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CALTRAIN 2017

Sustainability Report

Caltrain

ACKNOWLEDGMENTS

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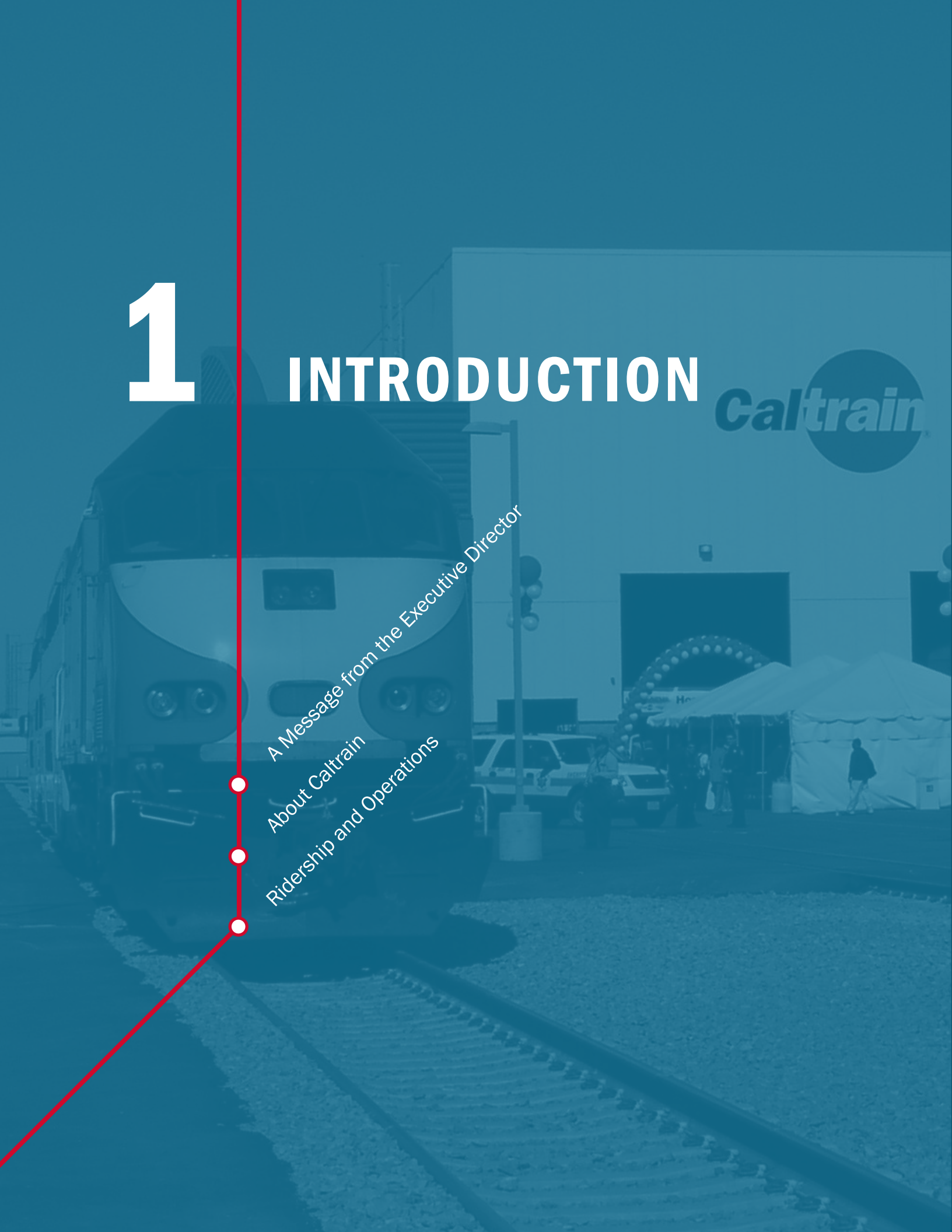
1 INTRODUCTION



A Message from the Executive Director
About Caltrain
Ridership and Operations

A Message from the Executive Director

As a life-long Peninsula resident, I understand the important role our train system plays in maintaining our quality of life and sustaining the economic vitality of our region. Serving over 60,000 riders each day along the San Francisco Peninsula Corridor, Caltrain is committed to supporting a more sustainable region by providing affordable, accessible, environmentally-friendly mobility options to move people where they live, work, and play.

Sustainability is a key component of Caltrain's vision to provide a safe, reliable, sustainable modern rail system that meets the growing mobility needs of the San Francisco Bay region.

Caltrain is committed to:

1. **Implement and expand environmentally sustainable business practices (i.e. sustainable procurement, construction policies, and facility and transportation operations)**
2. **Promote environmental stewardship through the development of Caltrain policies**
3. **Improve regional air quality and reduce system-wide noise and greenhouse gas emissions by electrifying and modernizing the railroad**

The transformation of Caltrain's aging diesel service into a modern, electrified system will provide Peninsula communities with faster, more reliable, more frequent, and more sustainable service. When complete, electrification of the corridor and the introduction of new, high performance trains will increase the capacity of the current system by nearly 50 percent, and as a result will reduce vehicle miles traveled by 619,000 miles every day. Electrification will reduce system noise and contribute to improved regional air quality.
The improved system will reduce criteria air pollutant emissions by up to 97 percent, and will eliminate over 176,000 metric tons of greenhouse gas emissions along the corridor each year. This is equivalent to the annual emissions from 40,000 passenger vehicles.

I am pleased to share this sustainability report, which summarizes our performance between fiscal years (FY) FY2010 and FY2016, highlights key accomplishments, and identifies planned initiatives.

Sincerely,

Jim Hartnett
Executive Director

About Caltrain

Caltrain is a commuter rail line on the San Francisco Peninsula, serving thirty-two stations in three counties from San Francisco to Gilroy. Caltrain is owned and operated by the Peninsula Corridor Joint Powers Board (JPB), which is comprised of three member agencies: the City and County of San Francisco, the San Mateo County Transit District (District), and the Santa Clara Valley Transportation Authority (VTA). The District serves as the managing agency for Caltrain, which includes oversight of the contract operator. Transit Services America, Inc. (TASI) is the contract operator responsible for providing rail operating services which includes operating and maintaining trains, as well as providing station maintenance and some capital project support.

In addition to the Caltrain business unit, the District is also the managing agency for two other business units: 1) SamTrans, which operates fixed-route bus, paratransit, and shuttle service in San Mateo County; and 2) the San Mateo County Transportation Authority, which administers the countywide half-cent sales tax dedicated to transportation-related projects and programs in San Mateo County. This sustainability inventory focuses specifically on the facilities, commuter rail, and shuttle services under the operational control of Caltrain.

Caltrain's Sustainability Program

Caltrain's Strategic Plan establishes social responsibility as one of seven key focus areas. Within this focus area, the Strategic Plan identifies a key goal of minimizing Caltrain's environmental footprint. Further, as the managing agency of Caltrain, the District's sustainability policies and practices extend to the facilities and employees that support the management of Caltrain's service.

The District (and through it, Caltrain) is a strong supporter of the American Public Transportation Association's Sustainability Program (APTA) and participates in the annual Sustainability and Public Transportation Workshop as well as APTA's Sustainability committees. In FY2010, the District became a founding signatory to the APTA Sustainability Commitment.

Report Purpose and Scope

Caltrain has prepared this report to quantify key sustainability indicators and summarize sustainability achievements for Caltrain operations in FY2010 through FY2016. The goal of this report is to provide information that will allow Caltrain to establish benchmarks and sustainability reduction goals, and to publically share data on Caltrain's sustainability performance.

Sustainability indicators for the purposes of this report include revenue fleet fuel usage, displaced/avoided customer trips, facility energy data, water usage, waste generation and diversion, greenhouse gas (GHG) emissions, and criteria air pollutants (CAPs). Sustainability indicators are normalized by Caltrain commuter rail ridership.

San Mateo County TRANSIT DISTRICT

The District's Sustainability Policy commits the agency to:

- **Streamline business practices** to reduce waste and improve operational effectiveness;
- **Evaluate and improve** the long-term resource efficiency of facilities and equipment, including the life-cycle return on investment;
- **Educate and incentivize** employees to integrate sustainability practices into their work and their personal lives;
- **Encourage business partners** to incorporate sustainability practices into their own operations;
- **Measure the environmental impacts** of activities on an ongoing basis, and set and meet targets to reduce our impacts; and
- **Deploy sustainability**-themed programs that encourage the use of public transit and that support our local communities.

Ridership and Operations

Caltrain commuter rail serves over 60,000 riders each day along the San Francisco Peninsula Corridor. For the past several years, Caltrain has experienced unprecedented ridership growth and many of its peak-hour trains now operate near, at, or above their seated capacity. Between FY2010 and FY2016, ridership grew from 10.6 million to 18.4 million boardings per year, or 73 percent. During the same time period, the service population (the population of the three counties Caltrain serves) grew more slowly, increasing from 3.3 million people in FY2010 to 3.6 million people in FY2016. The strong demand for Caltrain service underscores Caltrain's importance as a key regional transportation provider.

Table 1 summarizes Caltrain's service operation metrics. The significant increase in boardings (unlinked passenger trips) and passenger miles traveled relative to service population reflects the increasing demand for Caltrain service, due to increasing congestion along the Highway 101 corridor, expansion of businesses located near Caltrain stations, decreasing car ownership trends in San Francisco and Silicon Valley, and the expansion of Caltrain service and capacity, including the introduction of express Baby Bullet services.

Although the number of boardings and passenger miles traveled has increased significantly over this period, the number of miles covered by Caltrain's locomotives (vehicle miles traveled) has not significantly increased. This means that each locomotive is taking a greater number of passengers than before.

Table 1. Caltrain Service Operation Summary

	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016
Passenger Miles Traveled	298,028,702	292,354,004	284,585,033	360,873,448	392,240,455	477,927,913	490,734,443
Boardings Unlinked Passenger Trips	10,611,734	12,574,233	12,999,293	16,384,630	17,759,504	18,995,161	18,355,641
Service Population	3,319,971	3,363,049	3,413,391	3,458,704	3,501,032	3,542,589	3,569,522
Vehicle Miles Traveled	1,363,866	1,328,350	1,312,846	1,370,671	1,383,834	1,390,086	1,443,982

These values exclude shuttle operations because shuttle operations specifically service passengers boarding Caltrain trains.

2 CALTRAIN SUSTAINABILITY PERFORMANCE

- Achievements
- Sustainable Performance Summary
- GHG Inventory
- Criteria Air Pollutants
- Energy Use - Fleet
- Energy Use - Facilities
- Water
- Waste and Diversion

Achievements

+73%

Ridership increased by 73 percent

The number of boardings has increased by almost 73 percent over the past seven years. The average Caltrain passenger helps eliminate 3 pounds of GHG emissions with each train trip.

-36%

Total water consumption decreased 36 percent

Caltrain aggressively responded to the state drought, and reduced total water use by more than a third. A combination of reduced landscape irrigation, water-efficient plumbing upgrades, and conservation messaging saved over 7 million gallons of water in FY2016 compared to FY2014 (data for FY2010 were not available).

CO_2-22,474

GHGs declined by 22,474 $MTCO^2e$

Overall GHG emissions declined by 22,474 $MTCO_2e$ or over six times from -4,059 to -26,533.

Sustainability Programs

In addition to the energy, water, and waste initiatives described earlier, Caltrain has also implemented a number of other strategies and partnerships in the previous three fiscal years in support of the agency's commitment to sustainability. These include:

Caltrain Sustainability Webpage
The Caltrain sustainability website (www.caltrain.com/about/Sustainability) highlights the environmental and community benefits of riding public transit, as well as the agency's ongoing commitment to sustainability in operating and maintenance programs, capital projects, long-term planning, and everyday business practices. The Sustainability in Action subpage provides details on specific projects and initiatives.

Bay Area Transit Sustainability Working Group
Caltrain meets quarterly with SFMTA, VTA, BART, SFO, and other Bay Area transportation agencies to share best practices and support each other in sustainability efforts.

Resiliency and Sea Level Rise
Caltrain proactively assesses vulnerabilities and adaptation options at Caltrain facilities through the Technical Advisory Committee for the San Mateo County Sea Level Rise Vulnerability Assessment.

Earth Day
Each April, Caltrain celebrates Earth Day with public and employee events. Past events include a sustainable scavenger hunt, a tour of the Shoreway Recycling Center and Transfer Station, and "Lunch and Learn" presentations by the Bay Area Water Supply and Conservation Agency, Sustainable San Mateo County, and Peninsula Clean Energy.

Sustainable Performance Summary

Table 2: Sustainability Indicator Summary for FY2016 Compared to FY2010

The direction of the train indicates whether the change in the sustainability indicator per boarding (rider) reflects a positive step toward greater sustainability. For example, an increase in GHGs makes Caltrain less sustainable, and moves the train to the left (regressed). A decrease in the water consumed makes Caltrain more sustainable, and moves the train to the right (improved).

Generated GHG emissions or criteria air pollutants (CAPs) are emissions directly or indirectly generated by Caltrain operations, excluding any emissions that may be offset. Displaced/avoided GHG or CAP emissions are associated with emissions that would have been generated by passenger vehicles whose trips have been assumed to be displaced by persons taking Caltrain instead. The net GHG or CAP emissions is equal to the sum of generated and displaced emissions.

Indicator	← Less Sustainable Percent Change between FY2010 and FY2016[1]	More Sustainable → Percent Change between FY2010 and FY2016[1]
GHG Emissions Generated		38% 3.69 fewer pounds per boarding
Net GHG Emissions		278% 2.34 fewer pounds per boarding
Energy Use in Facilities		32% 0.71 fewer kBTU per boarding
Energy Use in Revenue Fleet		39% 21.99 fewer kBTU per boarding
Criteria Air Pollutants Generated		38% 0.06 fewer pounds per boarding
Water Consumed		38% 0.42 fewer gallons per boarding
Waste Generated	29% 0.02 additional pounds per boarding	
Waste Diverted (recycled/composted)[2]	18 p.p. 18 fewer percentage points of waste was diverted	

[1]Waste and water data were not available until FY2014. Therefore, performance for waste and water are compared to FY2014.

[2]Diversion is measured as the percent of total waste generated that was diverted from landfill through recycling or composting. The diversion rate is not normalized by boarding. The percentage points shown in Tables 2 and 3 may differ due to rounding.

Table 3: Historical Sustainability Indicator Summary

Indicator	Unit	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016
Greenhouse Gas Emissions								
Generated	$MTCO_2e$/year	46,515	46,860	47,319	48,097	46,812	47,920	49,723
Displaced/avoided	$MTCO_2e$/year	-50,575	-49,703	-47,813	-59,752	-63,830	-76,137	-76,256
Net total	$MTCO_2e$/year	-4,059	-2,843	-494	-11,655	-17,018	-28,217	-26,533
Criteria Air Pollutant Emissions[1]								
Generated	Tons	843	855	860	876	850	863	898
Displaced/avoided	Tons	-572	-513	-451	-508	-485	-521	-471
Net total	Tons	271	342	409	369	364	342	427
Facility Energy Use								
Electricity	kWh	6,234,204	6,227,954	6,629,336	6,629,336	6,853,474	7,533,223	7,811,512
Natural gas	therms	16,892	16,792	12,940	10,575	8,879	7,158	7,770
Total facility energy use	kBTU	23,434,504	22,950,785	22,544,351	23,677,480	24,272,711	26,420,052	27,430,799
Revenue Vehicle Energy Use								
Diesel	Gallons	4,296,357	4,326,614	4,341,974	4,415,396	4,289,258	4,351,371	4,535,867
Gasoline	Gallons	79,167	81,372	91,519	80,417	86,886	97,424	99,882
CNG	GGE	0	0	0	11,329	14,441	5,100	9,069
Biodiesel	Gallons	0	0	28,915	17,953	7,057	6,995	0
Total vehicle energy use	kBTU	603,202,318	607,656,290	614,749,682	623,229,610	605,534,578	614,487,519	639,773,567
Water								
Consumed	Gallons	NA[2]	NA[2]	NA[2]	NA[2]	19,994,728	18,364,262	12,890,297
Waste and Recycling								
Generated	Tons	NA[2]	NA[2]	NA[2]	NA[2]	576	770	770
Diverted	Percentage	NA[2]	NA[2]	NA[2]	NA[2]	77%	58%	58%

Notes: Totals may not add due to rounding. $MTCO_2e$ = metric tons of carbon dioxide equivalent; FY = fiscal year; kWh = kilowatt hours; kBTU = thousand British thermal units; CNG = compressed natural gas; GGE = gasoline gallon equivalent; NA = not available.

[1] Includes ROG, NO_x, CO, PM_{10}, and $PM_{2.5}$.

[2] These data were either not available or incomplete. For the purposes of consistency with the rest of the inventory, GHG emissions from waste and water between FY2010 and FY2013 were assumed to be the same as data in FY2014.

GHG Inventory

Greenhouse gas emissions (GHGs) are primarily generated by burning fossil fuels (such as gasoline and diesel used in vehicles) – but also through chemical reactions, the decay of organic waste, agricultural production, and industrial processes. In this inventory, emissions of carbon dioxide, methane, and nitrous oxide are calculated into a carbon dioxide equivalent (CO_2e) according to their global warming potentials, which measure's the pollutants insulating effect (i.e., ability to warm the earth's atmosphere or 'greenhouse effect'). Other GHGs, such as sulfur hexafluoride and refrigerants, are excluded from this inventory at this time, though they may be added in future inventories.

In FY2016, Caltrain generated approximately 49,723 metric tons (MT) of CO_2e. To compare that figure to overall Bay Area transportation emissions, the Metropolitan Transit Commission (MTC) estimated that approximately 30.2 million $MTCO_2e$ were emitted by cars, trucks, motorhomes, and motorcycles in FY2011.

Caltrain also displaces emissions that would have occurred if travelers chose to travel by private automobile. Figure 1 shows a line graph of Caltrain's net GHG emissions, with generated and displaced emissions highlighted as bars for each fiscal year. In this chart, displaced emissions are equal to the emissions avoided by passengers riding Caltrain instead of driving their personal cars. Over the past seven years, emissions generated from Caltrain operations increased by approximately 7 percent. However, primarily as a result of a large increase in ridership over the same period, displaced emissions also increased, nearly doubling over FY2010 levels. The result is a net reduction of 22,474 $MTCO_2e$ from FY2010 to FY2016

Between FY2010 and FY2016

GHG emissions declined by

22,474

METRIC TONS OF CO_2e

Which is EQUAL to removing

4,747

VEHICLES OFF THE ROAD

OR the amount of carbon sequestered by

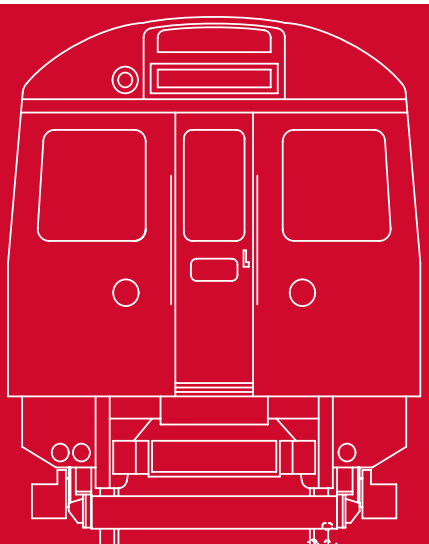
21,274

ACRES OF TREES IN ONE YEAR

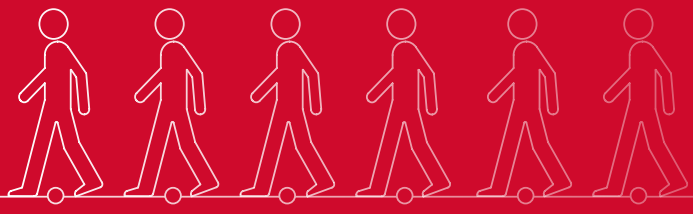
Which is EQUAL to the amount of energy used in

2,373

HOMES



Riding Caltrain instead of driving reduces regional GHG emissions.



FY2016 The average Caltrain passenger helps eliminate **3.2 pounds** of GHG emissions with each train trip.

Figure 1.
GHG Emissions – Generated, Displaced, and Net

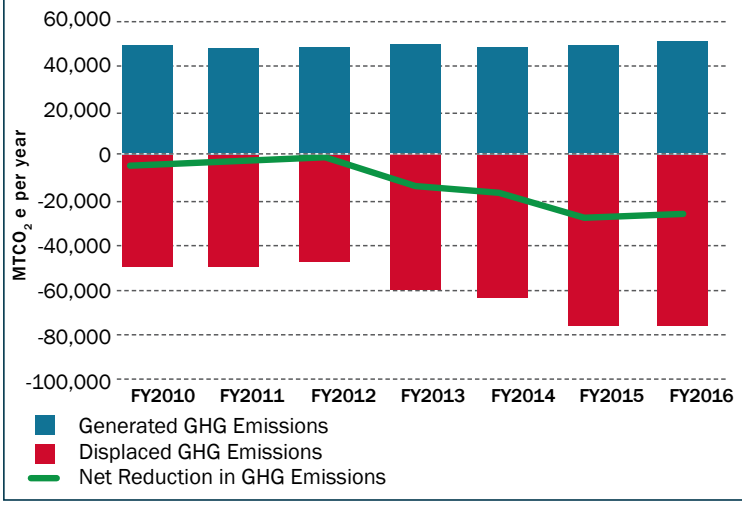


Figure 2. GHG Emissions by Source

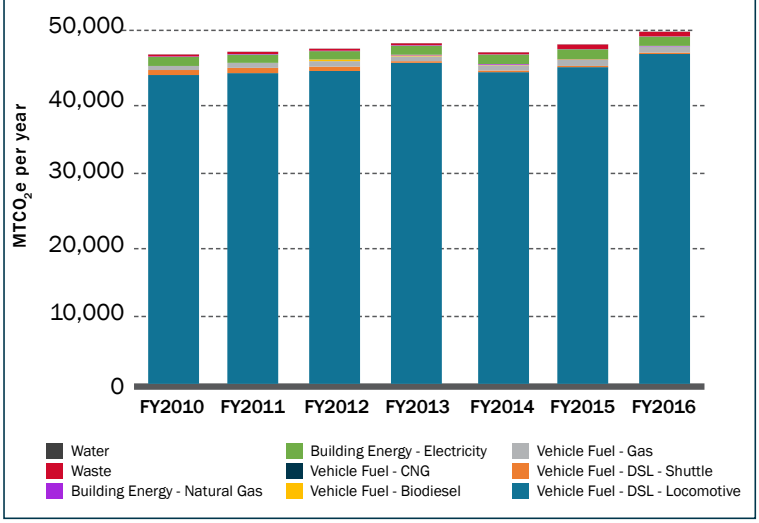
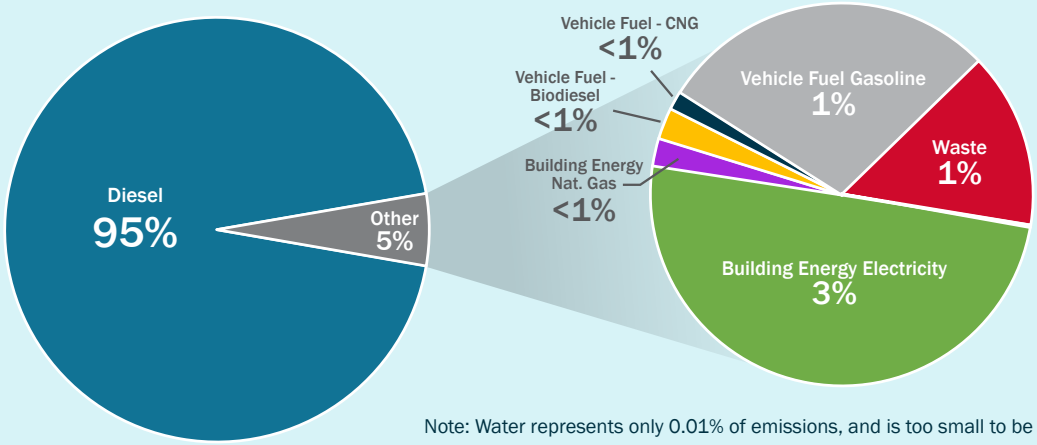


Figure 2 highlights only GHG emissions generated by Caltrain (and excludes displaced trips), and reveals an overall slight increasing trend. Figure 3 shows the percent breakdown of sources contributing to the GHG emission generated by Caltrain operations. Both graphs show that the overwhelming majority of emissions are generated by diesel use in in locomotives, which contributed approximately 95 percent of all GHG emissions in FY2016. Therefore, converting Caltrain to an electric fleet through the Peninsula Corridor Electrification Project will dramatically reduce the agency's GHG emissions.

Caltrain has also reduced emissions when measured against core ridership measures. As shown in Table 2, net GHG emissions from Caltrain operations measured in pounds per CO_2e have declined significantly relative to passenger boarding. When a passenger chooses to make a trip by Caltrain's services instead of by private automobile, on average approximately 3.2 pounds of GHGs were not emitted into the atmosphere.

Caltrain operates a diesel-powered shuttle service exclusively to provide connections to passengers boarding Caltrain trains. The shuttle accounts for less than half a percentage of all diesel usage. Shuttle usage accounts for 0.5 percent of $MTCO_2e$ emissions.

Figure 3. GHG Emissions by Source (FY2016 values)



Note: Water represents only 0.01% of emissions, and is too small to be shown in figure above.

Criteria Air Pollutants

Criteria air pollutants (CAPs) include pollutants that cause smog, acid rain, and have been linked to negative health effects. Caltrain emits CAPs when it burns fuel to run its locomotives and shuttles, but it also displaces CAPs that otherwise would have been emitted if its passengers had chosen to drive instead of taken public transit.

In Figure 4, the net reduction in CAPs is shown in a line graph, where the generated and displaced CAPs are shown in bars above and below the line. Figure 5 shows the breakdown of sources contributing to the CAPs generated by Caltrain, where over 99 percent of CAP emissions are from locomotive diesel fuel use.

Despite the increase in ridership which displaces passenger vehicle trips, Caltrain contributes a net increase in regional CAP emissions due to the differences in technology between diesel locomotives and passenger vehicles (Figure 4). In FY2016, Caltrain fleet operations generated nearly twice as many CAP emissions per passenger trip than per displaced passenger vehicle trip.

The Peninsula Corridor Electrification Project, which will convert Caltrain's diesel operations to an electric system starting in 2020, will reduce agency CAP emissions by over 90 percent. This conversion will result in a net reduction in CAPs as emissions from the fleet per passenger trip generate fewer CAP emissions compared to emissions saved from displaced passenger trips.

Figure 4. Criteria Air Pollutants - Generated, Displaced, and Net

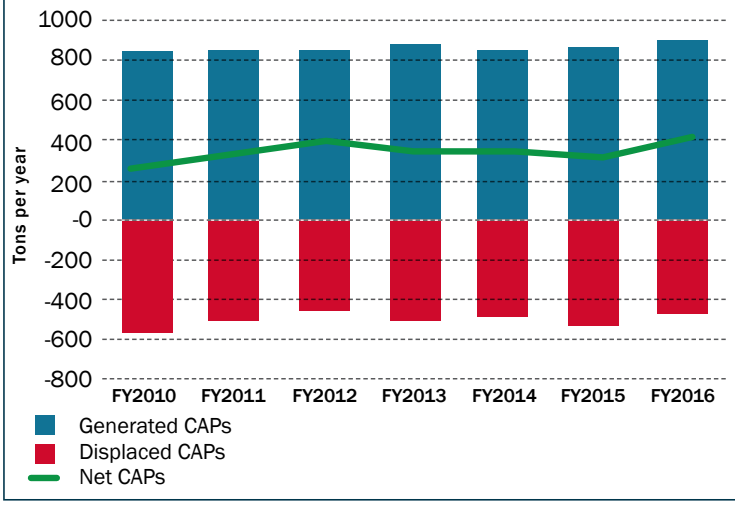
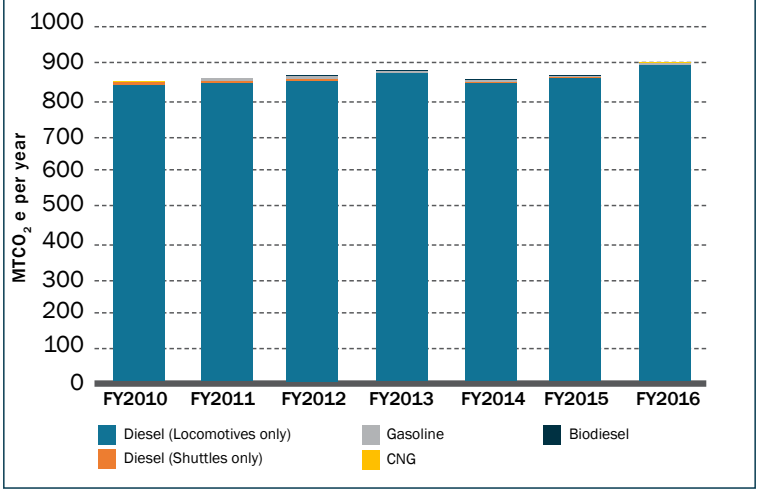


Figure 5. Criteria Air Pollutant Emissions by Source Type (Excludes Displaced/Avoided Trips)



Energy Use

Fleet

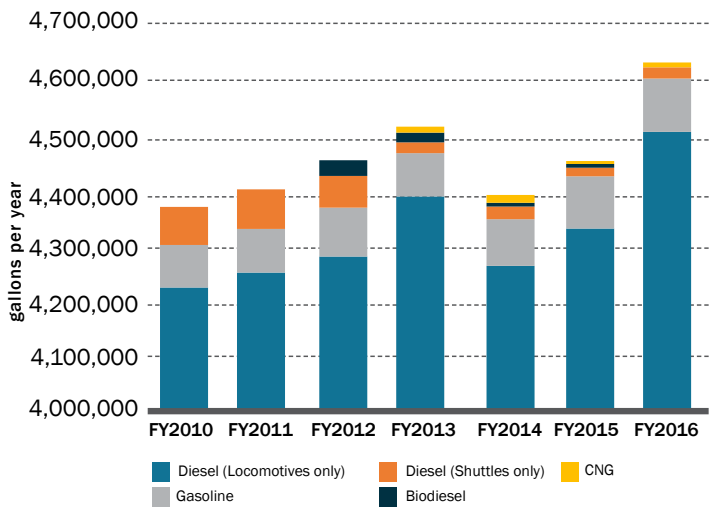
Caltrain's vehicle fleet operates on diesel, gasoline, biodiesel, and compressed natural gas (CNG). Caltrain's primary mode, commuter rail (i.e., Caltrain trains), uses ultra-low sulfur diesel fuel, per California fuel standards. Purchased transportation shuttle services use diesel, gasoline, biodiesel, and CNG fuels.

Energy use by fleet vehicles make up the majority of Caltrain's overall energy use, as measured in thousand British thermal units (kBTU). As shown in Table 2, diesel, gasoline, and CNG fuel use combined comprised 96 percent of all energy consumed by Caltrain's fleet and facilities in FY2016.

As shown in Figure 6, diesel fuel use in locomotives accounts for over 97 percent of the fuel used by Caltrain, with more than 4,500,000 gallons consumed in FY2016. A small increase in diesel fuel usage between FY2014 and FY2016 was due to the addition of train passenger cars to accommodate increased ridership.

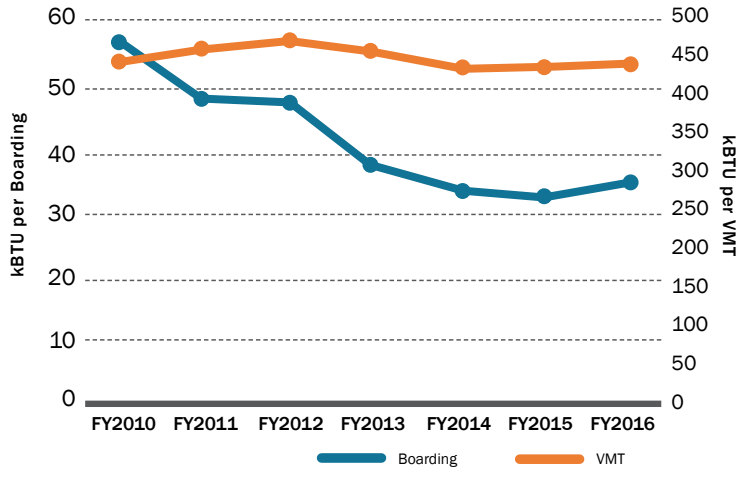
Figure 7 illustrates the fleet energy use per boarding and locomotive vehicle miles traveled (VMT), between FY2010 and FY2016. Consistent with increased in ridership since FY2010 and relatively constant fleetwide energy use, fleet energy use per boarding has declined by 39 percent between FY2010 and FY2016. Due to minimal additions to the revenue fleet operations amidst increasing ridership, fuel consumption per locomotive VMT has remained relatively steady.

Figure 6. Fuel Use by Fuel Type



*CNG is measured in gallons of gasoline equivalent

Figure 7. Fleet Energy Use per Boarding and VMT



Energy Use

Facilities

Currently, Caltrain uses electricity for lighting, equipment, and amenities at its stations, Centralized Equipment Maintenance and Operations Facility (CEMOF), and for signals along the right-of-way. Certain facilities also use natural gas for space heating. In addition, Caltrain and SamTrans both operate out of the Central Administrative Offices (Central) located at 1250 San Carlos Avenue. Energy use and emissions associated with Central are included in the SamTrans inventory.

Energy use by facilities is a very small share of the total energy consumed by Caltrain, as measured in kBTU. Natural gas and electricity made up only 4 percent of all energy consumed by Caltrain's fleet and facilities in FY2016. In FY2016, Caltrain purchased a total of 7.8 million kilowatt hours (kWh) of electricity and 8,000 therms of natural gas, equivalent to over 27 million kBTU. By contrast, Caltrain fleet consumed 640 million kBTU in FY2016.

Over the last seven years, facility energy use has increased, largely due to the relocation and expansion of the San Bruno station in FY2014, and the increased use of wayside power at CEMOF and the Gilroy, San Jose Diridon, and San Francisco 4th and King stations (Figure 8). Wayside power or "hotel power" allows Caltrain train sets to plug into grid electricity during key maintenance activities to minimize diesel fuel use and related emissions while idle. These changes increased Caltrain electricity purchases. However, since FY2011, natural gas use has declined every year except in FY2016. Once Caltrain successfully electrifies its locomotive fleet, electricity use will significantly increase compared to current trends.

Figure 8. Facility Energy Use

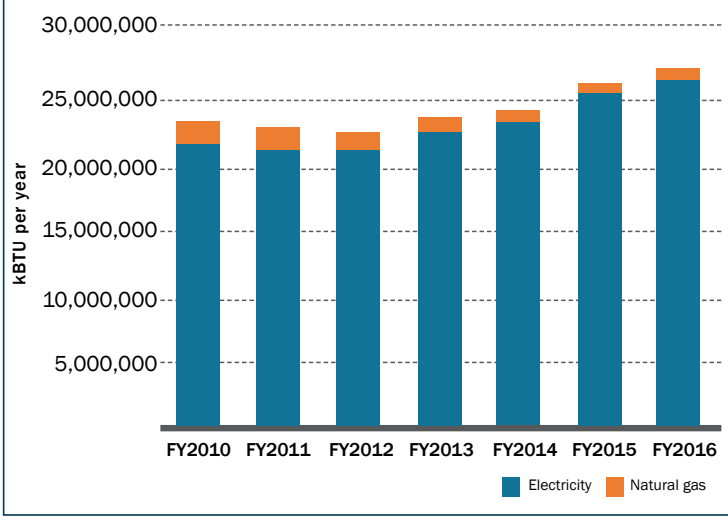


Figure 9. Facility Energy Use by Boarding and VMT

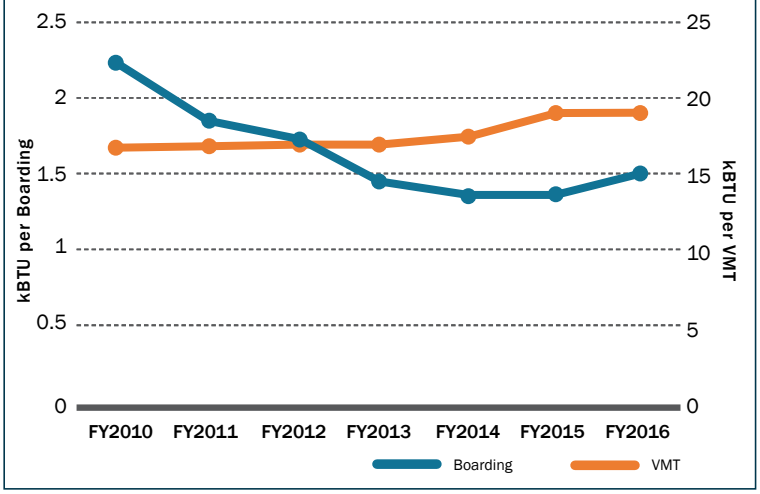


Figure 9 illustrates the facility energy use per boarding and locomotive VMT between FY2010 and FY2016. Consistent with increased in ridership since FY2010 and a slower increase in facility energy use, facility energy use per boarding has declined by 32 percent between FY2010 and FY2016. Due to slight increase in facility energy use mentioned and the relatively constant fleet activity, the facility energy use per locomotive VMT has increased by over 10 percent between FY2010 and FY2016.

LEDs are
80%
more efficient

Energy Efficient Lighting

In partnership with San Mateo County Energy Watch, a collaboration between PG&E and the City/County Association of Governments of San Mateo County, Caltrain has initiated a light-emitting diode (LED) lighting upgrade project at the San Carlos Caltrain station. The LEDs are approximately 80 percent more efficient than the high-intensity discharge lights they will replace, and require less maintenance. In conjunction with this effort, Caltrain is in the process of developing a procurement method that will that will help streamline the procurement and delivery of similar energy conservation projects in the future.

Water, Waste, and Diversion

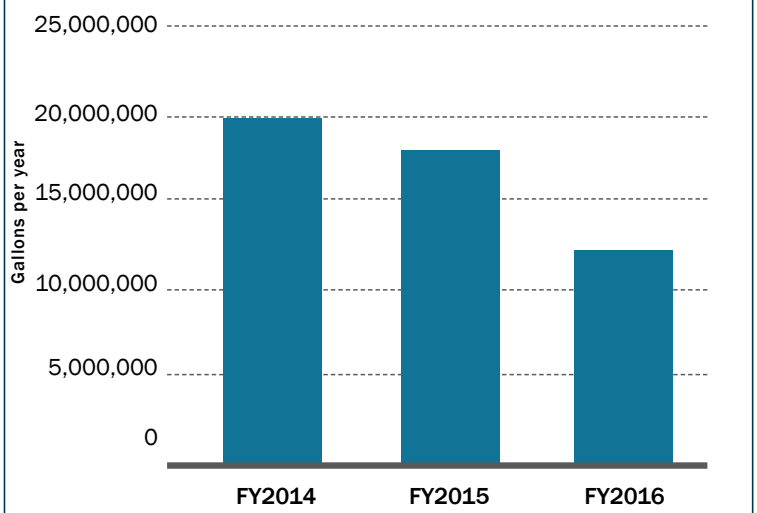
Water

Caltrain uses water for irrigation of outdoor landscaping at its stations, train washing at CEMOF, and indoor uses such as passenger and employee restrooms and crew showers at select stations. Emissions are generated indirectly through the combustion of fossil fuels in electricity generation that provides electricity for water delivery, conveyance, and treatment. Although Caltrain does not directly control these emissions, they are included in this inventory because any emissions are a consequence of Caltrain's use of the water.

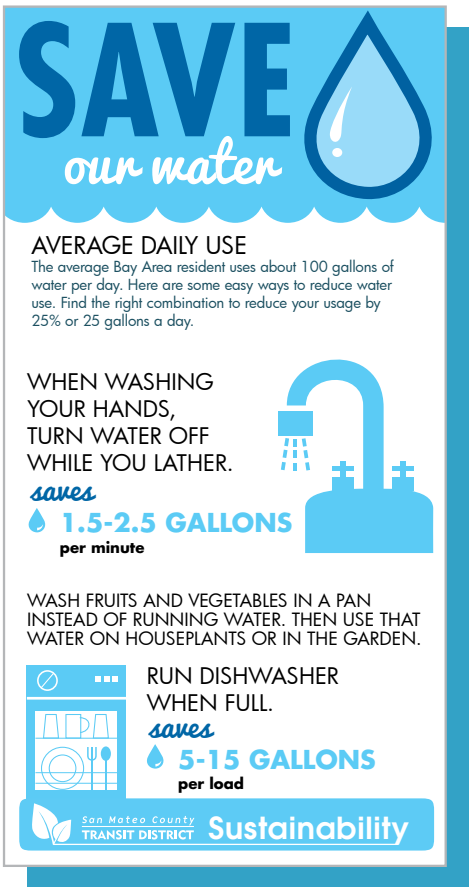
In response to California's historic drought in FY2012-FY2016, Caltrain implemented a number of conservation measures including: reducing landscape irrigation; installing high-efficiency faucet aerators and showerheads in customer, staff, and crew restrooms; promptly fixing leaks; and adding Save Our Water Signage at employee and station restrooms. Overall, water use has declined substantially over the past three years, going from over 20,000,000 gallons in FY2015 to less than 13,000,000 gallons in FY2016—a 36 percent reduction (Figure 10). A typical single-family household in California uses 360 gallons per day. Caltrain's water reduction is equivalent to the annual water use from 54 California households.

Caltrain also conserves water at stations by using "smart" irrigation controllers that adjust watering schedules based on local temperature and rainfall. In addition, Caltrain also uses drought-tolerant vegetation in new plantings wherever possible, and covers plant beds with mulch to reduce evaporation of water. Caltrain continues to employ these conservation measures in its daily operations and maintenance practices.

Figure 10. Water Consumption



*FY2010 through FY2013 are not shown due to insufficient data



Waste and Diversion

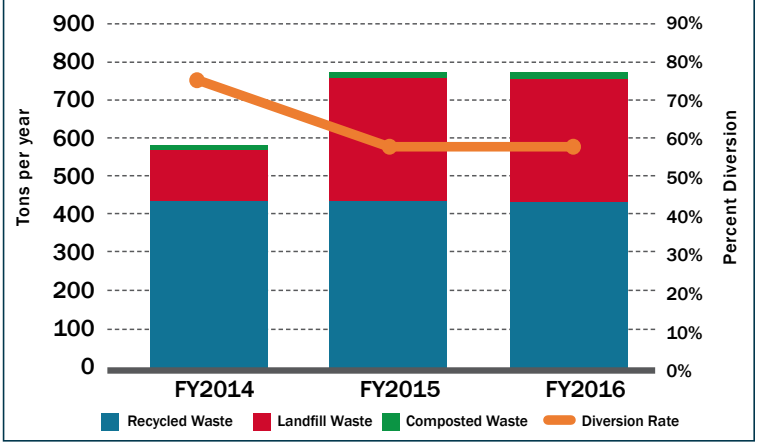
Caltrain-generated waste consists of municipal waste from passengers (paper, food scraps, bottles and cans, other common recyclables) and employees (from typical office activities and low-impact maintenance activities). Industrial maintenance waste such as hazardous waste and large metal scrap recycling are not included in this inventory.

The waste and diversion rates are estimated through invoices from Caltrain's waste service providers. For the purposes of this inventory, Caltrain assumes that all landfill, recycling and organics collection containers are 80 percent full when collected each week. This assumption may not reflect the actual amount of discards generated and diverted; however, this is the best available data as Caltrain's waste haulers do not report customer waste by actual weight, only volume of container capacity and scheduled pickup frequency.

Figure 11 shows total landfilled, recycled and composted waste as bars for each fiscal year. The total diversion rate, measured as the percent of total waste diverted as recycling or compost, is shown as an orange line.

Total composted waste and recycled waste remained relatively consistent. In FY2016, Caltrain's waste consisted of approximately 42 percent landfilled waste, 56 percent recycled and 2 percent composted.

Figure 11. Waste Disposal by Type



*FY2010 through FY2013 are not shown due to insufficient data

As shown in Figure 11, total landfilled waste increased by over 180 tons between FY2014 and FY2016 as a result of adding a large debris box to accommodate both construction-related and operational waste from the San Francisco facility. Caltrain is currently working to improve diversion rates from this debris box.

Caltrain station waste bins are labeled to help customers dispose of and divert waste efficiently.

At the San Francisco station, Caltrain has triple-stream bins designated for recyclables, compostables, and trash (landfill). These bins are clearly labeled and conveniently located throughout the station. At all other Caltrain stations, customers are able to place recyclables, food, and trash in the same bins, labeled "Contents Recycled Offsite." Caltain's janitorial service and waste hauler work together to transport the the material to a facility where machinery and trained staff sort the contents of the bins offsite, to ensure that waste is directed appropriately. This offsite sorting program was developed by the City of San Jose and has been very successful, achieving diversion rates of 70 percent.

3 RECENT AND ONGOING INITIATIVES

Recent and Ongoing Initiatives

Peninsula Corridor Electrification Project

The Peninsula Corridor Electrification Project will convert Caltrain's diesel operations to an electric system starting in 2020. This modernization effort will dramatically reduce operational greenhouse gas emissions, reduce engine noise, and help improve local and regional air quality all while increasing service and capacity for Caltrain customers. Specific advantages of electrification include:

- **Improved Train Performance, Increased Ridership Capacity and Increased Service:** Electrified trains can accelerate and decelerate more quickly, allowing Caltrain to run more efficiently and provide more frequent and faster service.
- **Reduced Engine Noise Emanating from Trains:** Noise from electrified train engines is measurably less than diesel train engines.
- **Improved Air Quality and Reduced GHG Emissions:** Electrified trains will produce substantially less air pollution even when the indirect emissions from electrical power generation are included. Increased ridership will reduce automobile usage, resulting in additional air quality benefits.

Commitment to Renewable Energy

By summer 2017, Caltrain's existing electricity usage at stations, facilities, and signals along the right-of-way will be 65 percent renewable and 79 percent GHG-free, system-wide. In March 2017, the Caltrain Board of Directors voted to expand the agency's use of renewable electricity by partnering with three Community Choice Energy Programs:

SILICON VALLEY CLEAN ENERGY

cleanpowerSF Same Service • Cleaner Energy

PENINSULA CLEAN ENERGY

These providers will supply 100 percent renewable power from sources such as solar, wind, and small hydroelectric. Caltrain chose these providers based on their reliability, cost, environmental benefits, administrative procedures, and compatibility with future Caltrain operations. The electricity will still be delivered in partnership with PG&E on PG&E's infrastructure and supported by PG&E's billing and customer service. The remainder of Caltrain's electricity meters are in locations where Community Choice Energy Programs and municipal utilities do not currently have jurisdiction. Through this effort, Caltrain will reduce its carbon footprint from electricity use by 20 percent, equivalent to the annual carbon emissions of 150 cars or 75 homes.

GREENHOUSE GASES (ANNUAL)

176,000 METRIC TONS CO_2

DIESEL TO ELECTRIC

Lower FUEL COSTS

TRAFFIC CONGESTION

619,000 VEHICLE MILES

21% INCREASE — DAILY RIDERSHIP

$2.5 BILLION — ECONOMIC BENEFITS

MORE SERVICE — MORE, FREQUENT, AND FASTER TRIPS