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## **Fleet and Parking Services**

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### **Biennial Report Required by ORS 276.255 Concerning Electric Vehicle Charging**

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Brian King, DAS Fleet and Parking Manager  
503-373-7723  
[Brian.king@oregon.gov](mailto:Brian.king@oregon.gov)

## **Executive Summary**

### **State Fleet Reporting**

As required by ORS 276.255, the Department of Administrative Services Fleet has gathered data from the state's fleets to report on the following areas:

1. List the number of devices or facilities for delivering electricity to the public for electric motor vehicles that state agencies installed or had installed in the previous two years and the total number of installations that have occurred since the effective date of this 2018 Act
2. List the number of devices or facilities that state agencies have planned for installation in the next two years
3. List the cost to the state agency of each installation and calculate an average cost for installations that state agencies have completed or had completed; and an overall trend line for costs that state agencies have incurred
4. Specify the current uniform price that each state agency charges under subsection of this section and any changes in the uniform price that occurred in the previous two years
5. Specify for each state agency an average rate of utilization for all of the devices or facilities located on premises that the state agency owns or controls, calculated as the ratio of the time each day during which a person is actually using the devices or facilities and the time each day in which the devices and facilities are available for use
6. Specify whether and to what extent using electric motor vehicles and devices or facilities located on premises that state agencies own or control to provide electricity for state agency electric motor vehicles results in a cost savings to the state agency in comparison to using motor vehicles that do not use electricity for propulsion.

DAS collected data from agencies under its authority via ORS 283. Almost all agencies had little or no data to report. This is because of the developing nature of the EV market, the lack of opportunities to install infrastructure, and for some, the limited types of vehicles available with a sufficient usage range that fit their state business needs.

DAS is has engaged Locke Engineering and Fluent Engineering for the EV charging infrastructure project for DAS Capitol Mall facilities and the Salem Motor Pool. This project will add up to 150 dual head, Level 2 chargers resulting in approximately 300 parking spaces with EV charging capability. The spaces are a combination of state vehicle use, employee use, and visitor use. The following table shows the sites and proposed numbers of chargers and spaces. However, the bid documents and bid for the project works is not completed and the counts may be reduced to accommodate available funding.

<b>Location/Description</b>	<b>Quantity of EV Chargers</b>	<b>Number of EV Spaces</b>
Agricultural- Underground Lot	1	2
Archives- Surface Lot	1	2
Archives- Underground Lot	1	2
Building 550 (PUC) Building	Add 3, replace L1 with L2	14
Capitol Mall Structure	40	80

Commerce Building	3	6
Employment Building Underground	1	2
Executive Building Lower	2	4
General Services Street and Lot	1	2
General Services Parking Structure	7	14
Green Lot	7	14
HSB Underground	5	10
Justice/Judicial	1	2
Motor Pool	40 to 60	88 (4 visitor/employee)
NMOB underground	9	18
Orange Lot	2	4
Revenue Underground	12	24
Yellow Lot	3	6
	<b>140 to 160</b>	<b>280 to 300</b>

In addition, this work is vital to implement Executive Order 17-21, Executive Order 20-04 and SB 1044 codified in ORS 283 to advance the adoption of electric vehicles in the public and private sector.

Agencies that owned land or facilities were contacted to provide data. Because of the ever changing nature of the EV market, the information contained in this report is the best that could be gathered at this time.

### **Reporting Criteria and Data:**

For the data below, please note that for EV chargers, each “unit” below refers to a cable or port capable of rendering a charging session. A double headed charging device with two cables is counted as two units.

DAS queried the agencies that have fleet and who have facilities they own and manage. In addition, agencies that rent light fleet vehicles from DAS but have their own facilities were asked to respond.

- 1. List the number of devices or facilities for delivering electricity to the public for electric motor vehicles that state agencies installed or had installed in the previous two years and the total number of installations that have occurred since the effective date of this 2018 Act**

<b>Total number of EV charging units installed since June 2, 2018</b>		
<b>Agency</b>	<b>Answer</b>	<b>Comments</b>
Department of Administrative Services	1	Installed charger on hand at Hillsboro Lab for DEQ use
Oregon Department of Transportation	1	
Oregon State Police	1	Pendleton; Property owner provided the device and installation
Oregon Military Department	2	USED FOR CHARGING STATE VEHICLES
Oregon Lottery	0	
Department of Forestry	0	
Department of Corrections	0	
Oregon Liquor Control Commission	0	
OHA Oregon State Hospital	0	Salem OSH has a total of 10 charging stations all installed prior to June 2, 2018. 2 are for security vehicle charging and 8 that are for staff and public use.
Oregon Employment Department	0	
Department of State Lands	0	
Oregon Youth Authority	0	
Oregon Travel Information Council	0	
Oregon Department of Fish and Wildlife	0	
Oregon Department of Education	0	
Department of Aviation	0	

Department of Agriculture	0	
Department of Public Safety Standards and Training	0	
Oregon Parks and Recreation Department	0	
Department of Veteran's Affairs	0	

Total number of EV charging units installed in the previous two years- October 1, 2018 through Sept 30, 2020		
Agency	Answer	Comments
Department of Administrative Services	1	Installed charger on hand at Hillsboro Lab for DEQ use
Oregon Department of Transportation	1	
Oregon State Police	1	Pendleton; Property owner provided the device and installation
Oregon Military Department	2	USED FOR CHARGING STATE VEHICLES
Oregon Lottery	0	
Department of Corrections	0	
Department of Forestry	0	
Oregon Liquor Control Commission	0	
OHA Oregon State Hospital	0	Salem OSH has a total of 10 charging stations all installed prior to October 1, 2018. 2 are for security vehicle charging and 8 that are for staff and public use.
Oregon Employment Department	0	
Department of State Lands	0	
Oregon Youth Authority	0	
Oregon Travel Information Council	0	
Oregon Department of Fish and Wildlife	0	
Oregon Department of Education	0	
Department of Aviation	0	
Department of Agriculture	0	
Oregon Parks and Recreation Department	0	

Department of Public Safety Standards and Training	0	
Department of Veteran's Affairs	0	

**2. List the number of devices or facilities that state agencies have planned for installation in the next two years**

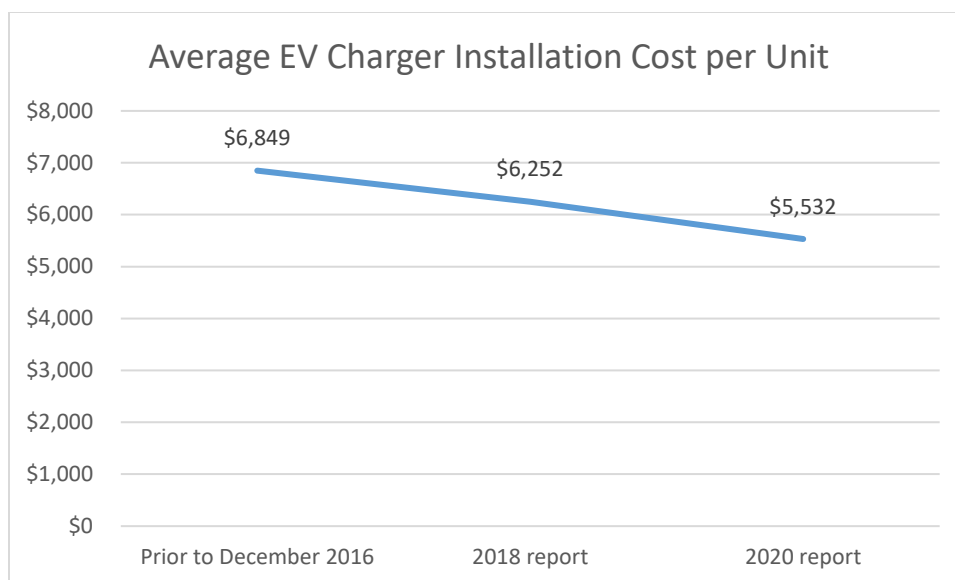
Number of devices or facilities that state agencies have planned for installation in the next two years		
Agency	Answer	Comments
Department of Administrative Services	300	Engineering in progress for Capitol Mall and Salem Motor Pool. Project expected to be completed by June 30, 2022.
Oregon Department of Transportation	10	Possible more employee EV and state vehicle charging
Department of Corrections	4	
Department of Forestry	2 to 4	Currently it is anticipated that these will serve staff/public private vehicles (non-subsidized).
Oregon Lottery	2	For Lottery owned state vehicles only
Oregon Employment Department	Number unknown at this time	Plan to install EV charging units in the next 1-2 years at Salem-210, WorkSource, 605 Cottage St NE, Salem OR 97301
Oregon State Police	0	
Oregon Military Department	0	
Oregon Liquor Control Commission	0	
Department of State Lands	0	
OHA- Oregon State Hospital	0	
Oregon Youth Authority	0	
Oregon Travel Information Council	0	May be constitutional prohibition preventing OTIC from using highway funds for EV infrastructure at rest stops
Oregon Department of Fish and Wildlife	0	
Oregon Military Department	0	
Oregon Department of Education	0	
Department of Aviation	0	
Department of Agriculture	0	

Oregon Parks and Recreation Department	0	
Department of Public Safety Standards and Training	0	
Department of Veteran's Affairs	0	

**3. List the cost to the state agency of each installation and calculate an average cost for installations that state agencies have completed or had completed; and an overall trend line for costs that state agencies have incurred**

While the costs are captured for the following installations, one aspect of the data is that installation costs vary widely based on the complexity of the units (whether they are networked or not) and the site preparation needed along with any electrical system upgrades. For example, The DAS/lottery project involved extensive site work combined with networked machines from ChargePoint but the Hillsboro Lab project used a non-networked single head charger installed where power was available and minimal installation costs were incurred.

Cost of state agency installations			
Agency	Units installed	Cost	
DAS/Lottery shared project	18	\$167,260	
DAS (Hillsboro Lab)	1	\$2,000	
ODOT (original 2011 Blink installation plus cost to replace failed units with SEMA Connect in 2018)	10	\$26,624	
ODOT 2019	1	\$5,480	
OMD	2	\$25,456	
OHA Oregon State Hospital	10	\$34,637 (chargers only, site improvement cost not included)	
OSP	1	No Data; Property owner provided the device and installation	
Total units	41 (OHA and OSP removed due to incomplete data)	Average cost/unit	\$5,532



Once the large DAS project for 300 chargers is completed, there could be an uptick in the trend line for cost. That project will involve extensive site and electrical service upgrades, which the agency is seeking to mitigate in partnership with PGE for possible grant opportunities.

**4. Specify the current uniform price that each state agency charges and any changes in the uniform price that occurred in the previous two years**

Currently most Employee charging is Level (110V outlets) or Level 2 non-networked chargers. For this, agencies are following pricing guidelines in Statewide Fleet Management Policy 107-011-040 where a monthly fee of \$20 or \$10 is collected via payroll deduction. The price difference is based on full or half day charging or an older vehicle with a smaller battery capacity. There has been no change in this pricing in the last two years.

DAS has the only state agency public chargers, which are located at the 550 Capitol St building and the Airport Rd PnD/Lottery lot. The pricing for electricity there is \$.48 per kilowatt hour. This pricing was established in 2019 to match local market pricing within the 110% required by statute.

Due to the low recorded cost for OHA Oregon State Hospital, the agency is charging a lower cost per kWh for use.

Specify the current uniform price that each state agency charges and any changes in the uniform price that occurred in the previous two years		
Agency	Answer	Comments
DAS	\$.48 per kWh	
ODOT	No Data	Only used for state vehicles and by employees using payroll deductions
OHA Oregon State Hospital	\$0.25 per kWh	
OSP	No Data	The station has not been used
OMD	No Data	Only used for state vehicles



**5. Specify for each state agency an average rate of utilization for all of the devices or facilities located on premises that the state agency owns or controls, calculated as the ratio of the time each day during which a person is actually using the devices or facilities and the time each day in which the devices and facilities are available for use**

For this reporting measure, the only devices able to capture the information are fully networked systems. This measure is interpreted to pertain only to chargers provided for public or employee use. State vehicles will come and go throughout the day as need be for state business and including that data will skew the perceived intent of the measure, which is interpreted as defining the rate of utilization of EV charging services being offered by the state.

In addition, the following assumption are included in calculating the ratio:

- Available days used for calculation are state workdays
- Available hours used for calculation are from 7:00am to 5:00 pm on workdays

For the year prior to 11/6/2020, the DAS chargers were used 25.12% of the hours they were available for use available. However, examination of the usage since the start of COVID shows a severe decrease to 9% due to state office closures and teleworking.

<b>Specify for each state agency an average rate of utilization for all of the devices or facilities located on premises that the state agency owns or controls</b>		
<b>Agency</b>	<b>Answer</b>	<b>Comments</b>
DAS	25.12% (pre COVID)	Down to 9% in last 90 days
ODOT	20.79%	
OHA Oregon State Hospital	Data not available in format requested	Over the last 365 days, charging sessions total 2036 with an average of 5.57 sessions per day

**6. Specify whether and to what extent using electric motor vehicles and devices or facilities located on premises that state agencies own or control to provide electricity for state agency electric motor vehicles results in a cost savings to the state agency in comparison to using motor vehicles that do not use electricity for propulsion.**

The Return on Investment for electric vehicles is a complex question and dependent on many factors.

- a. Cost differential between electric motor vehicles (EV) and internal combustion engine (ICE) vehicles: As prices increase for ICE cars and decrease for EV's, this factor becomes less impactful to the ROI in the upcoming years while expanding the useful range of the vehicles. DAS data shows a \$4,694 drop in price from the 2012 Nissan Leaf to the 2018 model while the travel range of the vehicle more than doubled.

- b. Gasoline versus electricity prices: This factor is highly impactful to the ROI. The price of gasoline has been relatively low for several years but should it rise toward the \$3.50 per gallon range or higher, the ROI for the EV's tips significantly toward the electric side of the equation.
- c. Maintenance cost: EV's have not been in service very long but industry gathered data indicates a lower life cycle maintenance cost versus ICE cars; similar to and possibly lower than hybrid vehicles.
- d. Utilization: Like hybrid vehicles and Plug-in Hybrid Vehicles (PHEV's), any ROI partially depends on the higher cost but more efficient vehicles traveling minimum miles per month.

Based on the factors above, a 2018 Nissan Leaf driving 630 miles per month with an average gas price of \$2.53 (that annually increases with inflation) has a positive 12-year lifecycle ROI and is less expensive to operate than an ICE car. However, a 2018 Chevy Bolt driving the same amount of miles per month has a negative ROI due to its higher purchase cost. The Chevy Bolt would need to drive 1,162 miles per month to achieve a favorable ROI.

Currently, only two of the thirteen DAS owned EV's, which are stationed with Department of Corrections and DAS Parking Enforcement, are traveling enough miles to realize a lifecycle cost savings. However, with increased charging infrastructure, lowering vehicles prices, and likely increasing gas prices, the vehicles will be able to achieve a positive ROI in the near future. Agencies are also looking for opportunities to place vehicles in favorable utilization locations and educate staff about driving the EV's to increase miles driven.

In addition, several vehicles are used on a daily basis but just do not travel many miles. Despite the overall cost ROI being negative, for these vehicles there is still a significant carbon reduction. For Example, DEQ has three Chevy Bolts for agency business travel that average 795 miles per month (pre COVID). Over a 12-year lifecycle, the EV's will reduce carbon emissions by an estimated 210,000 pounds of CO<sub>2</sub>e versus using a 2018 Chevy Malibu ICE car.

### **Conclusion:**

Although the current ROI on the very small number of state EV's in service (17) is negative, this will change over the next five years as EV vehicle prices decrease while ICE vehicle prices rise and gasoline prices are projected to increase. A recent electrification study showed that the total cost of ownership for EV versions of vehicles out now and soon emerging on the market is favorable in many use cases. However, the largest hurdle to fleet electrification is the cost and effort to install charging infrastructure and the incremental cost of the vehicles. Add to that the substantial cost of the people resources needed to manage the implementation of projects, and the cost is even higher. While there are not vehicles currently available that would meet all use cases, DAS estimates that were the state able to electrify all state light fleet with Zero Emission Vehicles right now, the cost to install enough charging infrastructure and pay the incremental cost for the higher price vehicles would be approximately \$200 million more than what the state currently would pay to replace the fleet with conventional ICE vehicles.

The effort to electrify the state fleet will be spread out over a decade or two and we can expect to see vehicle and charging infrastructure costs to decrease over time. However, the estimate above is a good indication of the scale and cost the effort entails to meet the Zero Emission Vehicle policy goals for state fleets in Governor Brown's Executive Order 17-21, Executive Order 20-04, and in ORS 283.327 that was updated by the Legislative Assembly in 2019.

Oregon would best be served by putting dedicated resources around developing and funding a coordinated, comprehensive plan for EV charging infrastructure that stretches across state agencies and their owned and leased facilities. Whether this effort is housed at DAS or not, the idea is to follow California's lead with a centralized program to coordinate the planning, funding, project management, and procurement activities needed to effectively install the EV charging infrastructure required to meet deployment goals for state fleets. This could include a dedicated program to assist agencies to plan, design and manage installation projects, coordinate with external entities for funding and resources and provide technical support for EV policy. For Oregon, this would include coordinating with utilities for grant and other funding opportunities to support electrification efforts. A centralized approach may initially take longer to set up and gain traction but would yield a comprehensive, expandable, and interoperable charging system for state vehicles now and for the next decade or more. This effort would also need to incorporate the infrastructure needed for employee and public visitor charging as well.