



# Calendar Year 2022 Annual Report: **Sustainability**

Pictured: BART's opening day in 1972. BART celebrated the 50th anniversary of its opening in 2022.

Let's go.



# General Manager Message

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In 2022, BART celebrated 50 years of serving the Bay Area. Much has changed in the five decades since BART was born, including the state of our planet. 2022 was the fifth hottest year on record, and rising levels of greenhouse gases in the atmosphere continue to warm the planet and expand the devastating impacts of climate change.

There is still time to change this rapidly unfolding narrative. A recent report from the Intergovernmental Panel on Climate Change stresses that “urgent climate action can secure a livable future for all,” citing public transportation as an essential tool in this fight. In the document that follows, I’m proud to report BART’s performance on a number of sustainability metrics and share stories that illustrate the impact of our efforts.

From its inception, BART’s founders recognized the importance of shifting regional travel away from automobiles and entwining sustainable practices into the design and operation of the system, including by powering trains with electricity rather than fuel.

Today, BART is one of the greenest options for Bay Area residents traveling around the region. Our system is powered by GHG-free energy that’s procured from renewable sources, including wind, solar, and hydro. Every time you ride rather than drive, you’re helping to reduce regional pollution and support sustainability.

Even as we’re taking strides to prioritize environmental issues, the rider experience is always at the forefront of our work. Most of our fleet is now comprised of Fleet of the Future trains, which are more efficient than legacy trains and save considerable energy. At the same time, in 2022 we expanded service to pre-pandemic levels and augmented Sunday service, extending our operating hours to midnight and providing five-line service for the first time in our history. Even with increased service, we are on track to meet our 2025 energy use targets.

Last year, BART completed modernization projects at Powell Street and 19th Street/Oakland stations. As part of the modernization program, we outfitted the stations with energy-efficient LED lighting that makes them brighter and safer and installed new water-efficient fixtures in their recently reopened public restrooms. 2022 was also the second year of BART’s Escalator Modernization Program; today, the escalators along San Francisco’s Market Street save more energy and are more reliable than ever before.

BART is also actively preparing for what the future may hold for our system and region. In 2022, we updated and readopted the Local Hazard Mitigation Plan, which identifies natural hazards that could impact BART and outlines actions for reducing risks. We also endorsed the Bay Adapt Joint Platform, a regional and consensus-driven strategy for adapting to sea level rise.

BART has taken substantial steps to support regional sustainability, but significant challenges lie ahead. Public transportation in the U.S. is facing a significant financial crisis that could drastically change the way people travel. Public transit is an essential tool in the fight to save our planet, and now, more than ever, we can’t afford to lose it.

We hope you will join BART in our mission to deliver fast, reliable, and sustainable service. Thank you for reading this report and thank you for riding BART.

Robert M. Powers  
General Manager  
San Francisco Bay Area Rapid Transit District

# BART Calendar Year 2022 Sustainability Highlights



## 358

housing units and 15,000 square feet of commercial space built next to Walnut Creek Station as part of BART's transit-oriented development (TOD) program

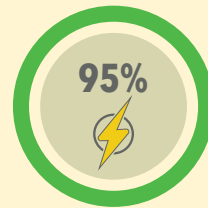


## 442

Fleet of the Future cars were in revenue service

## 95%

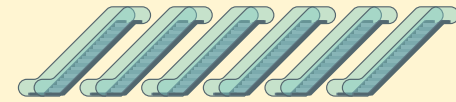
of BART's contracted electric supply was greenhouse gas-free



## 7.8 million

kilowatt-hours/year saved after LED retrofit at 14 parking garages; equivalent to average annual electricity use of about 730 typical U.S. homes

## 6



escalators replaced in system



## 26 lbs.

of CO<sub>2</sub>e emissions avoided per average round trip, which is equivalent to about 31 miles driven in a passenger car

## >26 thousand

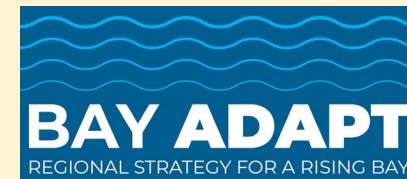
gallons of gas saved from all riders in one weekday



Leadership in Energy and Environmental Design (LEED) Gold certification for new headquarters at 2150 Webster Street



BART earned \$49 million dollar grant from CalSTA's Transit and Intercity Rail Capital Program (TIRCP) to improve TOD



Board-approved Bay Adapt Joint Platform to identify regional strategies to mitigate sea level rise impacts

# Table of Contents

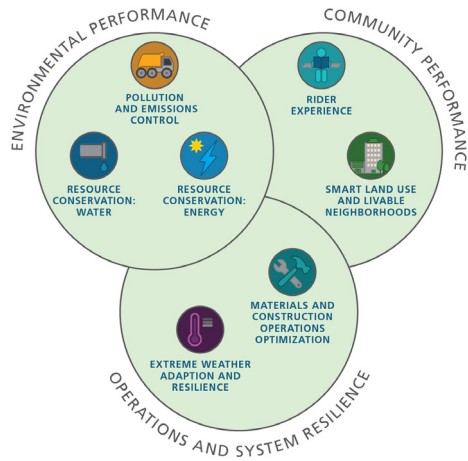
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- Introduction**..... page 2
- Case Study 1:** LED Lighting Upgrades at 14 Parking Garages ..... page 3
- Case Study 2:** Modernization Efforts Completed at 19th Street/Oakland and Powell Street Stations..... page 5
- Case Study 3:** Sustainable Critter Control at BART ..... page 7
- Case Study 4:** BART Re-adopts Local Hazard Mitigation Plan; Approves Bay Area Adapt Joint Plan..... page 9
- Case study 5:** BART Improves Station Access for Pedestrians and Bike Riders ..... page 11
- Case Study 6:** New Apartments and Commercial Space at Walnut Creek Transit Village..... page 13
- Case Study 7:** BART’s 50th Anniversary of Service: Looking Back at the System’s Sustainable Beginnings..... page 15
- Performance Metrics**..... page 17
- Appendix** ..... page 21



# Introduction

## 7 SUSTAINABILITY CATEGORIES



The *2022 Annual Report: Sustainability* communicates progress in BART's sustainability program. The purpose of the report is to provide transparency to the public and ensure BART's commitment to the goals of the program. The sustainability program aims to support a sustainable, healthy, and vibrant Bay Area through actions and investments that create a less car-dependent region and a greener transportation system.

### Report Format

The report contains a collection of case studies that highlight BART's achievements in sustainability for the reporting period and a summary of BART's sustainability performance metrics. In the Appendix, there are additional details about energy use, greenhouse gas emissions, and water use as well as status updates on each of the 120 action items identified in BART's Sustainability Action Plan.

### About the Sustainability Program

In concert with the District's Sustainability Policy, adopted in 2017, BART published a 10-year Sustainability Action Plan that details the targets, current progress, and future actions to integrate sustainability as a standard practice throughout BART. The plan was created with input from numerous

BART departments and in coordination with broader regional and American Public Transportation Association (APTA) sustainability goals. The detailed roadmap includes performance metrics to measure outcomes of actions that support BART's commitment to provide safe, affordable, equitable, and environmentally friendly transit. BART's energy, greenhouse gas emissions, and water targets were derived from Business as Usual (BAU) scenarios that utilize the baseline values in 2015 and planned growth in the number of stations, planned extensions to the existing lines, and expected improvements to the system. The committed and aspirational targets represent percentage reductions from the projected BAU values in 2025.

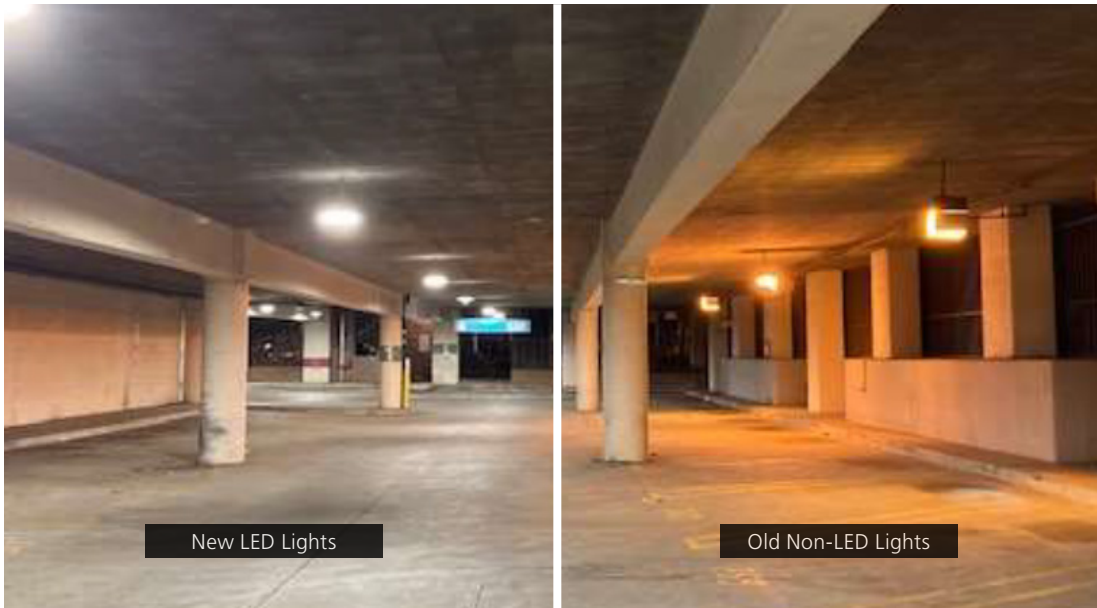
The Sustainability Action Plan contains seven categories representing different aspects of BART's sustainability program. Each of the case studies, metrics, and actions contained in this report relate to goals identified in the Sustainability Action Plan for one or more of the categories.

The policy and action plan may be found at <https://www.bart.gov/sustainability/policies>.

### Reporting Period

The report focuses on efforts from the 2022 calendar year (i.e., January 1 to December 31).

# LED Lighting Upgrades at 14 Parking Garages



*The new LED lights are brighter, last longer, and use less energy than the older lights.*

BART has upgraded over 10,500 lighting fixtures across fourteen of its parking garages. The new LED light fixtures that were installed are brighter, last longer, and use less energy than the previous metal halide, sodium-vapor, and fluorescent fixtures. A new, centralized control system helps dim lights during daylight hours and when there is little activity in the garage, and also helps identify maintenance issues more promptly. Together, these changes minimize the maintenance and labor costs associated with replacing bulbs, while improving the energy efficiency of the system.

BART is already one of the most energy-efficient transit systems in the U.S., thanks to its lightweight, electric trains. However, the

District also prioritizes projects that improve the energy efficiency of auxiliary components of the system beyond train service. This retrofit project was initiated in 2018 to help save energy, reduce maintenance costs, and improve quality of life issues associated with lighting in parking garages at stations. The garages that were retrofitted include Hayward, Walnut Creek, Millbrae, Daly City, Fruitvale, Concord, Pleasant Hill, San Bruno, Colma, South San Francisco, Dublin/Pleasanton, MacArthur, Richmond, and El Cerrito del Norte. Over 10,500 metal halide and sodium-vapor fixtures were replaced with LED lights from December 2020 to December 2022, and additional upgrades will be completed on the roof at El Cerrito Del Norte in 2023.

“Energy savings and quality of life improvements are what people are really going to notice,” said Isaac Lim, BART’s Project Manager overseeing the lighting upgrade. The project is estimated to save about 7.8 million kWh each year, which is equivalent to the average annual electricity use of about 730 average U.S. homes.<sup>1</sup> To fund the retrofit, BART took advantage of PG&E’s On-Bill Financing program, which allowed the District to take out a no-interest loan from PG&E to pay for the upfront costs. BART will repay the loan over a ten-year period using the cost savings realized from the retrofit.

Michael Cox, BART’s Sustainability Performance Analyst, added, “Luckily for us, many of our riders are just as enthusiastic about sustainability as we are. We received many comments from our riders about the wastefulness of our previous system since the lights were constantly on. This new control system will address those concerns, while still maintaining a safe environment for people moving about the garages.”

# LED Lighting Upgrades at 14 Parking Garages

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Lights near the entrances of the garages are brighter to help drivers' eyes adjust to the lighting conditions as they enter or exit. New infrared occupancy sensors within the fixtures can detect vehicles and pedestrians moving through the garage. When there is no activity after five minutes, the sensors dim the lights to 20% luminance to save energy. The sensors operate in groups so that only specific areas with traffic will be triggered.

Maintenance and replacement of the prior fixtures was often challenging. Since the lights did not last as long, maintenance staff had to frequently replace them. Additionally, the garages lacked a centralized control system to easily identify where and when lights were not functioning.

As part of the retrofit, the new wireless control system will allow BART staff to check the status of all the project's lights remotely using an app. The system provides notifications for lighting outages and data

about the lighting. This will allow for more prompt remediation of lighting issues instead of relying on visual inspection and complaints from parkers. And since the LED lights last longer than the previous ones and will need fewer replacements over their lifetimes, the retrofit will save both maintenance and labor costs.

The perimeter and roof lights also have daylighting sensors. The perimeter lights inside the garage have a built-in daylight/motion sensor, so when there is enough sunlight, the lights dim to 20% luminance. The roof lights turn off completely during the daytime and turn back on at dusk.

BART continues to upgrade the lighting inside and around stations and is currently scoping a project to retrofit lighting more broadly across all stations. BART is piloting LED flood lights at shops and yards.

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<sup>1</sup>Per the [EIA](#), the average US home uses 10,632 kWh/year of electricity as of 2021.

# Modernization Efforts Completed at 19th Street/Oakland and Powell Street Stations



*New energy-efficient LED lighting helped brighten the concourse and platform areas of 19th Street/Oakland Station.*

BART recently completed modernizations at 19th Street/Oakland and Powell Street stations to improve the rider experience. Additional sustainability features include LED lighting, new water-efficient fixtures in reopened public restrooms, and new art installations.

BART's Station Modernization Program seeks to encourage ridership and enhance station aesthetics by improving existing stations. 19th Street/Oakland and Powell Street are the most recent stations completed in this program. These projects revitalize the function, safety and security, capacity, sustainability, appearance, and customer experience of the stations.

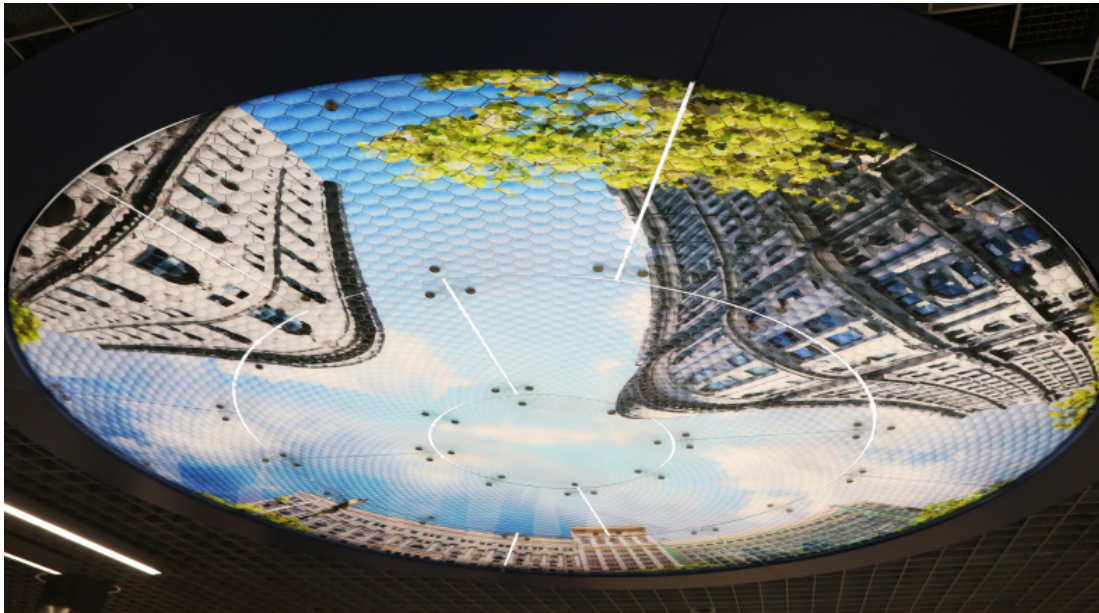
Both stations were made brighter, safer, and more welcoming to the thousands of riders who pass through them each day. Energy-efficient LED lighting replaced fluorescent lighting on the concourse and BART platforms at both stations and for trackside lighting at Powell. This brightened the stations and resulted in more than 510,000 kWh of annual savings between the two stations. This is equivalent to the electricity used by about 48 average U.S. homes for one year.<sup>2</sup> Glass fare barriers replaced metal railing barriers, and brick and other structures were removed to eliminate hidden corners and improve line of sight.

The projects also involved the renovation and reopening of the public restrooms. The bathrooms were brought up to code, are gender neutral, and include a touchless lavatory system. Restroom attendants help keep the areas clean and functioning for BART customers.

In addition to the improvements outlined above, the 19th Street/Oakland Station project redesigned the concourse to merge three paid areas into one continuous paid area, improving passenger flow. Upgraded features also included repair of terrazzo flooring and ceramic wall tiles, a new concourse to platform elevator on the northern end of the station, new interior bike parking, and the addition of bike channels on the stairs. Bike channels, which are ramps on stairwells that make it easier to maneuver bikes when ascending or descending, improve station access for bike riders. Artists Ron M. Saunders, Phillip Hua, Lisa Banks and Hailey Payne Banks created new artwork that references the history and vibrancy of the surrounding Uptown Oakland neighborhood. The art illuminates the three stairways connecting the platforms to the concourse, increasing the sense of safety



# Modernization Efforts Completed at 19th Street/Oakland and Powell Street Stations



*The Powell Street Modernization included the installation of a new illuminated ceiling artwork, titled "Elysium," by San Francisco artist Stephen Galloway.*

and encouraging more use of the stairways. The phone alcoves were also transformed into art displays that will feature rotating artworks.

"The new energy-efficient lighting, combined with new public art installations, have brought a glow to the blue brickwork of this iconic station," said BART Director Robert Raburn. "The improvements have not only changed the look of the station but also the feel."

The Powell Street Station boasts a modern metallic grid ceiling and a new external canopy. The modernization also included the installation of a new illuminated ceiling artwork, titled "Elysium," by San Francisco artist Stephen Galloway.

<sup>2</sup>Per the [EIA](#), the average US home uses 10,632 kWh/year of electricity as of 2021.

# Sustainable Critter Control at BART



*BART is experimenting with using hawks to scare pigeons away from stations.*

When practical, BART employs natural and humane methods to manage critters, including pigeons and bees at BART stations. This includes hiring a local beekeeper to remove beehives from stations and using a hawk to deter pigeons from roosting.

BART stations naturally attract unwanted critters searching for shelter. Many stations have open-air spaces that improve ventilation, but this leaves them vulnerable to pigeons perching on areas such as pipe conduits, signs, and ledges. Pigeon droppings, which can carry harmful pathogens, are a hazard to customers and staff. The droppings can also be slippery when wet, creating a slip-and-fall hazard,

and due to their acidity can eat away and damage property. Pigeons can also carry diseases and parasites.

With the help of a local falconer, BART is experimenting with using hawks, a natural predator to prey birds like pigeons, to scare them away.<sup>3</sup> The hawk does not kill the pigeons; rather, it creates a sufficiently hostile environment to encourage them to migrate and reside elsewhere. BART also employs static methods to deter roosting such as bird spikes and wire mesh barriers. These methods humanely manage pigeons without hurting or killing them and help BART avoid harmful methods such as “bird bombs” or poisons containing toxic chemicals.

Bees also find their way onto and into BART property. Bee colonies typically reproduce in the spring and often swarm to look for new places to live. As bees regroup to look for a new home, they often cluster and land in sheltered areas such as crevices of sidewalks, buildings, or vegetation. Instead of exterminating beehives and swarms, BART employs a local beekeeper to carefully relocate bees to a safe environment where they can thrive.<sup>4</sup>

BART recognizes that bees play a vital role as pollinators for agriculture and the natural ecosystem. Pollinators such as bees facilitate the fertilization of plants and crops. There are 4,000 known species of bees in the U.S. and California is home to 1,600. Many plants cannot reproduce without pollen carried to them by foraging pollinators. In the US, over one hundred different crops depend on pollinators; in the world, about 35% of food crops depend on pollinators.<sup>5</sup> Preserving bee populations has become even more critical as bee

# Sustainable Critter Control at BART



*Instead of exterminating beehives and swarms, BART employs a local beekeeper to carefully relocate bees to a safe environment where they can thrive.*

populations have declined in recent decades due to the widespread use of pesticides, disease, habitat loss, and climate change. If you see a swarm or beehive in your neighborhood, call a local beekeeper to rehome the bees.

To the extent that we can, BART strives to work harmoniously with the creatures around us and minimize our impact on the natural world. Whether using goats to mow BART properties<sup>6</sup> or hawks to deter pigeons, BART strives to think differently about how the natural world can help us provide better transit service and support our communities. Lastly, critters such as pigeons and bees may be considered a nuisance or a pest, but BART understands there are pathways in which we can minimize conflicts between humans and our urban wildlife.

<sup>3</sup>BART contracts falconer to deter pigeons at El Cerrito del Norte Station | [bart.gov](http://bart.gov)

<sup>4</sup>Local beekeeper makes honey with bees removed from BART property, protecting riders and helping to preserve the critical insect | [bart.gov](http://bart.gov)

<sup>5</sup>The Importance of Pollinators | [USDA](http://USDA)

<sup>6</sup>Bah bah BART: Grazing goats are back and reducing fire danger on BART property | [bart.gov](http://bart.gov)

# BART Re-adopts Local Hazard Mitigation Plan; Approves Bay Area Adapt Joint Plan



*Norman Wong, a Principal Engineer in the Office of the District Architect, led the efforts to update BART's Local Hazard Mitigation Plan (LHMP), which identifies the risks of natural hazards to BART and potential solutions to them. One risk that the LHMP addresses is sea level rise in areas like the Embarcadero Waterfront (pictured).*

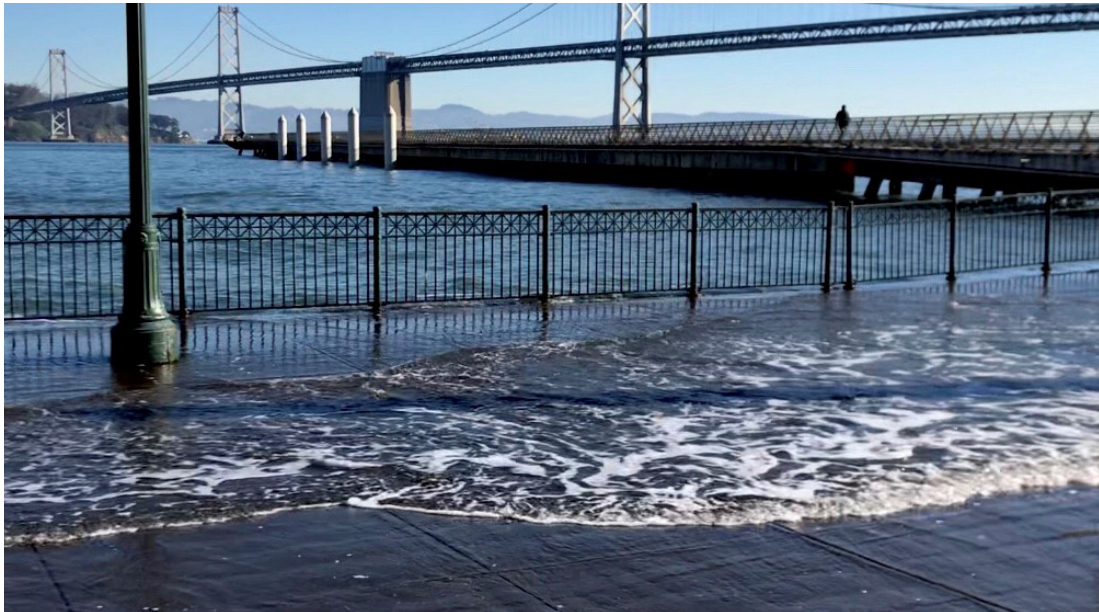
The District advances climate resiliency by updating its Local Hazard Mitigation Plan (LHMP) and endorsing the region's strategy for addressing sea level rise.

Flooding, rising sea levels, extreme heat, wildfires, and drought are examples of climate hazards – natural hazards that are exacerbated by climate change. BART helps slow the pace of global warming by taking cars off the road and thus reducing the Bay Area's greenhouse gas emissions. But BART also recognizes that we must adapt to the consequences of global warming by preparing and protecting the region from climate hazards.

In 2022, BART took two important steps to advance climate resiliency: updating the Local Hazard Mitigation Plan (LHMP), and endorsing the Bay Adapt Joint Platform.

- Local Hazard Mitigation Plan (LHMP) update: The BART LHMP<sup>7</sup> is a planning document that identifies the risks of natural hazards to BART and actions for reducing those risks. Examples of actions include seismic retrofits, slope stabilization and erosion control, and fire protection replacement. Many natural hazards, such as flooding and wildfires, are exacerbated by global warming and can diminish BART's capacity to operate and provide transit services. The LHMP reflects BART's commitment to maintain and enhance a disaster-resilient District by reducing the long-term risks of these natural hazards and protecting human life, property, and environment. By becoming more resilient, BART will be more protected from hazards that would impact service and will more easily recover from disruptions. The LHMP also keeps BART eligible for funding programs managed by FEMA which support projects that reduce risks from natural hazards.
- Bay Adapt Joint Platform endorsement: The Bay Adapt Joint Platform,<sup>8</sup> led by the San Francisco Bay Conservation and Development Commission (BCDC), is a consensus-driven strategy for how the region will adapt to the growing urgency of rising sea levels. By 2060, 28,000 socially vulnerable residents, 13,000 existing housing units, and 104,000 existing jobs may be at risk of flooding due to sea level rise. In 2022, BART's Board of Directors endorsed the Joint Platform, joining fifty-five other cities, counties, and organizations to affirm our support for regional adaptation to sea level rise. The BART Board of Directors recognizes the importance of regional adaptation and the need for local and regional governments and communities to cooperatively implement successful adaptation projects and protect the region.

# BART Re-adopts Local Hazard Mitigation Plan; Approves Bay Area Adapt Joint Plan



*The Bay Adapt Joint Platform is a consensus-driven strategy for how the region will adapt to the growing urgency of rising sea levels.*

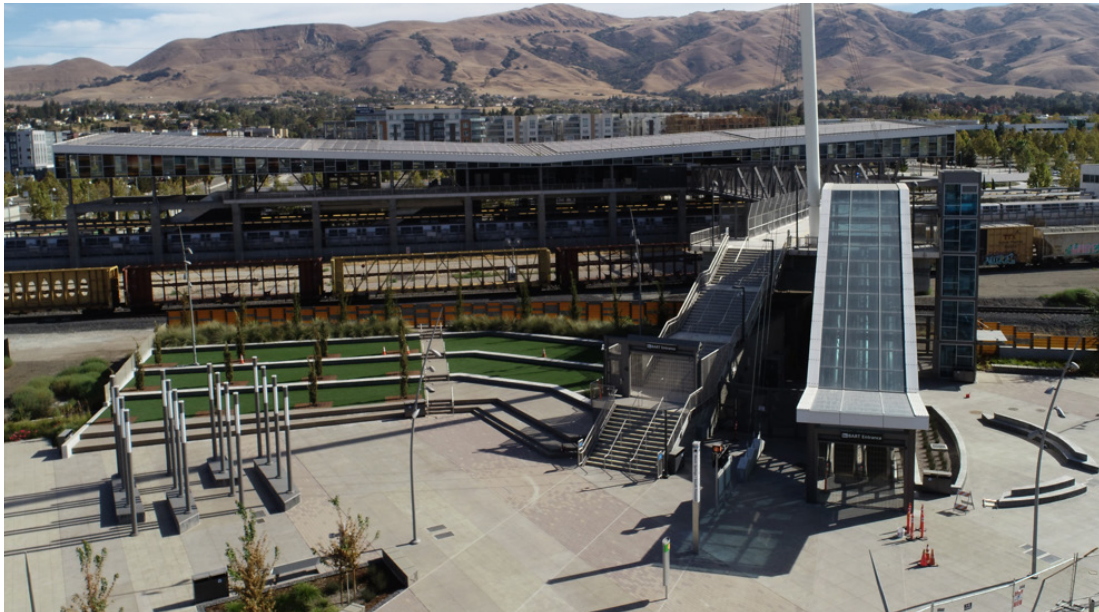
The need to become climate resilient is as urgent as ever. In 2022, a BART car experienced a partial derailment due to deformation of the rail caused by a rapid increase in ambient temperature.<sup>9</sup> As a lifeline to the communities in the region, BART cannot afford to fail during an extreme weather event. BART's efforts to advance climate resiliency will aid in protecting the BART system from climate hazards and prevent such disruptions.

<sup>7</sup>Local Hazard Mitigation Plan | [bart.gov](https://www.bart.gov)

<sup>8</sup>BART Board backs regional approach to sea level rise | [bart.gov](https://www.bart.gov)

<sup>9</sup>Update on partial train derailment between Pleasant Hill and Concord | [bart.gov](https://www.bart.gov)

# BART Improves Station Access for Pedestrians and Bike Riders



*The Warm Springs West Access Pedestrian Bridge allows quicker and more convenient station access for pedestrians and bikers approaching the station from the west.*

BART completed multiple projects in 2022 to improve station access for pedestrians and bicyclists. Walking and biking are prioritized in BART's Station Access Design Hierarchy, which guides design decisions for projects at and around stations. Investments in these access modes help BART meet various safety, public health, and greenhouse gas and pollution-reduction goals. Additionally, BART strives to be a better neighbor by providing excellent customer experience during the first and last mile of trips to and from BART stations, particularly for those with fewer access choices.

When the Warm Springs/South Fremont Station opened in 2017, there was only one way for pedestrians approaching from the west

to access the station: They had to walk three-quarters of a mile around the station and enter it from the east. This was due to five sets of Union Pacific railroad tracks adjacent to the station, which lacked a convenient crossing near the station entrance. The Warm Springs West Access Pedestrian Bridge opened in 2022 and crosses over these tracks, allowing quicker and more convenient station access for thousands of riders, neighbors, pedestrians, and bicyclists alike. The approximately 250-foot-long cable-stayed and steel truss bridge connects the Warm Springs/South Fremont Station with the Fremont Innovation District by providing direct access to businesses, offices, and homes on the west side of the station. The City of Fremont managed construction of the bridge, including a new plaza at the base with public art and amphitheater seating for community gatherings and future events. BART will maintain and operate the structures.

2022 marked the second year of BART's Escalator Modernization Program, which aims to enhance rider safety and escalator reliability. Phase one of the project is focusing on the San Francisco Market Street stations: Embarcadero, Montgomery Street, Powell Street, and Civic Center/UN Plaza stations. Modernization efforts were completed in 2022 for 6 of the planned 41 total escalators. A key provision of the program requires the contractor to maintain a reliability rate of at least 96% for the new escalators during the life of the nearly 10-year contract. These escalators are more energy-efficient, with LED lighting, a "sleep mode," and variable frequency regenerative drives. These new features allow escalators to slow down and save electricity when no passengers are using them. Phase two of the program will involve 38 escalators at the downtown Oakland and San Francisco Mission Street stations. Future phases will address the

# BART Improves Station Access for Pedestrians and Bike Riders



*BART released the Elevator Dimensions Guide to assist bicyclists in navigating BART elevators.*

remaining 96 escalators in the system.

There were two projects to improve access to BART stations for bicyclists. The new BikeLink app can be used instead of a pre-paid BikeLink card to access and pay for eLockers.<sup>10</sup> The eLockers are available at 40 BART stations and provide over 1,800 secure bike parking spaces in total. New users can start with only \$5 on their BikeLink account, whereas the minimum for the BikeLink card is \$20. Additionally, BART released the Elevator Dimensions Guide to assist bicyclists in navigating BART elevators.<sup>11</sup> As more BART riders use bikes, and larger cargo bikes in particular, this guide helps ensure bikes can be safely brought into the station.

<sup>10</sup>New BikeLink mobile app allows riders to park their bikes more easily | [bart.gov](http://bart.gov)

<sup>11</sup>BART Elevator Dimensions Guide | [bart.gov](http://bart.gov)

# New Apartments and Commercial Space at Walnut Creek Transit Village



*The new development, which is located next to Walnut Creek Station, includes 358 housing units, approximately 15,000 square feet of retail space, and public art.*

In December 2022, Walnut Creek Transit Lifestyle Associates (WCTLA) completed the second phase of construction at the Walnut Creek Transit Village. The new development, which is located next to the Walnut Creek Station, includes 358 housing units, approximately 15,000 square feet of retail space, and public art. The project was completed as part of BART's transit-oriented development (TOD) strategy, which focuses on building well-designed, mixed-use, higher-density developments adjacent to frequent transit.

The project took five years to complete, from final design review to construction. The development adds 358 studio, one-bedroom,

two-bedroom, and three-bedroom units, all at market rate. In lieu of providing affordable units within the project, the developer paid Walnut Creek's inclusionary housing fee. There are eight new retail spaces across approximately 15,000 square feet. A new underground parking garage with 518 spaces is available for residents, guests, and retail customers. The new buildings are adjacent to the Walnut Creek Station and are in walking distance of bustling Downtown Walnut Creek.

Incorporating public art and open space was a priority for the project. Sculptures and artistic mosaic tiles were installed on the grand staircase and on landscape elements including planters and benches. Landscaped areas surround the buildings and residents have access to a station-inspired Great Hall lounge and co-working space, pool and spa, rooftop deck, dining room, children's playroom, bike repair lounge, fitness center, dog run area, and more.

BART initiates TOD projects like the Walnut Creek Transit Village based on community feedback, funding availability, and existing infrastructure. Although travel patterns have changed since the pandemic, TOD remains a priority in our efforts to encourage Bay Area residents to use transit and shift away from high-carbon automobile travel. TOD residents are more likely to commute on BART than non-TOD residents, and housing near transit produces fewer auto trips than conventional development.<sup>12</sup> Even with the widespread adoption of remote work in the Bay Area, TOD is still appealing to prospective residents. "People still want to live near transit, regardless of whether they're working remotely or outside of their home," said Deb Castles, Manager of Property Development at BART.



# New Apartments and Commercial Space at Walnut Creek Transit Village

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The first phase of the Walnut Creek Transit Village project was completed in 2019 and included a new parking garage with over 900 stalls for BART riders. A third phase of the project is currently being planned and will bring approximately 240 more housing units, 12,000 square feet of commercial space, and additional improvements to the station entrance.

*TOD is a priority in our efforts to encourage Bay Area residents to use transit and shift away from high-carbon automobile travel.*

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<sup>12</sup>[Travel of TOD Residents in the San Francisco Bay Area: Examining the Impact of Affordable Housing](#)

# BART's 50th Anniversary of Service: Looking Back at the System's Sustainable Beginnings



*BART vehicles have always been engineered to save energy via their ultra-lightweight build. Lighter vehicles require less propulsion, which helps save electricity.*

On September 11, 2022, BART celebrated the 50th anniversary of its opening. Although BART adopted its first Sustainability Policy in 2009, many of the system's early design choices engendered a long-term commitment to sustainability principles. From its inception, BART has helped the region shift travel away from automobiles, reduce pollution, and minimize energy use, and continues to build on those efforts today.

The San Francisco Bay Area Rapid Transit Commission was created in 1951 to develop a transit solution for the region that would "prevent total dependence on automobiles and freeways."<sup>13</sup> Facing a post-World War II population boom, the Bay Area needed a system that

would alleviate the increasingly overcrowded bridges and gridlocked highways, among other problems. After extensive planning and engagement, BART was devised as a state-of-the-art system to help Bay Area residents move around the region.

The route alignments and station locations were selected to connect central business districts throughout the Bay and provide "convenient service within easy walking distance."<sup>14</sup> The system ventured to link outlying suburbs with urban centers to encourage riders to forgo driving. Today, the centralized locations of stations help BART implement its transit-oriented development (TOD) strategy, which focuses on concentrating new housing and commercial space near well-travelled transit hubs instead of in car-dependent areas. Keeping with BART's original goals, this TOD strategy aims to accommodate new growth while minimizing associated congestion and environmental impacts.

The core BART system was designed to be powered exclusively by electricity instead of fuel. It would have been difficult to remove exhaust caused by gasoline- or diesel-powered engines from BART's long tunnels and subway sections. Moreover, electric rail systems create no emissions or excess air pollution at the point of use. This is beneficial for a system like BART that travels through large population centers. In recent years, BART has been able to expand its electric portfolio by procuring 100% of its contracted electricity from greenhouse gas-free and renewable sources like hydro, wind, and solar, instead of from fossil fuels. Since the system has run on electricity from the beginning, this shift has not required any expensive retrofits to the power system or vehicles.

# BART's 50th Anniversary of Service: Looking Back at the System's Sustainable Beginnings



*Pictured is Glen Park Station, which opened on November 5, 1973. The stations were located to connect central business districts throughout the Bay.*

BART vehicles have always been engineered to save energy via their ultra-lightweight build. One report published during BART's design phase noted that a lighter vehicle design would make it easier to move the trains from standstill to high speed and to decelerate smoothly. Since lighter vehicles need less propulsion, this saves electricity. Easier braking also allows the vehicles to be quieter when coming to a stop. To compensate for the lighter vehicle weight and ensure stability of the train cars in high wind, BART uses a nonstandard gauge that is wider than the standard used in many other systems around the world.<sup>15</sup>

Looking forward to the next 50 years, BART will continue to rely on the excellent foundation that was laid five decades ago and ensure the system is resilient in the face of climate change, population change, and other sustainability challenges to come.

<sup>13</sup>BART History – as written by Justin Roberts of the Contra Costa Times | [bart.gov](http://bart.gov)

<sup>14</sup>Engineering Report to the San Francisco Bay Area Rapid Transit District –June 1964 | [bart.gov](http://bart.gov)

<sup>15</sup>50 years of BART: Why BART uses a non-standard broad gauge | [bart.gov](http://bart.gov)

# Performance Metrics

## RESOURCE CONSERVATION: ENERGY & GHG EMISSIONS



	Units	2015 (Baseline)	2016	2017	2018	2019	2020	2021	2022	Target 2025 <sup>1,2</sup>	
Total energy use	Megajoules (MJ) / vehicle revenue mile (VRM)	21.19	19.93	20.52	20.89	21.18	23.70	21.74	18.28	Committed 19.52	Aspirational 19.19
Total greenhouse gas (GHG) emissions	Metric tons of carbon dioxide equivalent (MT CO2e) / thousand VRM	1.92	1.66	0.22	0.25	0.26	0.11	0.10	0.17	Committed 0.31	Aspirational 0.24

## RESOURCE CONSERVATION: WATER



	Units	2015 (Baseline)	2016	2017	2018	2019	2020	2021	2022	Target 2025 <sup>3,4</sup>	
Total potable water use	Gallons / VRM	0.64	0.65	0.86	0.95	0.85	0.98	0.78	0.49	Committed 0.43	Aspirational 0.38

<sup>1</sup>Total energy use: see Appendix for additional charts and information

<sup>2</sup>Total GHG emissions: see Appendix for additional charts and information

<sup>3</sup>Total potable water use: see Appendix for additional charts and information

<sup>4</sup>Residential units, affordable residential units, and office/commercial square footage | [bart.gov](http://bart.gov)

# Performance Metrics

## SMART LAND USE AND LIVABLE NEIGHBORHOODS



	Units	2015 (Baseline)	2016	2017	2018	2019	2020	2021	2022	Target 2025 <sup>5,6</sup>
Residential units	# of units built (cumulative since 1993)	1,416	1,506	1,975	1,975	2,649	3,251	3,251	3,609	7,000
Affordable residential units	# of affordable units built (cumulative since 1993)	256	346	613	613	845	901	901	901	2,400
Office/commercial square footage	Square feet built (cumulative since 1993)	188,590	188,590	194,590	194,590	637,590	643,690	643,690	658,690	1,000,000
Mode share: active (walking and bicycling)	%	44%	Will be measured in next Station Profile Study							52%
Mode share: shared mobility	%	29%	Will be measured in next Station Profile Study							32%
Mode share: drive & park	%	27%	Will be measured in next Station Profile Study							16%
GHG emissions associated with passenger access to the station	kg of CO <sub>2</sub> e / rider / day	0.56	Will be measured in next Station Profile Study							0.43

<sup>5</sup>Mode share | [bart.gov](http://bart.gov)

<sup>6</sup>Mode share and GHG emissions associated with passenger access to the station: baseline calculations based on [2015 Station Profile Study](#) results

# Performance Metrics

## RIDER EXPERIENCE



	Units	2015 (Baseline)	2016	2017	2018	2019	2020	2021	2022	Target 2025 <sup>7,8</sup>
Quarterly reporting of safety and performance indicators	Completed / Not Completed				Completed					Completed
Has BART met all adopted Performance Standards for Safety and Patron Comfort?	Yes / No				No					Yes

## EMISSION AND POLLUTION CONTROL



Total solid waste and landfill diversion rate	BART's Sustainability Team is developing a Waste Management Plan to address and improve landfill, recycling, and composting across BART's facilities. As part of this Waste Management Plan, BART will collect data in order to establish a baseline and set realistic targets.
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<sup>7</sup>Reporting on safety and performance indicators | [bart.gov](http://bart.gov)

<sup>8</sup>The adopted Performance Standards for Safety and Patron Comfort consist of the following KPIs:

Safety KPI: see quarterly performance reports on crime against persons | [bart.gov](http://bart.gov)

Customer Satisfaction KPI: see quarterly performance reports on overall customer satisfaction | [bart.gov](http://bart.gov)

# Performance Metrics

## MATERIALS AND CONSTRUCTION OPERATIONS OPTIMIZATION



	Units	2015 (Baseline)	2016	2017	2018	2019	2020	2021	2022	Target 2025
Percentage of BART Project Delivery Staff trained in BART Facilities Standards (BFS) Sustainability Controls	%		Training commenced in 2021.					18%	31%	100%

## EXTREME WEATHER ADAPTATION AND RESILIENCE



	Units	2015 (Baseline)	2016	2017	2018	2019	2020	2021	2022	Target 2025 <sup>9</sup>
100% High Priority Actions in the BART Local Hazard Mitigation Plan (LHMP) Actions underway or complete	%		Tracking commenced in 2021.					86%	86%	100%

<sup>9</sup>High Priority Actions in the LHMP | [bart.gov](http://bart.gov)

# Appendix



# Energy Use



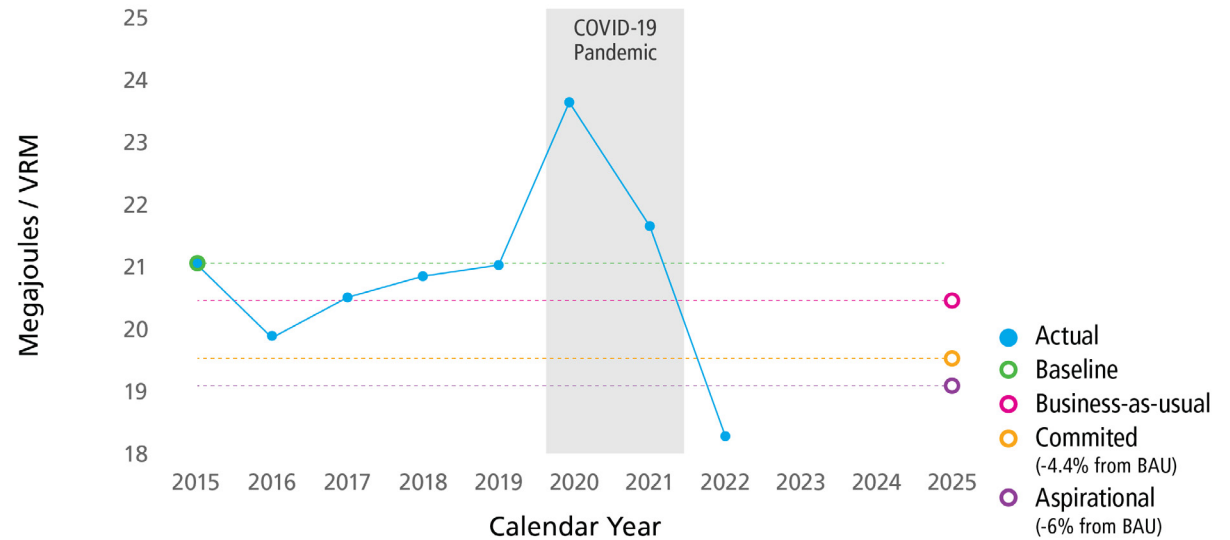
In 2022, BART for the first time met its 2025 Committed and Aspirational targets for energy use per vehicle revenue mile (VRM). BART made significant strides in improving energy efficiency to achieve this. A particular focus has been on traction power, which represents approximately 71% of BART's total energy use as of 2022. BART's new Fleet of the Future cars, which are built to be at least 7% more energy efficient than legacy vehicles, now represent over half of the current fleet. Additionally, BART trains convert their kinetic energy of motion into electrical energy as the trains slow down. The energy regenerated during this process is returned to the power distribution system where it is used by other trains. The more trains that are in service, the lower the amount of regenerative energy will be wasted from the power distribution system. Thus, energy use from traction power only increased by 18%, despite BART offering 30% more vehicle revenue miles of service than in 2021. This helped continue the decline in energy use per VRM that began in 2021, when BART returned to near pre-pandemic levels of service mid-year.

BART has also completed several projects to reduce energy use at stations and their parking garages by replacing old lighting fixtures with more energy-efficient LEDs. Total energy use at stations has decreased by approximately 8% compared to 2021. Year-over-year energy use at offices declined by 29% in 2022, which was BART's first full year in its new headquarters (BHQ). BHQ employs numerous energy conservation techniques and received a Leadership in Energy and Environmental Design (LEED) Gold certification in 2022.

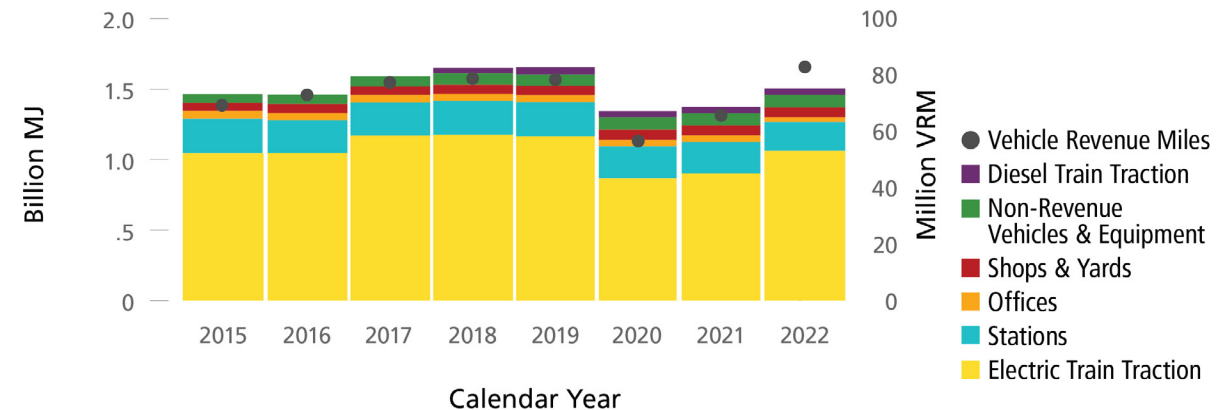
For the 2015-2019 period, BART generally increased energy use due to increased train service and the addition of new stations. BART's Warm Springs Extension, a 5.4-mile extension connecting the existing Fremont Station to the new Warm Springs/South Fremont Station, opened in March 2017. The BART to Antioch Extension, a 10-mile extension connecting the Pittsburg/Bay Point and Antioch stations, opened in May 2018. Trains on the extension, which are powered by on-board diesel engines, require more energy per VRM than trains on the main system, which are powered by an electric rail.

BART is undertaking actions to make the system more energy efficient. BART is continuing to increase the number of Fleet of the Future cars in service. These cars have features such as LED lighting, improved regenerative braking, and lightweight exteriors. BART is also pursuing additional LED lighting upgrades at stations across the system

## Energy Use per Vehicle Revenue Mile (VRM)



## Energy Use by Asset Category



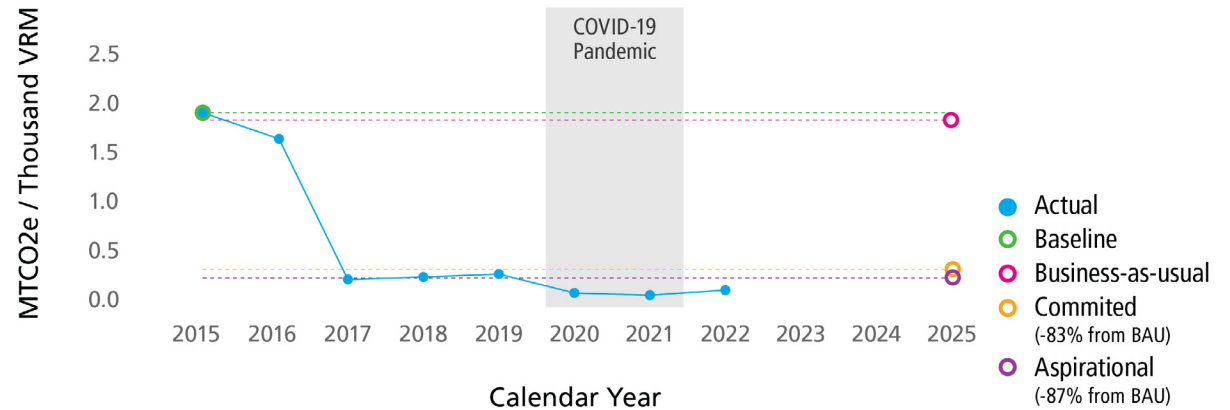
# Greenhouse Gas Emissions



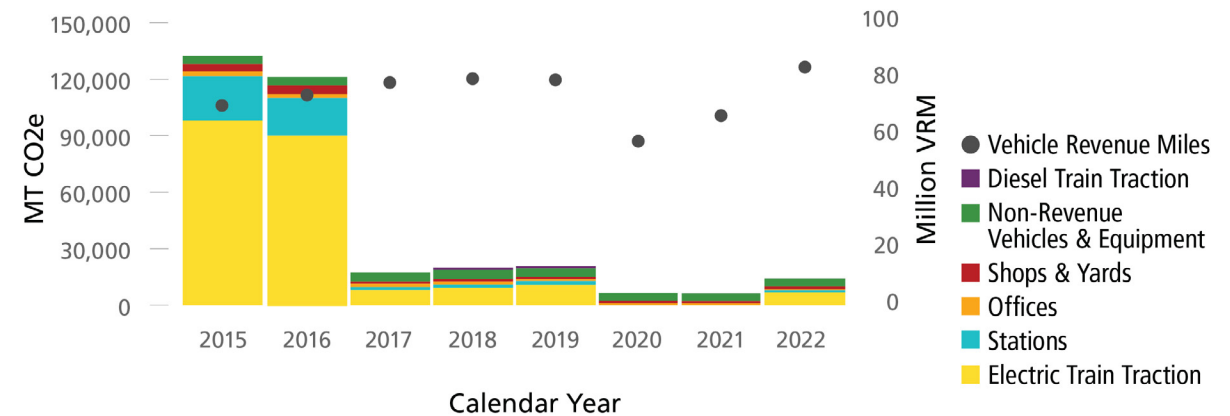
In 2022, BART continued to meet both its 2025 Committed and Aspirational targets for metric tons of carbon dioxide-equivalent per vehicle revenue mile (VRM). 95% of BART's contracted electricity supply was greenhouse gas-free, which is a 5% decline from the previous year. Due to drought, BART was unable to procure as much electricity from hydroelectric sources as anticipated. Technical issues also limited deliveries from one of BART's wind power purchase agreements (PPA), which provided about 25% of BART's electricity throughout the year. Finally, increased market demand for renewables made it more difficult to fill our open positions. As a result, BART filled its remaining open positions with electricity from unspecified sources, which are not designated as GHG-free. This caused year-over-year emissions to increase for traction power, stations, and shops and yards. Emissions for offices declined from 2021 because of reduced overall energy use in that category.

Since adopting the District's Wholesale Electricity Policy in 2017, BART has shifted its energy sourcing away from unspecified power sources in favor of specified GHG-free sources, which has significantly reduced BART's GHG emissions from the 2015 baseline. Additionally, the District has transitioned from conventional diesel to renewable diesel for use in BART to Antioch trains and the diesel-powered non-revenue fleet. BART is developing plans to increase electrification of its non-revenue fleet.

## GHG Emissions per Vehicle Revenue Mile (VRM)



## GHG Emissions by Asset Category



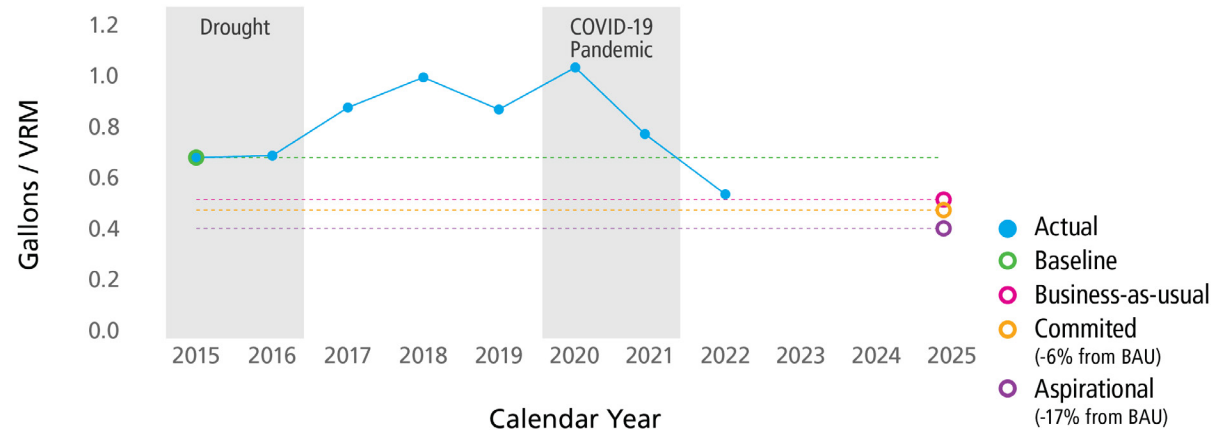
# Potable Water Use



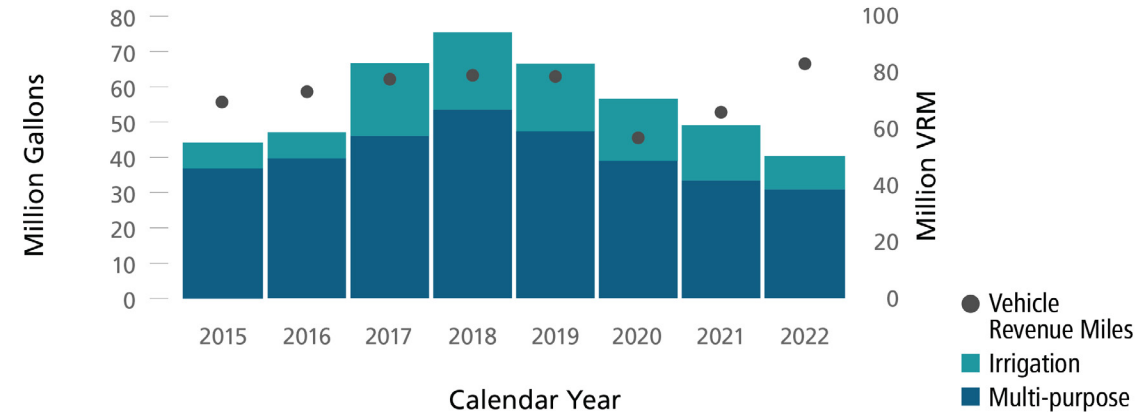
In 2022, BART's water use per vehicle revenue mile declined by 37% compared to previous years, driving performance of this metric closer to the 2025 goals. Overall water use decreased by approximately 18%, and vehicle revenue miles increased by approximately 30%. The drop in water use was largely the result of optimizations to irrigation schedules for plants at and around stations. Additionally, irrigation concluded at an environmental mitigation project, which required planting native species and irrigating them during their establishment period. Year-over-year water use at offices also declined in 2022, which was BART's first full year in its new headquarters (BHQ). BHQ employs numerous water conservation techniques and received a Leadership in Energy and Environmental Design (LEED) Gold certification in 2022.

Compared to the baseline year, BART's water use initially increased from 2015 to 2018. Due to drought conditions in 2015 and 2016, BART maintained low water usage by reducing the frequency of train car washing and irrigation. As drought conditions improved since late 2016, train car washing returned to the prior frequency and previously deactivated water fixtures for irrigation were reactivated, causing water use to increase. Additionally, the Warm Springs/South Fremont Station added sites that increased water consumption during that period, including the environmental mitigation project. To help address these trends, particularly in recognition of emerging drought conditions, new cross-departmental working groups were created in 2020 to optimize water use for irrigation and at BART's shops and yards. These groups will continue enhancing long- and short-term analysis of trends and will be developing new standard operating procedures accordingly.

## Water Use per Vehicle Revenue Mile (VRM)



## Water Use by Type



# Municipal Solid Waste Generation and Diversion

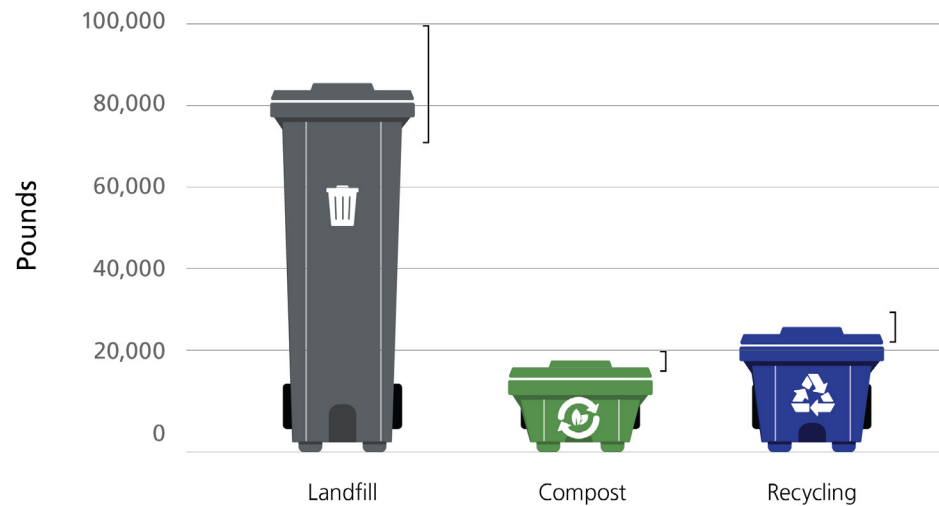


As part of BART's Waste Management Program, BART staff are taking a phased approach to refining waste metrics. BART estimated the waste generation and diversion rates for office buildings based on samples taken from BART headquarters. The results were extrapolated to other office buildings based on headcount. BART will use the lessons learned from this exercise to expand waste calculations to include other parts of BART operations, such as stations, shops, and yards.

BART estimated that 123,662 pounds of waste were generated at offices in 2022, with a waste diversion rate of 32% by weight. At BART Headquarters, this corresponded to about 89 pounds of landfill, 25 pounds of compost, and 32 pounds of recycling waste per person throughout the year.

After expanding the compost program to additional offices in late 2022 and early 2023, BART staff plans to pilot and implement composting at our shops and yards and passenger stations in the coming years.

## Total Waste Generated at Offices



] Margin of Error










# Action Table

Each of the actions and subactions described in BART's Sustainability Action Plan were reviewed to determine their status as of December 2022. Actions in the plan were inspired by BART initiatives that were either proposed or underway, as well as best practices from other transit agencies. The District's internal peer review of these actions reflects the professional input of relevant groups. The table below summarizes the status of each of the 118 actions and subactions.

**Bolded text has changed from the prior year**

\* STATUS UPDATE FOR 2022



 <b>RESOURCE CONSERVATION: ENERGY &amp; GHG EMISSIONS</b>			
ACTION	SUB-ACTION	STATUS	SUMMARY
RCE 1 - Increase Capacity to Support Regional GHG Goals	Enable expanded service for additional riders; increasing ridership capacity		<b>As of 12/2022, BART has received 459 new cars of the Fleet of the Future order of 775 (59.2%). Final design for new train control system initiated in June 2022 and preliminary engineering concluded in December 2022; forecasted completion in Sep 2023. Progressed on installation of two traction power substations in San Francisco (60% complete); completed 100% design on four traction power substations in the East Bay. Issued Notice to Proceed for the site preparation and grading contract for the Hayward Maintenance Complex Phase 2 (HMC2) East Storage Yard site; completed 90% design on the East Storage Yard.</b>
RCE 2 - Adopt a Strategic Energy Plan	2.1 - Develop plan to achieve low-carbon energy procurement targets		Energy plan developed and targets identified.
	2.2 - Develop Wholesale Electricity Portfolio Policy		Wholesale Electricity Portfolio Policy adopted by Board.
	2.3 - Track and report energy indicators; set performance goal		Energy use by location and power type reported annually and used to develop performance goals. Exploring options to better analyze energy use over time.
RCE 3 - Make Renewable Energy Purchases	Continue to invest in wholesale low-carbon, zero-carbon, and renewable electricity purchases		BART staff negotiated two power purchase agreements for output from a 50.5-megawatt solar project and a 30-megawatt wind project. Projects became operational in 2021.
RCE 4 - Invest in On-site Energy Generation	4.1 - Move forward with on-site solar power generation		Solar energy systems in place at Antioch, Lafayette, Warm Springs, Richmond, and Hayward. Additional systems being considered for new stations.
	4.2 - Solar power generation vs. TOD and housing policies		Five potential solar sites were identified for solar generation that do not have plans for any TOD development within the next 20 years.
	4.3 - Seek funding to support photovoltaic (PV) installations and storage		Funding pursued as needed for new projects.

# Action Table

**Bolded text has changed from the prior year**

\* STATUS UPDATE FOR 2022



## RESOURCE CONSERVATION: ENERGY & GHG EMISSIONS

ACTION	SUB-ACTION	STATUS	SUMMARY
RCE 5 - Investigate Investment in Renewable Diesel	Explore feasibility of renewable fuels for eBART and non-revenue fleet		BART has transitioned to renewable diesel for both eBART and non-revenue vehicles.
RCE 6 - Conduct Station Energy Consumption Analysis	Complete energy monitoring study for representative stations		A study was completed examining three representative stations. Based on the lessons learned, BART has no further plans to study three additional underground stations.
RCE 7 - Invest in District Lighting Retrofits	7.1 - Prioritize stations for energy-efficient lighting retrofits		<b>10 of 48 stations, 14 of 15 parking garages, and 12 of 29 parking lots have been retrofitted.</b>
	7.2 - Develop robust lighting design guidance		<b>Project underway for station lighting. Expected completion in 2023.</b>
RCE 8 - New Energy-Efficient Train Cars	Continue to fund the new train car procurement; conduct testing to confirm energy efficiency gains		<b>As of 12/2022, 459 new train cars out of a planned total of 775 in the current order have been accepted.</b>
RCE 9 - Reduce Electricity Losses from Traction Power	Explore and apply potential improvements to reduce traction power losses		BART will be installing reversible rectifiers at appropriate substations as the substations are replaced.
RCE 10 - Explore Opportunities for Energy Storage	10.1 - Funding options in coordination with new train car procurement		The Self-Generation Incentive Program (SGIP) offered by the California Public Utilities Commission was explored but would not apply for funding batteries for regenerative braking system. BART will continue exploring other options for funding as opportunities arise.
	10.2 - Engineering-level study of systemwide energy storage		Study completed in 2016 indicated that storing energy from regenerative braking is not feasible due to battery limitations. Potential opportunities will be revisited at a later date.
RCE 11 - Green Non-Revenue Fleet	11.1 - Replace retired vehicles with hybrids		<b>There are 3 electric motorcycles and 14 hybrids in the total fleet, with the potential for future purchases.</b>
	11.2 - Right-size heavy equipment to save fuel		Department superintendents provide guidance on vehicle uses prior to replacement by maintenance. Multi-use vehicles are pursued when possible.
	11.3 - Implement operational strategies, e.g., anti-idle and fuel saving driving		<b>New logistics trucks are designed to shut off after five minutes according to CA regulations. Maintenance &amp; Engineering employees are required to take driver safety course. All employees required to take Space Cushion Driving webinar, which offers defensive driving strategies that help reduce fuel consumption and maintenance.</b>
RCE 12 - Employee Trip Reduction in Non-Revenue Vehicles	Reduce fuel and emissions for BART employee work-related travel		Not started

# Action Table

**Bolded text has changed from the prior year**

\* STATUS UPDATE FOR 2022



## RESOURCE CONSERVATION: ENERGY & GHG EMISSIONS


ACTION	SUB-ACTION	STATUS	SUMMARY
RCE 13 - Support Energy Efficiency Operations in Offices	Assess the feasibility of reducing BART's corporate energy use via employee training		Not started
RCE 14 - Electric Vehicle (EV) Charging Policy and Implementation	14.1 - Pursue funding for installing EV charging stations		<b>Continued to follow Federal, California Energy Commission, California Air Resources Board, and local opportunities for EV charging funding.</b>
	14.2 - Pilot EV charging at Warm Springs Station		The EV charging pilot at Warm Springs has been implemented.
	14.3 - Develop expansion of station EV charging		<b>EV Charging at BART Policy adopted by the Board in November.</b>
	14.4 - Install EV charging at shops/ yards to enable EVs in non-revenue fleet		<b>EV charging stations available at eBART and Hayward Maintenance Complex for employees and non-revenue fleet. Planning is underway for further expansion.</b>
	14.5 - Install EV charging for convenient employee use		<b>EV charging stations available at eBART and Hayward Maintenance Complex for employees and non-revenue fleet. New dual-port charges added to the Hayward Maintenance Complex.</b>


# Action Table


**Bolded text has changed from the prior year**


\* STATUS UPDATE FOR 2022

Ongoing 

100% 

76%-99% 











26%-75% 

1%-25% 

0% 



## RESOURCE CONSERVATION: WATER

ACTION	SUB-ACTION	STATUS	SUMMARY
RCW 1 - Regularly Audit Water Use and Correct Issues	1.1 - Allocate resources to pilot water use data tracking		Water use is tracked systemwide by meter. Piloted data dashboard using newly implemented cloud analytics tool. Cross-departmental team has begun compiling additional data about meters and site-specific water use throughout system. Irrigation at several locations has been optimized as a result of analysis.
	1.2 - Leak detection and fixes		<b>13 Calsense controllers have been installed at various locations. Leak detection at shops &amp; yards will be enhanced upon installation of new water mains and piping. Water billing data and manual inspection techniques are used at other locations.</b>
	1.3 - Electronic data from water suppliers		BART developed a proposal for enhancing data intake for water data.
RCW 2 - Address Irrigation Usage and Infrastructure	2.1 - Prioritize and conduct irrigation upgrades		Developed dashboards and spreadsheets to assist with auditing water meters and consumption trends at key locations. Water use for irrigation declined by nearly 10 percent from 2020 to 2021.
	2.2 - Remote access controllers pilot and lessons learned		Pilot was completed at Warm Springs and lessons will be applied to future projects.
	2.3 - Update irrigation maintenance manual		Not started
RCW 3 - Upgrade Water Fixtures	3.1 - Prioritize and install water-saving fixtures		Water fixtures are upgraded during station modernization efforts. Other water fixtures needing repair are maintained according to their current specifications.
	3.2 - Audit existing fixtures		Audit completed to identify plumbing fixtures that are not low flow and do not meet current water efficiency requirements.
	3.3 - Pilot low-flow fixtures and apply findings		Low-flow pilot only applicable to new facilities. For existing toilets, not feasible to retrofit due to low slope of sewage pipe.
RCW 4 - Replace Water Systems in Shops and Yards	Identify leaks; consider upgrades to water systems		<b>Water main replacements are complete at Concord Yard, Oakland Shops and Richmond Yard, with more efficient distribution, a greater number of valves, and fire line flow monitoring. Hayward Yard Fire Protection project approaching 50% completion and will provide efficient water distribution for separated domestic and fire mains, a greater number of valves for better control of the system, and better monitoring for high flow.</b>



# Action Table

**Bolded text has changed from the prior year**

\* STATUS UPDATE FOR 2022



## RESOURCE CONSERVATION: WATER

ACTION	SUB-ACTION	STATUS	SUMMARY
RCW 5 - Investigate Train Car Washing	Determine the most water-efficient cycle/schedule		An audit of the train car washing schedule will be considered once the new cars are the majority of the fleet (anticipated late 2022).
RCW 6 - Engage Operations Staff for Water Conservation	Educate and engage relevant staff on ideas for water conservation in the workplace		Cross-departmental team created to address water consumption at shops and yards and develop standard operating procedures to better manage activities.
RCW 7 - Participate in Water District Conservation Programs	Explore available rebates, incentives, and technical assistance		12th Street Oakland/City Center Station has received the Water Smart Business Certification.

# Action Table

**Bolded text has changed from the prior year**

\* STATUS UPDATE FOR 2022



## SMART LAND USE AND LIVABLE NEIGHBORHOODS

ACTION	SUB-ACTION	STATUS	SUMMARY
SLU 1 - Improve Station Character and Community Fit	1.1 - Implement the "Connect & Create Great Places" work plan		<b>Overall, 14 capital projects identified: 5 complete, 5 in progress, 3 on hold, 1 not started.</b>
	1.2 - Seek funding for place-making investments via grants, bonds, etc.		<b>Affordable Housing and Sustainable Communities Round 6: \$34.8M awarded for rail cars and faregate improvements.</b> <b>Transit and Intercity Rail Capital Program: \$49M awarded for TOD transportation elements at Lake Merritt, West Oakland, and El Cerrito Plaza.</b>
	1.3 - Partner to implement complementary improvements on city streets		<b>BART secured \$49M in Transit and Intercity Rail Capital Program grant funding. Overall, 5 capital projects identified: 2 complete, 3 in progress.</b>
SLU 2 - Continue to Lead the Region in Transit-Oriented Development (TOD)	2.1 - Implement TOD Policy		<b>TOD completed at Walnut Creek.</b> <b>3 TODs under construction: Millbrae, Fruitvale Phase 2A, and Balboa Park.</b> <b>5 TODs under negotiation: West Dublin, Lake Merritt, West Oakland, El Cerrito Plaza, and North Berkeley.</b> <b>Board approved Lake Merritt TOD.</b> <b>Board selected developer for North Berkeley.</b>
	2.2 - Coordinate with local partners on Specific Plans or Station Area Plans		<b>AB2923: Conformance finding completed and adopted by Board on Aug 25 2022. BART Station Planners check in periodically if jurisdiction rezones and will update conformance findings accordingly.</b>
	2.3 - Activate stations in coordination with system expansion		<b>City of Milpitas adopted 'Milpitas Metro Specific Plan' for Milpitas Station in 2022. The plan provides a vision for development around the station.</b>

# Action Table

**Bolded text has changed from the prior year**

\* STATUS UPDATE FOR 2022



## SMART LAND USE AND LIVABLE NEIGHBORHOODS

ACTION	SUB-ACTION	STATUS	SUMMARY
SLU 3 - Station Access – Connect to Community	3.1 - Implement the Station Access Policy		Completed construction of the Warm Springs West Access Pedestrian Bridge. BART is advancing Measure RR-funded pedestrian and bike improvements including widening the Ohlone Greenway on BART’s property at North Berkeley Station and building a new plaza and passenger loading zone associated with the TOD at Balboa Park Station. Advanced construction of Measure RR-funded Safe Routes to BART projects on city streets to provide safer, more efficient pedestrian and bike connections to Dublin/Pleasanton and Powell Street stations. Other Measure RR-funded projects are in the design phase.
	3.2 - Implement the BART Bike Plan and Bike Parking Capital Program		Upgraded all 1,800+ bike lockers with Bluetooth technology to support functionality with the new BikeLink app.
	3.3 - Incorporate Multimodal Access Design Guidelines into the BFS		The guidelines are listed as an appendix in the BFS.
	3.4 - Improve multi-modal transfers; fund access upgrades		<p>BART participated in regional transit coordination work to support the Transit Transformation Action Plan. Improvements were identified for fare coordination and integration; regional mapping and wayfinding; accessibility; and paratransit improvements. BART helped launch the Clipper BayPass pilot program. BART released a draft of the Station Access Signage and Wayfinding Guidelines for public comment.</p> <p>BART and AC Transit launched the new East Bay Paratransit app. Elevator Dimensions Guide published to assist cyclists navigate elevators. New BikeLink mobile app released. Shared e-scooters added to BART Trip Planner.</p> <p>SFO Station easier to navigate with one center platform. 19th Street/Oakland Modernization completed: reconfigured concourse into one paid area, enclosed south platform elevator in the paid area, added a new north end platform elevator, bike stair channels, and interior bike parking. Walnut Creek TOD Phase 1 completed: improved connections to N. California St, improved pedestrian path leading to station, and relocated bus shelters. Millbrae TOD improvements: east side plaza and new bus area with updated signs. Started work on Balboa Park Station Plaza and continued work on North Berkeley Bicycle and Pedestrian access project.</p>





# Action Table

**Bolded text has changed from the prior year**

\* STATUS UPDATE FOR 2022



## SMART LAND USE AND LIVABLE NEIGHBORHOODS

ACTION	SUB-ACTION	STATUS	SUMMARY
SLU 4 - Participate in Local/Station and Regional Partnerships	4.1 - Identify opportunities for effective Plan Bay Area implementation		<b>BART is a participant on the Core Project Management Team for Transit 2050+, a comprehensive plan for the regional transit network as part of Plan Bay Area 2050+.</b>
	4.2 - Serve on Technical Advisory Committees, lend expertise		In 2022, operators and Metropolitan Transportation Commission kicked off scoping work for Transit 2050+. BART staff also served on several technical advisory committees and planning advisory committees for Contra Costa County, San Leandro, Hayward, Oakland, Berkeley, and Dublin. This included master plans related to biking, pedestrians, neighborhood/community improvement, VMT mitigation, and subregional planning.
	4.3 - Participate in state legislation and rule making to support TOD		BART Board supported legislation including AB 2011 (Wicks), SB 922 (Wiener), SB 942 (Newman) and AB 2097 (Friedman).
SLU 5 - Support Affordable Fares	Continue to explore strategies to support affordable fares		BART is a participant of Clipper START, a fare-discount pilot program for riders with lower incomes. The pilot program, which expires June 30, 2023, is under consideration for extension.  BART and Metropolitan Transportation Commission (MTC) co-lead regional fare coordination and integration efforts. Efforts include Clipper BayPass, a pilot program for an unlimited regional transit pass. Program has partnered with four local universities and twelve affordable housing sites.

# Action Table

**Bolded text has changed from the prior year**

\* STATUS UPDATE FOR 2022



## RIDER EXPERIENCE

ACTION	SUB-ACTION	STATUS	SUMMARY
RE 1 - Create Clean Station Environments	1.1 - Invest in the Station Brightening Program and increase staff		11/70 actions completed for Fremont Brightening Project. Hiring halted due to COVID-19.
	1.2 - Additional grounds maintenance crews to improve parking lot cleanliness		Two positions have been filled on maintenance crew. Other positions to be considered in the future.
RE 2 - Create Safer Station Environments	2.1 - Support community-based policing		The Progressive Policing and Community Engagement Bureau continued its expansion efforts with the addition of 19 of 20 Crisis Intervention Specialists (CIS) and 7 of 10 Police Officers. The CIS and Officers are engaged in a co-responder model of policing to increase safety and address quality of life issues on the BART system. The Community-Oriented Policing and Problem Solving (COPPS) Unit participated in a variety of community events. The Transit Ambassadors are at half of desired staffing level due to various job promotions, but have continued participating in community policing efforts through high visibility patrolling and attending community events. The Bureau staffing level is at approximately 80% of its goal. Examples of community-based policing included fare inspection efforts, addressing quality of life issues at the Mission station plazas, homeless encampment abatement, high visibility train patrols, and strategic train inspections during nights and weekends.
	2.2 - Analysis of high crime stations; leverage data to optimize police presence and support equitable policing practices		BART Police adjusted officer presence based on COVID-19 safety protocols and ridership numbers. Fare Inspectors conduct strategic proof of payment inspections. Community Service Officers were redeployed from parking lots to provide visible presence in stations and on trains.
	2.3 - Update audibility of Public Announcement (PA) system		<b>The Stations PA Improvement project includes Powell Street and Lafayette stations. Project is in procurement as of end of 2021.</b>
	2.4 - Improve real-time display (RTD) messages to communicate safety messages		<b>30 real-time displays installed at downtown Oakland and SF stations.</b>
RE 3 - Support Art in Transit	Develop an art program master plan		In 2020, BART completed an art collection analysis that details maintenance and cleaning. The BART Arts Master Plan, which includes guidelines, procedures, and metrics, is now complete. Funding is currently on a project-by-project basis.

# Action Table

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\* STATUS UPDATE FOR 2022



## RIDER EXPERIENCE


ACTION	SUB-ACTION	STATUS	SUMMARY
RE 4 - Invest in Employee Health and Wellness	Implement programs to enhance worker safety and wellness		<p><b>Continued to implement COVID-19 prevention program in line with local, state, and federal public health guidances. BART switched from mandatory to recommended masking in October 2022.</b></p> <p><b>In 2022, all employees complied with COVID-19 vaccination rules. BART continued partnerships to offer flu shots and COVID boosters to employees.</b></p>
RE 5 - Design Stations for Patron Comfort	Develop guidelines and other procedural tools to promote quality of life at stations		Rider comfort addressed in various guidelines and requirements including the Station Experience Design Guideline, Powell Street Station improvement Guideline, and the BART Facilities Standards (BFS).
RE 6 - Attenuate Noise	6.1 - Feasibility of piloting a physical barrier to mitigate local noise impacts		Upon analysis, a physical barrier at West Oakland Station was deemed infeasible.
	6.2 - Continue regular wheel and rail maintenance to mitigate noise		BART converted 95 percent of our fleet wheels and 40 percent of the rails to a new profile that together help to reduce the screeching noise frequently heard on BART. In the most problematic areas of the system, interior train car noise measurements decreased from 95dB to 75dB.
	6.3 - Specify materials in the BART Facilities Standards (BFS) that help noise attenuation		BFS architecture criteria for passenger stations include noise attenuation requirements.
RE 7 - Support an Enhanced Wayfinding Program	Update wayfinding program; expand the use of electronic signs with realtime information		<b>Wayfinding Phase 4 construction contract awarded. Wayfinding improvements for 38 stations completed to date.</b>
RE 8 - Build Awareness: Transit's Relationship to Public Health	8.1 - Explore opportunities for healthy behaviors, e.g. public art		<b>BART launched an Earth Day campaign throughout its stations to show how riders can reduce their GHG emissions by taking BART instead of driving. BART also took part in Clean Air Day, where riders and employees could take the pledge to reduce air emissions.</b>
	8.2 - Reflect public health benefits in emerging guidance for station design		BFS architecture criteria for passenger stations include requirements for bike stair channels to promote bike usage.


# Action Table


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\* STATUS UPDATE FOR 2022

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## EMISSIONS AND POLLUTION CONTROL

ACTION	SUB-ACTION	STATUS	SUMMARY
EP 1 - Support Solid Waste Reduction	1.1 - Review station recycling pilot; targets for landfill diversion and waste reduction		BART estimated total waste and diversion based on volume of waste containers and pickup frequency at all stations and offices.
	1.2 - Renegotiate waste hauling and recycling contracts	N/A	BART compiled all waste hauler contracts and service agreements, which were franchise agreements. Contract negotiations were not feasible.
	1.3 - Public education and marketing campaigns for recycling		Not started
	1.4 - Hire workers to service and support station recycling		Current System Service workforce is sufficient to meet projected recycling management needs.
EP 2 - Pilot Station Dumpster Enclosures	Implement pilot project for dumpster enclosures		Project completed to determine best practices for dumpster enclosure design. Rather than completing a pilot, accepted requirements were incorporated into BART Facilities Standards. New construction or future upgrades to dumpster enclosures will capture and use these best practices.
EP 3 - Pilot Facility-based Sustainability Program at Shop(s)/Yard(s)	3.1 - Opportunities for pilot of Sustainability Plan at shops/yards		Not started
	3.2 - Evaluate pilot; develop sustainability program for shops/yards		Not started
EP 4 - Improve Recycling at All District Shops and Yards	4.1 - Review Oakland shops' recycling, create plans for all other shops/yards		Visited Oakland Shops in December 2021 to document current waste streams and collection process. Plan to start a recycling and composting pilot at a smaller shop with fewer departments.
	4.2 - Identify costs and resources needed for systemwide recycling plan		Not started
EP 5 - Incorporate Composting in Employee Worksites	5.1 - Develop composting and recycling program for administration offices		300 Lakeside, Oakland has recycling and composting. Program will continue at 2150 Webster, Oakland upon move.
	5.2 - Recycling and composting in staff rooms at shops/yards systemwide		Visited Oakland Shops in December 2021 to document current waste streams and collection process. Plan to start a recycling and composting pilot at a smaller shop with fewer departments.
	5.3 - Investigate potential to include composting at BART stations		Research completed and pilot plan drafted.

# Action Table

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## EMISSIONS AND POLLUTION CONTROL

ACTION	SUB-ACTION	STATUS	SUMMARY
EP 6 - Improve Office Recycling and Re-use	6.1 - Inter-District "green team" to advance waste reduction strategies		Office of Chief Information Officer (OCIO) Digitization team implemented e-signatures and other resources to reduce processes that require paper. Initial outreach for "green team" creation and signup has begun.
	6.2 - Develop paperless policy; Board of Directors all-digital pilot; review union contracts		<b>BART Record Retention Manual, with exceptions, requires records created on or after January 1, 2021, to be stored digitally. Digital signatures have been in use, reducing printing. Board preparation meetings are paperless. Board meetings provide hard copies for accessibility reasons. Union contracts were reviewed for paper and printing requirements.</b>
	6.3 - Searchable database of materials available for salvage/re-use		Not started
EP 7 - Reduce District Hazardous Waste	7.1 - Specify non-hazardous materials in capital projects; seek alternatives		<b>Construction projects are routinely being routed to System Safety for material management review. Emphasis on recycling and reuse has resulted in significant diversion of waste from disposal site to reuse and reclaim.</b>
	7.2 - Expand program for reusing and laundering oily rags		BART has contract to launder and reuse rags at the BART vehicle shops. Nearly two tons of rags are diverted from waste annually due to the program.
EP 8 - Minimize and clean stormwater runoff	8.1 - Construct trash interceptors/ storm drain diversion structures		<b>No milestones; trash control measure action plan and cost estimate are in progress.</b>
	8.2 - Increase crews to improve cleanliness and inspect storm drain inlets		2 of 9 planned positions have been filled on maintenance crew. Other positions to be considered in the future.
	8.3 - Pilot the capture, storage, and reuse of rainwater		A potential pilot is currently unfunded. BART is actively exploring and applying for grants to fund this initiative.
	8.4 - Update BART Facilities Standards drainage sections to reflect best practices		<b>BFS 3.2.1 published in 2022. Civil design drainage criteria were updated. Requirements for biofiltration in facilities and site planning added under Article 11.4 Biotreatment and Article 11.5 Storm Water Control Plan (SWCP) respectively.</b>
EP 9 - Clean and Reuse Water	9.1 - Explore and implement the reuse of sump pump water	N/A	Upon analysis, reuse of sump pump water is currently infeasible for BART's operations.
	9.2 - Explore and implement grey water systems at the shops and yards	N/A	Due to public health concerns and metals in water discharge, grey water systems are currently infeasible for BART's operations.
	9.3 - Explore and implement storm water capture		Not started



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## EMISSIONS AND POLLUTION CONTROL

ACTION	SUB-ACTION	STATUS	SUMMARY
EP 10 - Invest in Tree Planting	10.1 - Direct resources to prioritize tree coverage		Several transit-oriented development projects at and around stations include tree planting as part of design. Trees are also considered and prioritized during planning for new stations. However, funding and staffing for maintaining existing and newly established trees have been identified as obstacles.
	10.2 - Include tree requirements in the BART Facilities Standards as possible		Updates added to landscape and vegetation control section of BFS.
EP 11 - Replace Gas-Powered Tools with Electric	11.1 - Prioritize landscaping tool replacement		BART replaces tools on an ongoing basis. Electric tools are tested prior to implementation to ensure they meet our needs.
	11.2 - Develop policy of purchasing electric (battery) tools		BART replaces tools on an ongoing basis. Electric tools are tested prior to implementation to ensure they meet our needs.
	11.3 - Outfit hi-rail crew trucks with outlets and areas to charge batteries		All hi-rail crew trucks have generators and outlets.

# Action Table

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## MATERIALS AND CONSTRUCTION OPERATIONS OPTIMIZATION


ACTION	SUB-ACTION	STATUS	SUMMARY
MC 1 - Select Green, Sustainable Materials and Products	1.1 - Green Purchasing Policy		<b>On hold due to changes in staffing.</b>
	1.2 - Department-specific procurement guidelines		<b>On hold due to changes in staffing.</b>
MC 2 - Update BART Facilities Standards (BFS) for Construction Activities	2.1 - Develop tools for BFS Sustainable Practices		Not every company produces an Environmental Product Declaration so BART is unable to make this a requirement. At this time, BART is including sustainability in construction specifications where practical.
	2.2 - Update BFS Construction Standard Specification		Not started
	2.3 - Modify BFS design standards to ensure resilient infrastructure design		Not started
MC 3 - Improve BFS Sustainability Guidance, Criteria and Standards	3.1 - Update guidelines and incorporate performance-based specifications		BFS Sustainability Guidelines have been revised.
MC 5 - Sustainable Contractual Tools (Capital Projects)	Explore contracting tools to best leverage sustainability		Not started
MC 6 - Develop Sustainability Design Guidance	6.1 - Project guidance (sustainability targets, financial resource allocation)		Not started
	6.2 - Experience with green building and LEED certification in new contracts		BART includes LEED experience as a desired qualification in RFPs for On-Call Agreements.
	6.3 - Pilot project with INVEST or Envision		Provided information about third-party sustainability certifications and cost premiums in internal "Sustainability in Project Delivery" training. VTA staff are pursuing Envision for BART Silicon Valley Phase II. BART staff are supporting their work and learning from the experience.


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## EXTREME WEATHER ADAPTATION AND RESILIENCE

ACTION	SUB-ACTION	STATUS	SUMMARY
EWA 1 - Coordinate with Regional Agencies in Climate Adaptation Planning and Implementation	1.1 - Consider climate change impacts as a part of project design		<b>BART project designs are required per BART Facilities Standards to account for climate change impacts.</b>
	1.2 - Seek funding or partner to adopt adaptation strategies		<b>No state, federal, or local grants awarded to District in 2022 for adaptation.</b>
	1.3 - Modify BFS design standards to ensure resilient infrastructure design		Included requirements in BFS for climate change adaptation.
EWA 2 - Conduct Hazard Mitigation Planning	2.1 - Incorporate Local Hazard Mitigation Plan (LHMP) (2016) considerations into capital improvement plans		<b>As part of LHMP update, LHMP actions are integrated into District's capital improvement need inventories and programs.</b>
	2.2 - Update LHMP (every 5 years)		<b>District initiated update of LHMP. Completion anticipated by end of 2022.</b>
EWA 3 - Expand the Water Intrusion program to respond to sea-level rise and extreme weather events	3.1 - Upgrade systems that track water inundation		Sump pump systems provide alert to Operations Control Center of water in the system. System is adequate. Upgrade not warranted at this time.
	3.2 - Expand Water Intrusion Program to identify vulnerable assets; develop risk mitigation program		Several Measure RR-sponsored projects are in progress.
	3.3 - Partnerships with local watershed jurisdictions for runoff analysis		Flood-prone areas were evaluated in the LHMP using FEMA Flood Insurance Rate Maps.
	3.4 - Partner with jurisdictions to protect around Transbay Tube portals		BART continued engagement with Port of San Francisco on Embarcadero Seawall Program.
	3.5 - Waterproof venting structures and entrances for underground stations		<b>Various water intrusion related work identified and in progress under Measure RR.</b>
EWA 4 - Train Control Resiliency	Implement the Train Control Modernization Program		<b>Preliminary engineering concluded in Dec 2022. Initiated final design in June 2022. Forecasted completion in September 2023.</b>



Let's go.