Appendix A – 2018 Sustainability Inventory

Executive Summary

This Appendix presents key data snapshots from Sound Transit's 2018 Annual Sustainability Progress Report, and identifies patterns of resource use compared to earlier years of performance. The report evaluates 2018 performance metrics in isolation, as well as performance data trends over multiple years.

Sound Transit has made a number of valuable improvements to the quality and sustainability of its services. Passenger miles traveled (PMT) across all modes increased by 3 percent in 2018. Despite expanded service, elevated ridership, and increased agency staffing levels, with the exception of electricity use for Link light rail, resource remained roughly stable or decreased across all utilities. These efficiency gains are a first for Sound Transit in more than eight years of data reporting.

When normalized by ridership, resource use per passenger mile traveled decreased from the previous year across all areas of the agency's operations. Total agency greenhouse gas (GHG) emissions remained nearly constant since 2017; as ridership continued to increase, however, these emissions decreased by 2 percent per PMT.

Key findings in resource use and efficiency include:

- Total energy use decreased by 22 percent per PMT since 2011 and 2 percent per PMT from 2017 to 2018.
- Water use decreased by 39 percent per PMT since 2010 and 30 percent per PMT from 2017 to 2018.
- Waste diversion increased to 46 percent, up from 27 percent in 2010 and 43 percent in 2017.
- Waste disposal decreased by 42 percent per PMT since 2010 and 31 percent per PMT from 2017 to 2018.

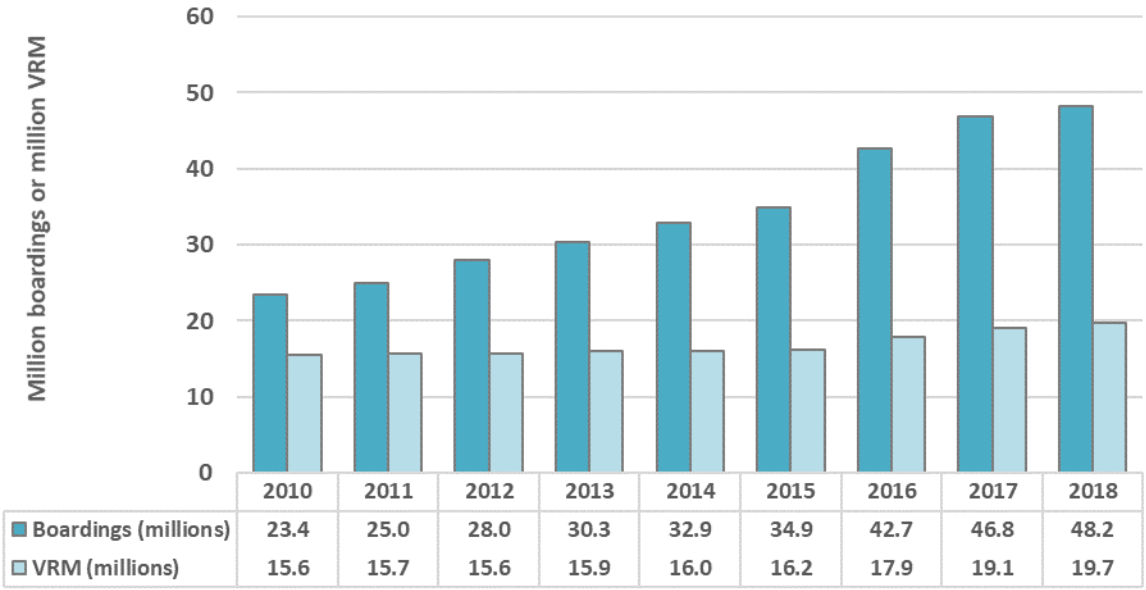
Note: This document illustrates resource use trends over time from baseline years (2010 or 2011, depending on data) and the preceding inventory year, 2017. In the following graphs, solid bars indicate total emissions, resource use, and resource costs. The trend lines show the resource use per passenger mile traveled over time.

Ridership and Level of Service

- Since 2010, ridership (measured in boardings) has grown by 106 percent.
- From 2017 to 2018, ridership grew by 3 percent.

Ridership has increased every year, growing by 106 percent since 2010 and reaching over 48 million boardings (unlinked passenger trips) in 2018. Meanwhile, the level of service, measured by vehicle revenue miles (VRM), has increased by nearly 26 percent since 2010. This difference in growth in service and ridership demonstrates that more people are using Sound Transit service every year. Figure 1 below shows the increasing trend of boardings per mile of service.

Figure 1. Ridership, 2010-2018



	2010	2011	2012	2013	2014	2015	2016	2017	2018
Boardings (millions)	23.4	25.0	28.0	30.3	32.9	34.9	42.7	46.8	48.2
VRM (millions)	15.6	15.7	15.6	15.9	16.0	16.2	17.9	19.1	19.7

Measuring Efficiency

Ridership has important implications for resource use; as the agency grows and serves more passengers, total resource use is expected to increase. To understand the efficiency of its operations as the agency grows, Sound Transit tracks resource use normalized by passenger boardings, vehicle revenue miles, and passenger miles traveled.

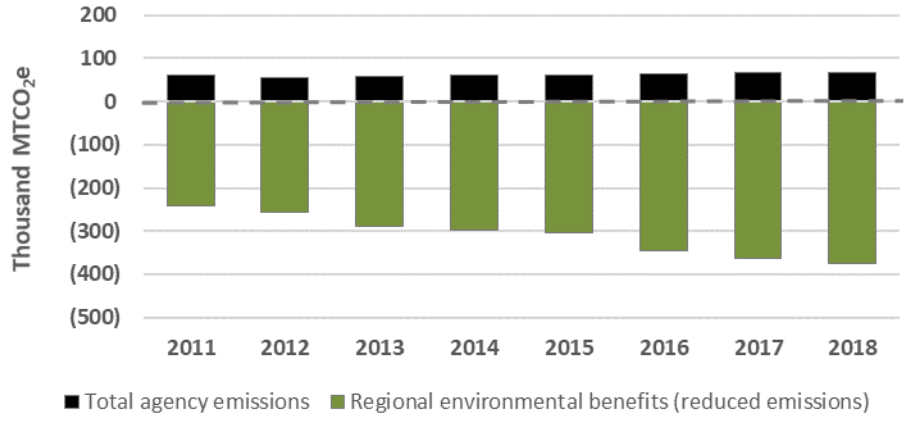
Using National Standards

Sound Transit and the other signatories of the American Public Transportation Association (APTA) Sustainability Commitment use a standard set of metrics developed by APTA to measure annual progress. Passenger miles traveled (PMT) represents both a measure of boardings and vehicle revenue miles, tracking both growth in service and increases in ridership. Using passenger miles traveled to normalize data allows Sound Transit to compare resource use over time using a single consistent metric. Therefore, this report normalizes by PMT in nearly all cases. Non-revenue fleet, however, is normalized by employees, as usage is tied more closely to agency staff levels than ridership.

Regional Environmental Benefit

Increased transit use reduces regional environmental impacts from passenger vehicles. As more people choose transit over driving, fuel consumption and greenhouse gas (GHG) emissions are reduced throughout the region. Displaced greenhouse gas emission reductions are a measure of the regional environmental benefit produced by transit. Sound Transit follows a methodology developed by APTA and The Climate Registry to account for emission reductions from transit ridership, measured in carbon dioxide equivalent (CO_2e), as shown in Figure 2 and Table 1. Greenhouse gas emissions can also serve as a proxy for fuel use savings.

Figure 2. Regional Greenhouse Gas Emissions (CO_2e) Displaced by Sound Transit Services, 2011-2018



As seen in Figure 2 above and Table 1 below, Sound Transit services save more GHG emissions than they emit in the course of operations. For every ton of GHG emissions Sound Transit emitted in 2018, the region avoided 5.7 tons of emissions through the benefits of transit. The regional environmental benefits shown in Figure 2 (in green) include the benefits from people taking transit instead of driving (mode shift) and reduced emissions associated from denser land use patterns supported by transit; these benefits have consistently been between four and seven times the agency's operational emissions (in black) since 2011.

Table 1. Regional Greenhouse Gas Emissions (CO_2e) Displaced by Sound Transit Services, 2018

Regional metric tons CO_2e Saved		
Mode Shift Benefits	Land-Use Benefits	Total Benefits
79,046	295,011	374,057
Displacement ratios - CO_2e units saved in the region per unit of CO_2e from Sound Transit operations		
Mode Shift Benefits	Land-Use Benefits	Total Benefits
1.2	4.5	5.7

Note: Totals do not sum due to rounding.

The definitions for each of the identified types of benefits are below:

- **Mode shift benefits** measure the reduced greenhouse gas emissions (amount displaced) resulting from shifting from one mode of transportation (e.g., single occupancy vehicle) to another (e.g., transit), measured on a per-passenger-mile-traveled (PMT) basis.
- **Land use change benefits** measure the reduced carbon outputs due to the denser land use patterns supported by transit systems.

Note about updated regional benefit calculation parameters:

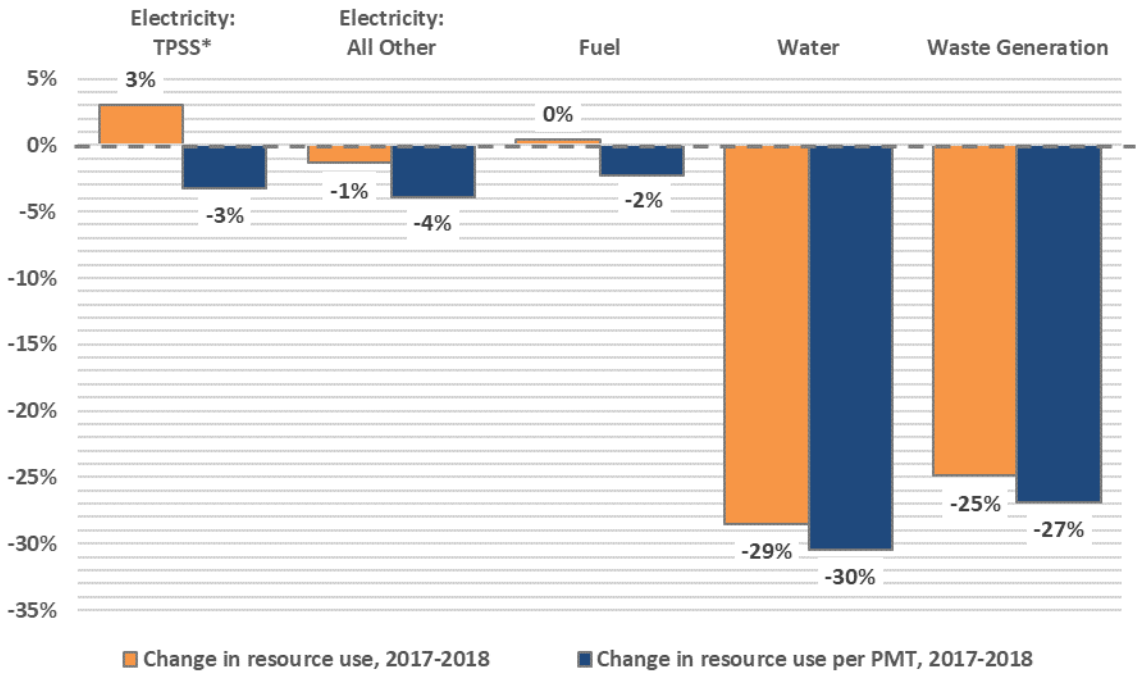
Sound Transit is continuously working to incorporate the latest climate science and third-party guidance into the GHG inventory process. In 2018, several updates to emissions factors and global warming potentials were made to better align with current industry standards. One such update was a shift from the global warming potentials provided in the IPCC Second Assessment Report (SAR), published in 1995, to those provided in the most recent Fifth Assessment Report (AR5), published in 2014. Another update involved adjustments to several mode shift and land-use change calculation factors (including the mode shift factor, N2O emissions factor for mode shift, and emissions per vehicle mile for land-use change) based on a 2018 revision to the American Public Transportation Association's recommended practice publication, "Quantifying Greenhouse Gas Emissions from Transit." These updates were applied retroactively to past inventory years and, as such, values from inventory years prior to 2018 presented in this report differ from those previously published.

Resource Use

Overall agency resource use has generally been increasing over time, reflecting Sound Transit's expanded system and services. Most increases in resource use have been in line with service changes and ridership increases as well as operational equipment changes, as described further in the sections below. Figure 3 below shows the change in total resource use from 2017 to 2018, as well as resource use normalized by PMT.

Total resource use decreased from 2017 to 2018 in every category except TPSS electricity and fuel use, which grew by 3 percent and less than 1 percent, respectively. Water usage and waste generation decreased dramatically from 2017 to 2018, primarily due to a number of water infrastructure improvements and fixes as well as the transition of waste billing at the CLOMF to King County Metro. The remaining figures in this document show trends in specific resource categories over time.

Figure 3. Change in Total Resource Use, 2017-2018; Change in Resource Use per PMT, 2017-2018



**Note: Electricity: TPSS is normalized by Link PMT, as TPSS is exclusively associated with the Link line of business. All other resource categories are normalized by total agency PMT, as they span multiple lines of business. The dashed line denotes the 0% axis, with increases shown above and decreases shown below.*

Fleet Energy Use

- Since 2011, total fleet energy use has grown by 16 percent but decreased by 25 percent per PMT.
- From 2017 to 2018, fleet energy use grew by 1 percent but decreased by 2 percent per PMT.

Fleet energy use (in MMBTU) across Sound Transit's three modes—ST Express bus, Sounder commuter rail, and Link light rail—has been increasing slowly over time as more service has been provided. However, service has become more efficient per passenger and PMT, as system ridership has grown significantly faster than level of service (VRM) and energy efficiency projects have been implemented.

- Traction power electricity use for Link light rail grew by 75 percent since 2011 and increased by 3 percent from 2017 to 2018, due to both increased vehicle mileage from additional service and a higher proportion of 3-car Link light rails trains in service.
- Diesel fuel consumption for Sounder commuter rail increased by 25 percent since 2011 and 4 percent from 2017 to 2018, due to the addition of two new round trips at the end of 2017.
    - Sounder fuel use has historically varied with changes in weather, as Sounder trains idle when the outside temperature is below 40 degrees F.
    - In 2018, winter temperatures were similar to the previous year. As such, there was little change in overall diesel fuel usage resulting from weather differences.
- Diesel fuel consumption for ST Express buses increased by 2 percent since 2011 and decreased by 3 percent from 2017 to 2018. The composition of this fuel mix has changed over time; compressed natural gas (CNG) use in ST Express buses has increased by 108 percent since 2011 and by 24 percent from 2017 to 2018.
    - In 2018, some less-efficient 2004 model year buses were phased out, contributing to the decrease in diesel fuel usage for ST Express buses.
    - CNG use has increased significantly since 2011, although it represented only 6 percent of overall energy use in 2018 (in MMBTU). This increase in CNG since 2011 is primarily the result of increased CNG bus purchases. From 2017 to 2018, the number of CNG buses remained the same but the mileage driven by each bus increased substantially.
    - Although using CNG instead of diesel fuel reduces total GHG emissions and most criteria air pollutant emissions including particulate matter (PM) and NO_x, CNG use increases carbon monoxide (CO) emissions. (Air pollutants are discussed on pages A9-11.)

Figure 4 below shows the trend in fleet fuel use over time. Table 2 below shows the percent change in energy use from 2017 to 2018 per mode, as well as the percent change in efficiency (fuel use normalized by PMT for each mode).

Figure 4. Revenue Fleet Energy Use, 2011-2018

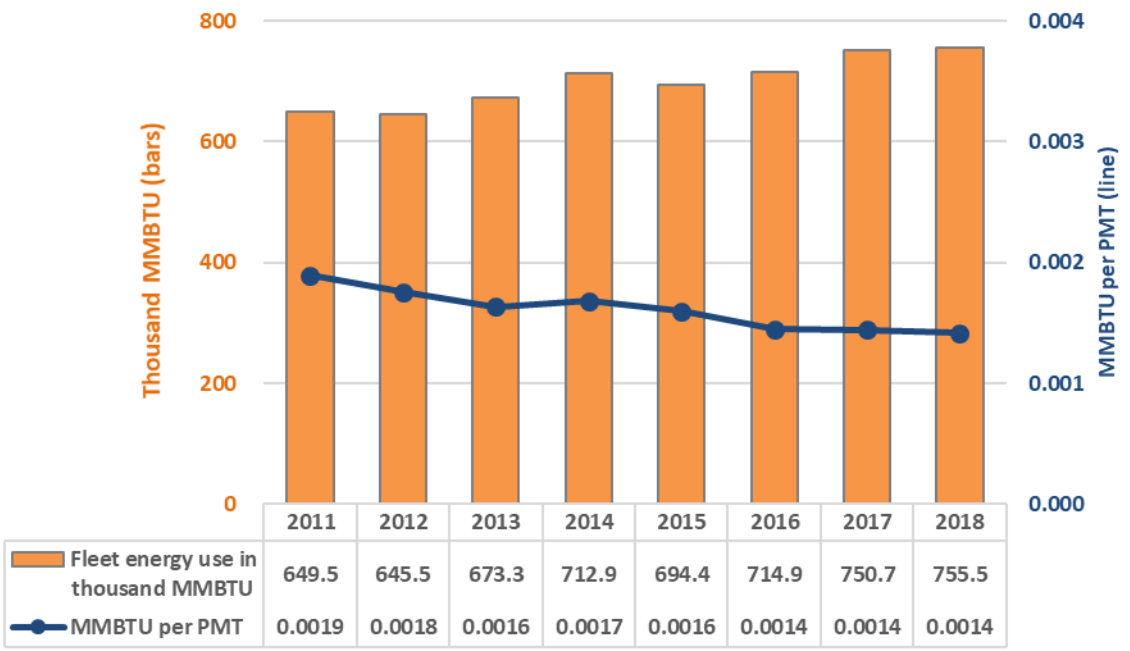


Table 2. Change in Energy Use by Mode, 2017-2018

Mode	% Change in Total Energy Use	% Change in Energy Use per PMT
Sounder Commuter Rail (diesel)	4%	-1%
ST Express Buses (diesel and CNG)	-1%	-1%
Link light rail traction power (electricity)	3%	-3%

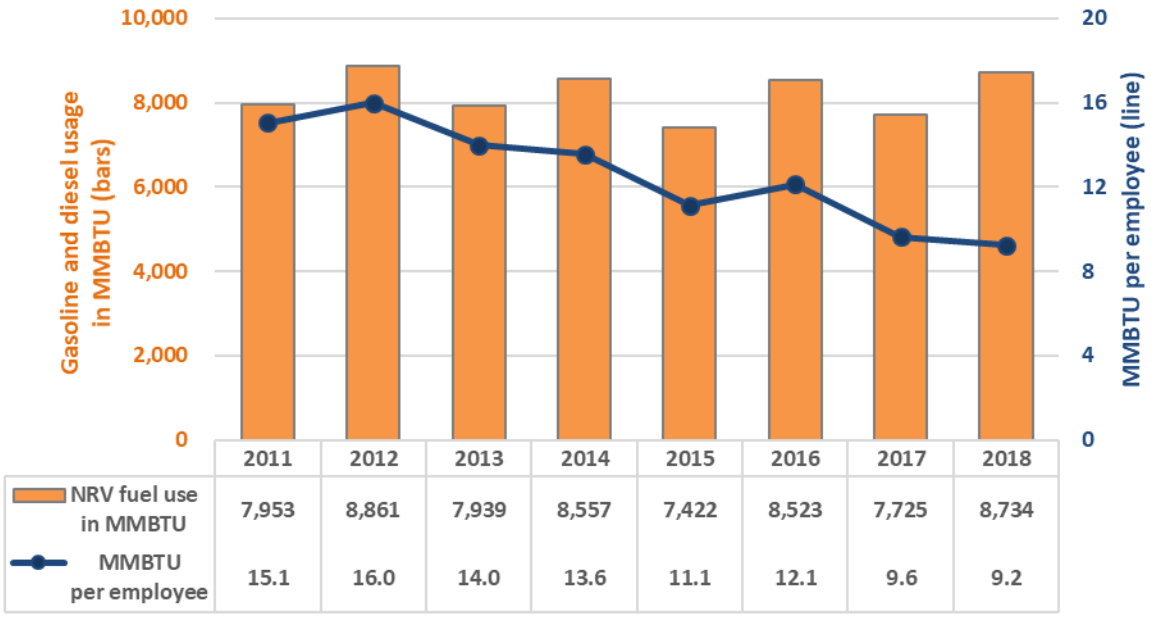
Note: Mode energy use is normalized by PMT specific to each mode.

Non-Revenue Fleet Energy Use

- Since 2011, non-revenue fleet energy use has increased by 10 percent overall but decreased by 39 percent per employee.
- From 2017 to 2018, non-revenue fleet energy use increased by 13 percent in total while decreasing by 4 percent per employee.

Energy use for the agency's non-revenue fleet has remained relatively stable over time, with some fluctuations from year to year, as shown in Figure 5. Non-revenue fleet energy use was 10 percent higher in 2018 than in the 2011 baseline year. While the agency's headcount has increased every year, contributing to more driving, Sound Transit has also purchased more hybrid vehicles, helping to reduce per-mile and per-employee energy use and air pollutant emissions. The agency also encourages carpools and use of transit options whenever feasible.

Figure 5. Non-Revenue Fleet Energy Use, 2011-2018



	2011	2012	2013	2014	2015	2016	2017	2018
NRV fuel use in MMBTU	7,953	8,861	7,939	8,557	7,422	8,523	7,725	8,734
MMBTU per employee	15.1	16.0	14.0	13.6	11.1	12.1	9.6	9.2

Facility Energy Use

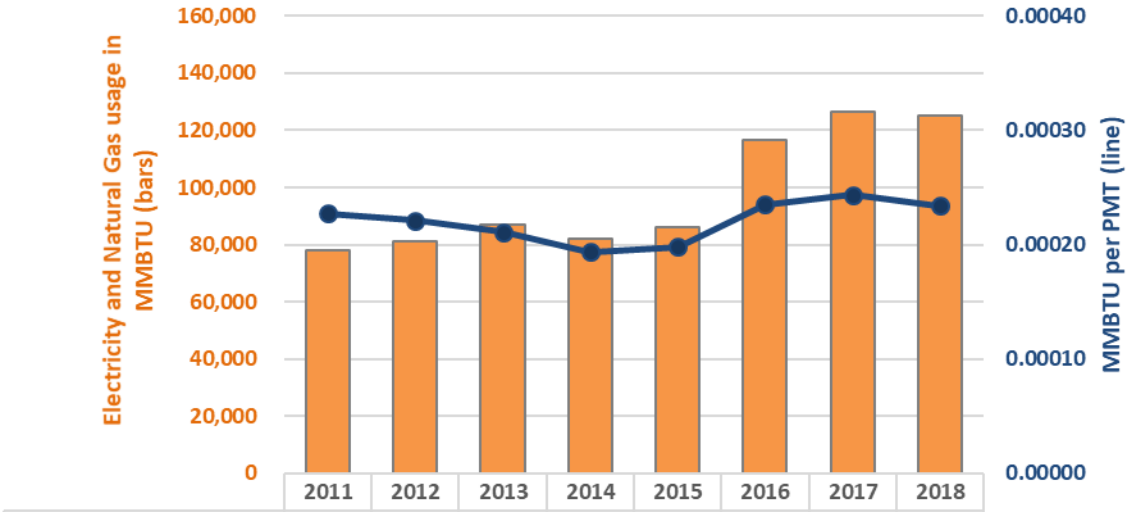
- Since 2011, total facility energy use has grown by 61 percent overall and by 3 percent per PMT.
- From 2017 to 2018, facility energy use decreased by 1 percent overall and by 4 percent per PMT, despite colder winter weather.

Facility energy use, shown in Figure 6, has increased 61 percent since 2011, as the agency has increased its staff as well as brought many new stations and facilities online, including the Capitol Hill, University of Washington, and Angle Lake Link light rail stations in 2016. Further development of the Mukilteo station in 2016, with a second platform, additional elevators, and a new pedestrian bridge, added to energy loads.

Energy use at some of Sound Transit's facilities is also dependent on weather. Although colder winter weather contributed to increased facility energy use in 2017 and 2018, overall energy use still dropped between these two years.

From 2017 to 2018, facility *electricity* use showed essentially no change overall but varied substantially by line of business. Sounder facilities increased electricity use by 19 percent, mainly due to additions of wayside power infrastructure. Meanwhile, ST Express and Link light rail facilities decreased electricity usage by 14 percent and 7 percent, respectively. The decrease in electricity usage for the ST Express facilities can largely be attributed to multiple LED lighting retrofit projects completed in 2018.

Figure 6. Facility Energy Use, 2011-2018

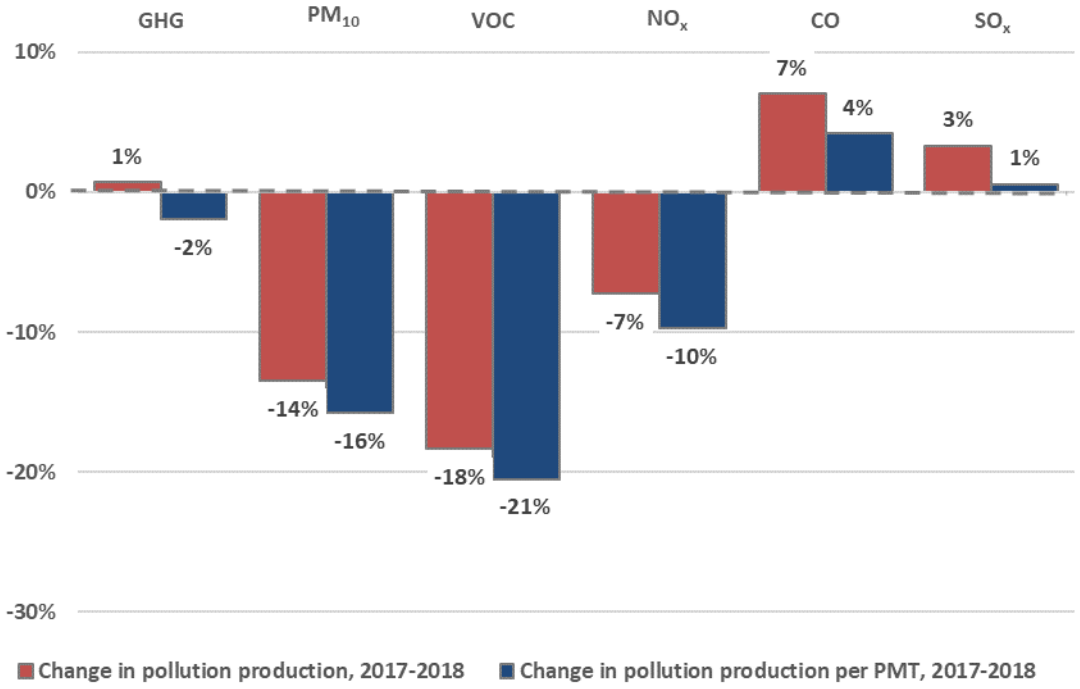


	2011	2012	2013	2014	2015	2016	2017	2018
Facility energy use in MMBTU	77,950	81,175	86,869	82,076	86,180	116,386	126,601	125,122
MMBTU per PMT	0.00023	0.00022	0.00021	0.00019	0.00020	0.00024	0.00024	0.00023

Air Pollutant Emissions

Sound Transit's air pollutant emissions occur because of its consumption of fuel and electricity. The sections below show the trends in greenhouse gas (GHG) emissions and criteria air pollutant emissions. Figure 7 below shows the overall percent change and the change normalized per passenger mile traveled (PMT) by pollutant type from 2017 to 2018. As noted above, PMT increased by 3 percent from 2017 to 2018.

Figure 7. Changes in Pollutant Emissions, 2017-2018; Change in Pollutant Emissions per PMT, 2017-2018

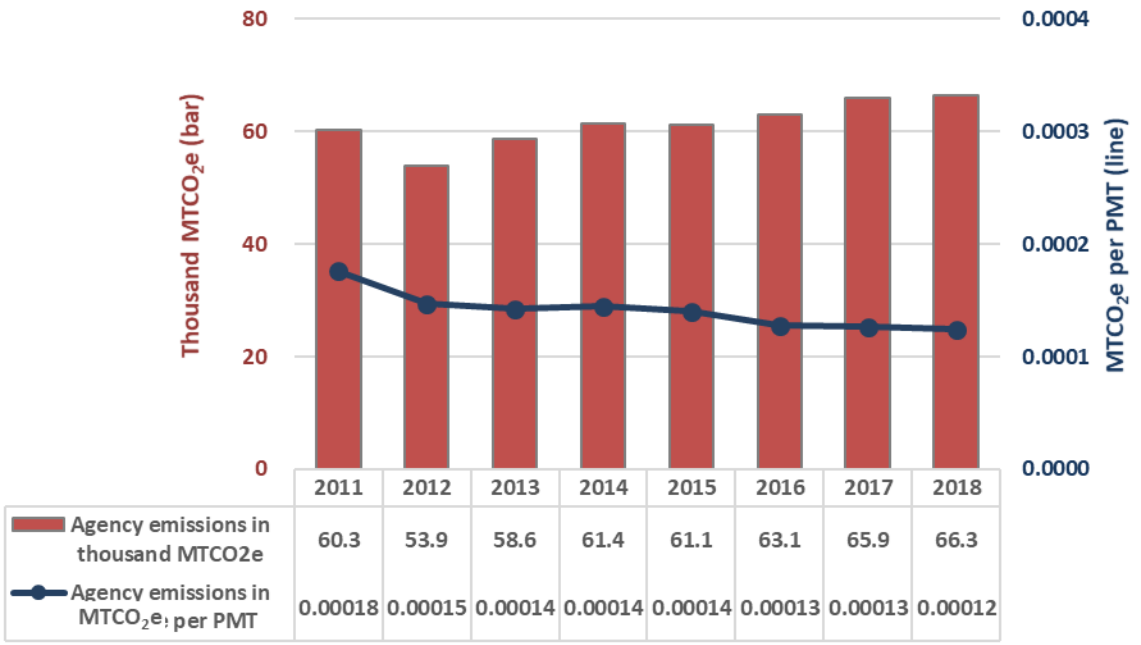


Greenhouse Gas Emissions

- Since 2011, total GHG emissions have grown by 10 percent but decreased by 29 percent per PMT.
- From 2017 to 2018, total GHG emissions increased by 1 percent, but decreased by 2 percent per PMT

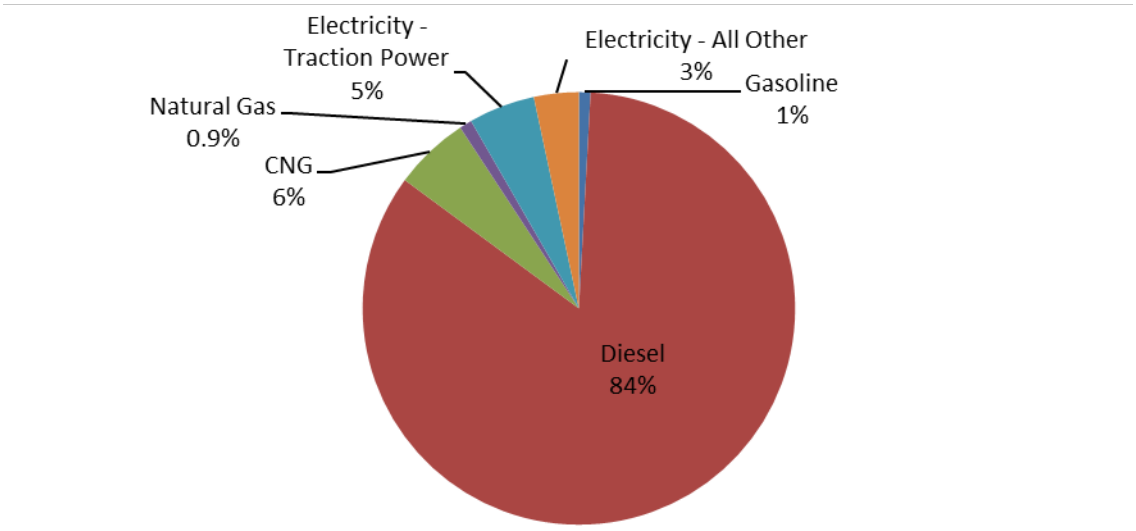
As service and ridership have increased, total agency GHG emissions have remained relatively stable since 2011 and have been declining on a normalized basis, as shown in Figure 8. From 2017 to 2018, GHG emissions associated with employee business travel and the non-revenue fleet vehicles, while a small portion of Sound Transit's overall footprint, increased by 31 percent and 13 percent, respectively. The majority of GHG emissions are due to the combustion of diesel fuel, as shown in Figure 9.

Figure 8. Agency GHG Emissions, 2011-2018 (thousand metric tons of carbon dioxide equivalent, $MTCO_2e$)



	2011	2012	2013	2014	2015	2016	2017	2018
Agency emissions in thousand MTCO2e	60.3	53.9	58.6	61.4	61.1	63.1	65.9	66.3
Agency emissions in $MTCO_2e$ per PMT	0.00018	0.00015	0.00014	0.00014	0.00014	0.00013	0.00013	0.00012

Figure 9. Greenhouse Gas Emissions by Energy Source, 2018



Criteria Air Pollutants

Table 3. Change in Criteria Air Pollutant Emissions

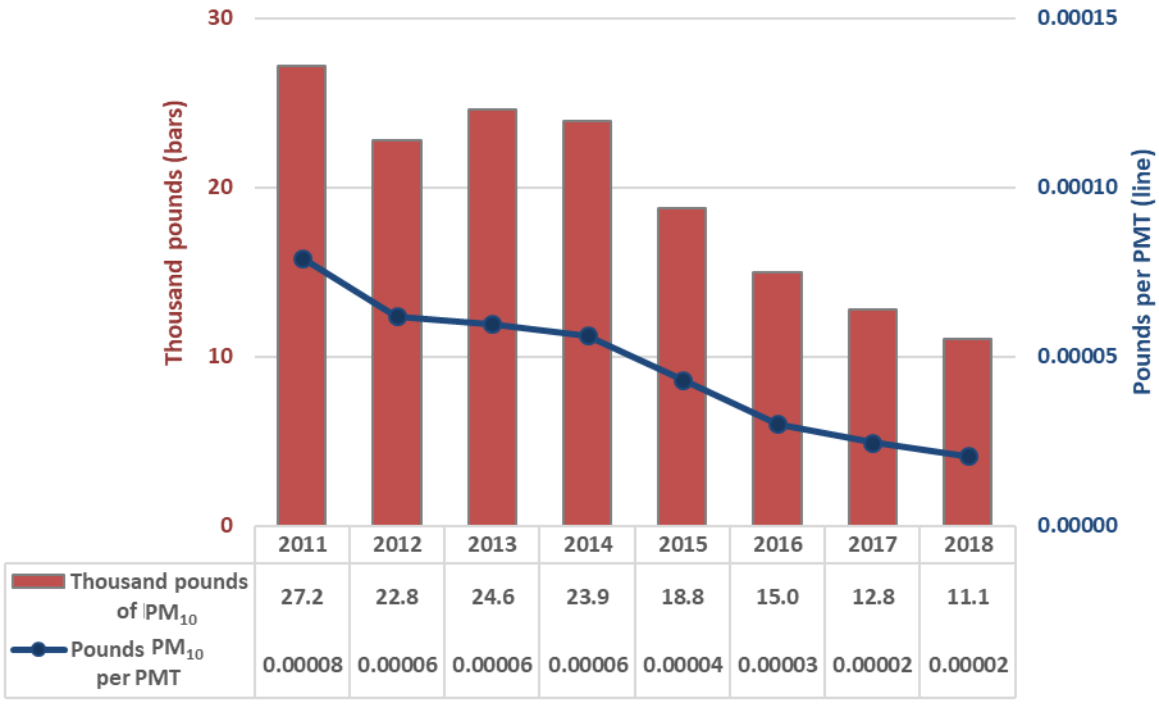
Pollutant	Change 2011-2018 (Absolute)	Change 2011-2018 (per PMT)	Change 2017-2018 (Absolute)	Change 2017-2018 (Per PMT)
PM_{10}	-59%	-74%	-14%	-16%
VOCs	-70%	-81%	-18%	-21%
NO_X	-45%	-65%	-7%	-10%
CO	-78%	-86%	**+7%**	**+4%**
SO_X	**+23%**	-21%	**+3%**	**+1%**

Sound Transit's Criteria Air Pollutant (CAP) emissions have declined in most areas over the past several years, in many cases significantly — including particulate matter (PM_{10}), volatile organic compounds (VOCs), nitrogen oxides (NO_x), carbon monoxide (CO), and sulfur oxides (SO_x). The Environmental Protection Agency regulates criteria air pollutants under the Clean Air Act, due to their impacts on smog and human health problems like asthma and heart attacks. Sound Transit's reduction in CAP emissions is primarily driven by a shift from diesel fuel to CNG in the bus fleet and fleet turnover as older, less efficient vehicles are gradually replaced with newer vehicles with better emissions control technologies. The agency has also worked to upgrade Sounder commuter rail engines to reduce air pollution.

Figure 10 and Figure 11 below show the decrease in total PM_{10} and CO production over time as well as the decrease per PMT since 2011. These criteria air pollutants are down 59 percent and 78 percent overall since 2011, respectively.

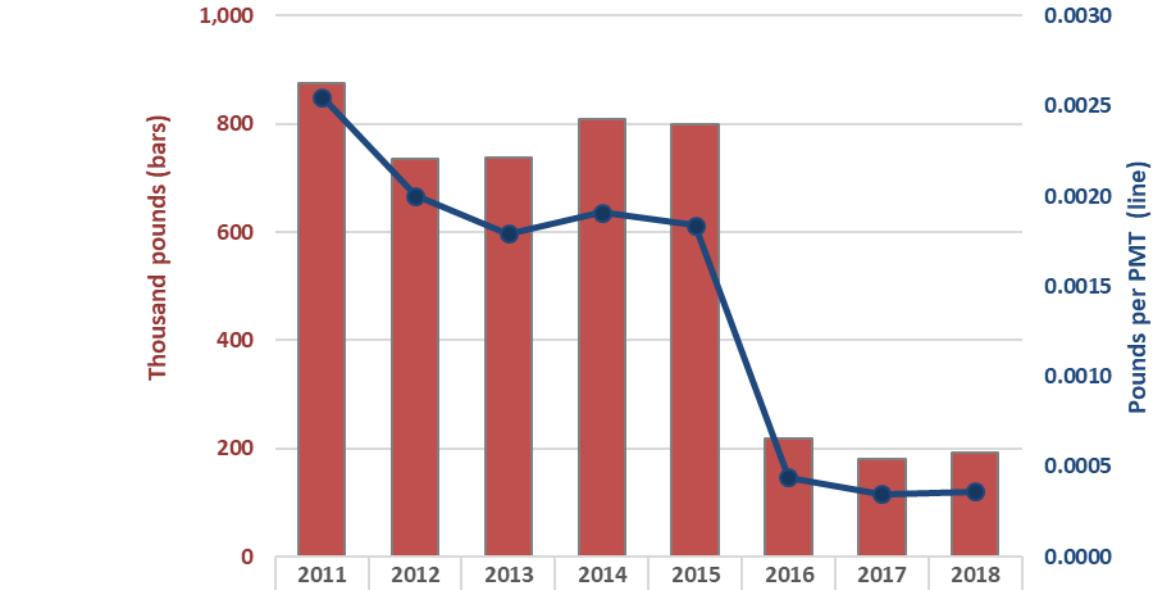
The noticeable drop in CO emissions starting in 2016 is primarily due to phasing out model year 2001 CNG buses. As technology has improved, the CO emissions per mile for CNG buses has dropped dramatically. From 2012-2015, the 2001 CNG buses contributed about 80 percent of total inventory CO emissions. The mileage usage of the 2001 CNG buses stepped down in 2016 and then was eliminated in 2017, accounting for the large drop in CO emissions in those years. In 2018, as CNG bus mileage continued to increase and replace diesel bus mileage, CO emissions increased slightly since CNG emits more CO per mile than diesel. SO_x increased by 3 percent from 2017 to 2018 due to increases in mileage (VRM) and diesel consumption for Sounder service.

Figure 10. Particulate Matter (PM_{10}) Emissions, 2011-2018



	2011	2012	2013	2014	2015	2016	2017	2018
Thousand pounds of PM_{10}	27.2	22.8	24.6	23.9	18.8	15.0	12.8	11.1
Pounds PM_{10} per PMT	0.00008	0.00006	0.00006	0.00006	0.00004	0.00003	0.00002	0.00002

Figure 11. Carbon Monoxide (CO) Emissions, 2011-2018



	2011	2012	2013	2014	2015	2016	2017	2018
Thousand pounds of CO	875.4	735.6	738.6	810.1	800.5	218.3	180.7	193.4
Pounds CO per PMT	0.0026	0.0020	0.0018	0.0019	0.0018	0.0004	0.0003	0.0004

Water Use

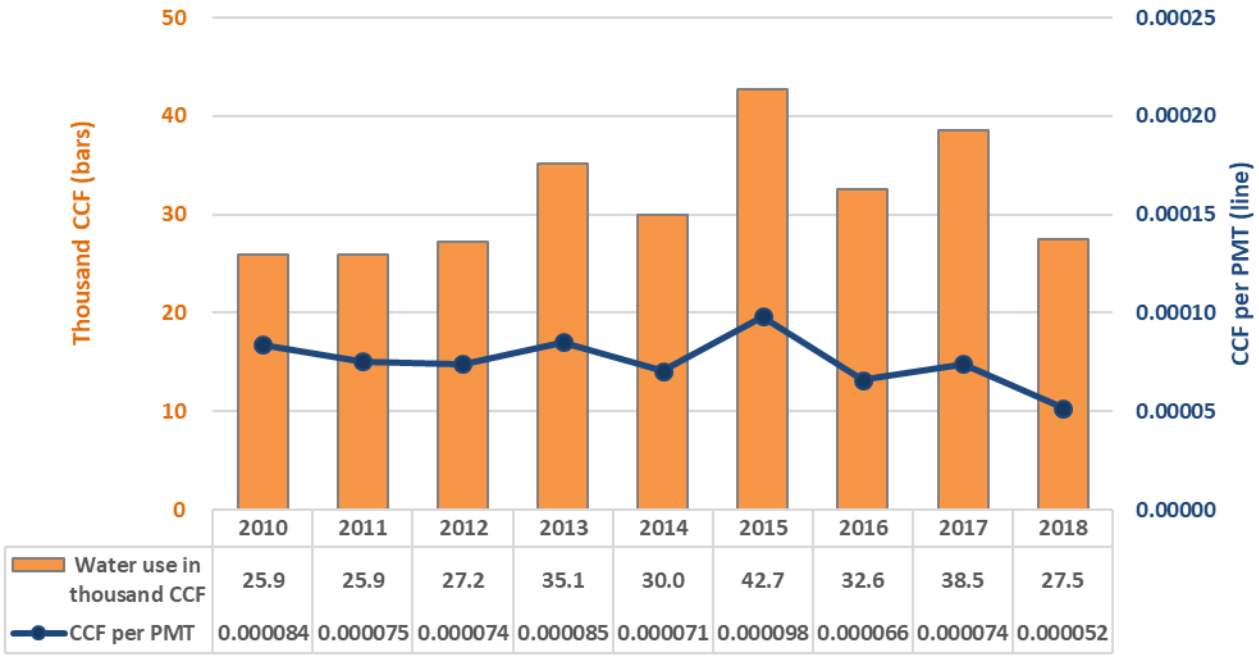
- Since 2010, water use has grown by 6 percent in total but decreased by 39 percent per PMT.
- From 2017 to 2018, water use decreased by 29 percent in total and 30 percent per PMT.

Water use overall has increased 6 percent since 2010 with increased agency headcount and expanded service, although water use for irrigation experiences high inter-annual variability.

- Customer facility water use is largely driven by landscape irrigation and is therefore variable from year to year depending on weather. The drought conditions of summer 2015 led to much higher customer facility water use.
- Non-weather related irrigation issues can also noticeably impact water consumption. In 2014, water use decreased as several large leaks were repaired, landscaping elements at several facilities reached maturity (recently planted trees and bushes typically require more water), and a rain sensor was installed at Union Station. Usage increased again in 2015, however, due to the aforementioned drought, a leak at SODO station, and the addition of new facilities with immature landscaping features.
- Agency reductions in water use from 2017 to 2018 reflected decreases across the board, with particularly significant reductions observed at administrative facilities. Water use dropped in 2018 due to a combination of repairs made to leaks occurring in 2017, previously planted landscaping features reaching maturity, installation of water conservation equipment, and irrigation scheduling improvements.

Figure 12 below shows the change in water use over time in total and per PMT.

Figure 12. Water Use, 2010-2018 (thousand CCF; 1 CCF equals 100 cubic feet, or 748 gallons)



Waste Generation

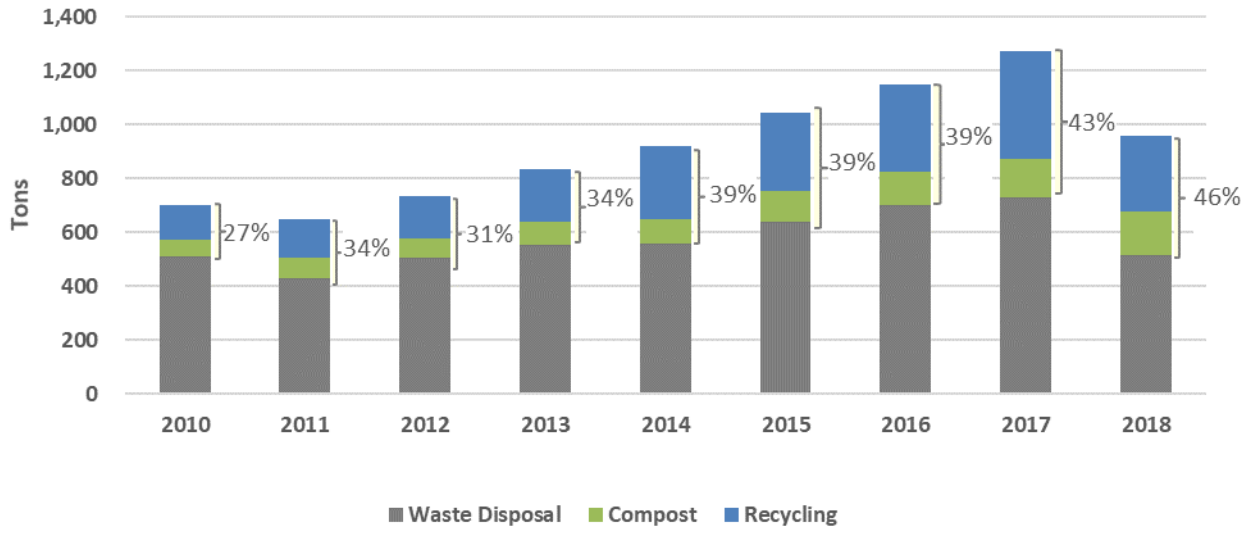
- Since 2010, waste generation has grown by 37 percent.
- From 2017 to 2018, waste generation decreased by 25 percent.

Waste generation at Sound Transit facilities has increased 37 percent since 2010 as service (vehicle revenue miles) and agency staff have increased. The total amount of garbage sent to landfill has increased by 1 percent over the same timeframe, as the rate at which recyclables and compost have been diverted from the landfill has also trended upward.

Diversion from the waste stream has increased from 27 percent in 2010 to 39 percent in 2014-2016 and then to 46 percent in 2018, largely due to improved recycling education and implementation of paper towel composting in the restrooms at Union Station. In 2016, the disposal bins at the CLOMF facility were too small for the volume of garbage, leading to co-mingling of solid waste and recyclables, until bins were upgraded. This problem underscores the importance of ongoing assessment and education, as well as appropriate infrastructure, to support recycling and composting efforts.

- From 2017 to 2018, waste generation decreased by 317 tons, or 25 percent, while agency staff increased by 18 percent in that timeframe. This dramatic reduction in waste generation and recycling volumes for Sound Transit is largely due to the reassignment of waste and recycling at the CLOMF facility to King County Metro.
- Composting quantities went up by 12 percent, while recycling quantities decreased by 30 percent. The agency's overall diversion rate during that period increased to 46 percent, as shown in Figure 13 below.

Figure 13. Waste Generation and Diversion, 2010-2018

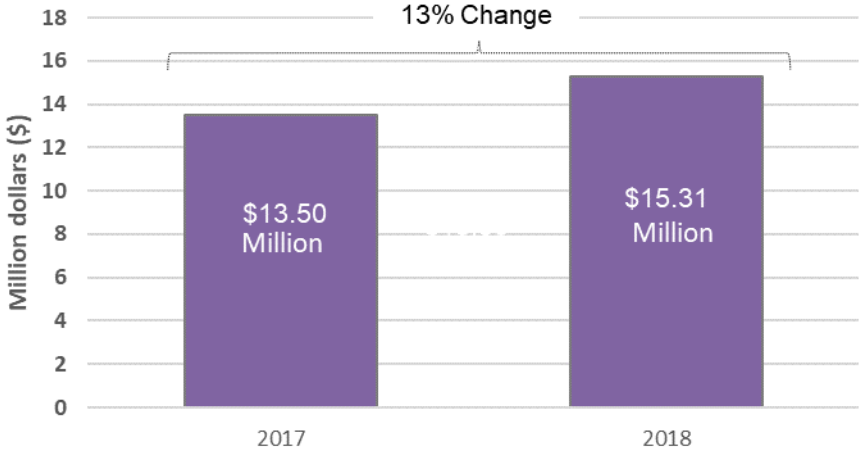


Fuel and Utility Expenses

- Since 2010, fuel costs for ST Express buses and Sounder commuter rail have increased by 6 percent in total and decreased by 28 percent per PMT.
- From 2017 to 2018, fuel costs increased by 22 percent in total and 20 percent per PMT.
- Since 2010, utility costs have increased by 108 percent in total and 20 percent per PMT.
- From 2017 to 2018, utility costs decreased by 2 percent in total and 5 percent per PMT.

Costs for nearly every resource category have trended upward since 2010. Figure 14 below shows the change in agency operating costs for fuel and utilities from 2017 to 2018. Passenger miles traveled increased by 3 percent in this period.

Figure 14. Fuel and Utility Expenses

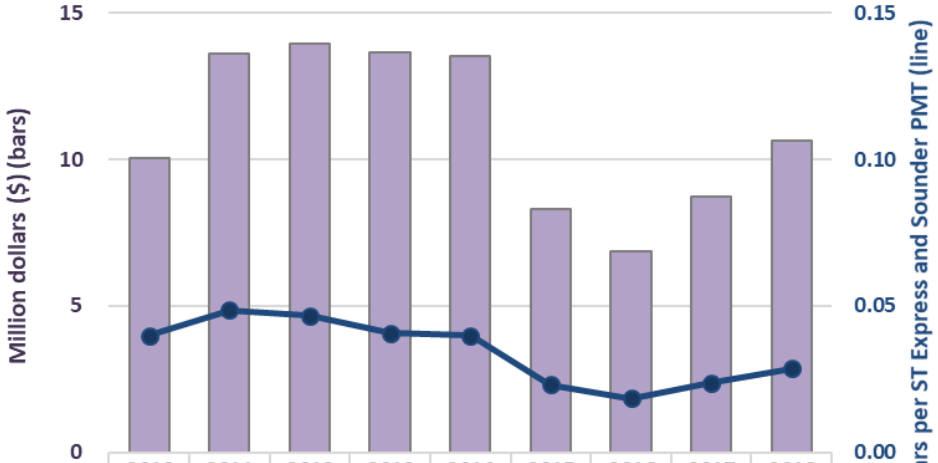


Fuel Costs

- Fuel costs for ST Express buses and Sounder commuter rail have increased by 6 percent since 2010 and by 22 percent from 2017 to 2018.
- Oil and gas prices nationally decreased from 2014 through 2016, though prices have been rising since then.
- Transit vehicle fuel makes up the bulk of Sound Transit's fuel and utility expenses; fuel use accounted for 69 percent of the agency's fuel and utility expenses in 2018.
- From 2017 to 2018, transit vehicle fuel accounted for 3 percent of Sound Transit's total operating costs.

The cost of fuel for Sounder and ST Express are shown in Figure 15.

Figure 15. Sounder and ST Express Fuel Costs, 2010-2018



	2010	2011	2012	2013	2014	2015	2016	2017	2018
Fuel costs in millions of dollars ($)	$10.04	$13.59	$13.94	$13.65	$13.52	$8.29	$6.87	$8.72	$10.62
Dollars per ST Express and Sounder PMT	0.040	0.049	0.047	0.041	0.040	0.023	0.019	0.024	0.029

Other Utility Expenses

- Since 2010, utility costs have increased by 108 percent overall, though they decreased by 2 percent from 2017 to 2018.

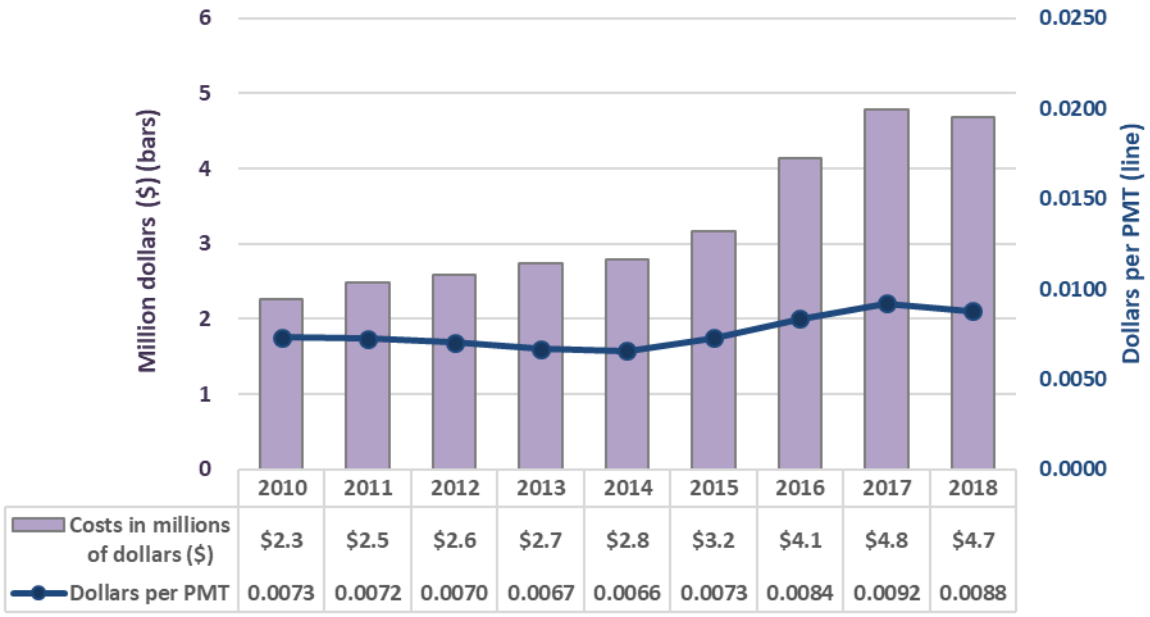
Table 4. Change in Utility Costs

	Change 2010-2018 (Absolute)	Change 2010-2018 (per PMT)	Change 2017-2018 (Absolute)	Change 2017-2018 (Per PMT)
Traction power electricity costs	+92%	**-33%***	**+4%**	**-2%***
Facility electricity costs	**+138%**	**+38%**	**-3%**	**-6%**
Facility natural gas costs	**+49%**	**-14%**	**-6%**	**-8%**
Water costs	**+41%**	**-18%**	**-6%**	**-9%**
Waste, recycling, and compost cost	**+121%**	**+28%**	**-30%**	**-31%**

**Reduction per Link passenger mile traveled.*

Other utility expenses for electricity, water, and waste have increased over time in line with usage trends. Figure 16 below shows the change in resource costs since 2010. Total facility electricity costs since 2010 have increased by 138 percent, water costs by 41 percent, and waste costs by 121 percent. The agency's fuel expenses have fluctuated with the volatility in petroleum prices, while other resource costs have increased more steadily.

Figure 16. Utility Costs (excluding transit vehicle fuel), 2010-2018



	2010	2011	2012	2013	2014	2015	2016	2017	2018
Costs in millions of dollars ($)	$2.3	$2.5	$2.6	$2.7	$2.8	$3.2	$4.1	$4.8	$4.7
Dollars per PMT	0.0073	0.0072	0.0070	0.0067	0.0066	0.0073	0.0084	0.0092	0.0088

Note: Stormwater and sewer costs are not included because costs were not in the inventory prior to 2013.

Appendix B – 2018 Sustainability costs and savings

The table below summarizes a sample of monetary costs and savings from resource conservation projects completed as of the end of 2018. This data captures many significant program costs and savings. However, projects may have additional sustainability benefits that cannot be represented as financial savings – from reduced maintenance cycles to improved air quality.

Note that the savings figures below do not include labor and material cost savings related to improved operations and maintenance efficiency. Payback year estimates do reflect applicable grants and or rebates.

PROJECT	PROJECT FINISHED	CAPITAL COSTS	2018 SAVINGS	SAVINGS TO DATE, 2018	PAY-BACK YEAR	DESCRIPTION
ST Express mid-day bus storage	2008	$0	**$94,763**	**$1,938,477**	2008	This program allows Pierce County buses to stay in Seattle until the afternoon commute to avoid driving back and forth empty – saving over 46,000 gallons of fuel in 2018.
Sounder Automatic Engine Start-Stop System	2009	$230,596	**$143,910**	**$789,738**	2013	This equipment was installed to shut down Sounder commuter rail engines when not in use, and reduces engine idling time by about 34 percent and significantly reduces air pollution.
Sounder Lakewood-Seattle wayside power	2010	$490,000	**$147,975**	**$862,391**	2015	Electric wayside power units are used instead of the commuter rail locomotives' diesel engines to heat and power coach cars during layover, reducing diesel use and air pollutant emissions. Wayside units were installed in Tacoma in 2010 and were then moved to Lakewood in 2013, where more units were added.
Sounder Everett-Seattle wayside power	2011	$315,000	**$15,711**	**$228,601**	2019	

PROJECT	PROJECT FINISHED	CAPITAL COSTS	2018 SAVINGS	SAVINGS TO DATE, 2018	PAY-BACK YEAR	DESCRIPTION
Central Link OMF sewer deduct meter	2012	$2,600	$50,731	$205,129	2012	This Central Link light rail Operations and Maintenance Facility meter reduces water costs by accounting for irrigation water that does not enter the wastewater stream.
Union Station HVAC Controls Upgrade*	2013	$405,778	$25,581	$127,978	2022	The agency upgraded the controls for the Union Station Heating, Ventilation and Cooling (HVAC) system.
Federal Way Transit Center garage lighting upgrades*	2013	$603,000	$32,436	$162,267	2023	Three transit facility garages were retrofitted for LED lighting. These locations included Federal Way Transit Center, Kent Sounder station and Auburn Sounder station.
Kent Station garage lighting upgrades*	2013	$111,995	$5,766	$28,847	2022	
Auburn Station garage lighting upgrades*	2013	$219,503	$11,533	$57,695	2023	
PROJECT	PROJECT FINISHED	CAPITAL COSTS	2018 SAVINGS	SAVINGS TO DATE, 2018	PAY-BACK YEAR	DESCRIPTION

Kent Station lighting upgrades*	2017	$169,849	$10,210	$17,958	2030	Kent, Sumner and Puyallup Stations were upgraded with LED lighting.
Sumner Station lighting upgrades*	2017	$138,967	$10,250	$18,029	2027	
Puyallup Station lighting upgrades*	2017	$169,849	$10,622	$18,683	2029	
OMF Interior and Exterior LED Lighting & EMS Controls Upgrade*	2018	$1,065,415	$56,561	$56,561	2026	The building control system was upgraded at the Operations & Maintenance Facility, which allows for improved building mechanical operations. The inefficient lighting was replaced with LED in the maintenance shop and exterior parking areas.

PROJECT	PROJECT FINISHED	CAPITAL COSTS	2018 SAVINGS	SAVINGS TO DATE, 2018	PAY-BACK YEAR	DESCRIPTION

Mukilteo Parking Lot lighting upgrade	2018	$13,150	$2,086	$2,086	2021	Parking lot lighting was retrofitted with LED lights near Mukilteo Station.
Issaquah Transit Center lighting upgrade*	2018	$161,514	$5,133	$5,133	2035	Lighting was upgraded to LEDs at the Issaquah Transit Center, Mercer Island Park & Ride, and King St. Stations from parking garages and station platforms to area lighting.
Mercer Island Park & Ride Lighting Upgrade*	2018	$191,424	$4,581	$4,581	2038	
King St. Station Lighting Upgrade*	2018	$245,262	$0	$0	2068	

* Cost savings figures for projects implemented through an Energy Performance Contract (denoted with an *) represent average, annualized savings based on the project's projected lifetime savings. These projects may ultimately achieve energy and cost savings in excess of the guaranteed amount.