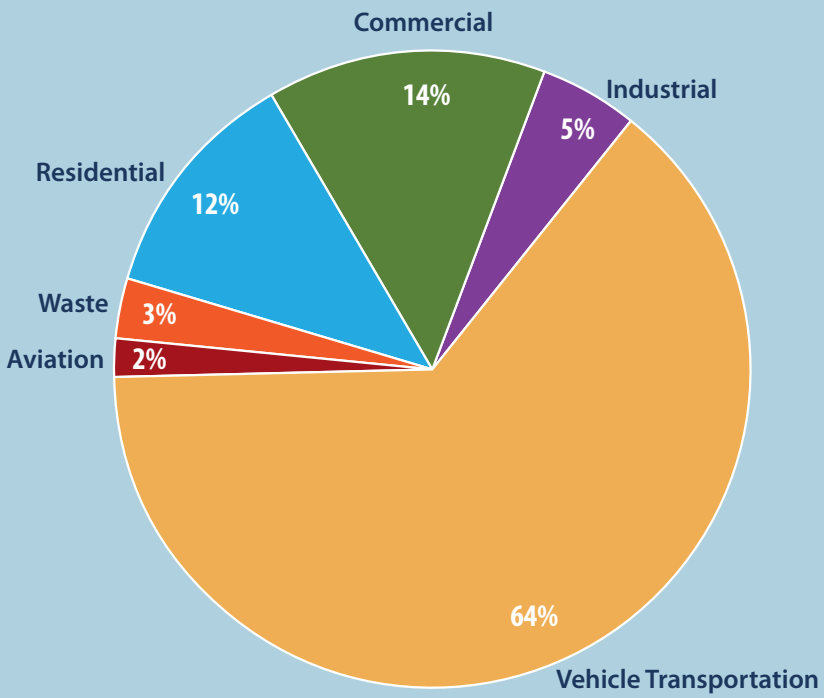
See the 15 x 15 Climate Action Plan at **sustainablesm.org/climate**

BY THE NUMBERS
Understanding Santa Monica's Carbon Footprint

Santa Monica has been tracking local greenhouse gas emissions for over 20 years through an annual community sector-based emissions inventory. This inventory method allocates emissions among residential, commercial, industrial, transportation and aviation sectors according to annual energy use and carbon intensity of energy use for each. It also assigns emissions to solid waste disposal based on the tonnage of materials hauled to regional landfills. This emissions inventory method is widely used by local, state and national governments. Over time, emissions inventory protocols and standards have been developed and updated, which have resulted in changes to the way each sector contributes to the overall inventory. For example, Santa Monica's emissions now include aviation fuel consumed by planes that use the Santa Monica Airport. Vehicle transportation now represents a greater share of local emissions due to a change in methodology that includes half of all vehicle miles traveled from trips that either start or end in Santa Monica.

SECTOR	DATA SOURCE
Residential	Electricity
	Natural Gas
Commercial	Electricity
	Natural Gas
Industrial	Electricity
	Natural Gas
Waste	Landfilled Waste
Transportation	Vehicle Miles Traveled
	Regional Vehicle Mix
Aviation	Aviation Fuel

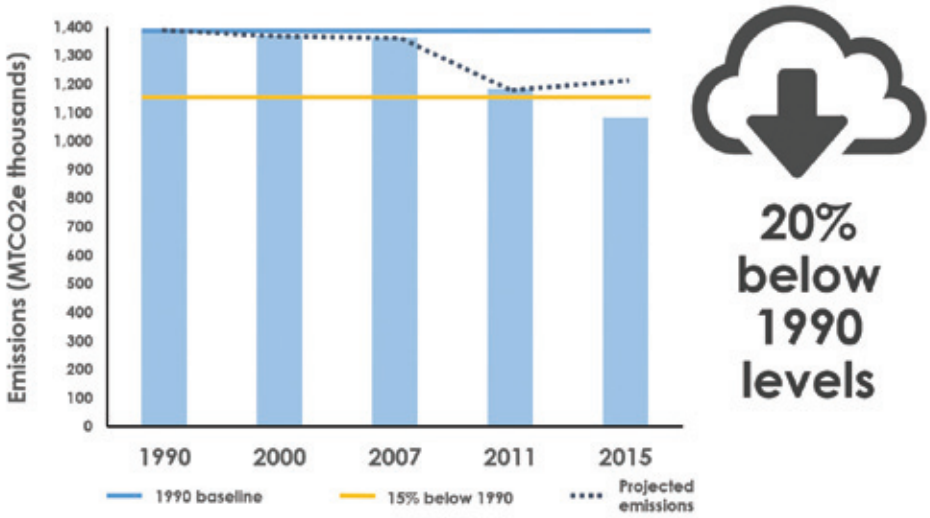
Emissions by Source (2015)



Emissions have dropped 20% below 1990 levels

Compared to 1990, Santa Monica has successfully reduced its annual emissions by 20%. This is the result of the City's efforts through the 15x15 Climate Action Plan and other community activities to be later described. In addition to local efforts, external factors have influenced the downward trend. The electricity that is provided to Santa Monica comes from sources that are now 28% renewable. Commercial energy use dropped significantly due to gains in energy efficiency. Vehicle fuel has also become more efficient in addition to hybrid and electric vehicles becoming more prevalent.

Greenhouse Gas Emission Trends

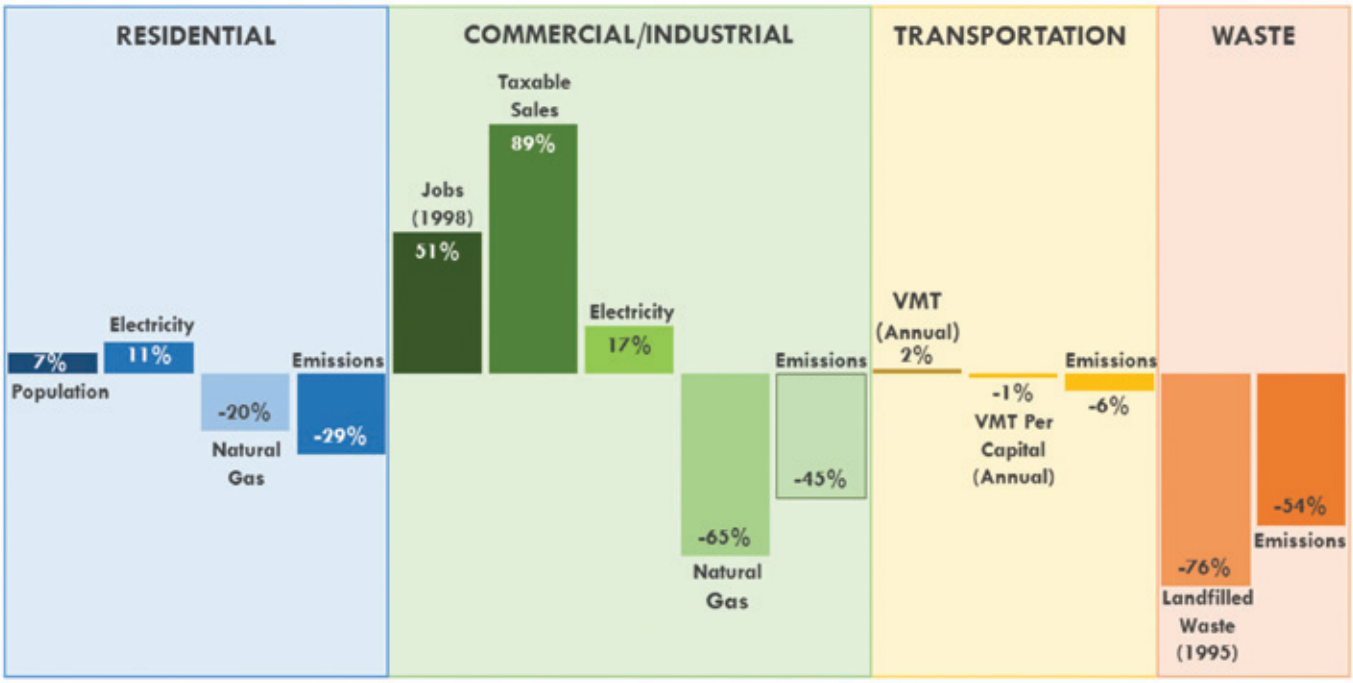


Growth Without Emissions

Since 1990, Santa Monica has also seen increases in population, commercial activity and tourism. Despite these demographic trends, greenhouse gas emissions have since decreased, demonstrating that resource efficiency has a significant impact.

This reality demonstrates that Santa Monica, and other communities, have the potential to enjoy prosperity and economic growth without increasing the environmental impact that was historically associated: decoupling carbon emissions and economic development.

Changes Since 1990 (unless otherwise noted)



While we were able to meet and exceed our aggressive greenhouse gas emissions reduction target, the process of creating and implementing the 15x15 CAP did not come without its challenges. The City did not successfully complete all of its committed actions originally outlined in the plan. Additionally, external factors, like the economy, gas prices and demographic shifts, can have a powerful influence on year-to-year changes.

Successes

Utility Programs

Utility resources have proven to be effective in driving energy efficiency. Between 2013 and 2015, commercial customers saved over 15M kWh of electricity and over 39,000 therms of natural gas.

Supportive Sustainability Goals

Santa Monica's long history of sustainability has laid an important foundation for its achievements in greenhouse gas emissions. Aspirational goals, such as zero waste and water self-sufficiency, have changed the way we view and consume our resources. As such, these goals support emissions reductions while providing similar benefits to the community.

Unexpected Innovations

Since the development of the plan, there have been significant advances in building technologies and vehicle fuels. One example is the fueling of Big Blue Bus using renewable natural gas. Where electrification seemed like the likely path for the fleet, the availability of renewable natural gas offered a low-carbon and low-cost alternative that could be realized immediately.

Challenges

Lack of Resources

A number of City projects did not receive the funding needed to carry out their implementation. Because reduction of greenhouse gas emissions tends to be a byproduct of other projects and programs, there is no dedicated source of funding. Solar projects require capital funds that are dedicated to other essential services and projects, including street repair and major renovations.

Extended Project Lead Time

Other actions took longer than expected to execute, or did not occur altogether. For example, installing electric vehicle charging stations, while increasingly important in Santa Monica, takes a very long time; almost 2 years from concept to construction. Extensive planning, siting, design and coordination is required with utilities and equipment providers. The City is continually planning new stations, identifying locations and developing methods of deployment to avoid this issue.

Split Incentive

The traditional split between tenants and property owners, whether commercial or residential, continue to prevent investment in sustainable building measures, including solar and electric vehicle charging infrastructure. As such, the multi-family population has historically been in and benefit from many sustainability programs, such as rebates. Green leases offer an opportunity for both parties to become more invested in sustainable and cost-efficient operations.

Next Steps

The City has begun the process of developing the next Climate Action and Adaptation Plan to achieve further reductions by 2030 and 2050, as well as to develop measures to adapt and prepare for unavoidable climate change impacts. Building on the success and lessons learned from the 15x15 CAP, the new planning process involves the inclusion of a consumption-based inventory, more robust stakeholder engagement, incorporation of innovative and socially equitable project concepts, and a community toolkit for individuals and organizations.

ENERGY USE AND GENERATION

1. **Increase energy efficiency of new buildings to perform 10% better than 2013 Title 24 Standards**
2. **Reduce energy use citywide in existing buildings by 1 million kWh annually**
3. **Increase total citywide solar capacity to 5 megawatts**

The built environment contributes more than 30% to Santa Monica's greenhouse gas emissions. A multi-pronged approach was implemented to reduce energy use in existing buildings and to ensure new buildings would be constructed with energy efficiency in mind.

Energy Efficiency and Solar Capacity on the Rise

Southern California Edison and the Southern California Gas Company helped residents and businesses install energy efficient measures and appliances saving a combined 5,105 MTCO2e during the 2013-2015 time period.

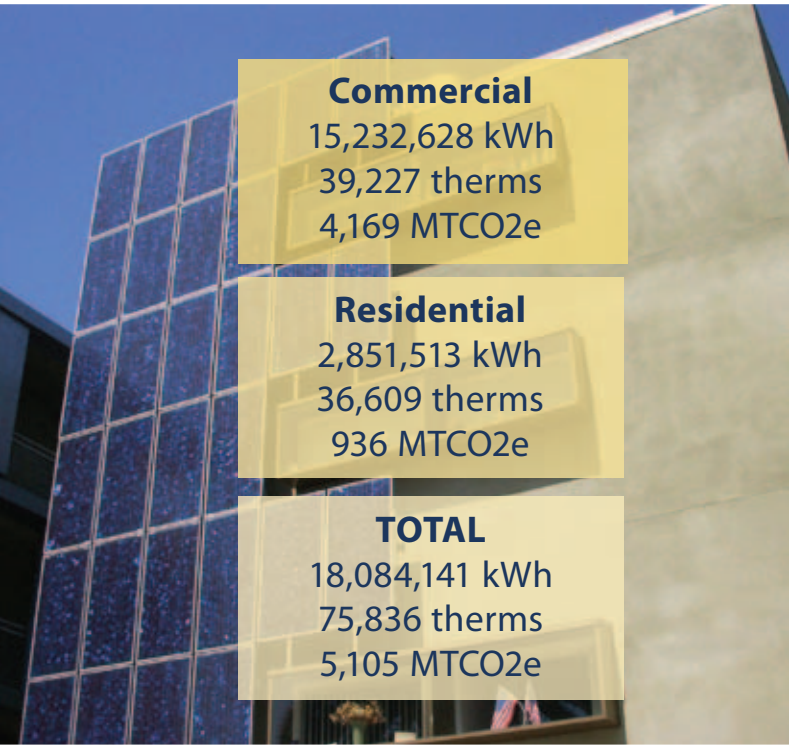


Figure 1: Electricity, water, and carbon emissions savings from utility-offered efficiency programs

Solar Santa Monica has served as a community resource through its free services for residential and commercial entities looking to go solar by providing technical and financial advice for energy efficiency and rooftop solar possibilities. Over three years, 1,479 kW in solar capacity was installed, capable of producing nearly 1 million kWh each year.

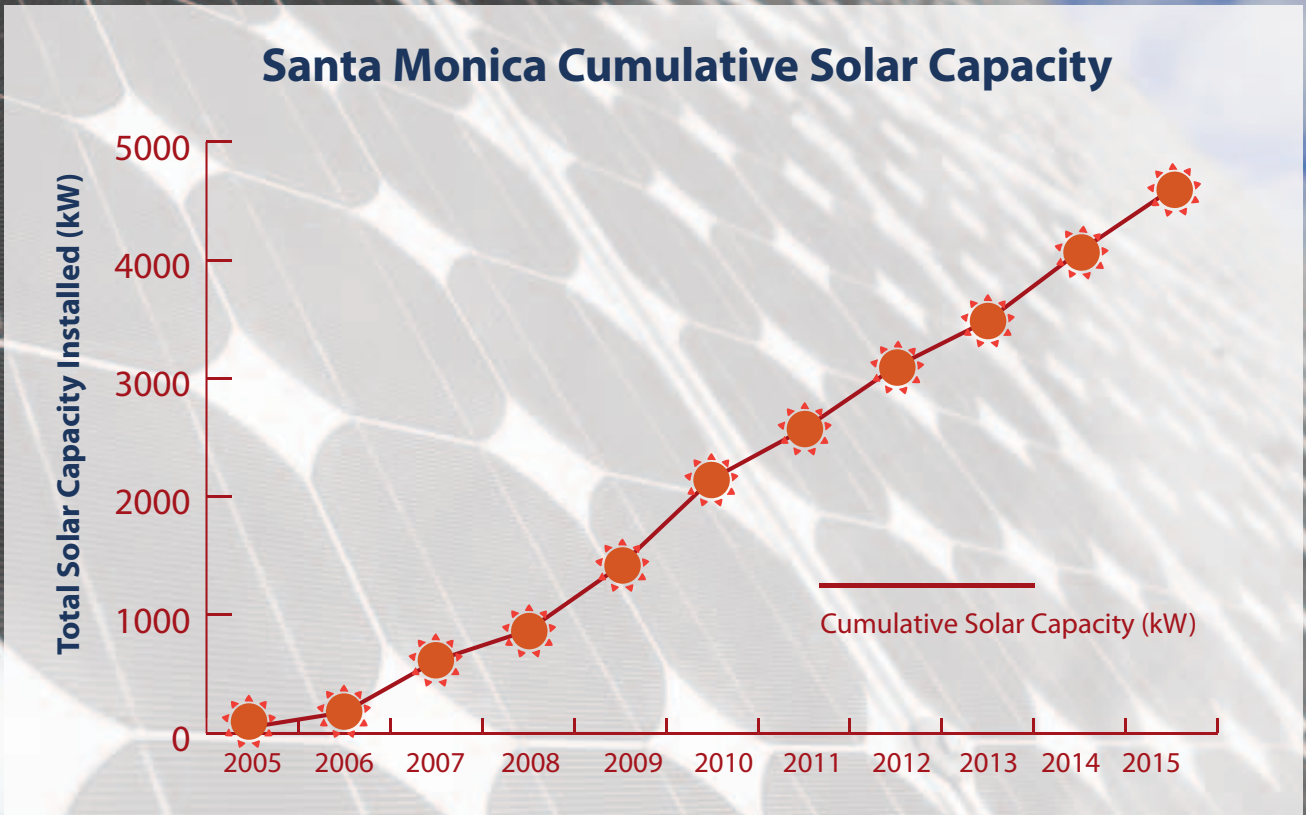
From Solar Ready to Solar Required as a Standard for New Construction

In 2016, the City updated the Green Building Ordinance (GBO) to mandate solar for all new construction. The update builds on the previous GBO, which required that newly constructed buildings reserve 15% of south and west rooftop space for future solar panel installation.

Advancing Building Performance to Reach Zero

One critical role of land-use policy and the CAP is the advancement of green building performance for new construction. As required by the Land Use Circulation Element (LUCE), and 15x15 CAP, the City negotiated multiple development agreement projects to achieve high levels of sustainability. Over 700,000 sq. ft. was approved to meet LEED certification, maximize solar energy and electric vehicle charging stations, and significantly reduce water use.

Currently, commercial energy benchmarking and utility data disclosure programs are being piloted across the U.S. Staff is aiming to incorporate concepts from a pending program in the City of Los Angeles to ensure regional consistency when Santa Monica's program is implemented.



Keeping Up the PACE

Property Assessed Clean Energy (PACE) offers a new financing product for property owners to implement renewable energy projects, efficiency measures, and seismic retrofit projects. All eligible projects can be installed with no money down. The savings from the efficiency measures can then be used to make the payments, which are assessed on the bi-annual property tax bill.

Prior to the 15x15 CAP, the City had authorized LA County Energy Program (LACEP) as its only PACE program, serving commercial customers. The City subsequently authorized Home Energy Renovation Opportunity (HERO), for residential customers, and later, Ygrene, Figtree, Energy Efficient Equity, Alliance NRG and CaliforniaFIRST in order to serve both commercial and residential customers in financing energy, water, and seismic retrofit projects. The City is currently monitoring project progress from all new PACE providers.

Figure 3: HERO PACE program implementation results and lifetime impacts, 2013-2015

73 projects approved
21 solar, water, and energy projects completed

3.91 million lifetime kWh saved

2.23 million lifetime gallons water saved

$569,118 in total completed project value

5 jobs created

$985,660 in economic impact

951 lifetime MTCO2e abated

WASTE REDUCTION AND RECYCLING

4. Achieve 80% diversion of waste from landfills

Landfill waste decomposes over time, releasing methane gas that contributes to the City's carbon footprint. While it represents a relatively small portion of our emissions portfolio – about 3% of Santa Monica's greenhouse gas emissions – solid waste is an emissions source that the City has the most control over through its programs and operations.

Planning for a Zero Waste Future

In 2014, Santa Monica adopted an aggressive Zero Waste Strategic Plan with a goal of diverting 95% of materials from the landfill by 2030 and reducing per capita disposal to almost 1 pound per day. By early 2013, the City was already achieving a 77% waste-from-landfill diversion rate, higher than the State's mandatory 65% diversion rate.

To demonstrate leadership, a zero waste program was implemented at City Hall and the library branches. Individual desk-side trash containers were replaced with recycling and composting containers and centralized zero-waste sorting stations.

Rethinking Reuse and Recycling

The City's Resource Recovery and Recycling Division manages community programs and projects to encourage innovative reuse and recycling while building community. Repair Cafés, where citizens can have broken items repaired by community "fixers" is one such activity. Coordinated regionally with partners, the Repair Cafés have fixed, mended, and repaired hundreds of items that would otherwise be discarded. The City also hosts prom dress and tuxedo swaps with Santa Monica High School and costume swaps at the Library for Halloween. An annual favorite waste reduction program is the citywide yard sale that offers the opportunity for residents to participate in a community wide yard sale.

The Bulky Item Collection program and the Move-in/Move-out Program for apartment and condominium residents collected over 1,055 tons of waste from 2014 to 2015, decreasing illegal dumping. Reverse vending machines that give local coupons for empty beverage containers were deployed at Santa Monica High School. Both programs were funded by grants from CalRecycle.

An Education on Food Waste

To meet State requirements by 2016, the City worked with businesses and large multi-family residential buildings to provide organic recycling programs.

City staff partnered with Santa Monica College to co-create an immersive academic curriculum on food waste and waste management. Students engaged with businesses to perform waste audits and encourage proactive source reduction, with final recommendations given on how each business can reduce their environmental impacts.

SPECIAL WASTE RECYCLING PROGRAM	WASTE DIVERTED (TONS)
Textile Recycling	9.5295
Shoe Recycling	0.5175
Junk Mail Opt-Out	19.2
Hazardous Waste	78.4
Christmas Tree Alley Collection	131
Residential Organics	14,253
Commercial Organics: Street Sweeping	3,896
Commercial Organics: Self Haul	1,572
Commercial Food Waste	7,107
School Composting	1,208
Public Landscape	204
TOTAL	28,479

Figure 4: Waste diverted as a result of RRR efforts, 2013-2015

TRANSPORTATION AND MOBILITY

5. Reduce daily vehicle miles traveled within the city to 100,000

6. Increase biking and walking mode share to 15%

7. Expand public and private infrastructure to support electric vehicle technology

Emissions from vehicle fuel comprise almost 40% of Santa Monica's overall carbon footprint. As only 10% of employees working in Santa Monica are local residents, shifting vehicle trips to more sustainable modes and de-carbonizing the commute are among the City's main tools for reducing emissions.

Managing Transportation Demand

Average Vehicle Ridership, or AVR, is simply defined as the ratio of people to vehicles entering Santa Monica. The higher the AVR, the more people there are in relation to vehicles, which means that more people are carpooling, using transit, biking, or walking, effectively reducing traffic and emissions. The City promoted transportation demand programs like CommuteSM.com, to incentivize alternative commutes. However, AVR actually decreased from 1.67 to 1.64 over three years. One of the factors influencing this decrease was the relocation of several large technology employers out of Santa Monica.

In 2015, the Transportation Demand Management Ordinance was expanded to capture businesses with 30 employees or more, which resulted in 166 additional employers now implementing trip reduction measures for 6,000 employees. The update also designated varying AVR targets of 2.2, 2.0, 1.75, and 1.60 based on proximity to transit, such as the Expo Light Rail.

Large Employers Modal Split

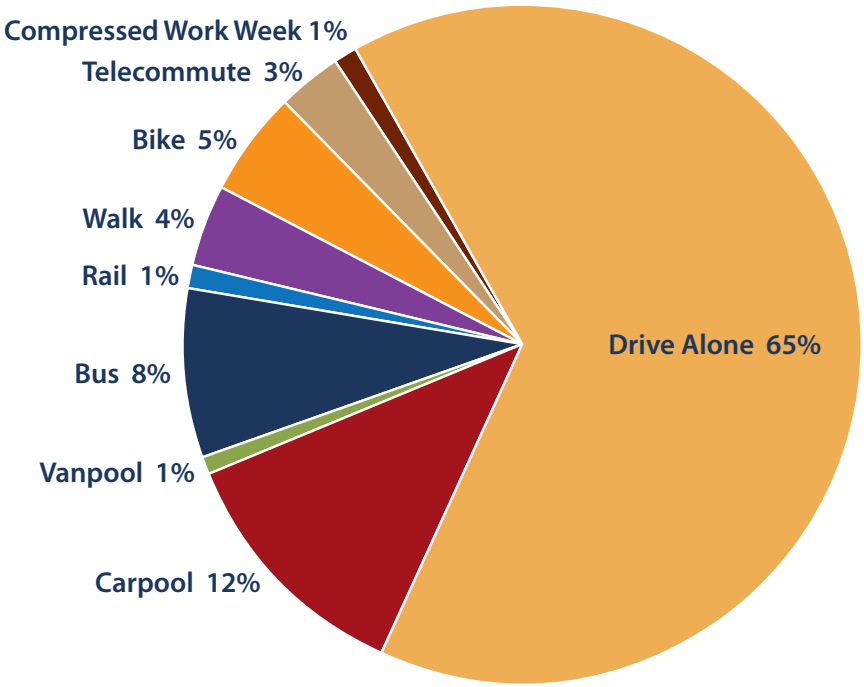


Figure 6: Distribution of Transportation Demand Management Ordinance Modal Split

An Emerging Car Share Program

Car sharing is estimated to reduce per capita carbon emissions by 1,100-1,600 pounds per year. Since 2000, Zipcar has taken an estimated 120,000 cars off the streets in the United States by providing vehicles along with gas, insurance, and 180 miles of driving per day. In 2016, Zipcar started a two-year pilot car-sharing service program at public on- and off-street parking spaces in Santa Monica, building off of the existing system of three private venues at the Seychelle and Waverly condominium complexes, and the Colorado Center.

Focus on Integrated Transit

In recent years, ridership on Big Blue Bus (BBB) has decreased significantly, falling well short of the City's goal to increase annual boardings by 200,000. The trend is consistent with transit usage in the region. LA Metro reported a 10% decrease in boardings from 2006 to 2015, despite a $9-billion investment in new light rail and subway lines during that time. During this same period, ridership on BBB declined by 25%. Changing job markets, falling gas prices, increasing bus fares, and the growing popularity of both bicycling and of ride-hailing services such as Uber and Lyft have been cited as likely causes for this shift.

To adjust to this change, Santa Monica is investing heavily in multimodal mobility and "mobility as a service." The BBB embarked in the single-largest service adjustment in its seven decades, to better integrate with the Expo Light Rail. Once the "Evolution of Blue" is fully implemented, residents and visitors will enjoy an "Uber-like" on-demand service in the evenings to help get people home from Expo stations as well as the addition of several new routes.

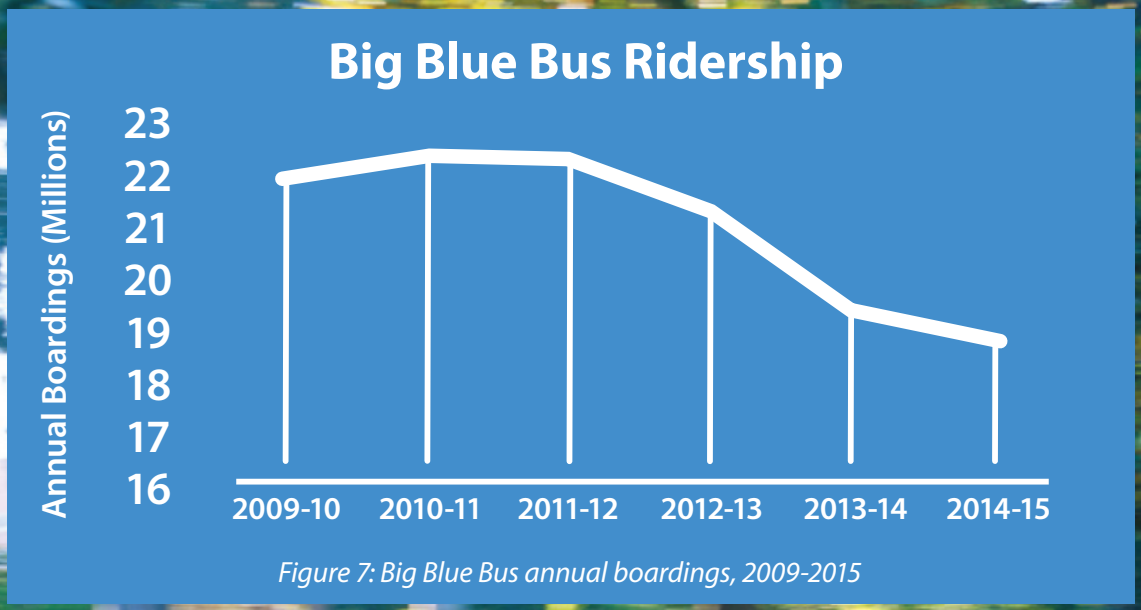


Figure 7: Big Blue Bus annual boardings, 2009-2015

Biking on the Rise

In 2015, Santa Monica became the first city in Southern California to launch a bike-sharing program. The Breeze Bike Share debuted 500 eight-speed bicycles at 75 stations throughout Santa Monica and Venice. Riders use a mobile app to reserve and unlock the bicycles for short trips. After 100 days of operation, 8,529 users logged a collective 86,180 miles traveled and 81,371 lbs. of carbon dioxide emissions avoided.

Bicyclists are also now enjoying 107 miles of new bike lanes, "sharrow" lanes, and other routes that have been added since the 2011 adoption of the Bike Action Plan (BAP): 90 miles of new bike lanes and 17 miles of shared-lane markings. While exceeding the 15x15 CAP's goal of a 69-mile addition to the City's bike path network, the BAP remains 57% complete*. The City is working toward 100% completion of the plan by 2020, which includes further expansion of bike paths, upgrades of existing roads, striping bikeways with high visibility treatments, addressing bike crashes, and other services.

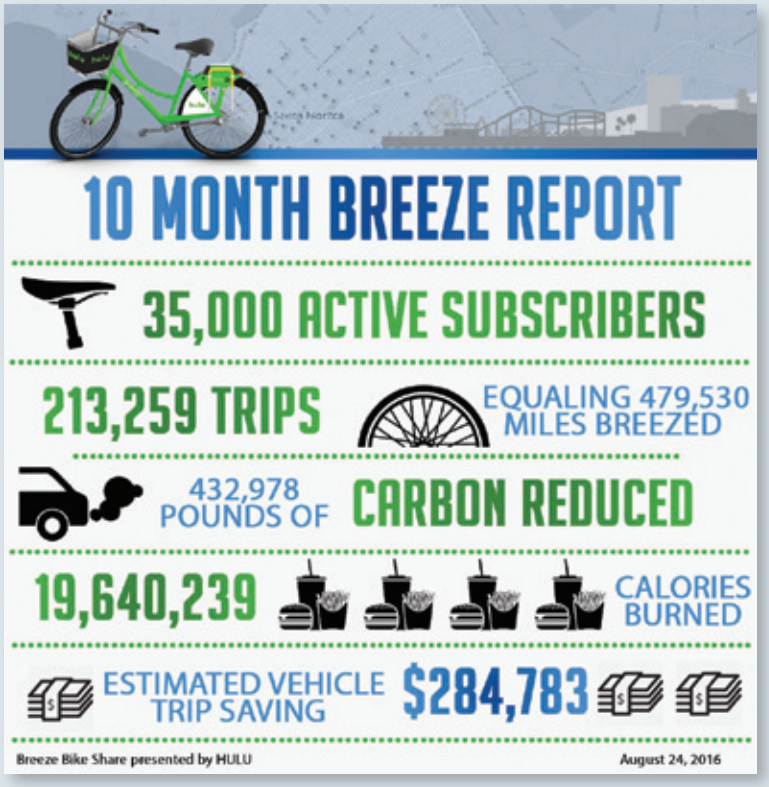


Figure 8: Data collected from Breeze Bike Share after 100 days of implementation

For its leadership in promoting biking, Santa Monica was recognized by the League of American Bicyclists as a "silver" bike-friendly community.

Increasing Citywide Walkability

Santa Monica is recognized as a community where residents walk for recreation and to make trips within the City, employees walk for daily errands, and visitors from around the world come to walk along the beach and through commercial areas.

To improve the safety and experience of walking, the City developed a Pedestrian Action Plan (PAP) to provide a comprehensive document to guide policy for improved pedestrian safety and useable infrastructure. It includes the City's first statement regarding "Vision Zero:" a plan to eliminate roadway injuries and fatalities.

The PAP calls for short-term projects like diagonal crossing or 'scramble' intersections in the downtown area, new curb ramps, signal timing changes, and pavement markings, and longer-term initiatives, such as greenways, lighting, and reconfigured intersections that will prioritize pedestrian access. Increasing walking will continue to reduce vehicle emissions and congestion, while improving personal wellbeing and health.

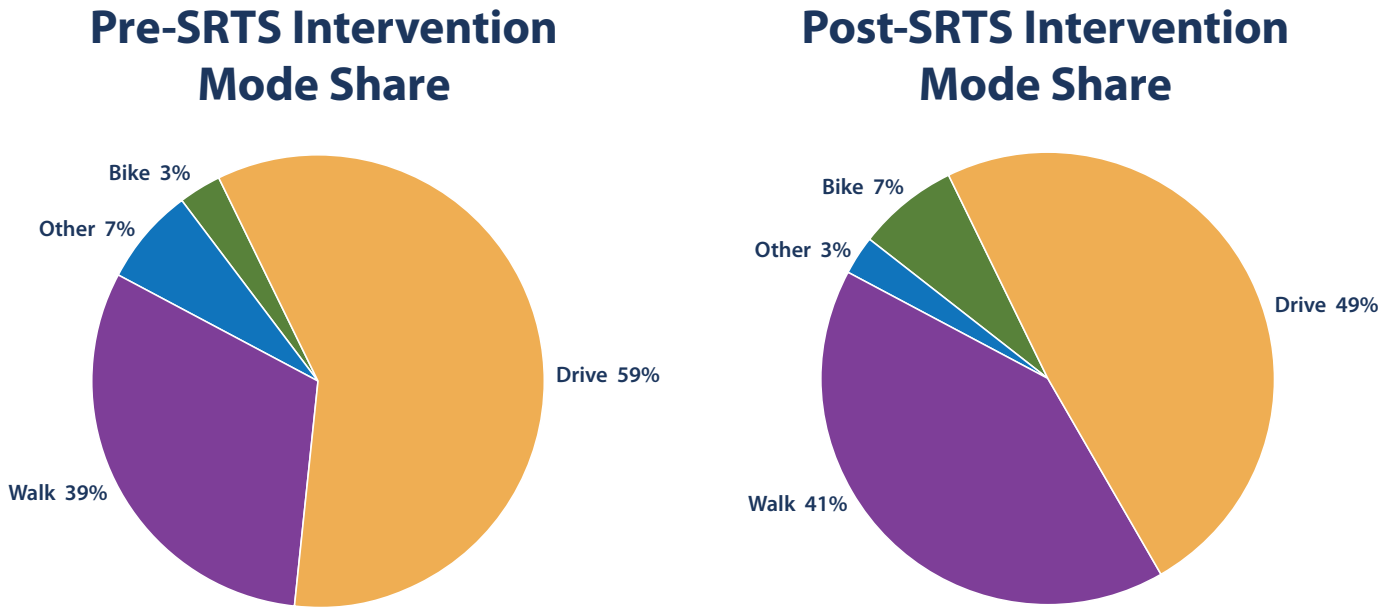


Figure 9: Estimated pre- and post-intervention mode shares for SRTS pilot project

Safe and Sustainable Routes to Schools

The Safe Routes to School (SRTS) program was established in 2012 in response to growing interest from schools in bicycling and walking. In its first year, grants were utilized to create a walking and biking curriculum for students, and bike safety training, as well as fund outreach and events, including National Bike and Walk to School Days at four schools.

The success of this program led to its expansion to include all 10 kindergarten through eighth grade (K-8) public schools in Santa Monica, with a total estimated enrollment of 6,371 students.

Charging Ahead with Electric Vehicles

Electric vehicle ownership in Santa Monica is on the rise. Approximately 2% of all vehicles registered in Santa Monica are electric or hybrid. The percentage of actual electric vehicles (EV) is likely much higher due to vehicles in neighboring areas or vehicles not registered to Santa Monica zip codes.

The 15x15 CAP called for a network of 200 public chargers by the end of 2015. To date, Santa Monica currently has 69 publicly available chargers located primarily in the western part of the city, with 18 more to be installed at mid-city and Main Street lots and downtown structures along Wilshire Blvd. by summer 2016.

The 15x15 CAP also set a target for the installation of 500 private EV chargers, yet only 142 have been installed to date. As most residents live in apartments and condos, which pose multiple challenges to private EV charging, the City and Southern California Edison (SCE) are now focused on increasing charger integration at public locations and multifamily properties. In 2016, Southern California Edison (SCE) launched its Charge Ready pilot program for electric vehicle charging stations. Charge Ready will install and operate the electrical infrastructure required to charge EVs at workplaces, multifamily properties and destinations. This program could help offset a significant portion of coordination and costs associated with EV charger deployment.

OPEN SPACE AND LAND USE

8. Create vibrant mixed use villages that enhance neighborhoods

9. Expand the age, diversity and number of trees in the urban forest

Effective land-use planning links transportation options with employment centers, housing, and green spaces to minimize the need to drive, which can result in significant reductions in associated emissions. Santa Monica seeks to ensure that neighborhoods are safe, walkable, bikeable, and green, utilizing natural features.

Promoting Smart Growth

Transit-oriented development (TOD) places dense nodes of residential and commercial development near mass-transit options allowing people to live within walking distance from where they work and relax.

Since 2013, the City has prioritized new TOD construction near the three Expo Light Rail stations, open spaces, and grocery stores. This new construction encompasses 826 housing units from 21 new projects. All new developments are located no more than a half-mile from open space.

Enhancing Neighborhoods with Green Streets

Green Streets is a concept that incorporates a variety of features to enhance the natural ecosystem and the pedestrian experience. This is achieved through sidewalk widening, sustainable landscaping, incorporation of recycled materials, traffic calming features, and stormwater mechanisms like bioswales and infiltration pits. Such project prioritize pedestrian and biker access, enhance aesthetics, improve air quality, and reduce energy and water maintenance inputs.

Although a standalone 'Complete Green Streets Policy' was not adopted by the City, various plans did incorporate green streets as an important component. The Bergamot Area Plan, Downtown Community Plan, Lincoln Neighborhood Corridor Plan, Memorial Park Neighborhood Plan and Michigan Avenue Neighborhood Greenway Plan all include green streets components.

A Growing Urban Forest

The practice of urban forestry is not only about adding trees to a community – it is about managing the health, quality and diversity of our urban trees. In addition to their aesthetic, trees absorb carbon dioxide, reduce energy use in nearby buildings and heat gain from hot surfaces, filter airborne particles, capture rain and reduce flooding, calm traffic, and even promote well-being.

Annually, Santa Monica's urban forest provides $5.1 million in ecosystem services, including savings in energy, carbon dioxide emissions, air quality, and stormwater. According to the US Forest Service, Santa Monica's trees currently sequester 29,809 metric tons of carbon dioxide.

The City successfully added a net total of 538 trees on public property from 2013-2015, in large part due to the completion of the Expo Line expansion and Esplanade projects.

The City has set a goal to now plant 600 trees annually in order to offset the estimated 400 tree removals that occur, on average, per year.

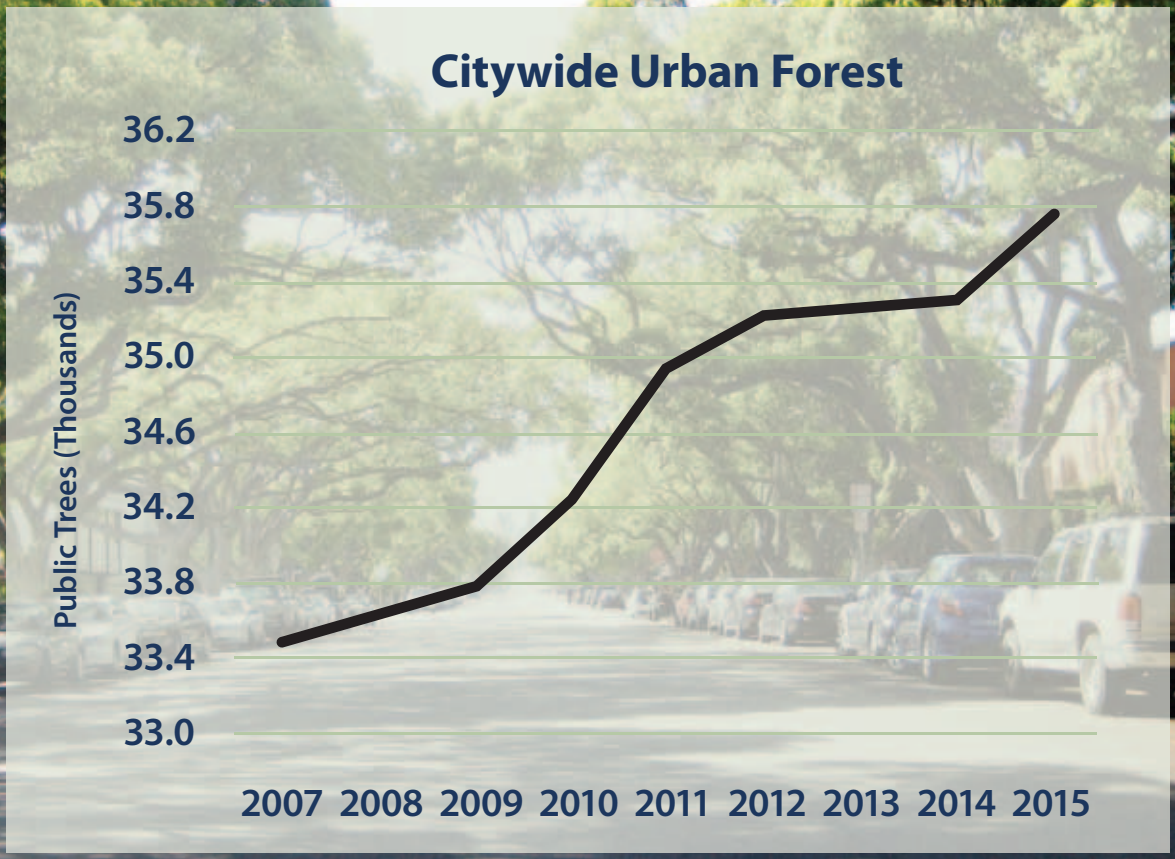


Figure 10: Growth of the Citywide Urban Forest, 2007-2015

WATER CONSERVATION AND EFFICENCY

10. Reduce water demand by 200,000 gallons per day

The pumping, treatment and delivery of water requires lots of energy, which contributes to greenhouse gas emissions. This "water-energy nexus" has taken center stage as the California drought has only intensified efforts to conserve water and its associated energy inputs.

Water conservation has become a way of life for Santa Monicans. The emergency drought response put in place in the last year has placed a lot of emphasis on water efficiency in the short and long-term. The City is boldly pursuing a path to long-term water sustainability with a plan to become water self-sufficient through the optimization of water conservation programs. This will occur through leveraging groundwater supplies, and adding alternate water supplies, include such as treated rainwater, stormwater and wastewater.

Water Conservation Becomes the New Normal

Under the directive to achieve 100% water self-sufficiency from imported water, as well as meet State conservation targets, the City adopted its Sustainable Water Master Plan (SWMP), updated the Water Shortage Response Plan and added a Water Conservation Unit.

An educational and marketing campaign was launched to encourage conservation. Residents and businesses were provided water-use consultations for indoor and outdoor solutions. The City also began to strictly enforce existing conservation ordinances and implemented water-use allowances, which provides a water budget to each customer.

Through these efforts, Santa Monica achieved the State mandated 20% reduction in water use (compared to 2013). From 2012 to 2015, water consumption decreased by approximately 2.8 million gallons per day (MGD), or by more than 20 gallons of water per person per day, well exceeding the goals outlined in the 15x15 CAP. Accordingly, thanks to conservation, the City annually saved 8,140,320 kWh and 2401 MTCO2e embedded in water transport, treatment, and consumption.

On Track to Water Self-Sufficiency

In coordination with the directive to reach water self-sufficiency, 13% of Santa Monica's total used water shifted from imported to locally produced from 2013 to 2015.

Local groundwater remains the largest single source of water supply for the City. To further develop local sources of water this year, the City is currently in the process of piloting a new water treatment plant and designing a wastewater treatment plant, the latter of which would create additional non-potable supply from wastewater through the Sustainable Water Infrastructure Project (SWIP), which is largely funded by State grants. Producing water locally is less energy intensive than importing it from Northern California and the Colorado River. Thanks to the increase of more locally produced water, the City helps avoid 126 MTCO2e that would have otherwise been used on imported water.

To mitigate any increase in new water demand, the City has plans to implement a water neutrality program which will establish water budgets for new development. Exceeding that budget will require the developer to fund community water conservation projects to offset the additional water demand.

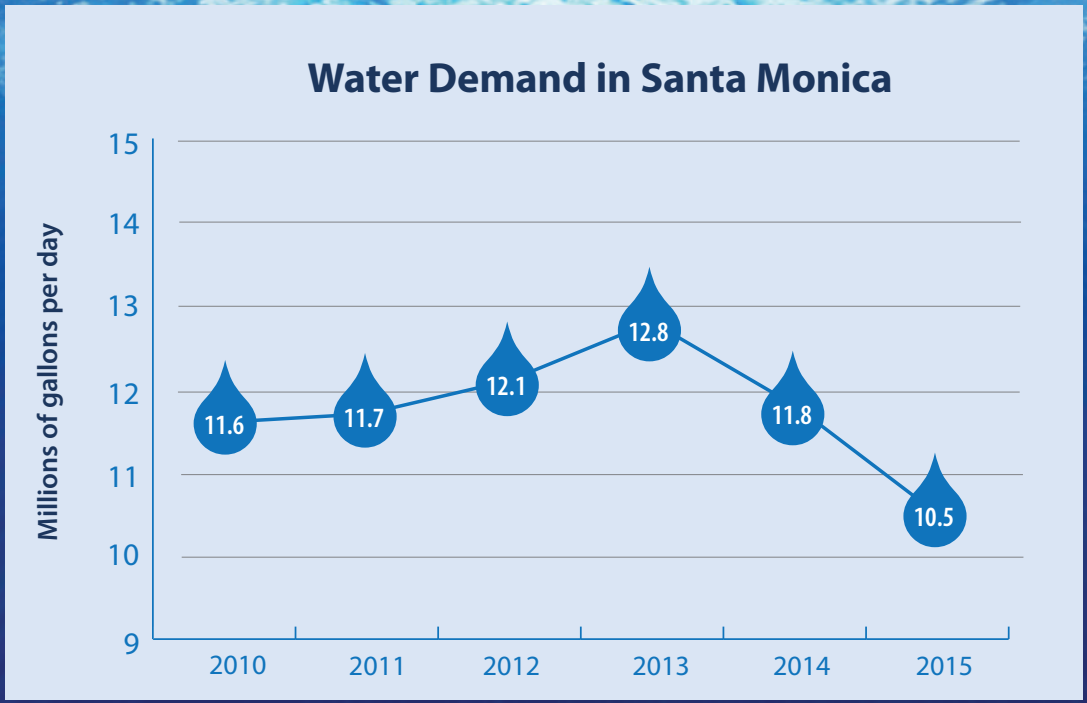


Figure 9: Community-wide water demand, 2010-2015

Paid to Save

Through the "Cash for Grass" and "Rain Harvest Rebate" programs, the City issued 230 rebates to transform water-thirsty lawns into drought-tolerant landscapes and provide rainfall-capturing barrels and cisterns, respectively. The programs saved 3,982,840 gallons of water. "Cash for Grass" in particular will replace an additional 1.1 million sq. ft. of turf by 2020, saving more than 1.6 million gallons annually.

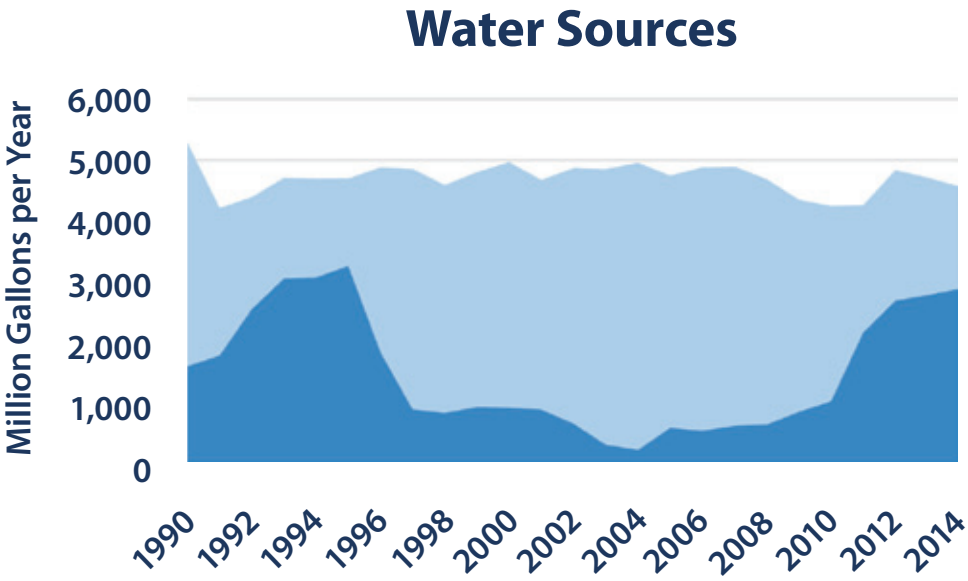


Figure 10: Community-wide water source distribution, 1990-2014

LOCAL FOOD AND AGRICULTURE

11. Reduce consumption of carbon intensive foods

12. Increase the production and consumption of local food

The embedded water, energy, and carbon emissions costs in meat and dairy foods and processed meals are potent, but often overlooked. Choosing to avoid processed and packaged meals, reduce meat and dairy consumption, and promoting locally grown foods is not only healthier and more economical for individuals, but also more sustainable for cities.

In order to reduce carbon emissions associated with food and agriculture, Santa Monica encouraged its own employees to eat meals with less meat and dairy and support local consumption through farmers markets.

Promoting Food Sustainability

In 2013, the City worked with local community members to develop the "Cookbook for a Sustainable Community," a collection of healthy, meat-free appetizers, salads, main dishes, and desserts.

In 2014, Santa Monica was the first city to partner with the Meatless Monday campaign meant to challenge residents to completely eliminate meat from their diets at least once a week. Local restaurants have also taken the challenge to offer Meatless Monday specials on their menus.

The City also created "Sustainable Healthy Food Purchasing Guidelines" to encourage City-hosted events to adhere to its five-principle "Sustainable Food Commitments" by involving more sustainable food.

Going Green by Going Meat-less

From 2014 to 2015, staff involvement in "Meatless in March" resulted in saving 6,059 lb. of carbon dioxide, 3,019,150 gallons of water, and 761 animals. The campaign was promoted online, and elicited 227 City employee pledges.

A Meat-less Municipality

With the Center for Food Safety, the City established a baseline of municipal purchases of meals with meat and dairy products. The information collected for 2014 revealed that 18% of meals purchased with public funds were meatless, well beyond the 2015 goal of 15% set in the Sustainable City Plan. Staff now aim to reduce meat purchases by another 15% by 2020.

In 2014, the Office of Sustainability and the Environment held its first "Meat-less in March" challenge, a call to all City employees to reduce meat and dairy from their meals for an entire month.

Farmers Markets Sales on the Decline

The City owns and operates four Certified Farmers' Markets (CFMs), with an estimated 900,000 annual shoppers. The markets feature locally grown produce with less carbon intensive storage and transportation than conventional produce, while also providing economic support for small farms.

The City did not meet its goal of increasing total farmers markets sales by 2% per year. A decrease in $315,570 in gross sales for 2015 was largely due to the Saturday markets closing for two market days during the December and January holidays. The drought also negatively affected total available produce.

Municipal Farmers Markets Sales

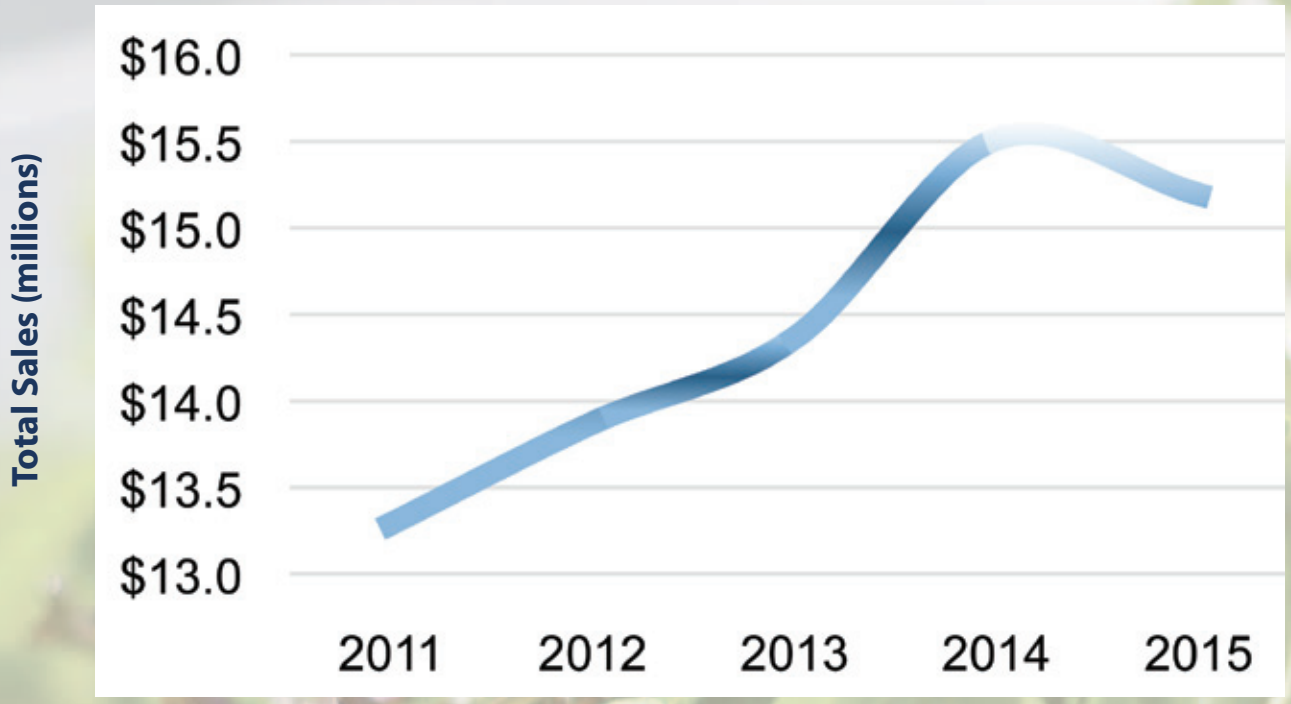


Figure 10: City-operated farmers markets sales, 2011-2015

MUNICIPAL OPERATIONS

13. Reduce municipal greenhouse gas emissions

Santa Monica also established a 30% emissions reduction goal for municipal operations by 2015. Emissions from municipal operations are a small portion of the overall community emissions. Overall emissions have decreased 44% compared to 1990 after a sharp increase in 2007.

The City continues to procure Renewable Energy Credits (RECs) for 100% of its eligible electricity accounts. Staff track municipal emissions in two scenarios: one accounting for RECs and one not accounting. This allows for staff to better understand both the value of energy efficiency and onsite renewable energy and purchasing RECs. When accounting for RECs, the City achieved a 42% reduction below 1990 levels for municipal greenhouse gas emissions.

Share of Emissions

Community Municipal Operations

Water-Energy Nexus

Approximately 30-35% of Santa Monica's water is imported from Northern California and the Colorado River. In 2011, the City set a goal to become water self-sufficient by 2020 and has since increased production of water from local groundwater wells.

Pumping and treating water uses a lot of energy and, as the City has increased production, energy use has risen as well. Currently, pumping and treating water accounts for almost 38% of the City's electricity consumption.

Increasing energy efficiency in operations and siting renewable energy generation for the City's water system will be increasingly important as Santa Monica reaches water self-sufficiency.

Energy Efficiency in Existing and New Buildings

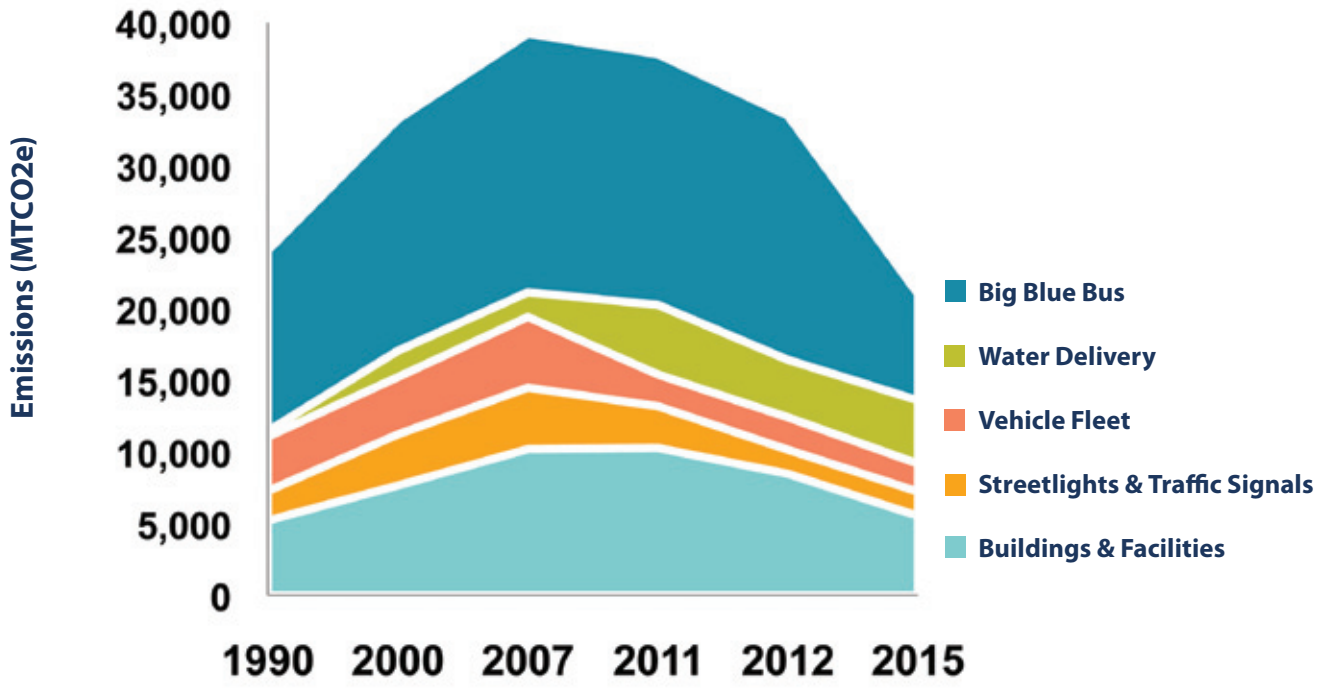
The City routinely identifies and implements energy efficiency projects to lower utility bills and maintenance hours.

Energy efficiency projects under the 15x15 CAP have reduced annual energy use by 1,398,896 kWh in electricity and 36,641 therms of natural gas.

The City's newest facilities were designed and built to the highest sustainability standards. Parking Structure 6 and Pico Branch Library both achieved LEED Platinum and feature solar energy systems.

The City's newest endeavor, the City Services Building, seeks to achieve the most advanced level of sustainability by generating its own energy needs and water needs onsite as a "Living Building".

Municipal Operations Emissions Trend



Big Blue Bus Goes Renewable

One of the biggest sources of emissions in City operations is Big Blue Bus (BBB). While Big Blue Bus has helped keep hundreds of thousands of vehicles off the road, increasing services has also meant increasing emissions, until recently. In 2015, Big Blue Bus announced that it is now fueling its fleet with renewable natural gas - becoming one of first municipal transit authorities in the country to do so - sourced from non-fracked methane gas captured from the decompostion of landfill waste. This bold achievement reduced the BBB fleet's carbon footprint by more than 60%.

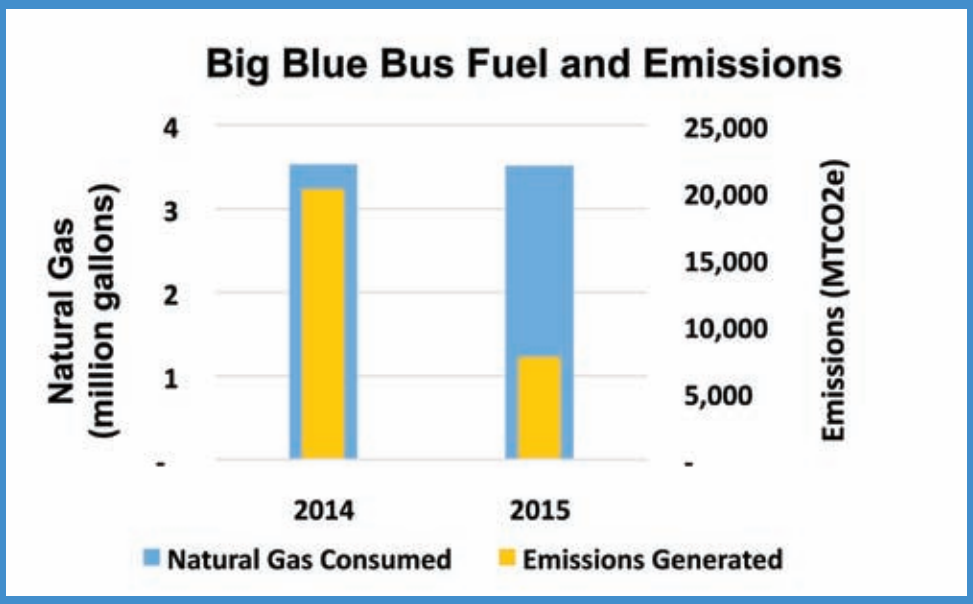


Figure 11: Big Blue Bus natural gas consumption and associated emissions, 2014-2015

CLIMATE MITIGATION AND ADAPTATION

14. Monitor greenhouse gas emissions

15. Adapt to the effects of climate change

Santa Monica works with State partners to prepare for climate change impacts by understanding hazards and potential risks. Researchers at the University of California, Los Angeles (UCLA), supported by the Los Angeles Regional Collaborative for Climate Change and Sustainability (LARC), have downscaled global climate models to understand the impacts of climate change at the neighborhood level. Santa Monica will use these results to identify risks and vulnerabilities to develop appropriate adaptation strategies.

Protecting the Vulnerable

The impacts of climate change, like increased heat and worsened air quality, place a greater burden on populations that are socially and economically vulnerable. Under the Pedestrian Action Plan, the City created a Community Health and Sustainability (CHS) Index to identify areas of Santa Monica where there exists greater disparities in social equity. The CHS Index considers social and economic factors, vulnerable populations, mortality, morbidity, the physical environment, pollution, and crime.

Specifically, vulnerable populations include the economically disadvantaged, elderly, homeless, and those with chronic illness. The areas shown in dark brown are locations where strategic investments in pedestrian and other facilities would have the greatest health and sustainability benefits in neighborhoods where it will make the most difference to people.

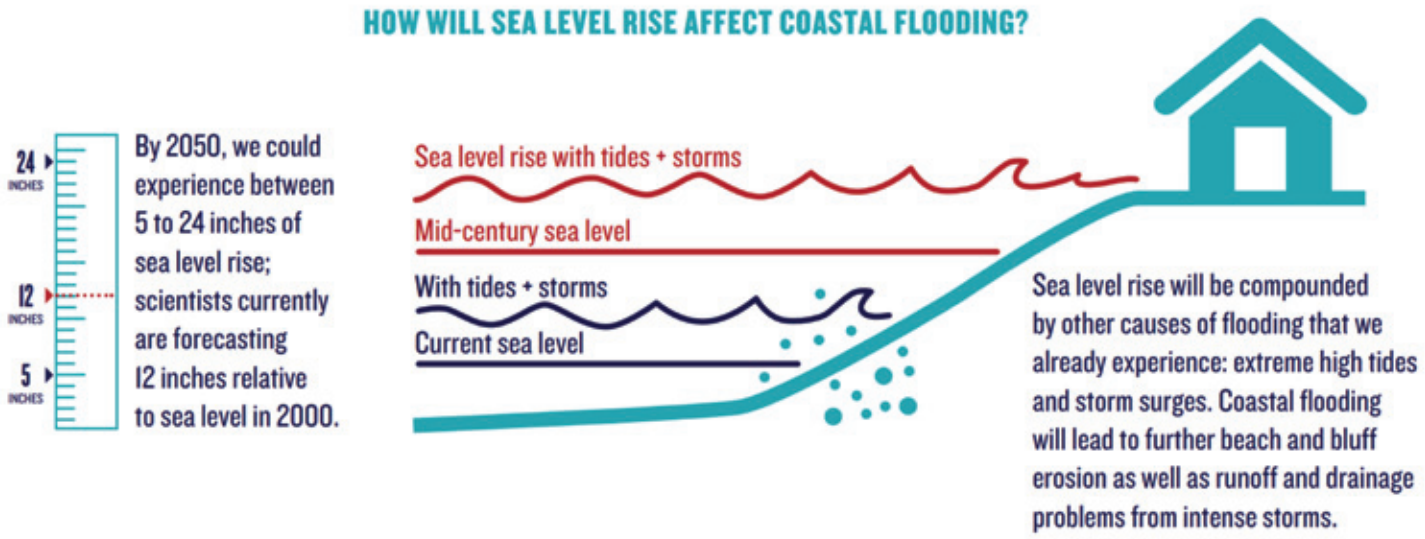
What impacts are likely to affect Santa Monica and greater Los Angeles?

- Moderate warming by an average of 3°F
- More extreme hot days over 95°F
- 31-42% loss of average annual snowfall and earlier spring melt, impacting long-term water supplies
- Increased intensity of Santa Ana winds, causing more wildfires
- Increase in sea levels between 5-24 inches

Figure 12: Pedestrian Action Plan Priority Investment Areas for Health and Sustainability

Sea Level Rise & Coastal Storms

While sea level rise may have a mild effect on Santa Monica relative to its neighbors, coastal storms will generate more extreme damage. Under a grant from the State's Ocean Protection Council, researchers have been working to understand how sea level rise and shoreline change will affect Santa Monica and the Los Angeles region. The United States Geological Survey (USGS) and other scientists are currently preparing local scenarios that will model the extent of flooding that might occur as a result of major storms during high tide events augmented by higher sea levels. These results will support the City's Local Coastal Program, which manages zoning within 300 feet of the ocean, and the forthcoming Climate Action & Adaptation Plan.



APPENDIX

Assumptions

Greenhouse Gas Emissions Inventory

Greenhouse gas emissions associated with different sectors of Santa Monica (energy, waste, transportation, water, and aviation) were calculated using the US Protocol for Community Greenhouse Gas Emissions. The Intergovernmental Panel on Climate Change (IPCC)'s most recent study, the Fifth Assessment Report (AR5), was used in calculating the greenhouse gas emissions associated with various sectors described in the 15x15 Climate Action Plan. Specifically, the 100-Year values were utilized in calculating emissions in the ICLEI (Local Governments for Sustainability) ClearPath tool.

The 2015 electricity emissions factor is 0.26 MTCO2e/MWh, from Southern California Edison's 2014 Social Responsibility Report.

Transportation emissions were calculated using the City's travel demand forecast model, with regional data provided by SCAG. The transportation emissions assumed half of all trips that either started or ended in Santa Monica.

Waste Reduction and Recycling

The City of Santa Monica utilizes waste characterization studies produced by the California Department of Resources Recycling and Recovery (CalRecycle), which leads statewide recycling and waste management programs.

Transportation and Mobility

The Bike Action Plan is considered to be 57% complete, despite the 107 mile increase in bike lanes and upgrades. Some expansion projects that occurred were not enumerated in the Bike Action Plan.

Water Conservation and Efficiency

In calculating emissions saved due to water conservation and efficiency, both quantities of water saved from consumption and locally produced water were analyzed. The total energy intensity of imported water is estimated at 10,620 kWh/MG; the emissions associated with the electricity was estimated using the statewide average emissions factor 0.0002949 MTCO2e/kWh. The total energy intensity of locally produced water is 5,139 kWh/MG Emissions factors provided by LA Department of Water and Power and the EPA were used to perform calculations for each, respectively.

ACKNOWLEDGEMENTS

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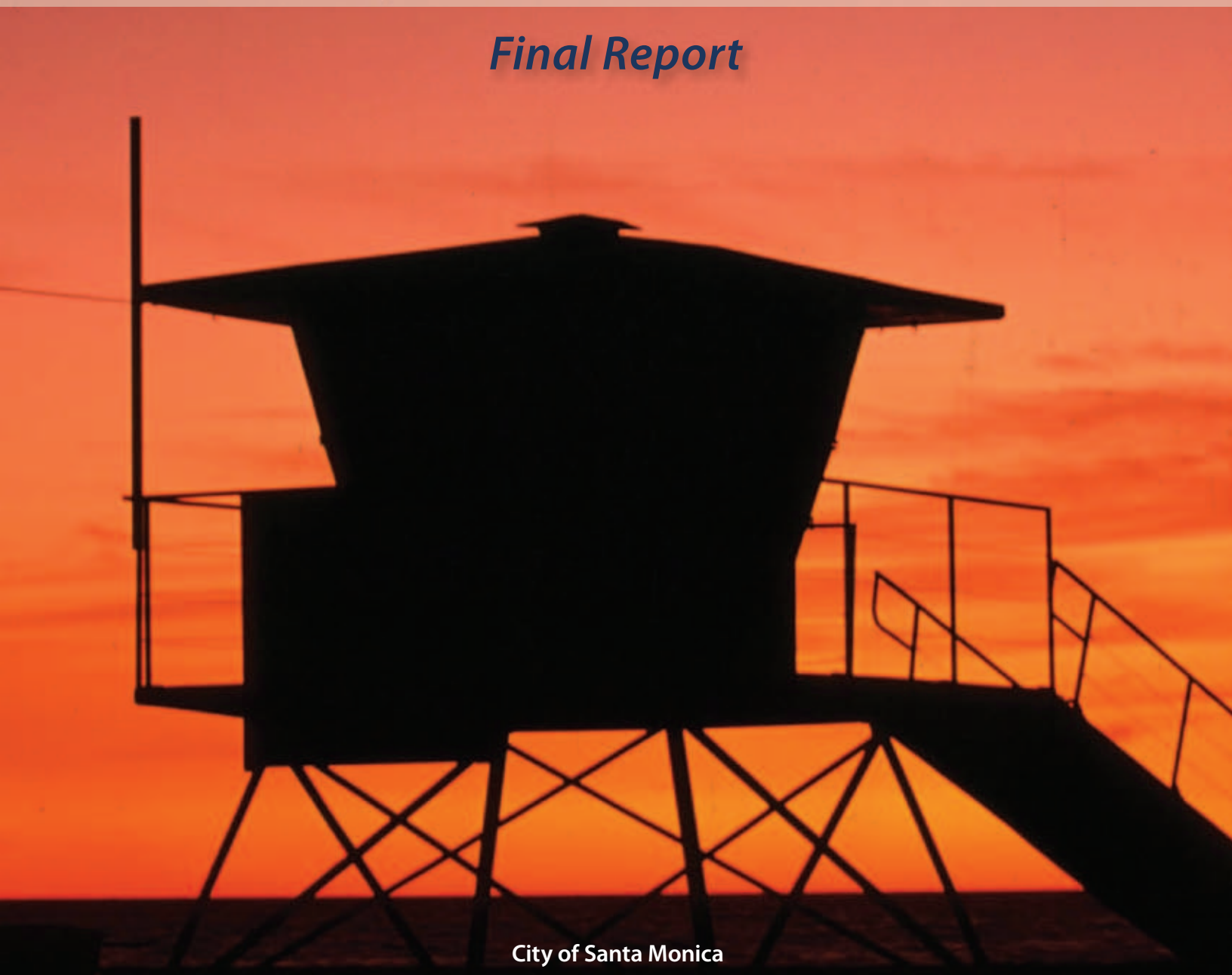
City of Santa Monica

15×15 CLIMATE ACTION PLAN

15 Measures to Reduce Emissions 15% by 2015

Final Report



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