
# Sustainability Annual Report

FY 2022

Valley Transportation Authority

# Contents

# Executive Summary

The FY 2022 Sustainability Report documents the progress made by the Santa Clara Valley Transportation Authority (VTA) towards meeting the objectives and targets adopted in its 2020 Sustainability Plan. This report is organized as follows:

**Section 1** provides background information related to VTA and its sustainability metrics.

**Section 2** documents VTA's performance during the FY 2022 reporting year (July 1, 2021, to June 30, 2022) for the following key performance indicators (KPI): greenhouse gas (GHG) emissions, criteria air pollutants, energy use (buildings and fleet), water, and waste. This performance is compared to baseline conditions (FY 2009), short-term (FY 2025) targets, and future (FY 2040) targets. The current status for each KPI, relative to the established targets, is indicated by Target Met, On Track, and Needs Improvement based on chart data and corresponding figures provided for each sub-section.

**Section 3** describes more Sustainability activities, including stormwater management, anti-litter initiatives, and VTA's work to promote transit-oriented communities. This section is new to this report and will evolve over time to include relevant collaborations, projects, and programs.

**Section 4** provides overall conclusions and recommendations to achieve long-term targets by 2040.

*VTA Sustainability Team*

In summary, during the FY 2022 reporting year, VTA's Sustainability Program focused on maintaining existing facilities, supporting state of good repair projects, and improving the efficiency and accuracy of the reporting process, resulting in a shorter overall reporting cycle. As an agency, VTA focused on recovering ridership and stabilizing its workforce after the unprecedented challenges of the pandemic and the tragic attack on our Guadalupe co-workers at the Guadalupe Light Rail Yard on May 26, 2021. VTA is on-track to meeting the fleet energy target; has met the short-term targets for criteria air pollutants and potable water and is on-track to meeting the established stretch targets; and needs improvement in the areas of GHG emissions, building energy, and waste diversion.

This report was prepared by the Environmental Programs staff in VTA's Engineering and Program Delivery Division with contributions from members of the Sustainability Team. This dedicated and inclusive Team was established in 2008 and is comprised of staff from all over the agency who share the vision of a greener VTA.

# 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.

*VTA bus stops feature LED lighting and passenger amenities.*

*Montague Expressway Pedestrian Overcrossing*

## 1.2 Sustainability Reporting Framework

This document is the fourteenth Annual Report for the Sustainability Program. The Report will continue to expand as new problems are solved, facilities are improved, and new technologies are implemented. It summarizes progress made during the FY 2022 reporting period (July 1, 2021, to June 30, 2022) towards meeting VTA's sustainability objectives and targets. These objectives and targets were 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 Annual Report 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 due to 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.

*Light rail trains serve commuters throughout Santa Clara County*

## 1.3 Summary of FY 22 Operations and Ridership

VTA's service and operations changed drastically to adjust to the vast declines in ridership during the Novel Coronavirus 2019 (COVID-19) pandemic. VTA bus and light rail ridership has grown slowly, but steadily since the early pandemic in 2020 when we were carrying just 20 percent of our typical riders. This reporting year, ridership is on a strong rebound, growing by 50 percent since the start of 2022. Light rail operations and facilities were significantly impacted by the shutdown of light rail service starting on May 26, 2021, after the tragic mass shooting at Guadalupe. Light rail service and operations resumed in phases starting in September 2021. The data in this report reflects these conditions.

# 2 Environmental Performance

The environmental performance for the last three years is presented below along with a comparison to baseline (FY 2009) conditions and future targets for each KPI. Historical data for all reporting years is provided in an appendix and available upon request.

# 2.1 Greenhouse Gas Emissions

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

**Status:** Needs Improvement

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, employee commute, and water. Figure 2.1.1 shows the breakdown of GHG emissions by source.

In FY 2022, VTA generated 46,648 MT CO2e of GHG. This is 33% lower than the GHG emissions generated in FY 2009. GHG emissions have generally been trending downward thanks to VTA's efforts to use cleaner vehicles and more renewable energy sources. However, the decrease in emissions over the last couple of years is largely attributed to non-standard operating conditions during the pandemic between FY 20 and FY 21, and the temporary shutdown of light rail service and closure of the Guadalupe Light Rail Division for part of FY 22.

***Figure 2.1.1*** **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 | 59,747 | 6,777 | 1,803 | 1,507 | 23 | 69,857 | |
| 2020 | 40,681 | 3,381 | 1,586 | 1,215 | 3 | 46,866 | -33% |
| 2021 | 34,017 | 3,024 | 1,548 | 832 | 4 | 39,425 | -44% |
| 2022* | 39,590 | 3,696 | 2,394 | 965 | 3 | 46,648 | -33% |

** Current reporting year*

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

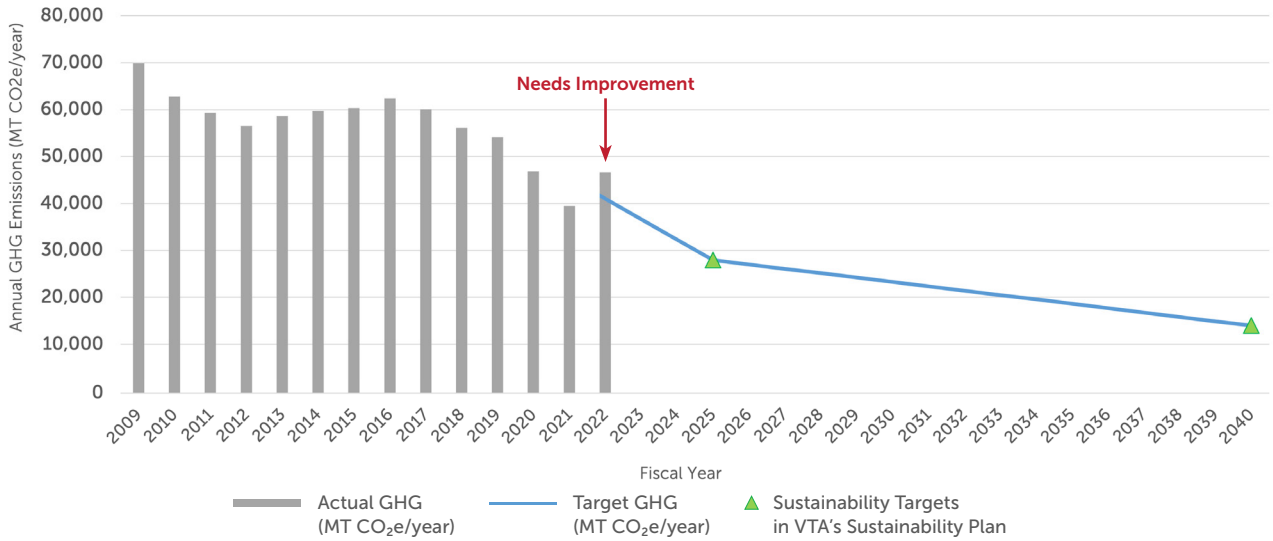


Figure 2.1.2 shows the emissions generated in this reporting year compared to the 2009 baseline. VTA is currently not on track to meet the FY 2022 target of reducing emissions by 41% and therefore may not meet the short-term target in FY 2025 of reducing by 60% below FY 2009 levels. To meet the short-term target in 2025, VTA will need to focus on decarbonizing its fleet, buildings, and facilities through the procurement of zero-emission vehicles and the procurement of 100% renewable energy options through local community choice energy (CCE) providers. While VTA does use renewable sources of energy from on-site solar production and from CCEs, including San Jose Clean Energy, Silicon Valley Power, Silicon Valley Clean Energy, and the City of Palo Alto, there is room for improvement. VTA's forthcoming Climate Action and Adaptation Plan will outline a series of strategies, measures, and implementing actions to reduce GHG emissions. This Plan is currently in development and expected in early 2024.

As a provider of public transportation, VTA helps reduce vehicle miles traveled (VMT), and offset regional GHG emissions by providing alternatives to driving alone. In FY 2022, VTA helped displace regional GHG emissions by 10,554 MT CO2e. According to the U.S. Environmental Protection Agency (EPA), this is equivalent to taking 2,349 gas-powered cars off the road for one year.[1]

Figure 2.1.3 shows the GHG emissions avoided through mode shift were from single-occupancy vehicles to transit. Between 2020 and 2022, avoided emissions are notably less than previous years. As discussed in Section 1.2, ridership plummeted during the pandemic when schools turned to distance learning, employers implemented work-from-home programs, and consumers turned to online shopping. However, the avoided emissions in FY 2022 show that ridership is making a slow rebound towards pre-pandemic levels.

***Figure 2.1.3*** **Generated and Avoided GHG Emissions**


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

## 2.2 Criteria Air Pollutants

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

**Status:** Target Met

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.

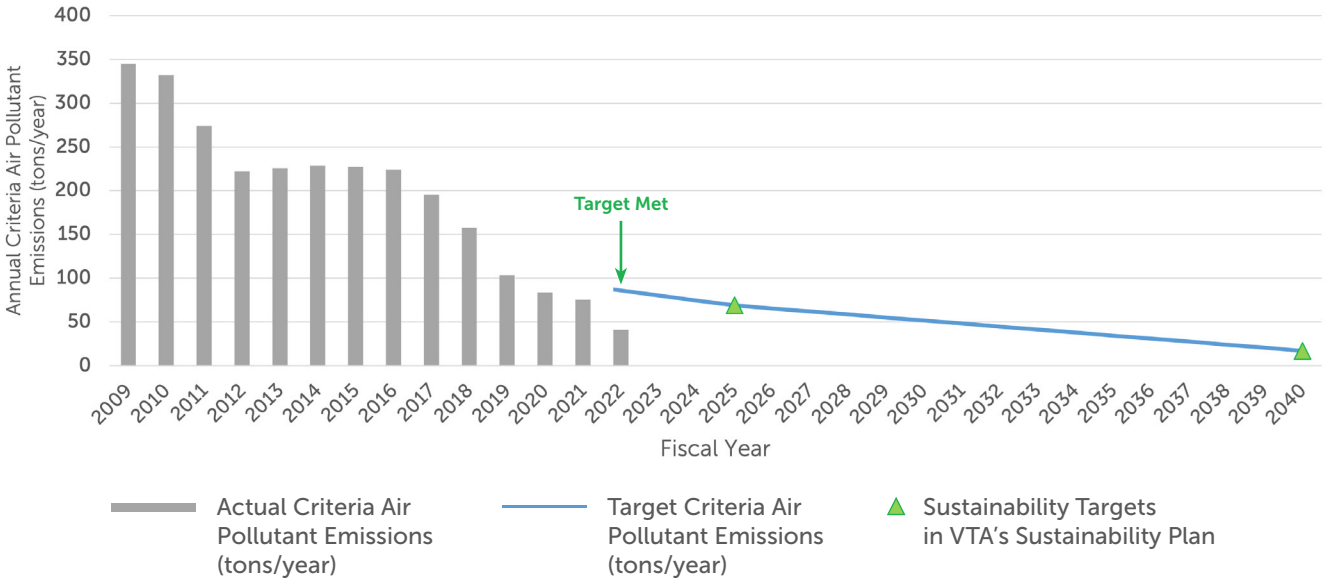
In FY 2022, VTA emitted 41 tons of criteria air pollutants through the operation of its vehicle fleet and employee commute. This is an 88% reduction from the baseline year and achieves the target set for FY 2025, as shown in Figures 2.2.1 and 2.2.2. These results are consistent with the downward trend of emissions reported by Bay Area Air Quality Management District (BAAQMD) for the Bay Area region. According to the BAAQMD, 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). With the implementation of the Zero-Emission Bus Rollout Plan, it is likely that VTA will also achieve the FY 2040 target of 95% reduction.

*Figure 2.2.1* **Criteria Air Pollutants Compared to FY 2009 Baseline**

| Fiscal Year | Criteria Air Pollutant Emissions (Tons) | Change from FY 09 |
|---|---|---|
| 2009 | 345 | |
| 2020 | 84 | -76% |
| 2021 | 75 | -78% |
| 2022* | 41 | -88% |

** 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 37% in FY 2022 compared to baseline. This reduction is mostly attributed to the temporary closure of Guadalupe Division for part of FY 2022. Compared to the baseline, natural gas use increased by 2% in FY 2022, and propane use decreased by 4%. These changes are mostly attributed to weather conditions as natural gas and propane are used for heating facilities. Figure 2.3.1 shows the total building energy use by fuel type.

Overall, VTA was able to achieve a 6% reduction in building energy consumption in FY 2022 compared to the baseline year. VTA is currently not on track to meet the FY 2022 target of reducing emissions by 41% and therefore may not meet the short-term target in FY 2025 of reducing by 60% below FY 2009 levels. While this may not be achievable, VTA can make progress towards the long-term FY 2040 target by focusing on decarbonizing existing

[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.

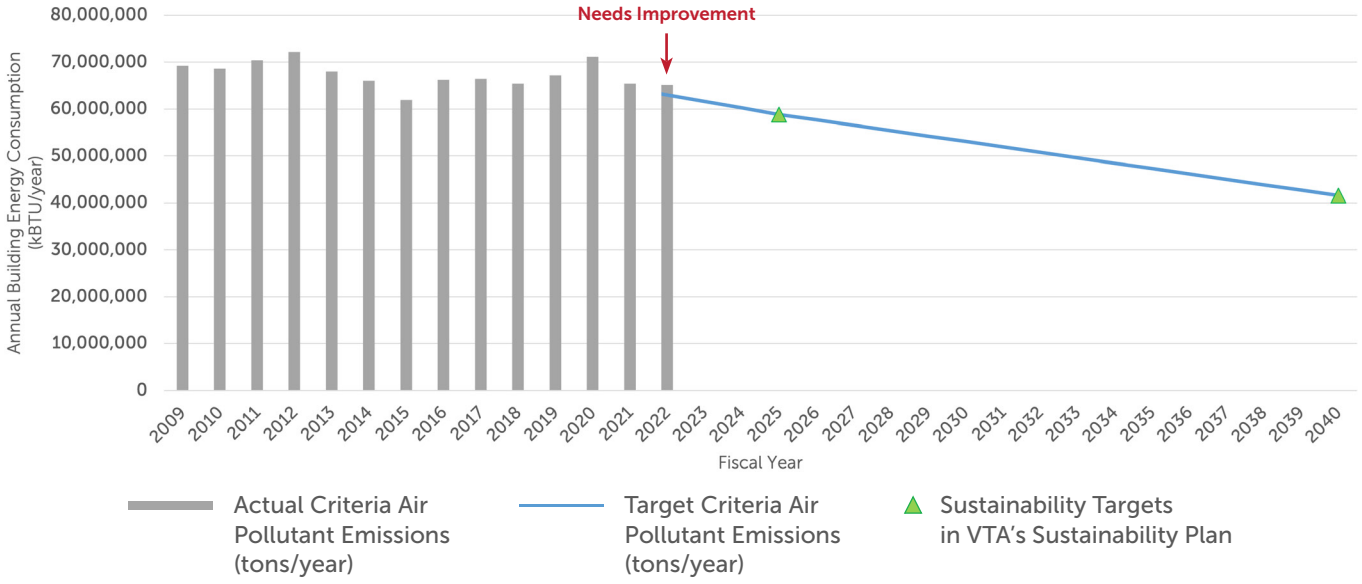
buildings; upgrading outdoor lighting at buildings, park-and-ride lots, and stations; prioritizing projects to retrofit buildings with energy-saving features and appliances; and implementing conservation best practices through occupant behavioral changes and energy management systems.

## *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 (kBTU) | Change of Total Building Energy Use from FY 09 |
|---|---|---|---|---|---|
| 2009 | 43,992,951 | 15,230,243 | 9,997,078 | 69,220,272 | |
| 2020 | 47,273,680 | 15,778,932 | 8,073,156 | 71,125,768 | 3% |
| 2021 | 42,385,605 | 16,602,205 | 6,347,602 | 65,335,412 | -6% |
| 2022* | 39,983,357 | 15,514,995 | 9,622,340 | 65,120,692 | -6% |

** Current reporting year*

## *Figure 2.3.2* Building Energy Consumption Targets



## 2.4 Fleet Energy

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

**Status:** On Track

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 2022 are provided below by fleet type.

- Non-revenue fleet: used 151,646 gallons of diesel and gasoline. Fuel use was down by 18% for diesel and up by 7% for gasoline compared to the baseline.
- Bus fleet: used 3,353,389 gallons of fuel and 95,613 kWH of electricity. Fuel use was down by 24% for diesel and by 67% for gasoline compared to the baseline.
- Paratransit fleet: used 213,003 gallons of gasoline. Fuel use reduced by 39% compared to the baseline.
- Light rail: used 14,045,932 kWh of electricity. Energy used for light rail operations declined by 47% compared to the baseline year. Unlike the above scenarios which declined due to the conversion of more fuel-efficient vehicles and service reductions, this decline is attributed to the complete shutdown of light rail service as described in Section 1.3.

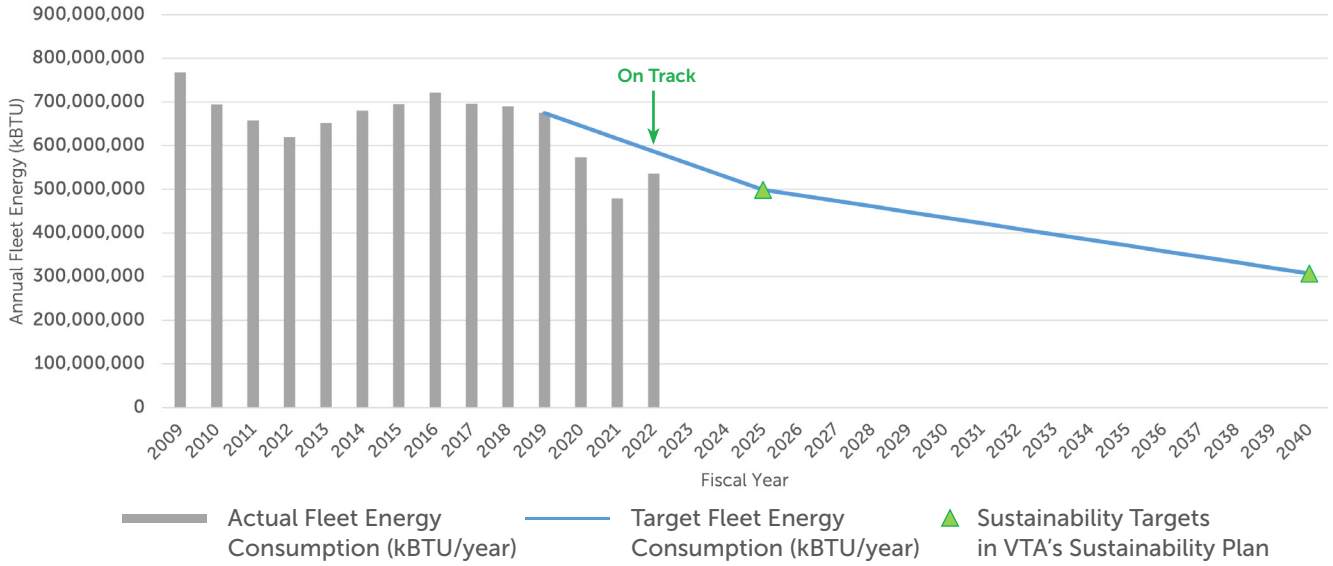
VTA's sustainability targets focus on improving efficiency of the revenue fleet which consists of bus, paratransit, and light rail service. Energy use is presented in BTUs to provide an equal comparison across the different sources of energy used. Figure 2.4.1 shows the total energy use compared to the baseline. In FY 2022, revenue fleet energy use was 30% lower than the baseline year. VTA is on-track towards meeting its reduction target of 35% below 2009 by 2025.

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

| Fiscal Year | Revenue Fleet Energy Consumption (MMBTU/year) | Change in Energy Consumption from FY 09 |
|---|---|---|
| 2009 | 767,726,503 | |
| 2020 | 573,569,545 | -25% |
| 2021 | 479,053,389 | -38% |
| 2022* | 536,154,939 | -30% |

** 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. VTA's ongoing activities spanning the next five yearswill result in a larger battery-electric bus fleet supported by new 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 electrical infrastructure, renewable energy, energy storage, and microgrid controls to support a fleet of 34 battery-electric buses by 2024.

# 2.5 Water

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

**Status:** Target Met

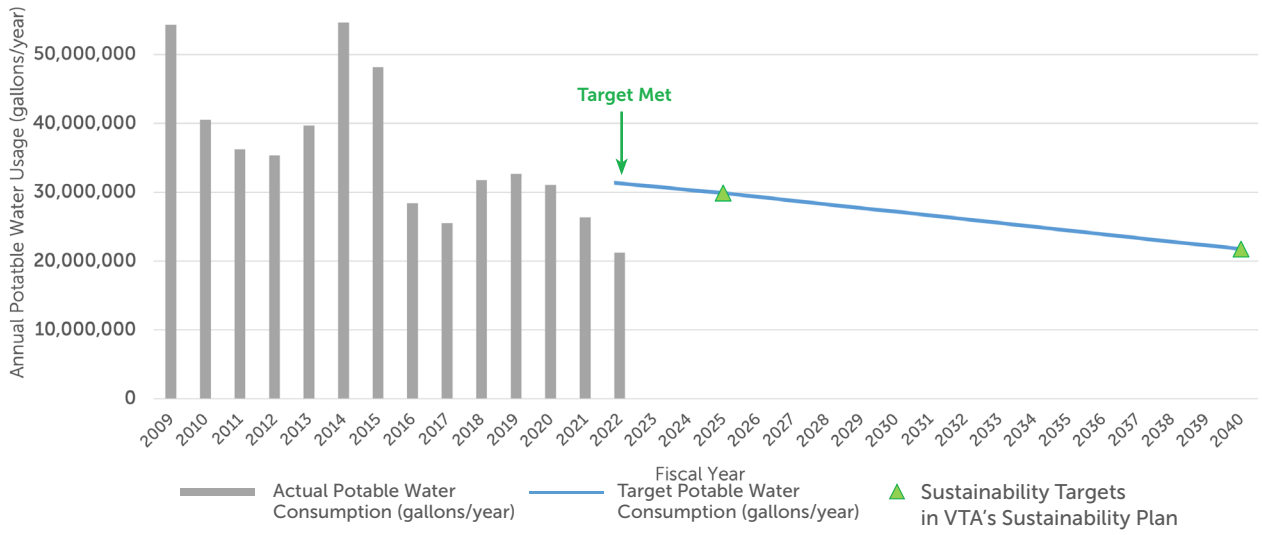
VTA used 21 million gallons of potable water[4] for landscaping, washing vehicles, and operating facilities in FY 2022, representing a decrease of 61% in potable water usage from the baseline year. This reduction exceeds the target set for FY 2025 and 2040. The large decrease in water use is attributed to employees teleworking; the shutdown of Guadalupe Division and suspension of light rail service, including washing of trains; and proactive maintenance efforts and quick repair of leaks by our Passenger Facilities and Wayside staff. The use of non-potable, or recycled water, increased dramatically, by 460% from the baseline year. Non-potable water is used for irrigation at seven facilities including the Milpitas and Berryessa BART stations. 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 Used in FY 2022 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 | |
| 2020 | 11,629,105 | 31,064,707 | 42,693,812 | -43% |
| 2021 | 12,745,214 | 26,347,823 | 39,093,036 | -51% |
| 2022* | 16,163,009 | 21,235,363 | 37,398,372 | -61% |

** 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.

# 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 29% in FY 2022. 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.

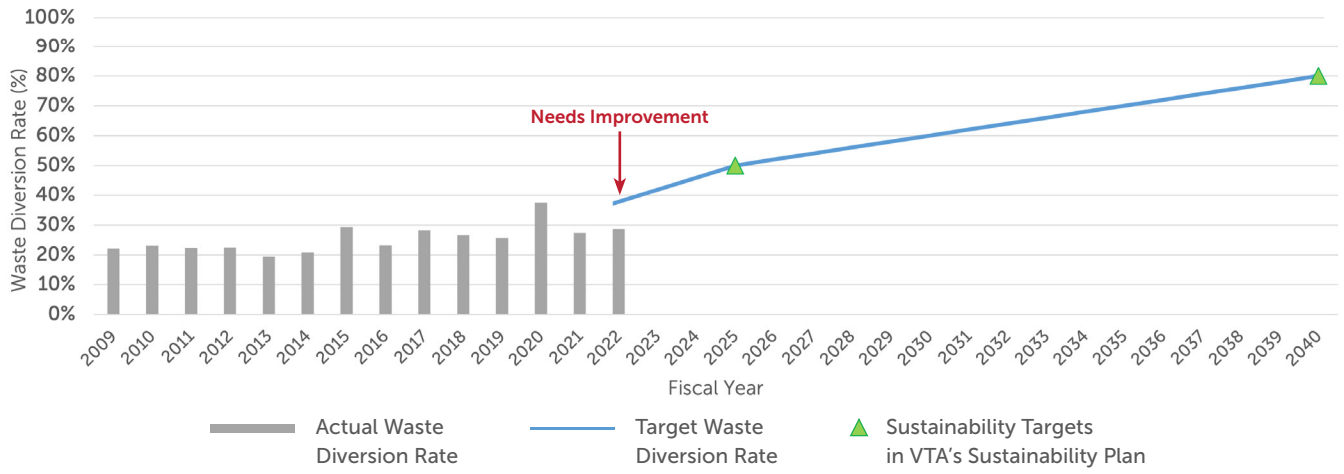
Figure 2.6.2 shows VTA's waste diversion rate targets. To meet the target diversion rate of 50% by FY 2025, VTA will need to substantially increase recycling and composting rates. The rehabilitation of existing facilities and rebuilding of VTA's light rail operating division presents opportunities to 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% |
| 2020 | 1,058 | 298 | 337 | 38% |
| 2021 | 1,032 | 287 | 102 | 27% |
| 2022* | 1,596 | 459 | 187 | 29% |

** Current reporting year*

*Figure 2.6.2* **Waste Diversion Rate Targets**




# 3 Additional Sustainability Efforts

## 3.1 Stormwater Management

Stormwater runoff is rain that does not soak into the ground and flows over land and other surfaces, carrying trash and other pollutants directly into local creeks and rivers, and to the San Francisco Bay to which they ultimately flow without any treatment. Through its Stormwater Management Program, VTA prevents pollution from stormwater runoff by:

- Designing projects that incorporate stormwater features and on-site treatment measures,
- Continually educating VTA employees, contractors, and the general public on best management practices to reduce runoff,
- Installing devices to capture trash before it enters receiving waters,
- Organizing clean-up events in partnership with agencies, and
- Participating in regional efforts to collect trash data and reduce litter.

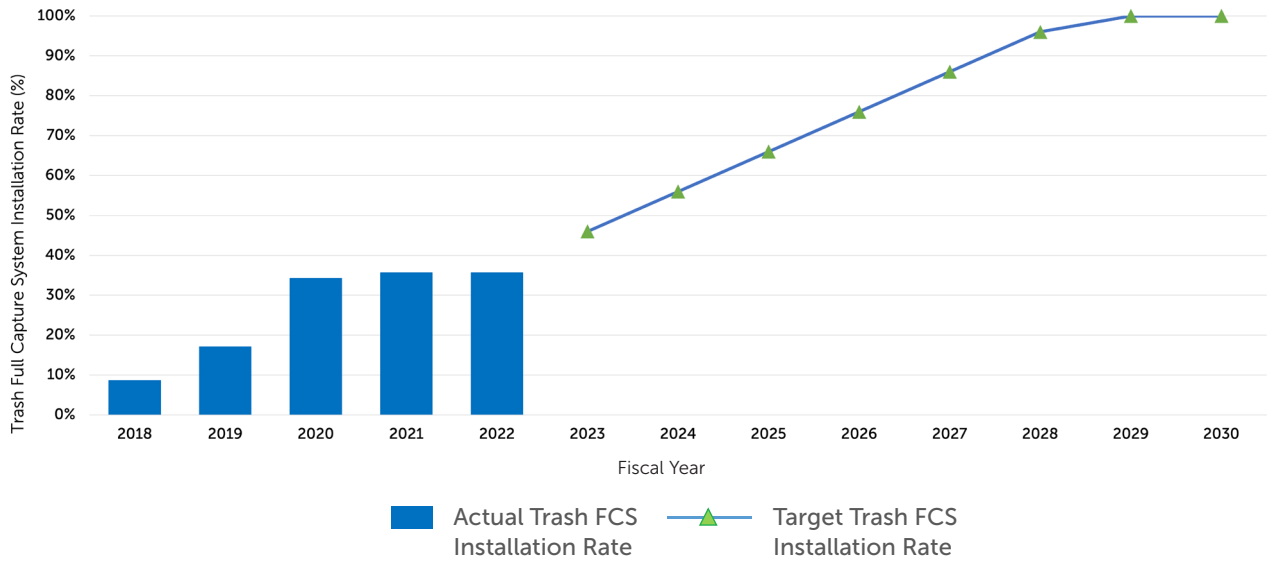
This Program has a goal of achieving 100% trash load reduction, or full trash capture equivalency by 2030. This goal will be achieved by installing Trash Full Capture Systems (FCS) and performing regular operations and maintenance activities at designated "hot spot" locations . Trash FCS include storm drain inlet inserts and multi-benefit treatment systems such as bioretention facilities and hydrodynamic separators. Operation and maintenance activities include inspection of facilities and landscaping, litter removal, cleaning out drain inlets, and general housekeeping.

*Bioswale at the Berryessa/North San Jose Transit Center.*

VTA started installing Trash FCS in FY 2018. Figure 3.1 shows the targeted rate of Trash FCS installation. To date, VTA has installed 173 storm drain inlet inserts and incorporated multi-benefit treatment systems into the design of several facilities, including the Eastridge Transit Center and Berryessa and Milpitas BART Stations.

Education and outreach efforts are continually underway to raise awareness about protecting our waterways. These include the posting of educational signs in work areas, annual staff trainings, new employee orientation, employee surveys, and a public-facing website with resources and tips to reduce stormwater runoff at home and in the community.

***Figure 3.1*** **Targeted Rate of Trash FCS Installation**




## 3.2 Litter Programs

Keep Santa Clara Valley Beautiful is a countywide, multi-agency initiative to clean and prevent littering on the highways in Santa Clara County. Trash on the highways is hazardous to drivers, the environment, and residents. VTA is working together with several partners to change people's attitudes and behaviors towards throwing litter on the highways instead of in garbage cans or recycling containers. The program includes organizing monthly popup cleanup events in cities and towns throughout Santa Clara County, installing No Dumping enforcement signs at frequently littered locations, and forming local volunteer groups to help keep the community highways clean.

## 3.3 Transit Oriented Communities

Transit-Oriented Communities (TOCs) link development within a half-mile of transit stations to their surrounding neighborhoods to create areas with access to multiple housing choices, jobs, parks and open space, and infrastructure for bicyclists and pedestrians. In these communities, cars are welcome, but not necessary. By design, TOCs are accessible and make transit use easy and convenient, resulting in less driving, more walking, and reduced GHG emissions.

In June 2022, VTA updated its TOC Policy to include the following goals:

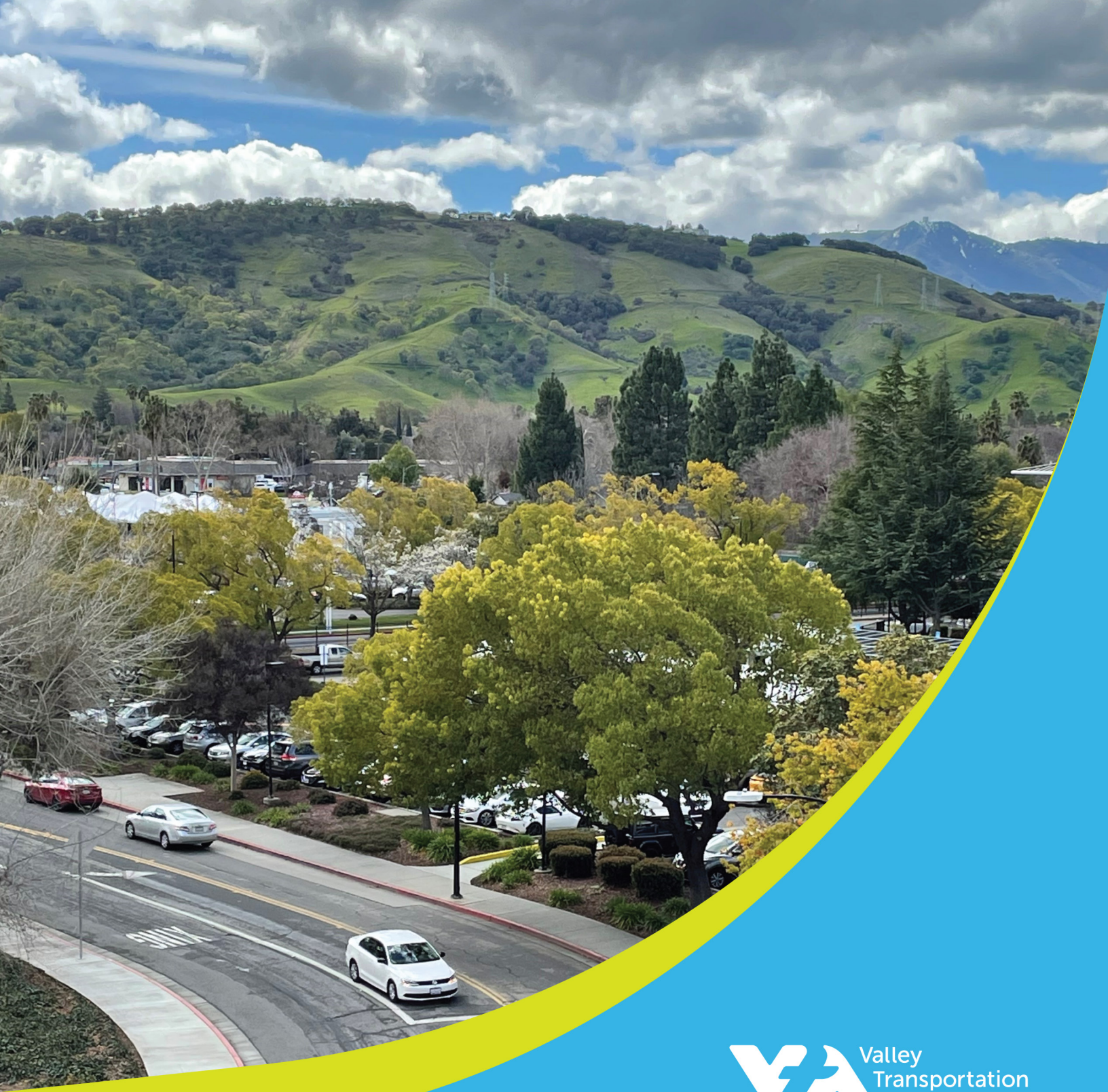
- Increase ridership overall and throughout non-commute periods.
- Leverage Transit-Oriented Development projects as catalysts to create equitable and complete TOCs around transit stations that include housing affordable to all income levels, and balance employment, housing, institutional uses, and other services.
- Generate revenues to sustain transit capital investment and operations.

VTA is currently working on the implementation of TOC Playbooks for the BART Phase II station areas of Downtown San Jose, 28th Street/Little Portugal, and Santa Clara.

## 4 Conclusions

VTA has met or is on track towards meeting short-term targets identified for FY 2025 in all KPI areas except GHG emissions, building energy, and waste reduction. However, this reporting year should be considered an outlier year when compared to earlier years, and future trends, because it does not represent standard operating conditions. The data reflects VTA's operations during a time when it faced unprecedented challenges as described earlier in the report. Therefore, all short-term results should be viewed with caution when considering FY 2040 stretch targets.

The findings in this report demonstrate that VTA continues to make incremental progress toward sustainability goals as it focuses on recovering ridership and stabilizing its workforce. Future efforts should prioritize projects that reduce energy consumption and increase recycling and compost rates. Overall, VTA will need to take bolder and more aggressive steps to transition away from fossil fuels by electrifying its fleet and decarbonizing its buildings and facilities.



Valley Transportation Authority

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