Sustainability Annual Report

FY 2021

Valley Transportation Authority

Solutions that move you

Contents

Acknowledgments

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Cover Page Photo Credit: Danny Quintana

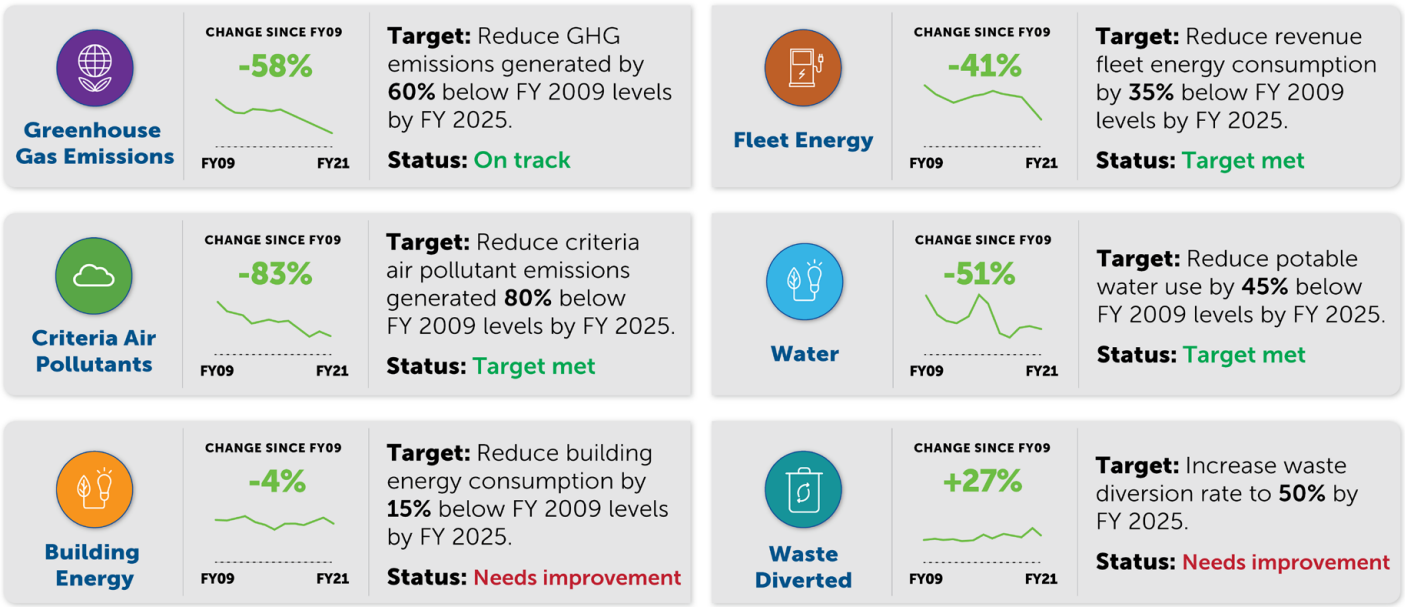
Executive Summary

The FY 2021 Sustainability Report documents Santa Clara Valley Transportation Authority's progress and highlights achievements in sustainability for the reporting period of July 1, 2020, to June 30, 2021.

While VTA's work—as a provider of public transit—is inherently sustainable, this report takes an inward look to assess VTA's progress towards meeting sustainability objectives and targets. Sustainability progress is measured on an annual basis for the following key performance indicators (KPI): greenhouse gas (GHG) emissions, criteria air pollutants, energy use (buildings and fleet), water, and waste.

Despite unprecedented challenges over the last two years, VTA has met or is on-track towards meeting short-term targets identified for all KPI areas except building energy and waste reduction. A summary of this progress is shown in Figure 1 and described in detail in the Environmental Performance section of this report.

Figure 1 **FY 2021 Sustainability Progress**



Current projects and achievements to conserve resources and protect the environment are highlighted throughout this report. Notable projects include the Lighting Upgrade Project which replaces over 500 exterior lighting fixtures with LEDs, and the innovative Cerone Zero Emission Bus Infrastructure and Microgrid Project which provides charging infrastructure powered by on-site solar energy, paired with a battery storage system and microgrid controls. Other achievements include securing funding to support VTA's transition to zero-emission vehicles and the organization of several volunteer events to pick up litter along highways in Santa Clara County.

The findings in this report demonstrate that VTA continues to make incremental progress toward sustainability goals. However, bolder, and more urgent action is needed to achieve long-term targets. Future efforts should focus on making buildings more efficient, optimizing current energy use, and transitioning away from fossil fuels through the electrification of transportation and procurement of energy from renewable sources.

1 Introduction

1.1 About VTA

Santa Clara Valley Transportation Authority (VTA) is an independent special district with wide-ranging responsibilities consisting of transit planning and operations, congestion management, funding, highway design and construction, real estate and transit-oriented development, and bicycle and pedestrian planning. VTA provides bus, light rail, and paratransit services to cities and towns throughout Santa Clara County, including Campbell, Cupertino, Gilroy, Los Altos, Los Altos Hills, Los Gatos, Milpitas, Monte Sereno, Morgan Hill, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga and Sunnyvale. VTA also serves as the Congestion Management Agency (CMA) for the county and maintains a Congestion Management Program (CMP). This Program works with local jurisdictions to reduce traffic congestion and improve land use decision-making and air quality.

VTA's work also extends to regional rail service. VTA participates as a funding partner to operate Caltrain, Capital Corridor, and the Altamont Corridor Express. VTA's BART Silicon Valley Extension Program (BSV) expands Bay Area Rapid Transit service into Santa Clara County, bringing frequent and reliable regional rail service to over 1.7 million county residents. More than a transit project, BSV is an entire program of improvements that will transform Silicon Valley. Facets of the project include transit-oriented communities, multimodal transportation connectivity, as well as roadway, utility, and environmental improvements.

1.2 Sustainability Reporting Framework

The purpose of this report is to present VTA's progress towards meeting the objectives and targets set forth in the Sustainability Plan approved by VTA's Board of Directors in 2020. The sustainability metrics are applicable to the facilities and fleet under the direct operational control of VTA. The data found in this Plan are derived from utility bills, invoices, utility vendors, and fuel and mileage reports, and are as accurate and complete as these data sources allow. Sustainability metrics are used to measure VTA's performance over time. The key performance indicators (KPI) tracked by VTA include greenhouse gas (GHG) emissions, criteria air pollutants, energy use (buildings and fleet), water, and waste. Fiscal Year (FY) 2009 was selected as the baseline year based on available data and establishment of the Sustainability Program in February 2008. Fiscal Year 2025 was selected as a short-term target and FY 2040

was identified as a stretch target for the future. Please refer to the Sustainability Plan for a description of how these years and metrics were identified, the scope of operations included in the reporting process, and the methodologies used to calculate results.

1.3 Summary of FY 21 Operations and Ridership

VTA experienced significant declines in ridership due to the Novel Coronavirus 2019 (COVID-19) pandemic which started in March 2020 with a shelter-in-place order issued for Santa Clara County. For FY 2021, overall ridership was down by 57.6% compared to the prior fiscal year. Limited vehicle capacity seating was imposed and service adjustments were implemented to address passenger pass-ups in accordance with social distancing guidelines. No special event service was provided this year because large gatherings were not permitted. School service was reduced as most schools adopted distance learning programs. Commute trips decreased as most offices and businesses allowed employees to work from home and online shopping was substituted for in-person trips. Ridership began to increase towards the end of the fiscal year when vaccinations became more available to the public. However, light rail service was suspended from May 26, 2021, through the end of the fiscal year, due to a tragic mass shooting incident at the Guadalupe Yard.

Light rail vehicle
Photo Credit: Danny Quintana

2 Environmental Performance

The environmental performance for the last three years are presented below along with a comparison to baseline (FY 2009) conditions and future targets for each KPI. Historical data for all reporting years are provided at the end of this report.

2.1 Greenhouse Gas Emissions

Target: Reduce GHG emissions generated by **60%** below FY 2009 levels by FY 2025.

Status: On track

GHG emissions include carbon dioxide, methane, and nitrous oxide, and are reported as metric tons of carbon dioxide equivalent (MT CO2e). Sources of GHG emissions generated by VTA include the operation of revenue and non-revenue fleets, building energy use, waste, and employee commute. Figure 2.1.1 shows the breakdown of GHG emissions by source. With respect to GHG emissions from electricity use, VTA uses renewable sources of energy from the following Community Choice Aggregators (CCA): San Jose Clean Energy, Silicon Valley Power, Silicon Valley Clean Energy, City of Palo Alto, and PG&E.

In FY 2021, VTA generated 31,012 MT CO2e of GHG. This is 58% lower than the GHG emissions generated in FY 2009. However, this decrease in emissions is largely attributed to non-standard operating conditions during the pandemic, making FY 2021 an outlier year. Compared to a non-pandemic year (FY 2019), GHG emissions per unlinked passenger trip (g CO2e per boarding) was 841 higher in FY 2021. A summary of operating changes made in FY 2021 associated with the COVID-19 pandemic include the following:

- Bus service was reduced to align with lower ridership demand.
- Hybrid paratransit vehicles were taken out of service. It was not possible to maintain social distancing requirements between the driver and passengers in Toyota Prius models. Therefore, larger non-hybrid vans were used.
- Meetings and events were held virtually and required no travel by VTA staff to attend. Therefore, the use of non-revenue vehicles declined.
- Implementation of a work-from-home program allowed employees to work remotely and not commute to/from the office.

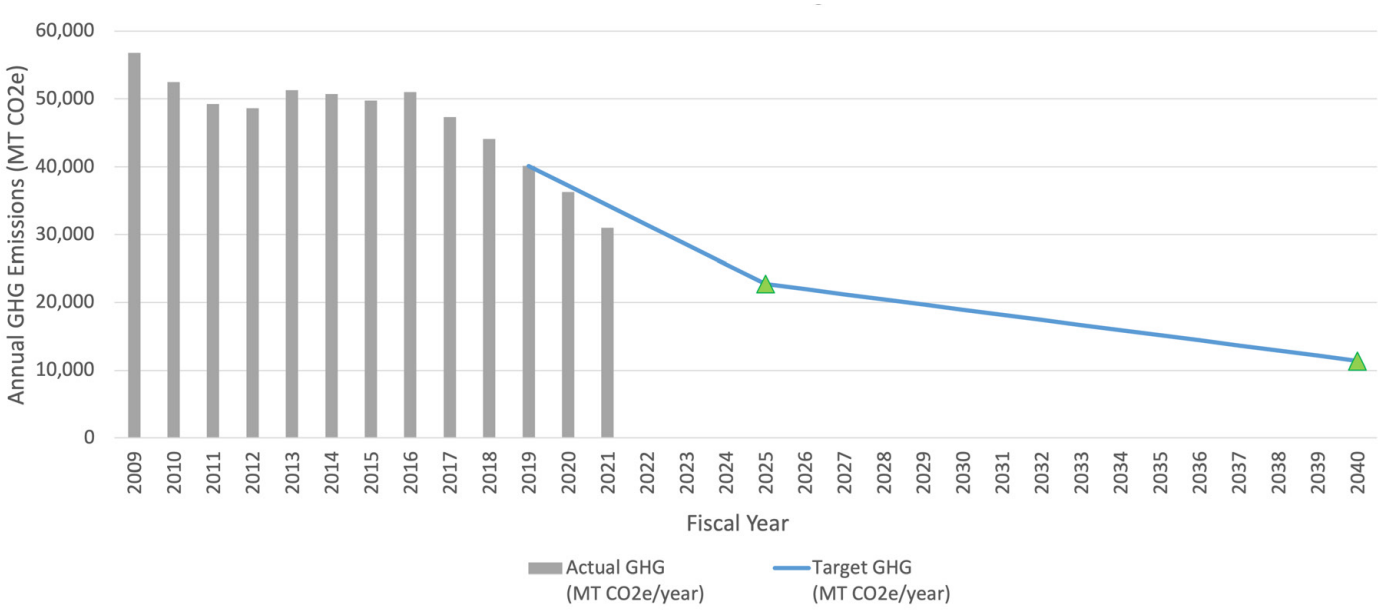
Figure 2.1.2 shows the emissions generated in this reporting year compared to the 2009 baseline. VTA is currently on track to meeting the targets set for FY 2025, assuming the downward trend continues at a rate of approximately 10% each year. Since the revenue fleet is the leading contributor–representing 79% of the total emissions VTA generates–this achievement is largely dependent on the conversion of VTA's fleet to cleaner vehicles.

Figure 2.1.2 GHG Emissions Generated by Source Compared to FY 2009 Baseline

Fiscal Year	Fleet (MT CO_2e)	Building Energy (MT CO_2e)	Waste (MT CO_2e)	Employee Commute (MT CO_2e)	Water (MT CO_2e)	Total GHG Emissions Generated (MT CO_2e)	Change from FY 09
2009	46,699	6,777	1,803	1,471	23	56,773	
2019	34,213	3,030	1,726	1,249	17	40,235	-30%
2020	30,422	3,105	1,586	1,107	11	36,232	-36%
2021*	26,185	2,522	1,548	753	4	31,012	-58%

** Current reporting year*

Figure 2.1.3 GHG Emissions Reduction Targets



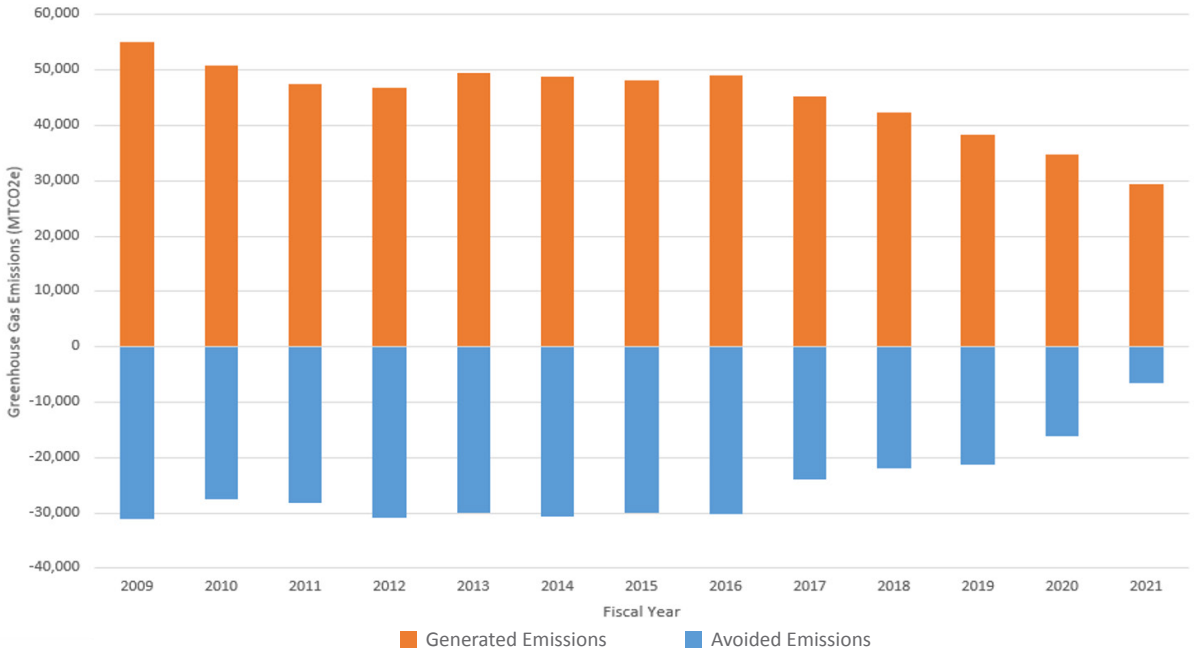
According to the 2017 Community Wide GHG Inventory and Forecast prepared by the County of Santa Clara (June 2021), emissions from the on-road transportation sector, calculated from passenger and commercial vehicle miles traveled (VMT), account for 45% of the GHG emissions in the county. As a transit provider, VTA helps reduce VMT and offset regional GHG emissions by providing alternatives to driving alone. In FY 2021, VTA helped displace regional GHG emissions by 6,658 MT CO2e. According to the U.S. Environmental Protection Agency (EPA), this is equivalent to taking 1,435 gas-powered cars off the road for one year.[1] Figure 2.1.3 shows the GHG emissions avoided through mode shift from single-occupancy vehicles to transit.

The avoided emissions in FY 2021 are significantly less compared to a non-pandemic year when ridership was higher. As discussed in Section 1.2, ridership plummeted during the

[1] Source: EPA's GHG Equivalencies Calculator, https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

pandemic when schools turned to distance learning, employers implemented work-from-home programs, and consumers turned to online shopping. How many commuters will return to transit and workplaces post-pandemic is yet to be seen. However, it remains clear that reducing VMT is a central component of ensuring the region's ability to meet climate goals as the population grows. Measures to reduce VMT and GHG emissions will be studied in the forthcoming Climate Action and Adaptation Plan (CAAP) and Valley Transportation Plan prepared by VTA, and Climate Roadmap 2030 prepared by the County of Santa Clara.

Figure 2.1.3 **Generated and Avoided GHG Emissions**



2.2 Criteria Air Pollutants

Target: Reduce criteria air pollutant emissions generated **80%** below FY 2009 levels by FY 2025.

Status: Target met

High Occupancy Vehicle Lanes in Santa Clara County

To protect public health and the environment, the U.S. EPA set national standards for six common air pollutants, known as criteria pollutants. These include ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead. These pollutants are linked to public health concerns including increases in respiratory disease, lung damage, and cancer.

In FY 2021, VTA emitted 71 tons of criteria air pollutants through the operation of its vehicle fleet and employee commute. This is an 83% reduction from the baseline year and achieves the target set for FY 2025, as shown in Figures 2.2.1 and 2.2.2. These results are consistent with the downward trend of emissions reported for the Bay Area region. According to the Bay Area Air Quality Management District, criteria air pollutant emissions have reduced despite regional growth in the local economy, population, and traffic over the past several decades. This is attributed to air quality measures and improvements such as more stringent emission and fuel economy standards required by the California Air Resources Board (CARB).

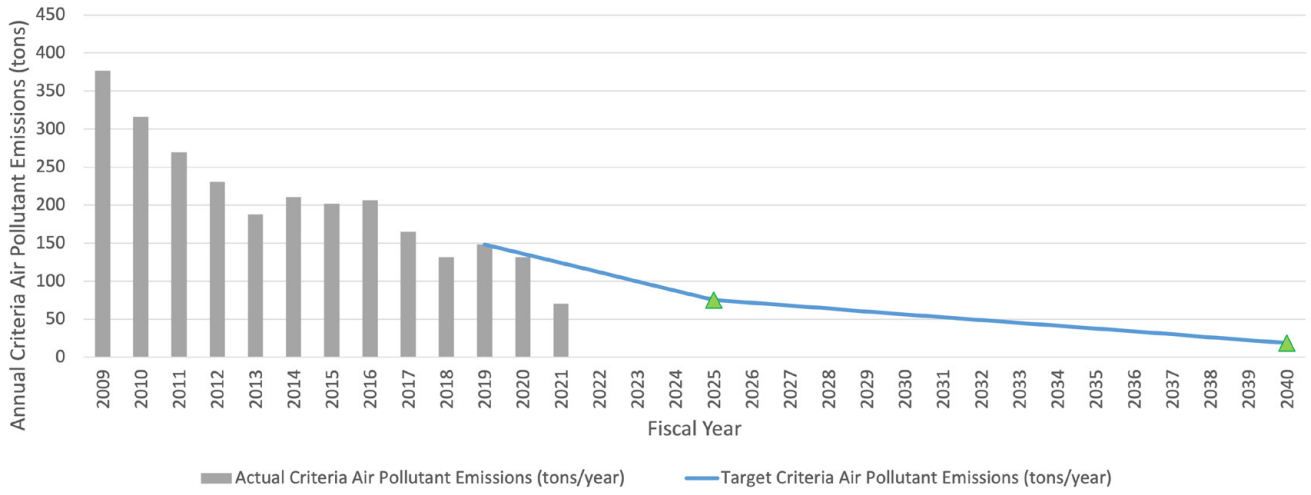
Importantly, while VTA generates emissions, it also helps lower emissions and improve air quality by providing public transportation and alternatives to single-occupancy vehicles. As VTA converts more of its fleet to zero-emission vehicles, the amount of displaced emissions will be higher than the amount generated. Currently, VTA's net reduction of criteria air pollutants is 37 tons (71 tons generated – 34 tons displaced). Please refer to Section 2.4 for a discussion of VTA's zero-emission bus transition.

Figure 2.2.1 Criteria Air Pollutants Compared to FY 2009 Baseline

Fiscal Year	Criteria Air Pollutant Emissions (Tons)	Change from FY 09
2009	377	
2019	148	-61%
2020	132	-65%
2021*	71	-83%

** Current reporting year*

Figure 2.2.2 Criteria Air Pollutant Reduction Targets



2.3 Building Energy

Target: Reduce building energy consumption by **15%** below FY 2009 levels by FY 2025.

Status: Needs improvement

Buildings and facilities are powered by electricity,[2] natural gas, and propane. Net grid[3] electricity use decreased by 33% in FY 2021 compared to baseline. This reduction is mostly attributed to the temporary closure of Guadalupe Division and increase in productivity from solar panels. Natural gas use increased by 12% in FY 2021 compared to the baseline. This increase is caused by the changes required to manage indoor temperature and ventilation systems in compliance with Centers for Disease Control and Prevention (CDC) guidelines during the pandemic. Propane use decreased by 32% in FY 2021 due to lower heating requirements because of warmer weather, reduced operations, and moving break areas outdoors during the pandemic. Figure 2.3.1 shows the total building energy use by fuel type.

Overall, VTA was able to achieve a 4% reduction in building energy consumption in FY 2021 compared to the baseline year. This reduction is shown in Figure 2.3.2. Unless more can be done to conserve energy and improve efficiency, VTA will not be on track to meet the FY 2025 target of reducing building energy consumption by 15% below FY 2009 levels.

Figure 2.3.1 **Building Energy Use by Fuel Type Compared to FY 2009 Baseline**

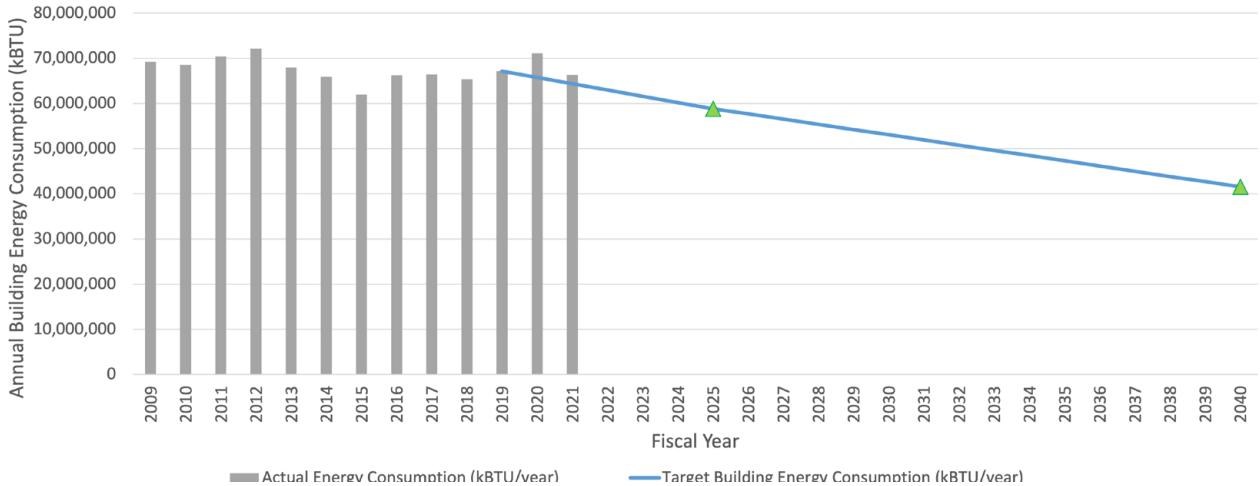
Fiscal Year	Electricity (kBTU)	Natural Gas (kBTU)	Propane (kBTU)	Total Building Energy Use[6] (kBTU)	Change of Total Building Energy Use from FY 09
2009	43,992,951	15,230,243	9,997,078	69,220,272	
2019	45,935,385	13,910,378	7,294,651	67,140,414	-3%
2020	47,273,680	15,778,932	8,073,156	71,125,768	3%
2021*	42,385,605	17,092,488	6,813,249	66,291,341	-4%

** Current reporting year*

[2] Purchased directly from the utility, or grid, as well as from the generation of on-site solar panels.

[3] Grid electricity is the electricity received from the electrical grid from electrical providers such as Independently-Owned Utilities, Community Choice Aggregators, and Municipally-Owned Utilities . Net grid electricity usage is the difference between the total electricity consumption by VTA and the solar-generated electricity from 5 on-site solar or photovoltaic (PV) systems. In addition to the installation of PV systems, VTA attributes reduction in net grid electricity usage to participating in Community Choice Aggregate programs.

Figure 2.3.2 **Building Energy Consumption Targets**



Many Bay Area jurisdictions are adopting Zero Net Energy/Zero Net Carbon (ZNE/ZNC) goals for their buildings as part of their commitment to address the climate crisis. Zero Net Energy buildings produce as much energy on-site as they use. All-electric buildings that produce as much energy on-site as they use are also Zero Net Carbon. VTA's ongoing facility master planning process is assessing the condition of existing facilities for the purpose of planning and programming future rehabilitation work. The Sustainability Team is involved in this process and will make recommendations to help optimize energy use and identify equipment upgrades to move VTA towards ZNE/ZNC goals.

A project to upgrade outdoor lighting efficiency at River Oaks and the Cerone Bus Yard is currently underway and expected to be complete in 2023. The Lighting Upgrade Project will replace 506 existing outdoor fixtures with new, energy efficient LED fixtures. Light fixtures are being designed to maximize usable light for people, while reducing light pollution and minimizing disturbance to nocturnal wildlife. This project includes lighting controls that enable the light fixtures to be dimmed as needed. The brighter lights improve visibility and enhance safety and security needs while reducing energy use by approximately 272,000 kWh per year. The project is expected to save VTA $52,000 in energy costs per year.

Zero Emission Buses

2.4 Fleet Energy

Target: Reduce revenue fleet energy consumption by **35%** below FY 2009 levels by FY 2025.

Status: Target met

VTA's fleet includes non-revenue vehicles, buses, paratransit vehicles, and light rail trains. Fleet energy includes the consumption of fuel and electricity. With the conversion to a more efficient fleet, fuel use has declined in all fleet types since the baseline year. The metrics for FY 2021 are provided below by fleet type.

- Non-revenue fleet: used 117,496 gallons of diesel and gasoline. Fuel use was down by 31% for diesel and 25% for gasoline compared to the baseline.
- Bus fleet: used 2,993,834 gallons of fuel and 135,325 kWH of electricity. Fuel use was down by 34% for diesel and by 66% for gasoline compared to the baseline.
- Paratransit fleet: used 59,448 gallons of gasoline. Fuel use reduced by 84% compared to the baseline.
- Light rail: used 22,348,002 kWh of electricity. Energy used for light rail operations declined by 16% compared to the baseline year.

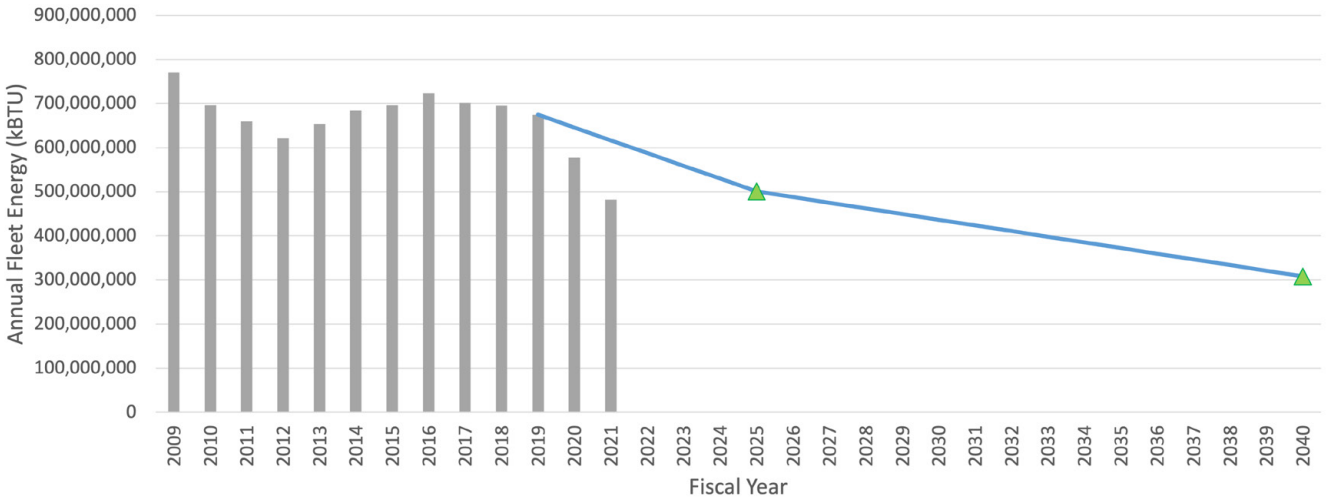
VTA's sustainability targets focus on improving efficiency of the revenue fleet which consists of bus, paratransit, and light rail service. Energy is presented in BTUs to provide an equal comparison across the different sources of energy used. Figure 2.4.1 shows the total energy use compared to the baseline. In FY 2021, revenue fleet energy use was 41% lower than the baseline year, which achieves the target set for FY 2025. However, this decline is abnormal and attributed to reduced bus service provided during the pandemic.

Figure 2.4.1 **Revenue Fleet Energy Use Compared to FY 2009 Baseline**

Fiscal Year	Revenue Fleet Energy Consumption (MMBTU/year)[7]	Change in Energy Consumption from FY 09
2009	770,669	
2019	674,570	-12%
2020	577,053	-25%
2021*	481,632	-41%

** Current reporting year*

Figure 2.4.2 **Fleet Energy Use Reduction Targets**



VTA is committed to a full transition of its fleet to zero-emission vehicles. In 2021, VTA's Board of Directors approved battery-electric buses as VTA's path towards near-term implementation of CARB's Innovative Clean Transit Regulation. Over approximately the next five years, VTA will grow its battery-electric bus fleet and install charging infrastructure at bus depots. Battery-electric buses would be deployed on VTA's shorter service blocks where travel range limits are not a concern. VTA secured 15 million dollars in federal funding from the Federal Transit Administration to install electric chargers at the Milpitas Transit Center and Cerone Division. These on-route chargers are necessary to extend the range of battery-electric buses given VTA's longer service blocks. This funding will also enhance workforce development by recruiting and training VTA staff to operate and maintain this new technology.

The Cerone Zero Emission Bus Infrastructure and Microgrid Project is also underway. This innovative project provides the electrical infrastructure, renewable energy, energy storage, and microgrid controls to support a fleet of 34 battery electric buses by 2024.

Electrical charging infrastructure

2.5 Water

Target: Reduce potable water use by **45%** below FY 2009 levels by FY 2025.

Status: Target met

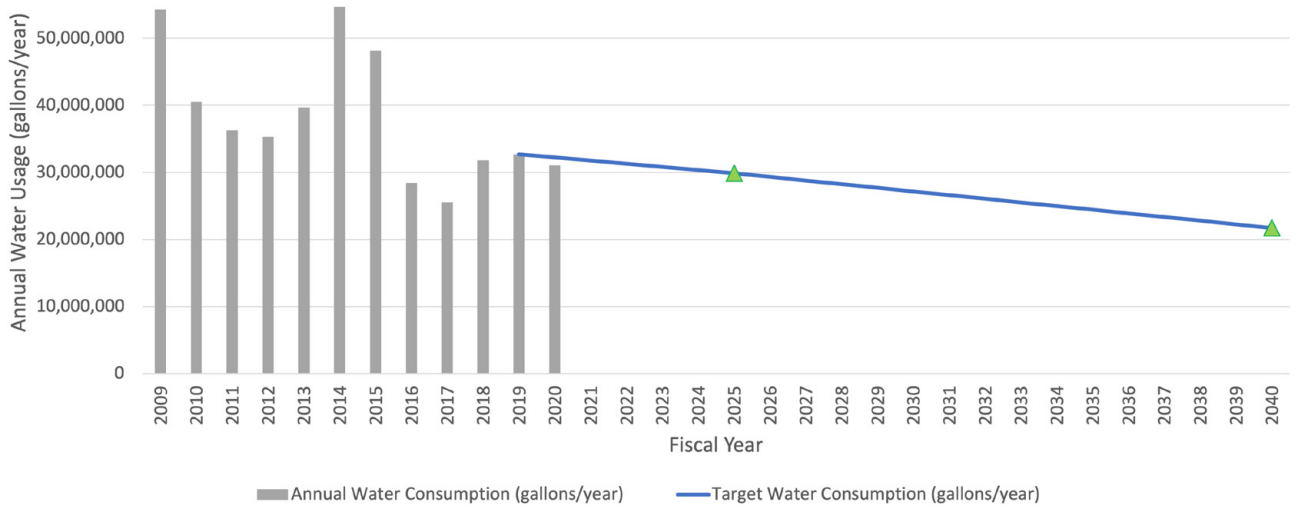
VTA used 26 million gallons of potable water[4] for landscaping, washing vehicles, and operating facilities in FY 2021, representing a decrease of 51% in potable water usage from the baseline year. This reduction achieves the target set for FY 2025. The large decrease in water use is attributed to employees teleworking; the shutdown of Guadalupe Division and suspension of light rail service, including washing of trains; and proactive repair of leaks. The use of non-potable, or recycled water, increased dramatically, by 342% from the baseline year. Non-potable water is used for irrigation at the Milpitas and Berryessa BART stations which opened in 2020. Figure 2.5.1 shows total water use by source and compares potable water use compared to the baseline year. Figure 2.5.2 shows VTA's targets for potable water use.

Figure 2.5.1 Potable Water Use Compared to FY 2009 Baseline

Fiscal Year	Non-Potable Use (Gallons)	Potable Use (Gallons)	Total Water Use (Gallons)	Change of Potable Water Use from FY 09
2009	2,883,910	54,321,484	57,205,394	
2019	15,691,916	32,691,249	48,383,165	-40%
2020	11,629,105	31,064,707	42,693,812	-43%
2021*	12,745,214	26,347,823	39,093,036	-51%

** Current reporting year*

Figure 2.5.2 Potable Water Reduction Targets



[4] Potable water is defined as water that is treated to levels that meet state and federal standards for human consumption.

U.S. Drought Monitor classifies all of Santa Clara County in severe drought, the state's largest reservoirs are well below average, and snowpack levels in the Sierra Nevada are at historic lows. In July 2021, Governor Newsom issued an executive order and called on all Californians to voluntarily reduce their water use by 15% compared to 2020. Santa Clara County residents and businesses answered the call, and reduced water use by 9%, more than double the state average. In April 2022, the Valley Water Board of Directors voted to restrict the watering of lawns and ornamental landscapes in Santa Clara to no more than two days a week and to prohibit watering during the warmest parts of the day (for example, no irrigation between 7 a.m. and 7 p.m.). VTA adjusted irrigation schedules accordingly and encouraged employees to conserve water at home.

Regarding indoor water use, VTA is renovating facilities as part of its ongoing rehabilitation work. A project to upgrade restroom facilities at Chaboya Division was completed in 2021. This project included the installation of low flow faucets and toilets to conserve water.

Landscaping at Milpitas Transit Center

2.6 Waste Diversion

Target: Increase waste diversion rate to **50%** by FY 2025.

Status: Needs improvement

Figure 2.6.1 shows the weight of waste generated by VTA and the percentage of waste diverted away from landfills through either recycling or composting. VTA had a diversion rate of 27% in FY 2021. This rate is generally consistent with pre-pandemic conditions because the increase in disposables (e.g., face masks, face shields, gloves, disposable wipes used to disinfect vehicles and facilities, and single-use plastics) was offset by lower ridership and less waste generated by employees working from home during the pandemic.

Figure 2.6.2 shows VTA's waste diversion rate targets. To meet the target diversion rate of 50% by FY 2025, VTA will need to substantially increase recycling and composting rates. The rehabilitation of existing facilities and rebuilding of VTA's light rail operating division presents opportunities to expand the composting program beyond the administrative headquarters building and into break areas, restroom facilities, and locker rooms as new facilities are designed and constructed. Other strategies to address the waste problem include revising procurement policies and processes to prioritize environmental preferrable procurement, conducting waste assessments and audits to identify improvements, and obtaining additional waste and recycling data from vendors.

Figure 2.6.1 **Weight by Waste Type and Diversion Rate Compared to FY 2009 Baseline**

Fiscal Year	Landfill Waste (Tons)	Recycled Waste (Tons)	Composted Waste (Tons)	Diversion Rate (Recycled + Composted)/Total Generated Waste
2009	1,202	176	164	22%
2019	1,151	186	212	26%
2020	1,058	298	337	38%
2021*	1,032	287	102	27%

** Current reporting year*

Figure 2.6.2 Waste Diversion Rate Targets

In addition to reducing the waste that it generates, VTA has teamed up with Caltrans, California Highway Patrol, and Valley Water to clean up trash and prevent litter on highways in Santa Clara County. The Keep Santa Clara Valley Beautiful Project is a multi-jurisdictional initiative to change behaviors and attitudes toward littering. Trash on the highways is hazardous to drivers, the environment, and residents. In FY 2021, VTA organized several volunteer cleanup events and placed No Dumping enforcement signs at frequently littered locations to help keep highways and communities safe and clean.

Volunteers pick up litter at cleanup events

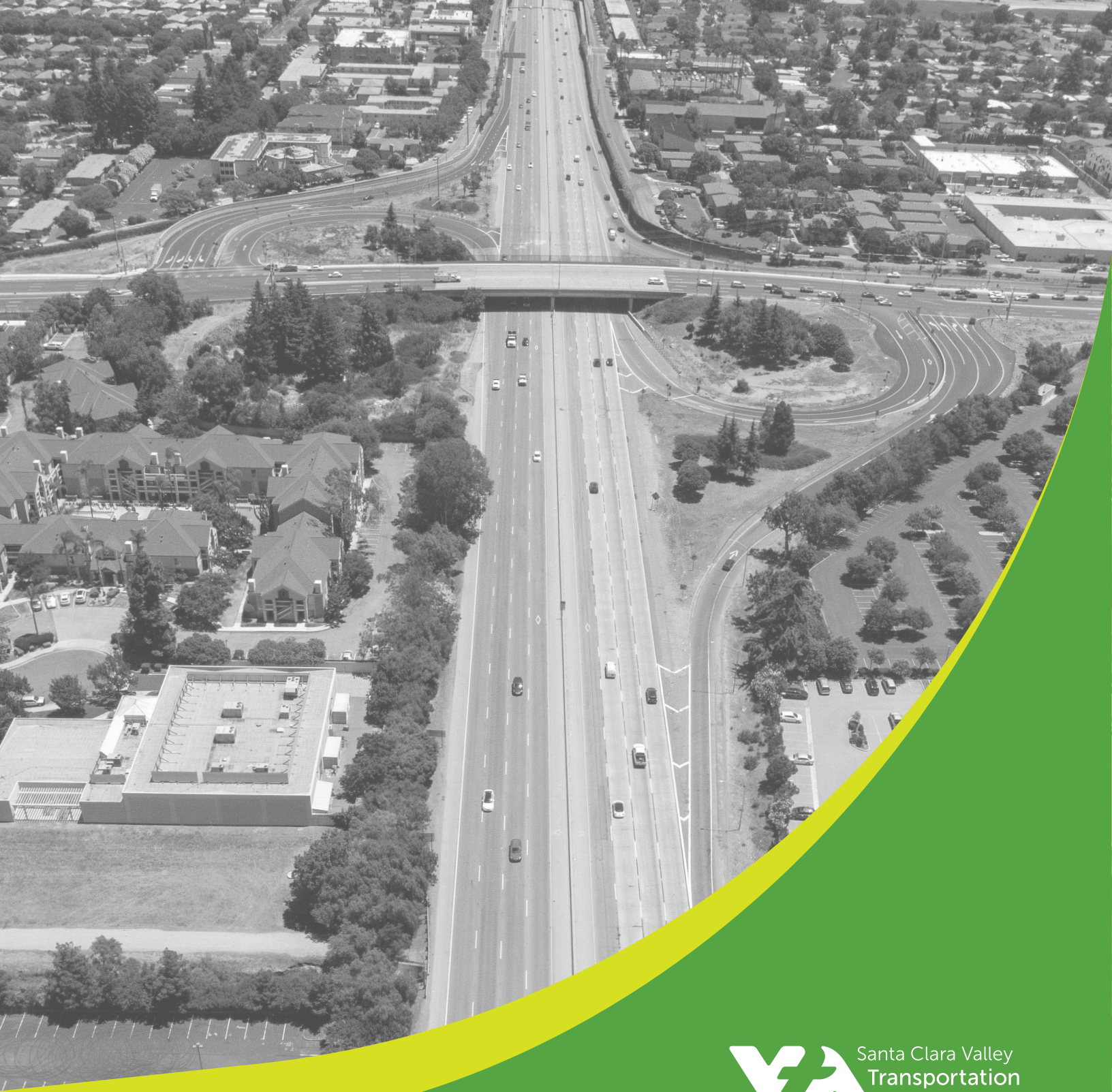
3 Conclusions and Recommendations

VTA has met or is on track towards meeting short-term targets identified for FY 2025 in all KPI areas except building energy and waste reduction. However, the FY 2021 reporting year will likely be considered an outlier year when compared to earlier years, and potentially future trends, because it does not represent standard operating conditions. Therefore, these short-term results should be viewed with caution when considering FY 2040 stretch targets.

For example, while the targets for fleet energy have been met for the short-term, this does not indicate that VTA is necessarily on-track towards meeting longer term targets for this KPI. The significant decline in diesel fuel used by buses in FY 2021 is abnormal and attributed to reduced service levels provided during the pandemic. Efforts to restore transit to pre-pandemic levels are underway. After service is fully restored, it will be expanded to provide more frequency. This could result in increased use of fuel consumption, leading to higher GHG emissions, unless aggressive counteractions are taken to decarbonize VTA's operations—not eventually, but right now.

Modernizing buildings to make them more energy efficient, optimizing current energy use, transitioning to zero-emission vehicles, and buying more energy from renewable sources are required actions to confront the climate crisis. In addition, improving waste management, designing sustainable infrastructure, and promoting environmental procurement practices are key to moving VTA forward.

Family bicycling in downtown San Jose



Santa Clara Valley Transportation Authority

Solutions that move you

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