



# ▶ Sustainability Action Plan Update

Sustainability and Energy Division

April 8, 2021



# Agenda

- Sustainability at BART
- Overview of Sustainability Action Plan
- Sustainability Progress and Updates
  - Environmental Performance
  - Operations and System Resilience
  - Community Experience
- Clean Power Procurement Update
- 2021 Sustainability Key Initiatives
- Challenges and Opportunities

# Sustainability at BART

- Transportation accounts for 40% of greenhouse gas (GHG) emissions in CA, and of those, 70% are produced by passenger vehicles<sup>1</sup>.
- By providing over 409,000 passenger trips per weekday<sup>2</sup>, BART supports a shift from driving alone to transit and thereby contributes significantly to the reduction of GHG emissions from Transportation in the Bay Area.
- In addition, BART is committed to integrating sustainability into its daily operations and future transit investments.

<sup>1</sup>2020 CA Air Resources Board (CARB) *California Emissions Trends Report: 2000 – 2018*

# Sustainability at BART

- [Strategic Plan](#) (Adopted by Board, 2015) includes “Advance Sustainability” as one of the strategies.
- [Sustainability Policy](#) (Adopted by Board, April 2017) Vision: “BART is committed to advancing regional sustainability ...” through high level goals set out according to the American Public Transportation Association (APTA) sustainability categories.
- [Sustainability Action Plan](#) (Dec 2017): The Plan includes specific types of projects that BART has/is/will implement to pursue and achieve the APTA sustainability categories goals and BART specific targets.
- Progress Reports published annually ([CY2018](#), [CY2019](#)).

# Sustainability Action Plan Overview

## TARGETS

- Time Horizon: 2015 (baseline year) to 2025
- Types of targets:
  - Commitment – based on commitment to high scoring actions, implementation is constrained by potential funding limitations
  - Aspiration – assumes full plan implementation and fewer budget constraints

## ACTIONS



- The Plan is broken down into **55** Actions covering the seven Sustainability Categories that align with APTA Sustainability Indicators
- **20** Priority Actions are highlighted as near-term focus areas
- Different BART departments lead in the implementation of Actions in their area of control





# Performance Metrics and Targets

From 2019 Sustainability Progress Report

	Units	2015 Baseline	2016	2017	2018	2019	Target 2025	
 RESOURCE CONSERVATION: ENERGY & GHG EMISSIONS								
Total energy use	Megajoules (MJ) / vehicle revenue mile (VRM)	21.19	19.93	20.52	20.89	21.13	Committed 19.52	Aspirational 19.19
Total greenhouse gas (GHG) emissions	Metric tons of carbon dioxide equivalent (MT CO2e) / thousand VRM	1.92	1.65	0.24	0.26	0.30	Committed 0.31	Aspirational 0.24
 RESOURCE CONSERVATION: WATER								
Total potable water use	Gallons / VRM	0.61	0.59	0.81	0.91	0.79	Committed 0.42	Aspirational 0.37

# Priority Actions

From Sustainability Action Plan, Accepted 2017

## ENVIRONMENTAL PERFORMANCE PRIORITY ACTIONS

### Resource Conservation – Energy and Greenhouse Gas Emissions



RCE 1	Increase Capacity to Support Regional Greenhouse Gas Goals
RCE 2	Adopt a Strategic Energy Plan
RCE 3	Make Renewable Energy Purchases
RCE 4	Invest in On-site Energy Generation
RCE 7	Invest in District Lighting Retrofits
RCE 8	Onboard new Energy Efficient Train Cars

### Resource Conservation – Water



RCW 1	Regularly Audit Water Use and Correct Issues
RCW 3	Upgrade Water Fixtures

### Emissions and Pollution Control



EP 1	Support Solid Waste Reduction
EP 4	Improve Recycling at All District Shops and Yards
EP 9	Clean and Reuse Water

## OPERATIONS & SYSTEM RESILIENCE PRIORITY ACTIONS

### Materials and Construction Operations Optimization



MC 2	Update the BART Facilities Standards (BFS) for Construction Activities
MC 6	Develop Sustainability Design Guidance

### Extreme Weather Adaptation and Resilience



EWA 1	Coordinate with Regional Agencies in Climate Adaptation Planning and Implementation
EWA 2	Conduct Hazard Mitigation Planning

### Smart Land Use and Livable Neighborhoods



SLU 1	Improve Station Character and Community Fit
SLU 2	Continue to Lead the Region in Transit-Oriented Development
SLU 3	Connect to Community – Station Access

### Patron Experience



PE 1	Create Cleaner Station Environments
PE 2	Create Safer Station Environments

## COMMUNITY EXPERIENCE PRIORITY ACTIONS

# Environmental Performance

Selected Key Achievements. See Annual Reports for more information.



**2018**



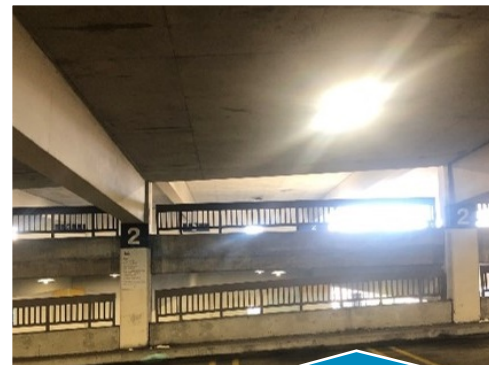
**LEED Silver Certified Warm Springs Station opened.**

**2019**



**Low Impact Development completed at Lafayette.**

**2020**



**Commenced energy-efficient LED lighting retrofits for garages.**



**Switched from fossil diesel to renewable diesel for eBART and non-revenue heavy equipment.**



**Energy-efficient LED lighting retrofits completed at 5 parking lots.**



**Electric Vehicle Charging Pilot, started in 2017, met objectives.**





# Operations and System Resilience

Selected Key Achievements. See Annual Reports for more information.



**2018**



**Fleet of the Future Train cars, with lifecycle sustainability features, introduced.**

**2019**



**Completed critical seismic retrofits at Coliseum and Fruitvale Stations.**

**2020**



**Berryessa/North San Jose and Milpitas Stations, with sustainability measures, opened.**



**Initiated Sea-Level-Rise and Flood Resiliency Study.**



**Commenced decommissioning of legacy fleet.**



**Implemented Clipper-Only fares.**



# Community Experience

Selected Key Achievements. See Annual Reports for more information.



**2018**



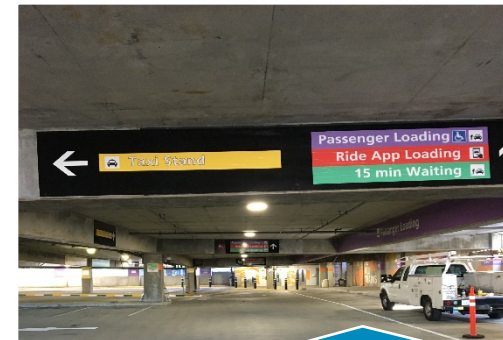
**Initiated multi-modal transfer improvements at 5 stations.**

**2019**



**5 Transit-Oriented Development (TOD) projects completed.**

**2020**



**New passenger loading zones at Millbrae and El Cerrito Del Norte.**



**Completed Downtown Berkeley and Transit Area improvement.**



**Added 258 bike parking spaces and 59 Bay Wheels docks.**



**Daily fee and carpool payments via BART mobile app.**

# BART Clean Power Procurement

## Background & Status Update

# Profile of BART's Power Procurement



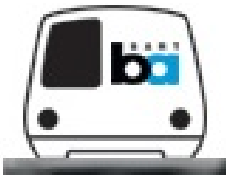
## Electric Supply

- Since 1995, BART has procured the majority of its electric supply from wholesale resources rather than taking bundled retail service from PG&E
- With authorities granted under statute, BART has assembled a portfolio of power purchase agreements (PPAs) to serve the District's electric load requirements
- Beginning in 2017, BART has participated directly in CAISO wholesale electric markets, with 24/7/365 scheduling support from NCPA



## Electric Delivery

- BART relies on PG&E for delivery of electricity from BART's contracted sources of supply to its various points of interface with PG&E's electric system
- Transmission fees, including BART's portion of the Transmission Access Charge, are paid to the CAISO for allocation to Transmission Owners and other end uses
- Distribution charges and other Special Facilities fees are paid directly to PG&E



## Electric Consumption

- Historically, BART consumes approximately 400,000 MWh of electricity each year making it one of Northern California's largest end users
- Approximately 80% of BART's electricity usage is attributed to its 34.5 kV traction power system; therefore, annual load requirements correlate directly with the District's service plan
- BART's daily load profile generally reflects its transit schedule, with load peaking during the morning and evening commutes, and other special events



# Wholesale Electricity Portfolio Policy

In 2017, BART’s Board of Directors adopted ambitious clean energy commitments on behalf of the District under BART’s Wholesale Electricity Portfolio Policy (WEPP).

Objective	Performance Measures
Reliable	▪ Procure uninterrupted electric supply to support dependable transit service for the public
Affordable	▪ Maintain long-term cost advantage over retail electric service to promote affordable BART fares and encourage ridership
Stable	▪ Manage wholesale electric portfolio in a manner that supports price stability and predictability of energy budget-setting
Clean	▪ Meet or exceed California’s energy policy goals established under the Renewable Portfolio Standard (RPS)



## Clean Energy Commitments

BART Commitments <i>(adopted 2017)</i>	California Commitments <i>(adopted 2018 under S.B. 100)</i>
<b>2025:</b> 50% RPS-eligible renewables	<b>2025:</b> 50% RPS-eligible renewables
<b>2035:</b> 100% GHG-free electric supply	<b>2030:</b> 60% RPS-eligible renewables
<b>2045:</b> 100% RPS-eligible renewables	<b>2045:</b> 100% GHG-free electric supply

Notes

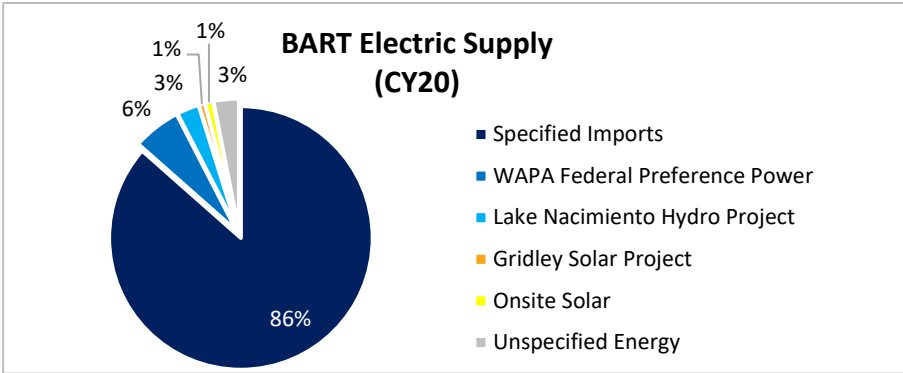
- Detailed definitions of renewable eligibility requirements can be found in the Renewable Portfolio Standard Eligibility Guidebook (“RPS Guidebook”) published by the California Energy Commission. Notably, under this definition of “eligible renewables” hydroelectric facilities >30MW are not considered renewable for the purposes of compliance with California’s RPS Program.





# BART’s Electric Supply Portfolio

In 2020, BART sourced over ≥95% of its electric supply from GHG-free sources, including ≥10% designated as “eligible renewables” under California state law.



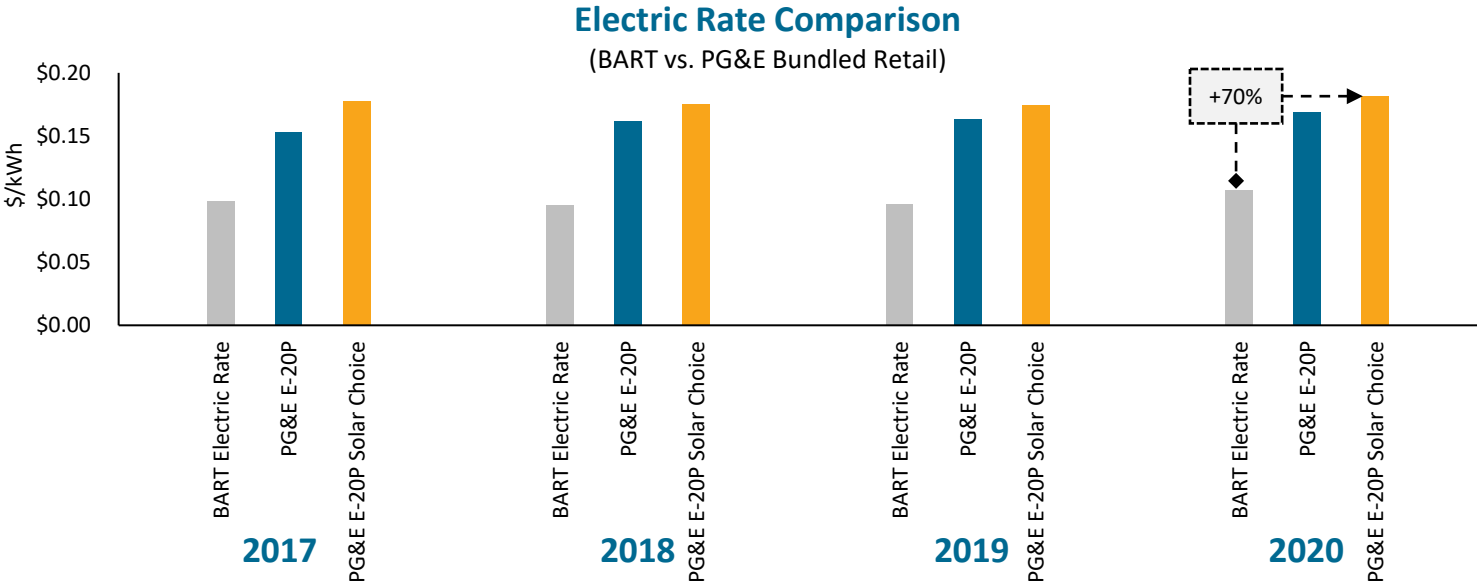
Electric Supply Source	Technology	Energy Type	Annual Contribution*	Contract Term	Location
Specified Imports	Large Hydroelectric & ACS Power	GHG-free	87%	6 mo. & 1 yr. (Exp. 12/2020, 8/2021)	Pacific NW
WAPA Federal Preference Power (12 Units, 2,117 MW)	Large Hydroelectric	GHG-free & Partially Renewable	6%	20 years (Exp. 12/2024)	Northern/Central California
Lake Nacimiento Hydro Project (4.4 MW)	Small Hydroelectric	GHG-free & Renewable	3%	20 years (Exp. 12/2033)	San Luis Obispo County
Gridley Solar Project (2.5 MW)	Wholesale Solar PV	GHG-free & Renewable	1%	25 years (Exp. 3/2038)	Butte County
Onsite Solar (5 Units, 3.2 MW)	Behind-the-Meter Solar PV	GHG-free & Partially Renewable	1%	20 years (Exp. 2029-37)	<div>Antioch Maintenance Facility</div> <div>Lafayette Passenger Station</div> <div>Warm Springs Passenger Station</div> <div>Hayward Yard</div> <div>Richmond Yard</div>
Unspecified Energy	Unspecified Market Energy	Grid Avg. Carbon Intensity	3%	N/A	CAISO Market

**Notes**

- Preliminary accounting subject to further adjustment(s) pending receipt of settlement quality data and subsequent verification by an independent third-party auditor.
- **WAPA:** Western Area Power Administration, a power market entity within the U.S. Department of Energy
- **ACS Power:** Asset-Controlled Supplier Power is a specific type of electric power entity approved and registered by CARB under the Mandatory Reporting Regulation (MRR).

# Portfolio Performance

	Metric	Fiscal vs. Calendar	2017	2018	2019	2020
Non-labor Power Cost (\$)		FY	\$37.9M	\$39.0M	\$39.2M	\$40.6M
BART System Load (MWh)		FY	385,972	411,109	407,915	380,155
Car-Miles (#)		FY	77.3M	78.6M	79.6M	71.9M
Emission Factor (lbs CO2e/MWh)		CY	54.1	61.6	75.5	≤70*
GHG-free (%)		CY	95%	94%	92%	≥95%*
Renewable (%)		CY	6%	3%	5%	≥10%*



Notes

- Preliminary accounting subject to further adjustment(s) pending receipt of settlement quality data and subsequent verification by an independent third-party auditor.
- PG&E electric rates sourced from PG&E’s Annual Joint Rate Comparison, produced by PG&E at the direction of the California Public Utilities Commission (CPUC)



# Power Content Label

**BART’s first Power Content Label produced for 2019 under California Energy Commission’s Power Source Disclosure program certified its power supply as over 92% GHG-free.**

## Power Content Label (PCL)

- The PCL is an annual report certified by the California Energy Commission (CEC) under its Power Source Disclosure program
- The PCL utilizes a standardized methodology established by the CEC designed to promote an accurate comparison of electric supply portfolios
- PCLs are audited by an independent third-party to verify input data and accounting
- PCLs provide a comparison of BART’s supply sources against California’s grid average power mix in a given reporting year



2019 POWER CONTENT LABEL		
San Francisco Bay Area Rapid Transit District (BART)		
BART Electric Supply Portfolio		
ENERGY RESOURCES	Power Mix	2019 CA Power Mix
Eligible Renewable <sup>1</sup>	5.1%	31.7%
Biomass & Biowaste	0.0%	2.4%
Geothermal	0.0%	4.8%
Eligible Hydroelectric	3.3%	2.0%
Solar	1.8%	12.3%
Wind	0.0%	10.2%
Coal	0.0%	3.0%
Large Hydroelectric	86.3%	14.6%
Natural Gas	0.0%	34.2%
Nuclear	0.8%	9.0%
Other	0.0%	0.2%
Unspecified sources of power <sup>2</sup>	7.9%	7.3%
TOTAL	100%	100%
Percentage of Retail Sales Covered by Retired Unbundled RECs <sup>3</sup>	0.0%	
<sup>1</sup> The eligible renewable percentage above does not reflect RPS compliance, which is determined using a different methodology.		
<sup>2</sup> Unspecified power is electricity that has been purchased through open market transactions and is not traceable to a specific generation source.		
<sup>3</sup> Renewable energy credits (RECs) are tracking instruments issued for renewable generation. Unbundled renewable energy credits (RECs) represent renewable generation that was not delivered to serve retail sales. Unbundled RECs are not reflected in the power mix or GHG emissions intensities above.		
For specific information about this electricity product, contact:	BART 510-917-9990	
For general information about the Power Content Label, please visit:	<a href="http://www.energy.ca.gov/pcl/">http://www.energy.ca.gov/pcl/</a>	
For additional questions, please contact the California Energy Commission at:	Toll-free in California: 844-454-2906 Outside California: 916-653-0237	



Notes

- BART is not a retail provider and is not authorized under state law to serve retail load. As a result, any and all references to “retail sales” associated with BART’s Power Content Label should be interpreted as “total system load” until the Power Source Disclosure program rules are formally updated to accommodate BART’s participation.



# Status of BART’s Renewable PPAs

**BART’s (2) renewable PPAs approved by the Board in 2017 are expected online in 2021 and are collectively projected to serve upwards of 60% of the District’s annual electric requirements.**

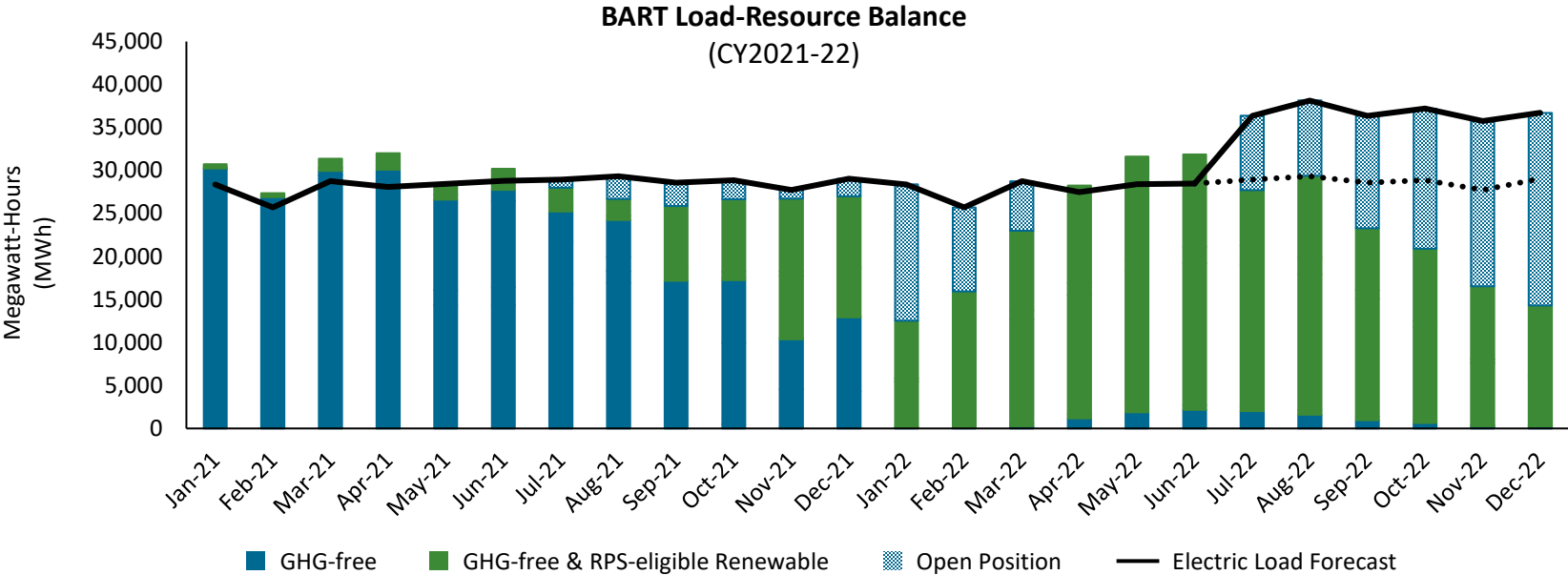
	Sky River Wind	Slate Solar
Total Project Capacity (MW)	30 MW	50.5 MW
Annual Expected Output (MWh)	105,681 MWh	142,038 MWh
Location	Kern County, CA	Kings County, CA
Projected Commercial Online Date	Sept. 2021	Oct. 2021
Products	Energy, Capacity, RECs	Energy, Capacity, RECs
Contract Term	20 years	20 years
Current Status	<ul style="list-style-type: none"><li>Construction financing secured</li><li>Permitting complete</li><li>Construction underway</li><li>CAISO onboarding in progress</li></ul>	<ul style="list-style-type: none"><li>Construction financing secured</li><li>Permitting complete</li><li>Construction underway</li><li>CAISO onboarding in progress</li></ul>
		

*NextEra’s North Sky River Wind, located adjacent to its Sky River Wind project, which is currently under redevelopment.*

*Recurrent Energy’s Mustang Solar project, located adjacent to its Slate Solar project, which is currently under development.*

# Load-Resource Balance

**BART is currently hedged with fixed-price energy at  $\geq 90\%$  through CY21 with procurement planning for CY22 and beyond actively underway.**



## Planning Considerations

- Load uncertainty (*e.g., FY22-23 service schedules*)
- Commercial operation of Slate Solar & Sky River Wind
- Regional hydro conditions (*e.g., annual precipitation*)
- Evaluation of So. Feather PPA (*targeting deliveries by 1/1/2022*)
- Seasonality of generation resources (*e.g., solar, hydro*)



# 2021 Sustainability Key Initiatives

# Electric Vehicle (EV) Charging

Prioritized in 2020 as GHG Emissions Reduction Action Item

## ***Warm Springs (42 EV parking spaces) – Pilot met objectives***

- Exceeded Bay Area Air Quality Management District's required minimum usage of 378 MWh over 3 years.
- Renewed ChargePoint O&M and monitoring agreement.
- Implemented Low Carbon Fuel Standards (LCFS) reporting requirements.

## ***EV Policy Development***

- Drafting EV Charging Policy (passenger stations only) for board discussion in Spring/Summer 2021.
- Tracking federal/state funding opportunities to inform Implementation Plan to scale EV charging.

## ***Other EV applications***

- Created working group with bus operators to add inductive electric bus charging at BART stations in compliance with CA Air Resources Board's Innovative Clean Transit (ICT) regulation.
- Analyze fleet replacement schedule to enable purchase/lease of EVs, pending funding for charging infrastructure, as part of BART's non-revenue fleet (NRVE).



# District Lighting Retrofits

Prioritized as Energy Conservation Action Item in Sustainability Action Plan

## ***Lighting Retrofit in 14 District Parking Garages***

- Replacing existing light fixtures to light emitting diode (LED) technology and installing wireless lighting controls.
- Savings in energy and maintenance costs over 20 years.
- Leverages PG&E's On-Bill Financing (OBF) which ensures availability of Sustainability capital funds for other sustainability projects.
- Construction underway with 3 garages (Hayward, Millbrae, and Daly City) expected to be substantially completed in April 2021.
- Expected project completion in Q1 CY2022.

## ***Stations***

- Study lighting standards for different station types and stations zones per Station Experience Design Guidelines and Powell Station Guidelines.
- Develop an energy savings and implementation plan.



# Optimize Water Consumption

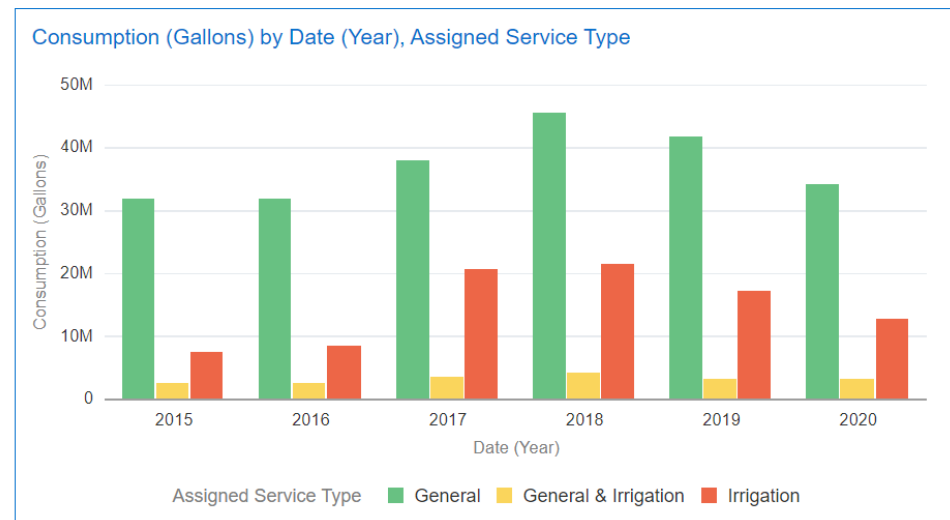
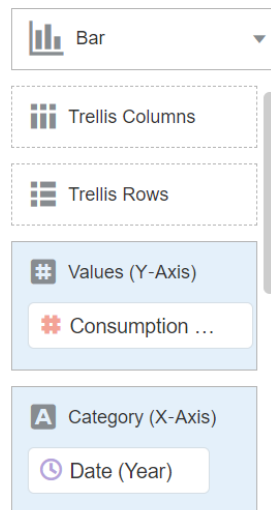
Prioritized as Water Conservation Action Item in Sustainability Action Plan

## ***Water reduction***

- Collaborating with landscape architect to optimize irrigation across the district and at Warm Springs wetland mitigation site.
- Created cross-departmental team to address consumption at shops & yards and develop standard operating procedures.

## ***Data and Analytics***

- Developed interactive dashboards using BART Analytics Cloud to analyze water use and devise new projects.
- Compiled information about water meters to aid leak detection and maintenance.



# Risks and Challenges

- Garage LED lighting project delivery coordination based on ridership recovery and parking demand
- Reduced vehicle revenue miles negatively skews annual metric performance when compared to targets
- Load uncertainty (*e.g., FY22-23 service schedules*)
- Hydro conditions (*e.g., annual precipitation, reservoir storage*)
- PG&E Public Safety Power Shutoff (PSPS) due to high wildfire risk
- Increase in transmission and distribution delivery rates due to system-hardening upgrades
- Intermittency and seasonality of new renewable PPAs



# Opportunities

- Leadership in Energy and Environmental Design (LEED) Gold Certification for BHQ
- Climate Action Plan for Transportation Infrastructure (CAPTI) funding
- Execution of WAPA successor PPA
- Evaluation of South Feather PPA and other new energy resources (*e.g., flexible, dispatchable, firm*)
- Federal Infrastructure Package
- State energy-related grant funding (*e.g., resiliency, clean energy incentives, emerging technologies*) and large-scale EV infrastructure funding opportunities
- Non-revenue vehicle fleet electrification