



Every Mile Counts: Alternative Fuels Report

Barriers to Adoption for
Medium- and Heavy- Duty Vehicles
in Oregon

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Executive Summary

Oregon DEQ conducted a study to explore opportunities for medium- and heavy-duty, or MHD, fleets to transition from gasoline or diesel as their primary fuel to electricity, hydrogen, renewable natural gas, or other alternatives. DEQ assessed a fleet profile that provides a snapshot of MHD vehicles in Oregon and a survey of MHD users to determine barriers for adoption of alternative fuels. The findings will be used to inform state agencies as they develop approaches to encourage greater use of alternative fuels and reduce emissions from the transportation sector.



The fleet profile is derived from data provided by the Oregon Department of Transportation and includes MHD vehicles broken out by fuel type, body style and type, age and turnover rate. As agencies work to promote a transition to alternative fuels, this data provides the starting point for policy makers to understand how changes to the fleet will impact fuel consumption and greenhouse gas emissions.

The data indicates that the majority of Oregon's MHD vehicles use gasoline and diesel. The data also show that approximately half of Oregon's MHD vehicles are model year 2010 or newer, resulting in delayed replacement of newer gas and diesel vehicles. While programs like the Zero Emission Vehicle regulations and the Clean Fuels Program have been a part of Oregon's toolkit to reduce transportation-related emissions, the data confirm more work and resources are needed to increase alternative fuel adoption for medium- and heavy-duty fleets.

The survey determined fleet owners' knowledge of alternative fuels, current alternative fuel adoption efforts (if any) and the reasons why fleets have not transitioned to alternative fuels. The goal was to understand fleet owners' hesitations, concerns, and barriers to adopting alternative fuels, as well as what motivated early adopters of alternative fuel vehicles and if they are satisfied with their decisions. The survey gathered responses from over 200 fleets representing 13 different sectors of the economy across Oregon. Fleets identified the cost of the vehicles and fueling infrastructure, the range limitations of electric vehicles, and the availability of public infrastructure throughout Oregon as the main barriers to switching to alternative fuels.

Agencies need to do more to encourage the use of alternative fuels in order to meet the state's climate goals. Some key areas are to identify both short and long-term options for fleets; differentiate the pros and cons of both zero-emission and other alternatives; reduce the cost and increase the availability of alternative fueled MHD vehicles and fueling infrastructure.

Supporting our fleets through incentives, infrastructure access and outreach will enable DEQ and partner agencies to reduce emissions in the transportation sector. Communicating directly with Oregon's fleet owners will also provide information on sector specific adoption, availability, and infrastructure placement.

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Background

In 2021, Governor Kate Brown stated that Oregon has experienced more extreme weather events, chronic heat and drought, flooding and more intense wildfires as a result of climate change. The Governor also acknowledged and supported Oregon's efforts on addressing climate change through the reduction of greenhouse gas emissions.¹ According to the Oregon Global Warming Commission, state-wide emissions must be reduced by over 50 percent to meet Oregon's 2035 GHG reduction goal.²

In the United States, the transportation sector is one of the largest contributors of human caused GHG emissions; in Oregon, it is the largest source and accounted for 35% of all emissions in 2019.³ The combustion of fossil fuels in cars, trucks, commercial aircraft, and railroads contribute the most GHG emissions.⁴ Reducing the use of fossil fuels in the transportation sector will decrease GHG emissions, most significantly carbon dioxide (CO₂), methane (CH₄), and nitrous oxides (NO_x). It will also reduce criteria pollutants and other toxic air pollutants (most significantly diesel particulate matter (DPM)).

A report published by MJB&A in 2021 showed MHD vehicles emit an estimated 9.3 million metric tons of greenhouse gases annually. The same report showed MHD vehicles emitting 70% of NO_x and 64% of particulate matter (PM).⁵ Oregon must take actions to reduce the use of fossil fuel and increase the use of alternatives to achieve its air quality and climate goals for medium- and heavy-duty vehicles.²

DPM composition includes solid and liquid particles in air droplets that are emitted when vehicles combust diesel fuel.⁷ The most significant sources of DPM in Oregon are on-road, heavy-duty diesel trucks and diesel construction equipment.⁶ Additional sources of DPM are locomotives and marine vessels. Exposure to DPM, both the particulate matter and the toxics carcinogens attached to the particles, is associated with a variety of negative health impacts including aggravated asthma, decreased lung function and chronic obstruction pulmonary disease.⁷ Since the major sources of DPM are often located along the state's main transportation corridors and in dense urban areas, many of the neighboring communities are disproportionately impacted by the combustion of fossil fuels. In the [Portland Air Toxics Study](#), DEQ modeled the Portland Metro region's exposure to DPM using projected emissions data and found that many areas of the region exceeded the ambient air benchmark by greater than 10 times.⁸

Comparing the emissions from fossil-based fuels to alternative or renewable fuels, overall emissions from the tail pipe and lifecycle emissions are reduced. For example, current studies on Renewable Diesel compared to fossil- diesel have shown that tail pipe PM emissions are

¹ [EQC votes on CPP](#)

² [Oregon Global Warming Commission 2020 Biennial Report to the Oregon Legislature](#)

³ [Oregon Greenhouse Gas Emissions from 1990-2019](#)

⁴ [EPA: Fast Facts on Transportation Greenhouse Gas Emissions](#)

⁵ [Oregon Clean Truck Program](#)

⁶ [ODEQ: Sources of Diesel Exhaust](#)

⁷ [CARB: Overview: Diesel Exhaust & Health](#)

⁸ [Portland Air Toxics Study](#)

between 10-30% lower.^{9,10,11} Similarly, NOx reductions range between 10-20%.¹⁰ Oregon fleets have reported R99 is also cleaner burning resulting in lower maintenance costs. A study looking at generators saw significant reductions in Polychlorinated Aromatic Hydrocarbons (PAHs) with renewable diesel.¹¹ The replacement of fossil fuels with alternative fuels holds significant promise for reducing emissions, including GHGs and criteria pollutants, which is good for climate and public health.¹²

DEQ is reducing transportation-related emissions through a variety of actions including the recent adoption of the [Climate Protection Program](#) and the Clean Trucks Rule ([Advanced Clean Trucks and Low NOx Omnibus regulations](#)); the implementation of the [Clean Fuels Program](#) and the Employee Commute Options Program; and the administration of several grants ([Diesel Emissions Mitigation grants](#), [Diesel Emission Reduction Act grants](#), and the [Congestion Mitigation and Air Quality grants](#)). In addition, [DEQ](#) collaborates with partner agencies (the [Oregon Department of Transportation](#), the [Oregon Department of Energy](#), and the [Department of Land Conservation and Development](#)) on the [Every Mile Counts, EMC](#), effort to find ways to reduce transportation emissions by adopting cleaner fuels, using better vehicle technology, and reducing the number of miles that are traveled in Oregon.¹³ This [Alternative Fuels Study](#) was identified as an action in the EMC workplan to increase awareness of how the use of alternative fuels by Oregon's fleets can help decarbonize the transportation sector.

Oregon's Medium- and Heavy-Duty Fleet Profile

To better understand the state of Oregon's MHD vehicles, DEQ created a comprehensive profile of Oregon's MHD vehicles. For all the information contained in the profile section, DEQ analyzed registration records from ODOT's Driver and Motor Vehicle Services Division and the Commerce and Compliance Division to determine the weight class, fuel use, year of manufacture, and body type and style. The goal of reviewing the MHD vehicle profile is to assess what currently exists in the state of Oregon and provide a baseline for alternative fuel and vehicle adoption in the future. This study utilizes data from 2020 but recognize there may be a small percentage of vehicles not captured due to closed offices and delayed registrations during the COVID-19 pandemic. This study includes vehicles that are registered in Oregon (Oregon-based) and vehicles that travel in Oregon but are not garaged or registered in Oregon (Oregon-apportioned). See Appendix 1 for the R code and a discussion of the steps used to merge the data sets.

DEQ analyzed fleet vehicle data in a variety of ways for both the Oregon-based and apportioned vehicles. First, data was classified by category, or Gross Vehicle Weight Range. GVWR is defined as the maximum loaded weight of a vehicle, as determined by the manufacturer. Understanding the number of MHD vehicles, the class category as well as the fuel used allows us to see the change over time as well as what type of vehicles and fuels are contributing to GHG and DPM emissions. Next, DEQ determined what types of fuel fleets used and in what percentage. DEQ analyzed vehicle body type and style to assess how MHD vehicles are being

⁹ [2019 Technical Report: R99 Renewable Fuel in Emergency Diesel Generators](#)

¹⁰ [Effects of biodiesel and Hydrotreated Vegetable Oil on the performance and exhaust emissions of a stationary diesel engine](#)

¹¹ [Multimedia Evaluation of Renewable Diesel](#)

¹² [Portland Air Toxics Study](#)

¹³ Oregon Advance Clean Truck Staff report, DEQ 2021

used in different sectors or for different functions. This data can also help state agencies target outreach and technical support for alternative fuel adoption. DEQ assessed alternative fuel adoption readiness and ways to focus outreach by reviewing weight and model year ranges. For example, heavier vehicles may not be ready to electrify, and the technology may not be available.

DEQ also analyzed 10 years of data to determine the rate of older vehicles being replaced with newer vehicles, or the turnover rate. DEQ broke the data out from 2010 through 2019 into three categories: vehicles 2000 and older- which have few to no emission controls and are likely nearing the end of their life span; 2001-2009 which have more emission controls but will still be on the road for several years; and 2010 and newer which have a high level of emission controls and will be on the road even longer. After breaking out each category we looked at the percentage of vehicles in 2010 and 2019 for each category and the average change ten years, providing us with a rate of turnover. This information looks at the current vehicle turnover rate to compare to future years examining if grant incentives, regulations for ZEV, or alternative fuel outreach impacts this rate.

Defining medium- and heavy-duty vehicles

For this study, DEQ used the categories in Table 1. These categories are consistent with those used by DEQ in the recently adopted Advanced Clean Trucks rule (OAR 340-257).

Table 1: MHD vehicle categories and corresponding weight ranges

Category	Gross Vehicle Weight Range (GVWR)
Class 2b and 3 Trucks (Light-/Medium-)	8,500 lbs. < GVWR ≤ 14,000 lbs.
Class 4 and 5 Trucks (Medium-/Heavy-)	14,000 lbs. < GVWR ≤ 19,500 lbs.
Class 6 and 7 Trucks (Medium-/Heavy-)	19,500 lbs. < GVWR ≤ 33,000 lbs.
Class 8a and 8b Trucks (Heavy-)	GVWR > 33,000 lbs.
Class 7-8 Tractors	GVWR 26,001+

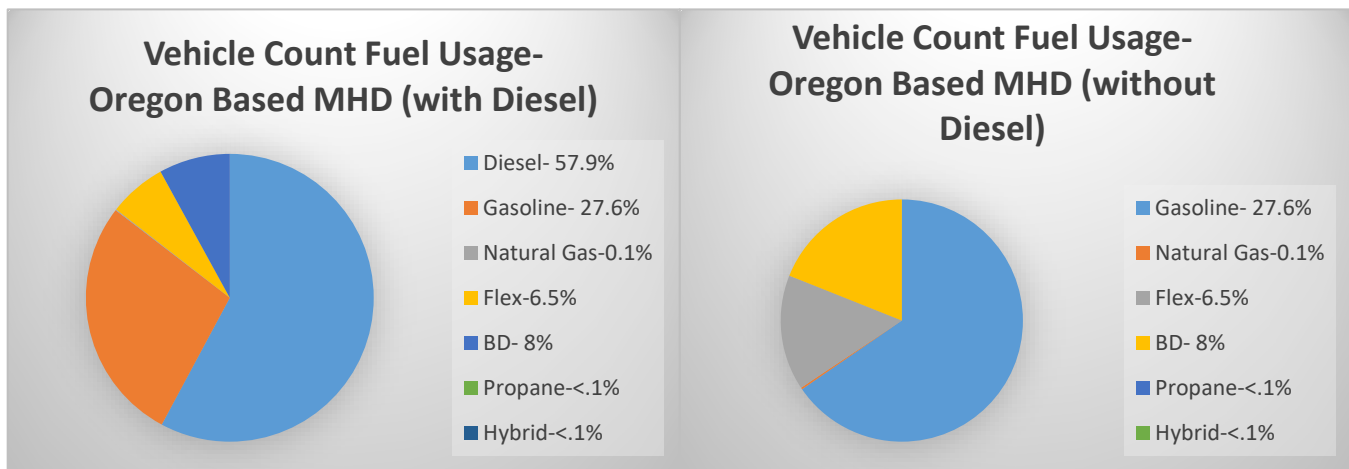
Oregon-based MHD vehicles by category

Based on the data provided by ODOT, Table 2 shows the number of vehicles and the percent of the fleet for each class. About 17% of DMV vehicle records have no VIN decode (mostly pre-1981 vehicles) and therefore are not represented in these counts. The data shows that 84% of MHD vehicles fall in the 2b-3 category which are vehicles greater than 8,500 lbs. but less than 14,000 lbs. Figure 1 shows fuel use for MHD Oregon based fleets. 58% of MHD vehicles use diesel.

Table 2: MHD vehicle categories and corresponding fleet percentages

Category	Counts	Percent of Fleet
Class 2b and 3 Trucks	322,525	84%
Class 4 and 5 Trucks	796	>1%
Class 6 and 7 Trucks	6,139	2%
Class 8a and 8b Trucks	21,500	6%
Class 7-8 Tractors	32,177	8%

Figure 1: Oregon Based Fleet MHD fuel use with and without Diesel (2020 data)



Fuel acronyms: Flex- also called E85 is a gasoline-ethanol blend; BD- Biodiesel

Oregon-based MHD vehicles by body style and type

Table 3 below shows the number of vehicles and the percent of the fleet for the top three categories for each body style. Table 4 shows the number of vehicles and the percent of the fleet for each body type.

Table 3: Oregon-based MHD vehicle breakdown by body style

Category	Count	Percentage (of Total)
Van	12738	20.80%
Flatbed	6787	11.08%
Dump	6198	10.12%

Table 4: Oregon-based MHD vehicle breakdown by body type

Category	Count	Percentage
Tractor	32356	52.82%
Solo Truck	14726	24.04%
Truck Trailer	11408	18.62%

Oregon-based MHD vehicles by weight

Figure 2 below shows the registered weight ranges of the Oregon-based MHD vehicles. The histogram shows a high concentration of vehicles with a low GVWR of approximately 30,000 lbs., this coincides with Class 2b and 3 being the highest counts in the Oregon fleets. Looking at the weight ranges of different vehicles along with sectors may aid in determining the best way to provide incentives, infrastructure, and outreach for MHD vehicles. Figure 3 below shows the model years of the Oregon MHD fleet with many vehicles being year 2000 and newer.

Figure 2: Oregon-based MHD vehicles by registered weight

From DMV and CCD (non-apportioned only)
n = 402013 vehicles are included, weight range 8506 to 105500 lbs

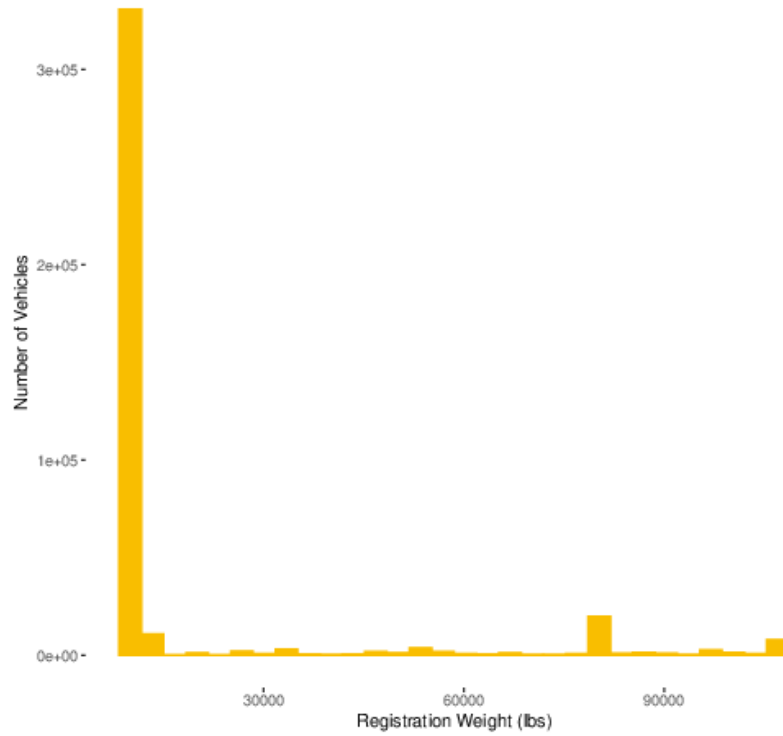
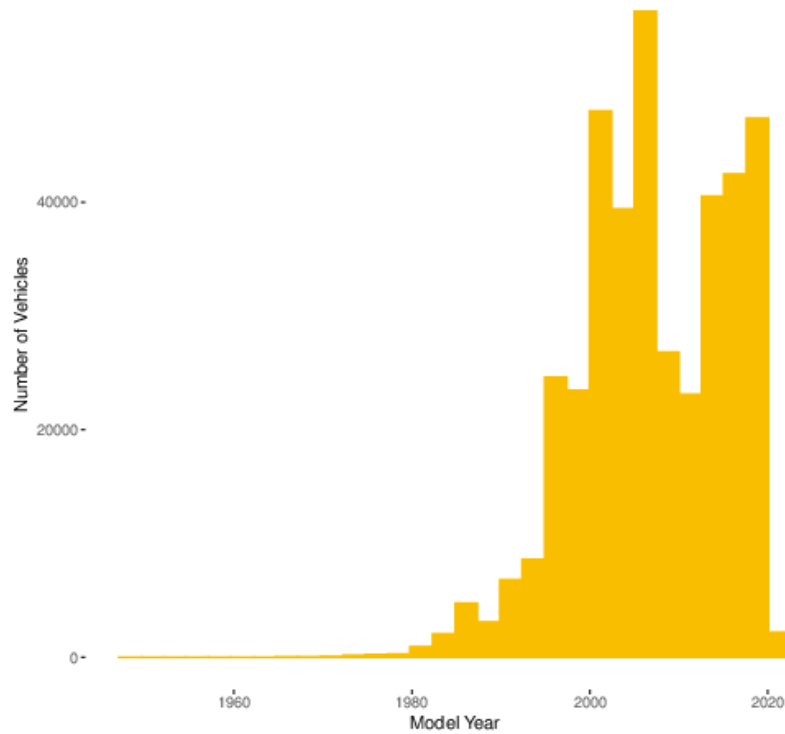


Figure 3: Oregon-based MHD Vehicles by model year

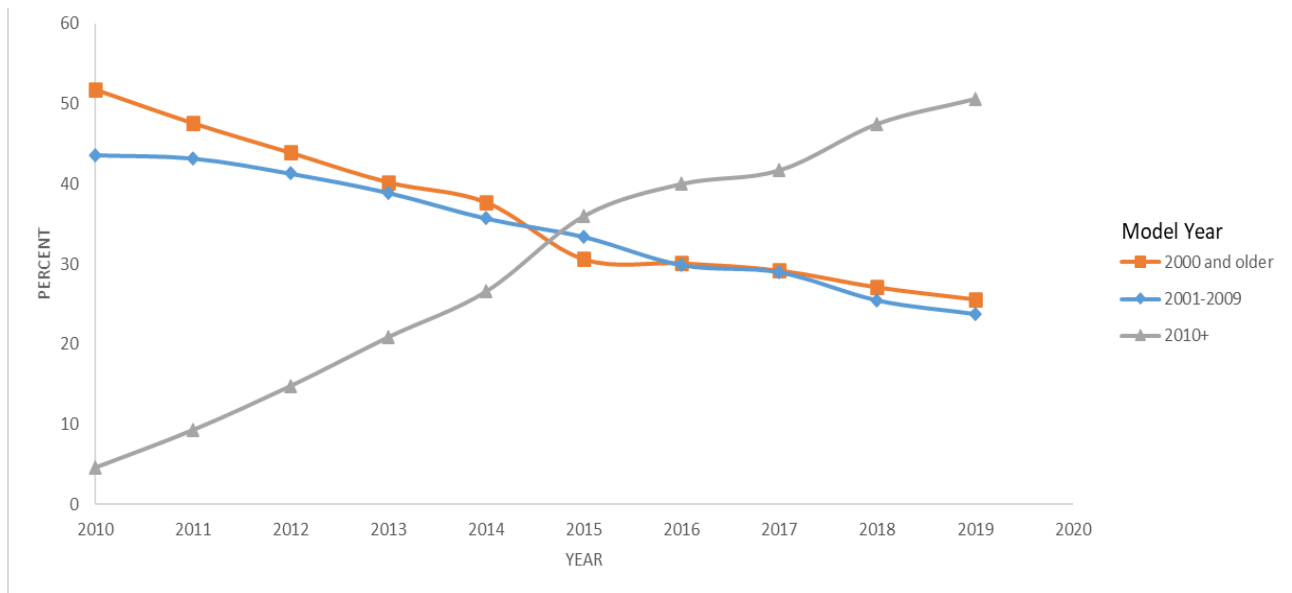
From DMV and CCD (non-apportioned only)
n = 402013 vehicles are included, weight range 8506 to 105500 lbs



Oregon-based MHD vehicles by turnover rate

To determine turnover rate, DEQ examined the Oregon-based fleet vehicle data from 2010 through 2019 in three categories as previously described. Figure 4 shows an average decreasing rate of 2.6% of 2000 and older vehicles, a decreasing rate of 2% turnover rate of 2010-2001 vehicles and increasing 4.6% rate for 2010 and newer. Oregon's current fleet as of 2020 has 22.6% of MHD vehicles 2000 and older; 21.3% between 2001-2010; and 56.1% 2010 and newer with an approximate overall turnover rate just under 4%.

Figure 4: Ten-year trend of total MHD Vehicle Oregon based fleet turn over



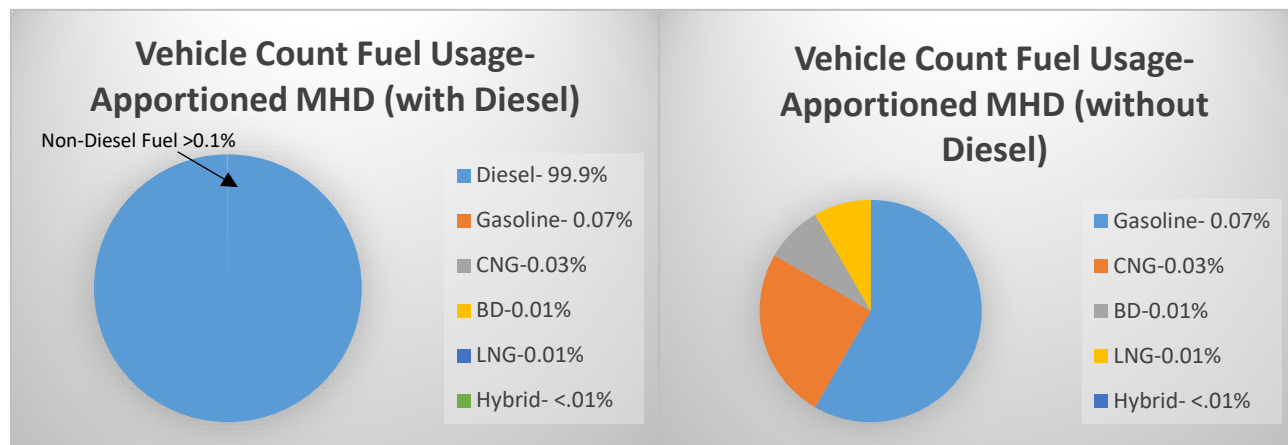
Oregon-apportioned MHD vehicles

Apportioned vehicles, or vehicles that travel inside Oregon but are not garaged or registered in the state of Oregon, are tracked by the Commerce and Compliance Division at ODOT. Data is only available for MHD class 6 and higher vehicles. Class 2b-5 apportioned vehicles are not tracked in Oregon. DEQ used the same data analysis for Oregon-based fleet vehicles to help determine outreach, technical support needs, areas most ready to shift to alternative fuels, and to provide baseline data. Based on the categories outlined in Table 1, Table 5 shows the number of vehicles in each category and percent of Oregon apportioned fleet for each vehicle category. Most of the apportioned fleet is in Class 7-8 tractors, which are a specific body style with a GVWR of 26,001 or higher. Figure 5 shows fuel use for MHD Oregon apportioned fleets, approximately 98% being diesel.

Table 5: Oregon apportioned MHD vehicle break down by class

Class	Counts	Percent of Fleet
2b-3	Not Applicable	Not Applicable
4-5	Not Applicable	Not Applicable
6-7	2532	>1
8 (no tractors)	22573	4
Class 7-8 Tractors	512731	95

Figure 5: Oregon Based Fleet MHD fuel use with and without Diesel (2020 data)



Fuel acronyms: CNG- Compressed Natural Gas; LNG- liquid Natural Gas; BD- Biodiesel; Flex- also called E85 is a gasoline-ethanol blend

DEQ analyzed the data to look at the weight range age of the Oregon apportioned MHD fleet. Figure 6 shows the registered weight ranges distributed with a peak at approximately 80,000 lbs., indicating that the majority of apportioned vehicles are likely class 7 and 8. In this case, there are fewer apportioned vehicles of any other size, as compared to the Oregon based fleet vehicles. Figure 7 shows the ages of the apportioned MHD fleet to be mostly year 2010 and newer.

Figure 6: A histogram of the MHD weights for Oregon Apportioned MHD vehicles

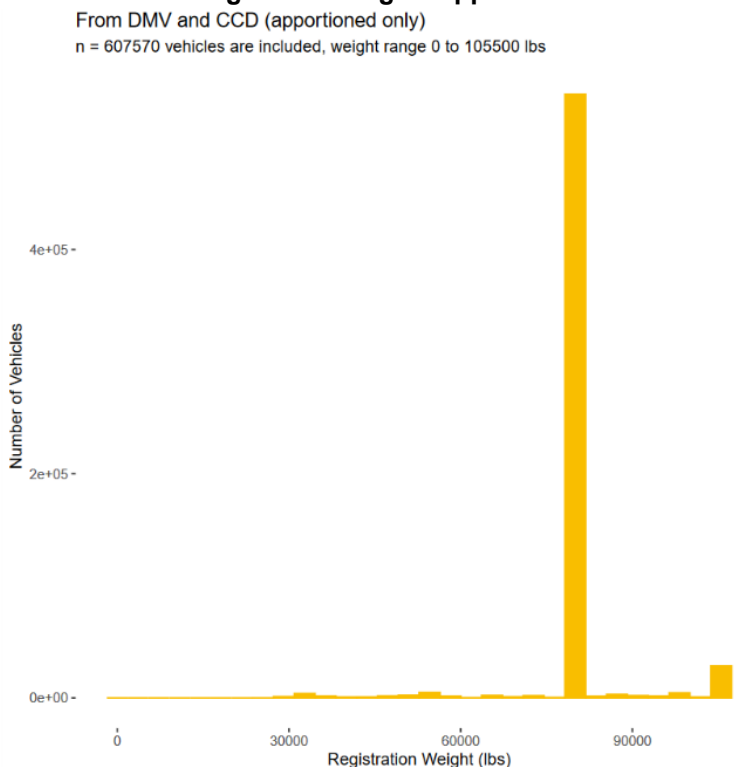
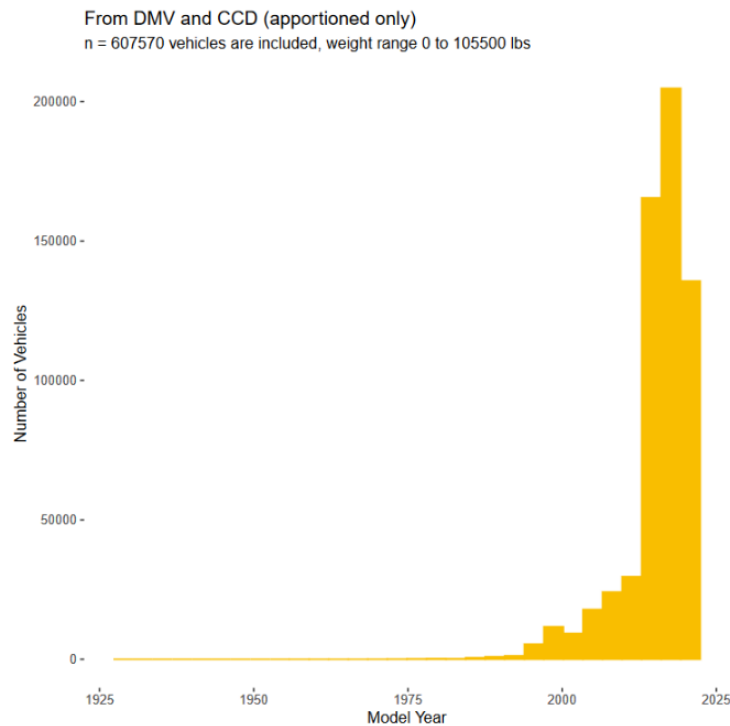
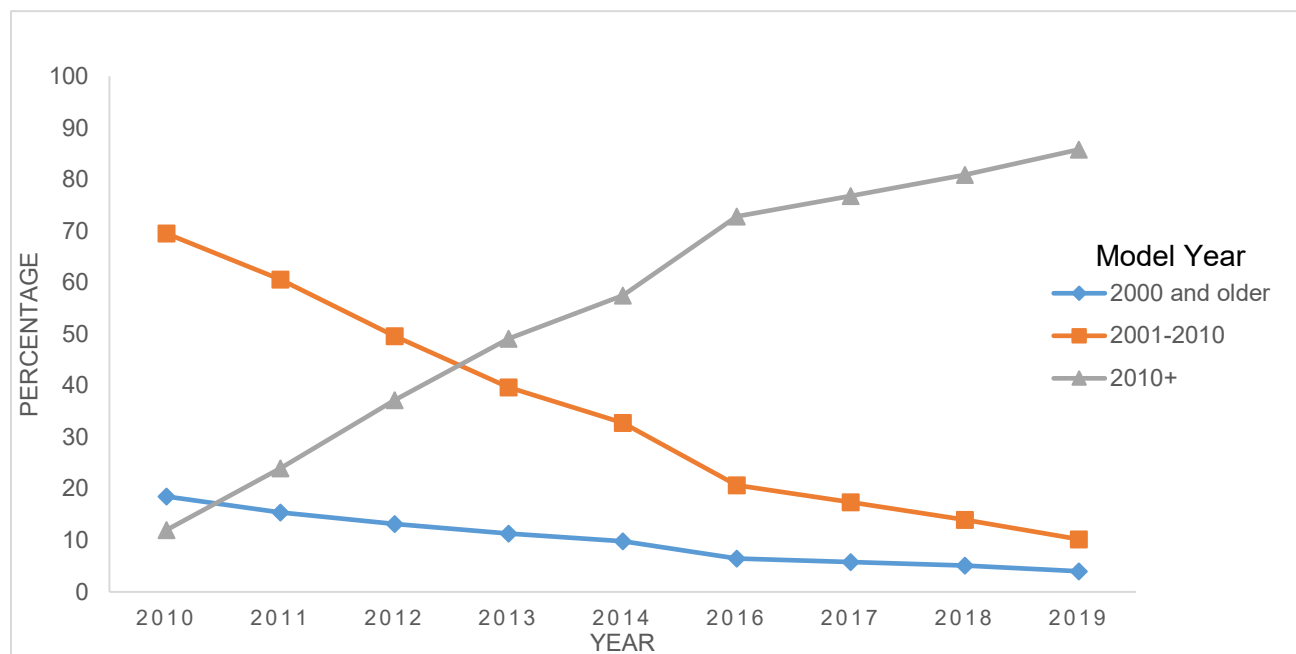


Figure 7: A histogram of the model years for Oregon Apportioned MHD Vehicles



DEQ examined apportioned fleet vehicle data from 2010 through 2019 into three categories as previously described. Figure 8 shows an average decreasing rate of 1.5% of 2000 and older vehicles, a decreasing rate of 6.5% turnover rate of 2010-2001 vehicles and increasing 7.4% rate for 2010 and newer vehicles. Oregon’s apportioned fleet in 2020 had 3.4% of MHD vehicles 2000 and older; 8.4% between 2001-2010; and 88.2% 2010 and newer with an approximate overall turnover rate just over 6%.

Figure 8: Ten-year trend of total MHD Vehicle Oregon Apportioned fleet turn over



Survey of Oregon's Medium- and Heavy-Duty Fleets

To understand fleet perspectives about alternative fuels in Oregon, DEQ developed a survey and collected data from February 2021 to April 2021. DEQ collected survey responses using Survey Monkey® via a GovDelivery notification that was sent directly to fleets; included in newsletters such as the NW Alliance for Clean Transportation and several Clean Cities Coalitions; and broadcast on DEQ's social media accounts. DEQ received over 200 responses, including 13 different transportation sectors and from across the entire state. DEQ analyzed all open comment fields by reviewing for recurring themes and then consolidated themes for each question. DEQ staff sincerely thank all the fleets that took time out of their busy schedules to complete this survey. Sector categories were designed to align with past surveys conducted by the West Coast Collaborative which is a public-private partnership with the EPA, committed to reducing diesel emissions and advancing clean air technologies and practices along the West Coast of North America.¹⁴

Basic structure of the survey

DEQ asked several general questions of all survey respondents including information assessing the size of their fleet, what the vehicles were used for, what types of fuel were being used, and their location. Fleets were then divided into two subsets: 1) ones that have adopted alternative fuels and 2) ones that still use fossil fuels. Each subset was asked separate questions. Respondents could select multiple options for many of the survey questions. Therefore, the response percentage is the percent of all respondents to that question, and the total response rate is higher than 100% for the multi-selection questions. Many survey questions allowed for additional comments, which added significant detail and information to the response for this survey. DEQ reviewed the comments for common themes, which are included in Appendix 2.

This summary has only included some of the questions in the survey and has limited the information to the top 5 responses for those questions. To see the complete set of questions included in the survey and the results, please see Appendix 2.

Key definitions

Alternative fuels are defined as: biodiesel (greater than 5% blend with diesel), renewable diesel (any amount), fossil or renewable compressed natural gas, fossil or renewable liquified natural gas, fossil or renewable propane, fossil, or renewable hydrogen, and fossil-fueled or renewable electricity.

Electric vehicles include full battery electric, plug-in hybrid electric, or hybrid electric.

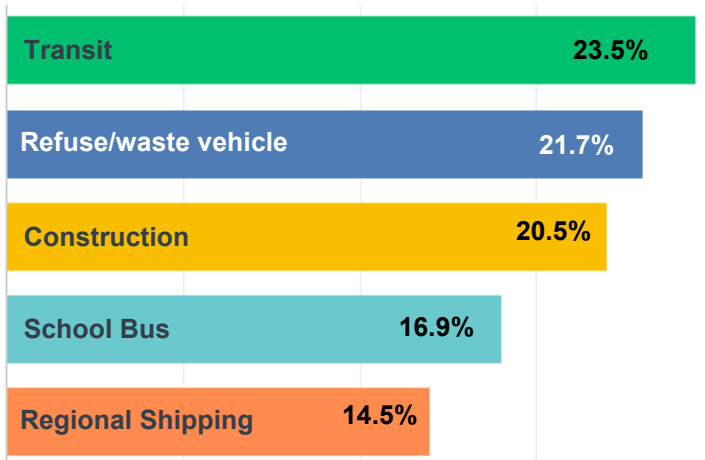
¹⁴ <https://www.westcoastcollaborative.org/>

For all respondents

What sectors are represented?

Sector responses included in the “other” category were manufacturing, government, logging, utility, fire and other emergency districts, wood products, recreation, flower and library delivery. Overall, this survey reached all sectors that were included as response categories. The sectors with the five highest response rates are shown in Figure 9. For additional information on survey responses, see Appendix 2.

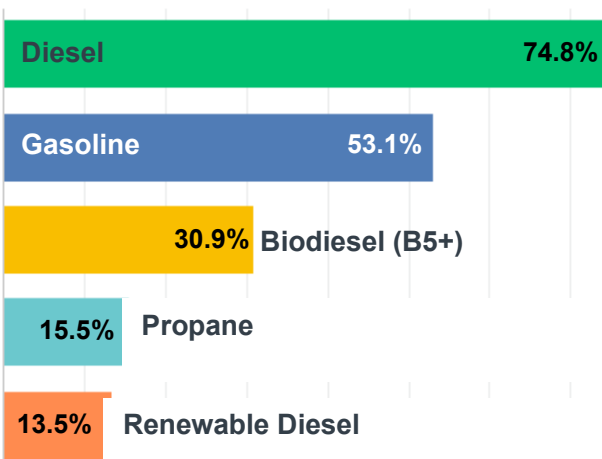
Figure 9: MHD Fleet Survey Responses- Top 5 Vehicle Sectors



What fuels are used?

Most respondents use gasoline and diesel in the MHD fleet vehicles which reinforces the ODOT MHD vehicle data that DEQ analyzed. The next highest used fuel was biodiesel, as seen in Figure 10.

Figure 10: MHD Fleet Survey Responses- Fuel Use



For the alternative-fueled fleets

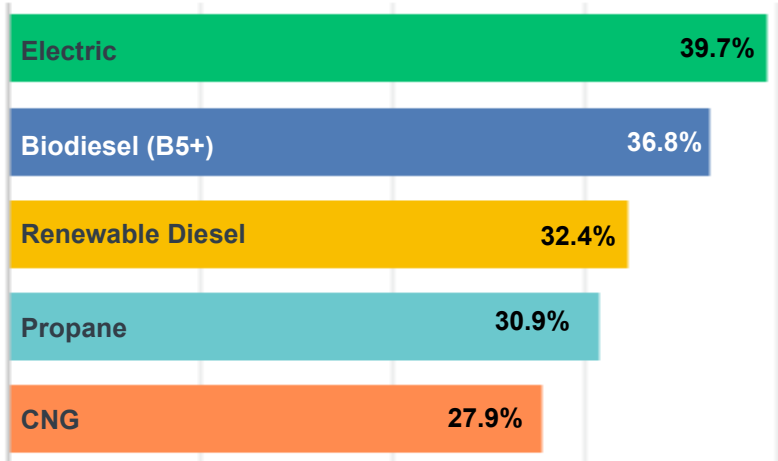
Approximately one third of respondents indicated they had already switched vehicles to alternative fuels (Appendix 2). Of those fleets, most had converted between 11- 50% of their fleets; and 84% indicated they intended to switch more vehicles to alternative fuels. Most early adopters switched to alternative fuels because of environmental and public health considerations. The issues that early adopters have experienced include power and range issues, insufficient refueling or recharging locations, higher cost and fuel storage issues. Benefits seen by this same group include:

- Better air/ lower carbon emissions/GHG
- Lower maintenance costs/ needs
- Employee safety/ support
- Community support
- Lower fueling costs/ increased MPG
- Less noise
- Cleaner shop/ less soot

What alternative fuels are being used?

Most fleets already employing alternative fuels, as seen in Figure 11. They utilize electric, biodiesel, renewable diesel, propane and compressed natural gas.

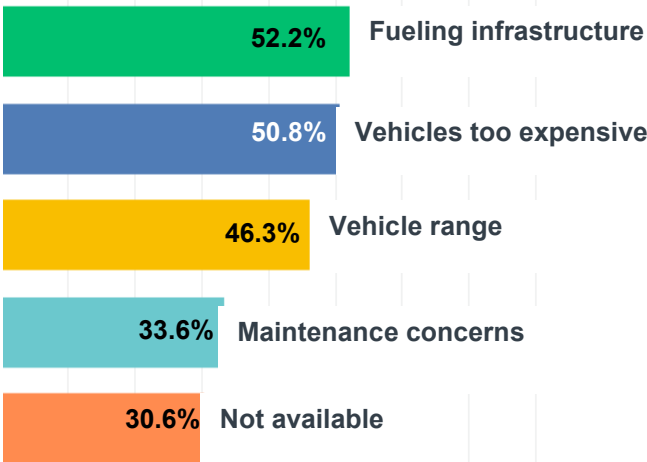
Figure 11: MHD Fleet Survey Responses- Alternative Fuel Use



For the fossil-fueled fleets

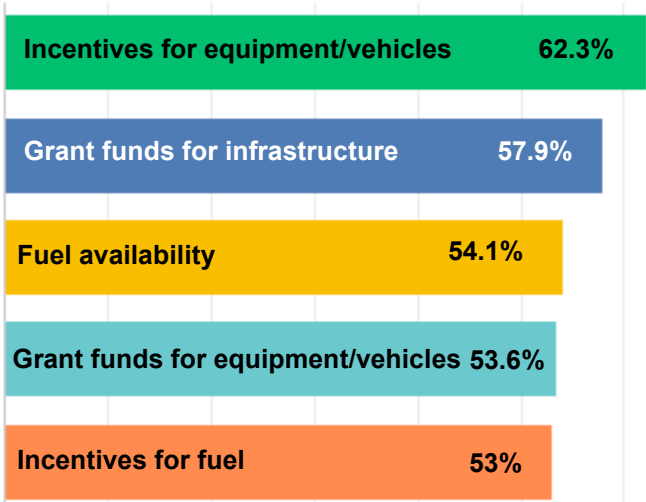
Many respondents have not switched to alternative fuels (Figure 12). The reasons varied but included open responses such as overall financial impact, current vehicles are efficient and newer, current alternatives are not able to handle the work, alternatives for industry are in its infancy, and not fully vetted, terrain concerns and geographic isolation.

Figure 12: MHD Fleet Survey Responses- Alternative Fuel Hesitancy



When asked what would aid in the adoption of alternatives fuels (Figure 13), respondents included vehicle innovations for range, reliability, and power; greater understanding and education on alternative fuels; knowledge about vehicle warranties and incentives; infrastructure development, particularly for rural areas; and lower costs for fuels, vehicles and maintenance.

Figure 13: MHD Fleet Survey Responses: Converting to Alternative Fuel



Additional barriers and concerns

The survey asked all respondents to describe additional barriers and concerns to switching to MHD fleets to alternative fuels. Most responses for this last question fell into one of four categories:

- Access/Infrastructure
- Cost Concerns (vehicle and infrastructure)
- Education, outreach, and training
- Vehicle/ Fuel (cost and access)

Key Findings

- Diesel is the predominant fuel being used in Oregon.
- About half of the MHD vehicles in Oregon are model year 2010 or newer.
- The majority of respondents had a fleet size between 6-20 medium and heavy-duty vehicles.
- Over 78% of fleet respondents said they were aware of alternative fuel options.
- Main barriers to adopting alternative fuels are access to fueling infrastructure, cost of vehicles, and vehicle range concerns.
- Ways to assist fleets adopt alternative fuels include incentives for equipment and vehicles; grant funds for infrastructure; education outreach, and training; grants and incentives for alternative fuel vehicles; and incentives for alternative fuels.

Reducing Barriers for Alternative Fuel Adoption

Both the fleet profile and the survey in this study indicate many barriers in moving fleets towards widespread alternative fuel adoption. Some are easy, while others are hard; some need short-term solutions, while others are longer-term; and some are expensive, while others are less so. There are a number of tasks that both DEQ and its partner agencies can undertake to mitigate or eliminate such barriers. First and foremost, there needs to be more collaboration between state agencies and Oregon's fleets to better understand:

- Where and how MHD vehicles are used
- How and to what extent different sectors impact community exposure to DPM and associated toxics
- Most beneficial fueling infrastructure locations
- Additional incentive and grant program development for vehicles and infrastructure

Next steps

For fleets, next steps include differentiating between electric and other alternative fuel options as short- and long-term fleets options; and support for fleets on planning and incentives. Such outreach can also identify gaps in incentives and provide state agencies a better assessment of timeline for fleet adoption. To inform and support fleets, outreach needs to include sector-appropriate, accessible information covering:

- Existing incentives for fuels and vehicles and how they can or cannot be used together

- Narrative from early adopters on lessons learned and satisfaction
- Tools to help guide with training and administration
- FAQs on different fuels and myth busting

For policy and planning, additional emphasis is needed regarding alternative fuels' role in reducing GHGs in the short term. While the future for some sectors is electric, there are sectors that are not well suited for that fuel type. Additionally, there is a gap in fueling infrastructure for medium and heavy duty electric vehicles and long term planning to reduce barriers for electric adoption must be considered including the for both rural and urban fleets.

- Additional information MHD vehicle traveling patterns for infrastructure assessment;
- Additional incentives for MHD fleets including amount and type of program
- Research on GHG reduction, co-benefits, technology and fueling infrastructure readiness, availability, and cost
- Consideration of communities burdened with high DPM exposure for alternative fuel incentives

Supporting our fleets through the measures that they have told us they need such as incentives, infrastructure access and outreach will enable DEQ and partner agencies to implement [Advance Clean Trucks and Low NOx Omnibus regulations](#). It also supports the expansion of the [Clean Fuels](#) Program and the [Climate Protection Program](#). Communicating directly with Oregon's fleets will also provide information on sector specific adoption and availability, and infrastructure placement. Lowering DPM through the adoption of alternative fuels can also benefit communities that have a high level of DPM exposure and should be considered in how incentives and alternative infrastructure is employed.

Every ton of greenhouse gas produced today- stays with us. Addressing transportation-generated emissions is imperative not only to reaching Oregon's goals for GHG reduction, but for preventing further climate change. Oregon's agencies are collaborating to address the barriers Oregon fleets face through outreach, assessing expansion of grant and other incentive programs for vehicles, and infrastructure access. Vehicle technology for some sectors is on the precipice for electric adoption. For others that is a long way off, if it ever becomes feasible. Electric and hydrogen are the cleanest option where it is available, but for all others, and for the short-term reduction of emissions, alternative fuels are the best option.

Additional Resources

Fleet tools

Transit Fleet Electrification

As directed by the Executive Order 17-21, the collaborative [Zero Emission Vehicle Interagency Working Group](#) (ZEVIWG) was formed to coordinate and achieve the EO goals, one of which was the development of the ODOT lead informational and cost analysis guide for transit agencies to aid in the adoption of electric and alternative fuel transit vehicles.

- [Transit Electrification Guide](#)
- [Oregon Transit Vehicle Lifecycle Cost Analysis Tool](#)
- [Oregon Transit Vehicle Lifecycle Cost Analysis Tool - User Guide](#)
- [School Bus Electrification Cost Comparison Guide](#)

Current incentives and grants

There are several funding opportunities available in Oregon to target the reduction of diesel use and GHG emissions. Most opportunities have limitations on who is eligible, how much funding can be obtained, and how the funds can be spent. Some of these can be “stacked” or used together, while others cannot. Federal sources of funds cannot be used with other federal funds, but can be used in concert with state and utility funds. Several of the opportunities are described below and the links to their web pages are provided for more information.

[Clean Fuels Program](#)

Launched in 2016, the Oregon Department of Environmental Quality's Clean Fuels Program is designed to reduce the carbon footprint associated with the transportation of Oregonians. The Clean Fuels Program aims to encourage the use of cleaner fuels such as electricity, ethanol, biodiesel, renewable diesel, and renewable natural gas by providing incentives and requirements to create demand for cleaner fuels in the marketplace. The [Clean Fuels Program encourages](#) reductions in carbon intensity by allowing a fuel provider to sell credits they have earned by going beyond the reduction goals for that year. Those excess credits can be saved to offset future deficits the entity may incur or for future sale as demand increases.

Examples of clean fuel providers include businesses that own electric vehicle charging stations, compressors for natural gas, or dispensers for propane. Utilities that supply electricity for electric vehicles, or manufacturers of ethanol and biodiesel, also earn credits that they can sell to pay for charging stations or to lower the cost of producing alternative fuels.

[Statewide transportation improvement fund](#)

This is a dedicated source of funding for improving or expanding public transportation service in Oregon. ODOT provides additional information on funded projects and the solicitation schedule on their [website](#).

[Diesel reduction grants](#)

DEQ provides multiple types of grants to reduce diesel emissions throughout Oregon.

- [Diesel Mitigation Grants](#): Competitive application process open once per year (summer), requires destruction of older diesel vehicles.
- [State DERA Grants](#): Project and vehicle specific funding, rolling applications
- DEQ's allocated [Congestion, Mitigation and Air Quality](#) (CMAQ) program- biennial funding

The EPA also has a [National DERA Grant](#) program that opens once per year for the replacement of older diesel vehicles with newer clean diesel or alternative fueled vehicles. EPA also has a similar program that is dedicated to mitigating diesel from [school buses](#).

Utility grants

[Pacific Power Electric Mobility Grants](#)

Grants for electric transportation projects are available to non-residential customers in Oregon.

Oregon Electric Mobility Grants can cover up to 100% of the eligible costs of studying, planning, promoting or deploying electric transportation technology and projects. Email plugin@pacificpower.net for more information.

[The PGE Drive Change Fund](#)

Drive Change Funds from PGE are available to support electric vehicle adoption through funding for infrastructure and educational projects. Projects cover a range of vehicle types from transit, electric bikes, and community vehicles. Please check their website for eligibility, project examples and application dates.

Appendix 1

Methodology for fleet profile: Data merge and analysis

DEQ technical services put together the medium and heavy-duty report aspects based on data from ODOT’s DMV and CCD. The steps to analyze and merge these two sets of data are below for reproducibility and transparency of quality control and assurance. All methods are based on previously published “MHD Oregon-only Fleet Breakdown” (J.E. Powell, July 23, 2021). For additional information about this analysis or to review more details about this process, please contact James Powell, james.powell@deq.oregon.gov.

Our goal is to count the MHD vehicles in the state of Oregon and plot their population by fuel type.

- Oregon-based only
- 2020
- Broken down by weight class ('2B-3 - Vehicles with a GVWR from 8,501 to 14,000 lb.'), using the same weight ranges as we used in the ACT: 14-19 LMD, 19-33 HMD, 33+ HD, as in user_guide_for_MOVES_2014.txt.

The numbers and histograms supporting the Fleet Profile for MHD Vehicles in Oregon were describe the fleet in the calendar year 2020. The record counts were 4,569,895 (DMV) and 668,828 (CCD).

- About 17 % (776,503) of the DMV records were dropped because registration weights were not recorded for these.
- Only a handful of the rest of the records were not included because of anomalies.

The two data sets were merged using the crosswalk shown in the table below.

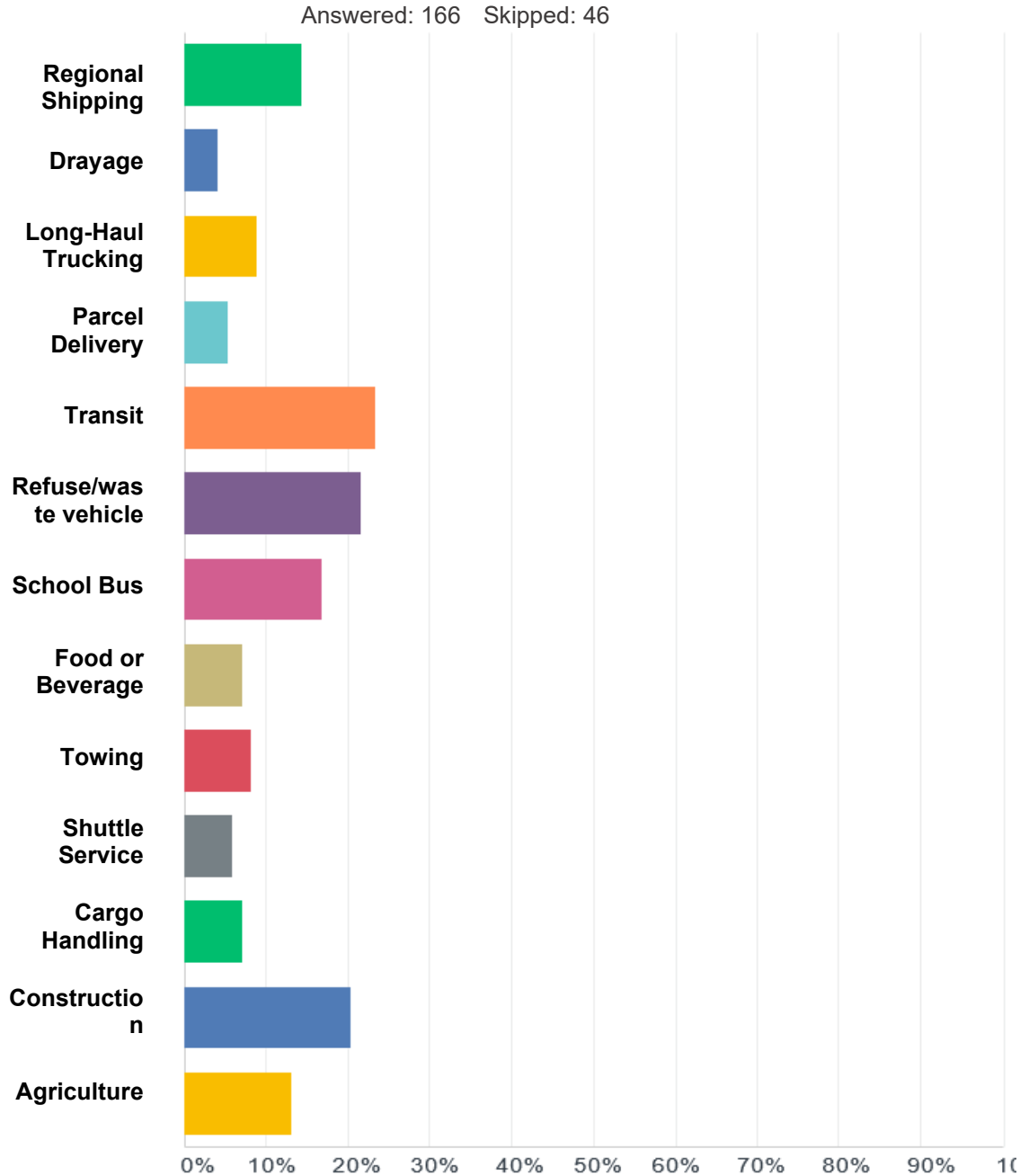
Table: Data dictionaries provided by ODOT informed this collection of fuel types and description.			
DMV _{fueltype1}	DMV _{fueltype} (DataOne)	CCD Fuel Code	CCD Fuel Description
G	Gasoline	G	Gas
F	Flex Fuel	?	nil
D	Diesel	D	Diesel
L	Electric	Y	Electric
P	Propane	P	Propane
B	Bio Diesel	B	Biodiesel
Y	Gas/Electric Hybrid	X	Hybrid
N	Natural Gas	C	Compressed Natural Gas

Table: Data dictionaries provided by ODOT informed this collection of fuel types and description.

DMV_{fueltype1}	DMV_{fueltype} (DataOne)	CCD Fuel Code	CCD Fuel Description
I	Plug-in Hybrid	no equivalent	Hybrid
E	Electric	no equivalent	Electric

Appendix 2 - Complete survey responses

Question 1. What sector(s) do you work in? Select all that apply



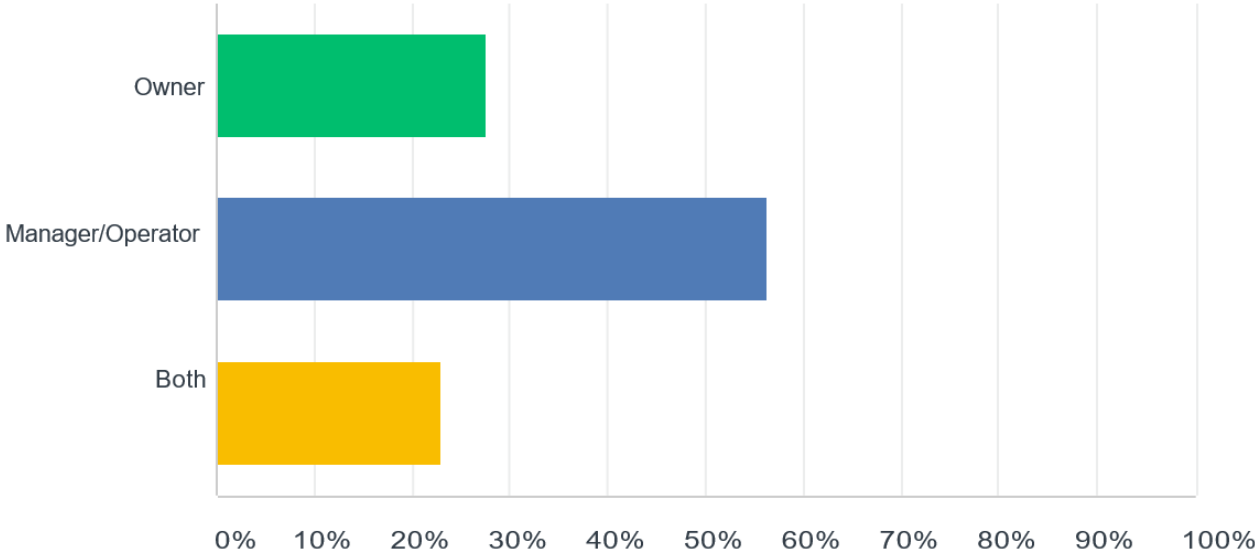
ANSWER CHOICES	RESPONSES	
Regional Shipping	14.46%	24
Drayage	4.22%	7
Long-Haul Trucking	9.04%	15
Parcel Delivery	5.42%	9
Transit	23.49%	39
Refuse/ waste vehicle	21.69%	36
School Bus	16.87%	28
Food or Beverage Distribution	7.23%	12
Towing	8.43%	14
Shuttle Service	6.02%	10
Cargo Handling	7.23%	12
Construction	20.48%	34
Agriculture	13.25%	22

Total Respondents: 166

Other sector responses included in the other category were manufacturing, government, logging, utility, fire and other emergency districts, wood products, recreation, flower and library delivery.

Question 2. What is your role regarding equipment or vehicle management?

Answered: 192 Skipped: 20

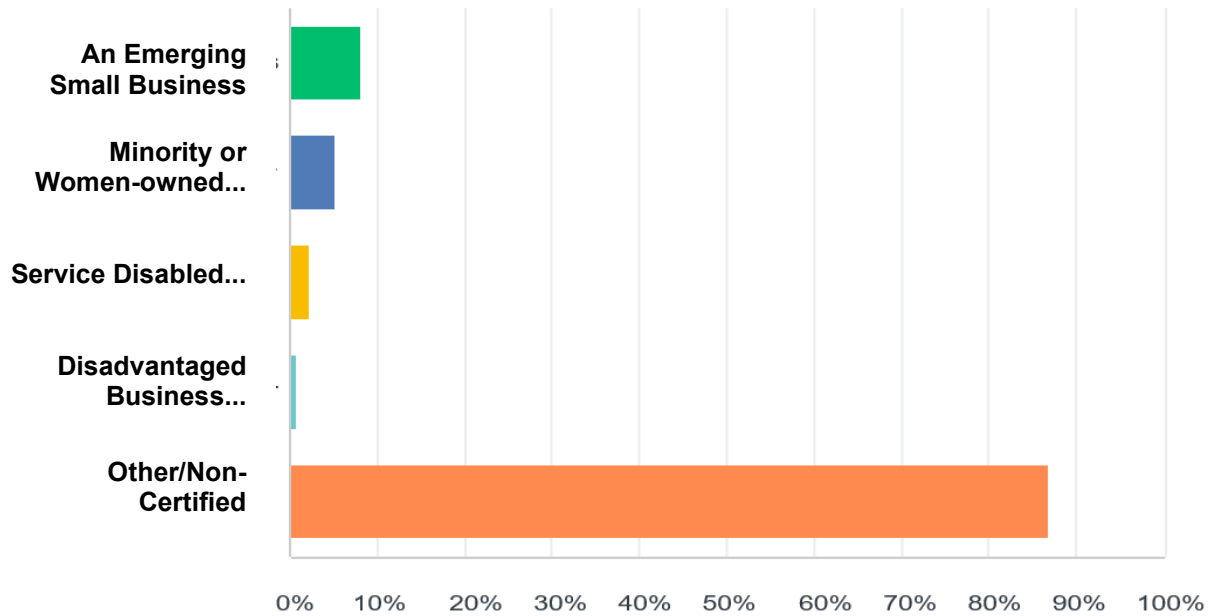


ANSWER CHOICES	RESPONSES	
Owner	27.60%	53
Manager/ Operator	56.25%	108
Both	22.92%	44

Total Respondents: 192

Question 3. Are you or your business certified through Oregon's COBID system ? Select all that apply

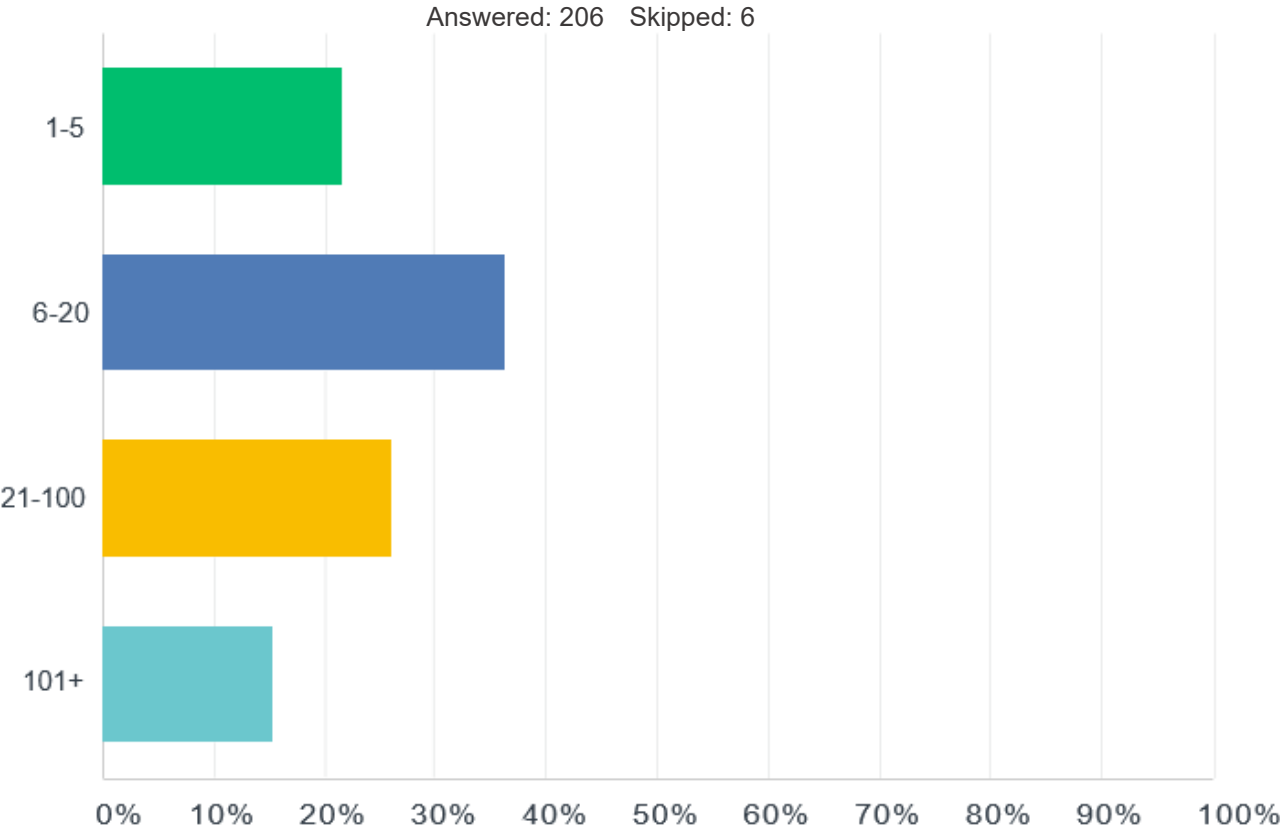
Answered: 136 Skipped: 76



ANSWER CHOICES	RESPONSES	
An Emerging Small Business	8.09%	11
Minority or Women owned small Enterprise	5.15%	7
Service-Disabled Veteran	2.21%	3
Disadvantaged Business Enterprise	0.74%	1
Other / Non-Certified (please specify)	86.76%	118

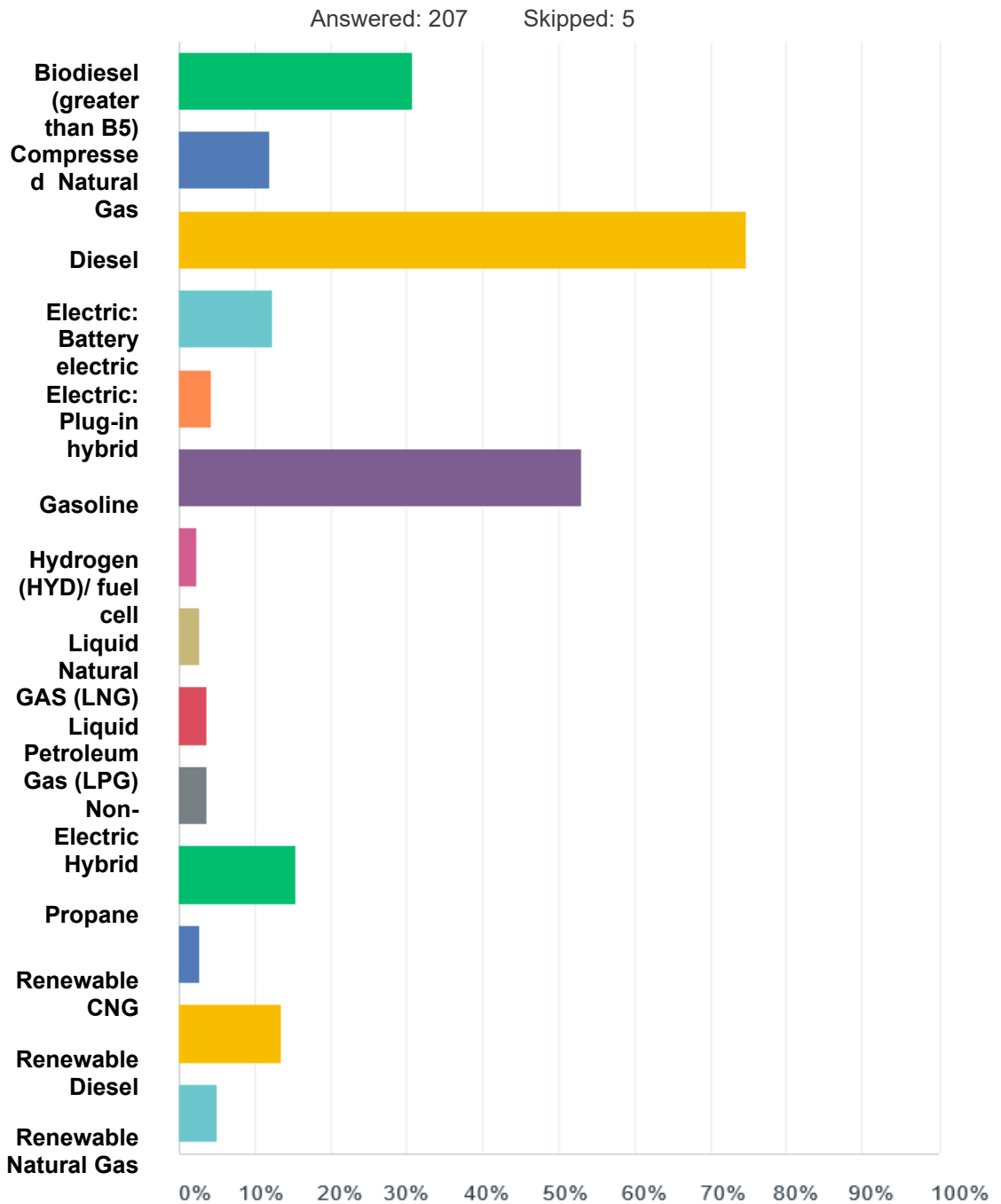
Total Respondents: 136

Question 4. How many medium and heavy-duty vehicles are in your fleet?



ANSWER CHOICES	RESPONSES	
1-5	21.84%	45
6-20	36.41%	75
21-100	26.21%	54
101	15.53%	32
TOTAL		206

Question 5. What fuels do you use for your fleet? Select all that apply



ANSWER CHOICES	RESPONSES	
Biodiesel (greater than B5)	30.92%	64
Compressed Natural Gas (CNG- Fossil)	12.08%	25
Diesel	74.88%	155
Electric: Battery electric vehicle	12.56%	26
Electric: Plug-in hybrid electric vehicle	4.35%	9
Gasoline	53.14%	110
Hydrogen (HYD)/ fuel cell	2.42%	5
Liquid Natural Gas (LNG)	2.90%	6
Liquid Petroleum Gas (LPG)/ Auto gas	3.86%	8
Non-Electric Hybrid	3.86%	8
Propane	15.46%	32
Renewable CNG	2.90%	6
Renewable Diesel	13.53%	28
Renewable Natural Gas (RNG)	5.31%	11

Total Respondents: 207

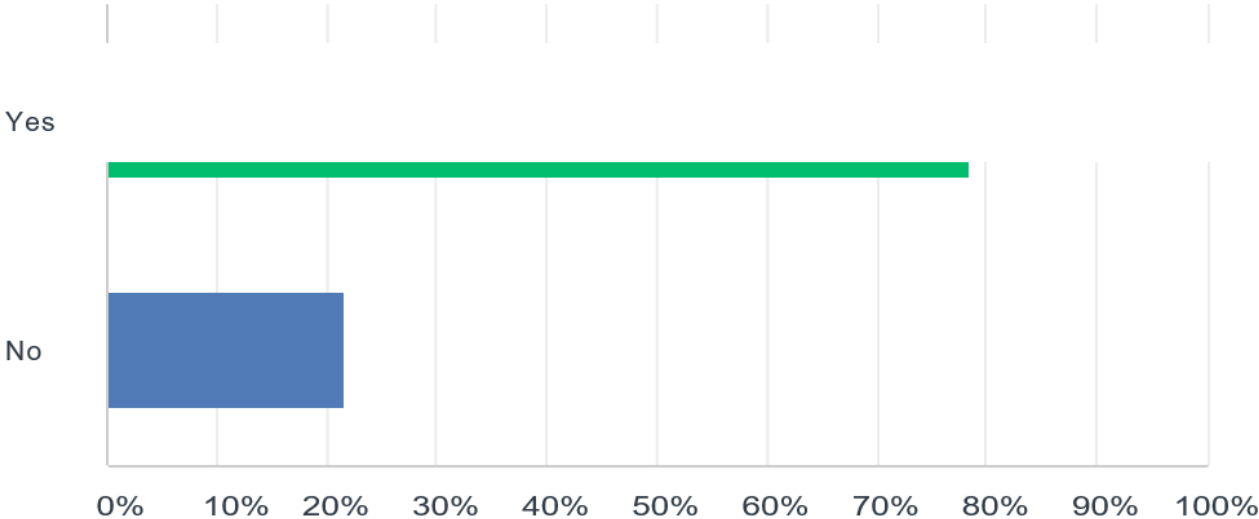
Question 6. How many other pieces of diesel equipment such as forklifts or yard goats does your entity use?

Answered: 188 Skipped: 24

Pieces of other Equipment	# of Fleets
None	58
0-10	82
11 and higher	40

Question 7. Are you aware of alternative fuel options for your fleet?

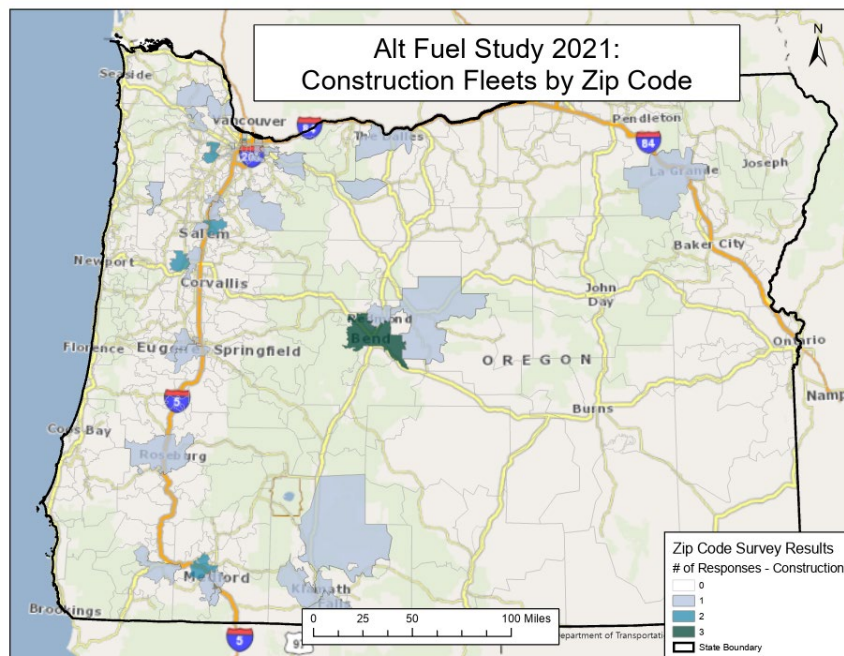
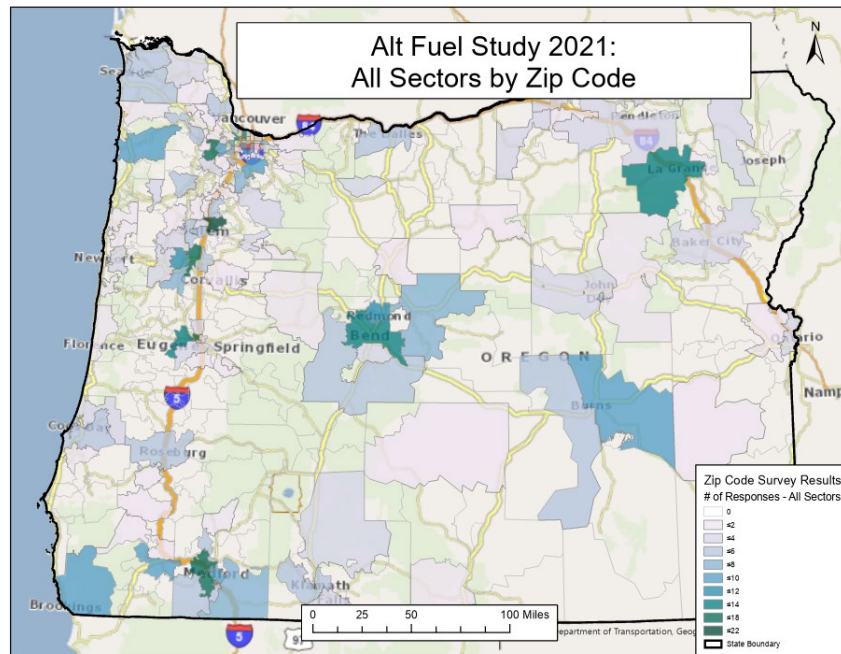
Answered: 205 Skipped: 7

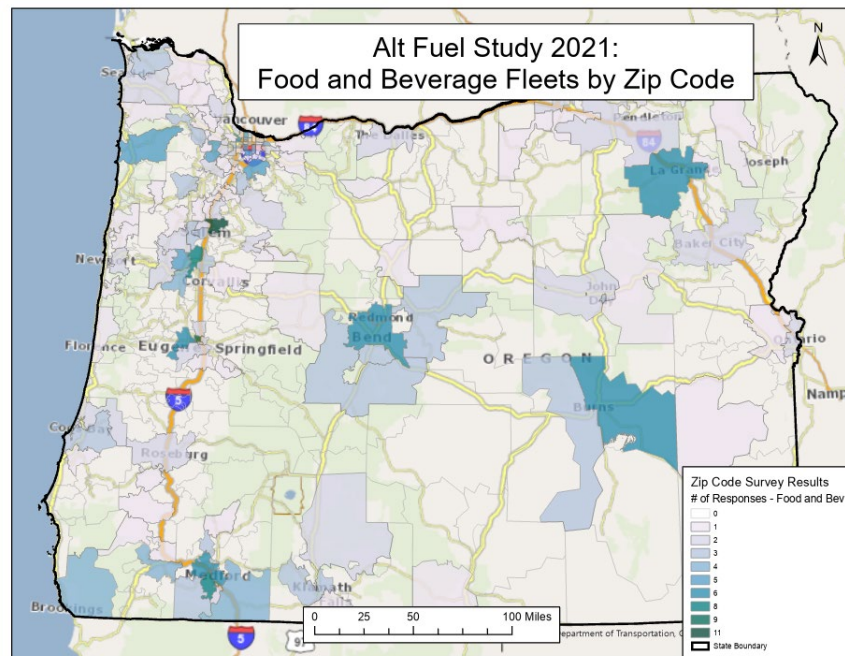
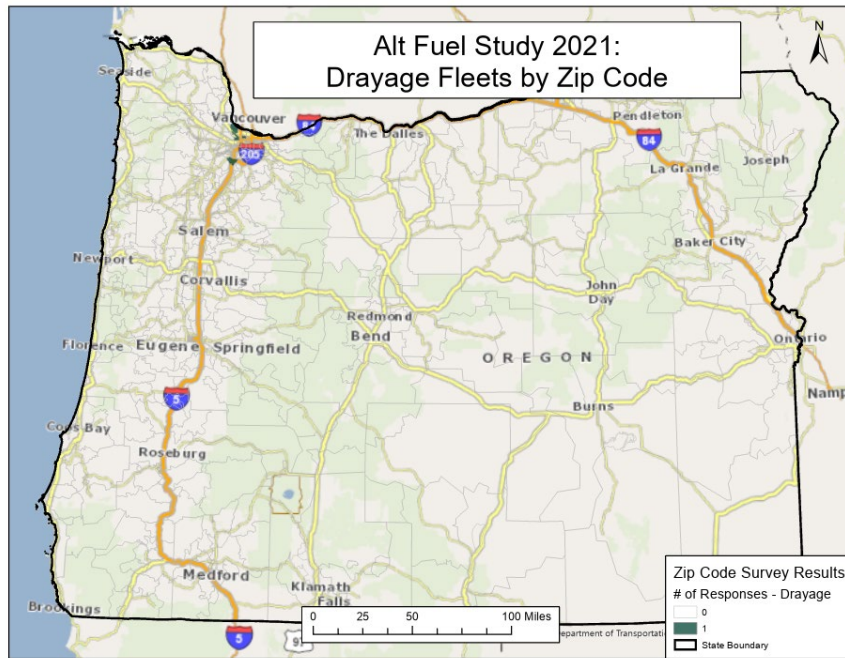


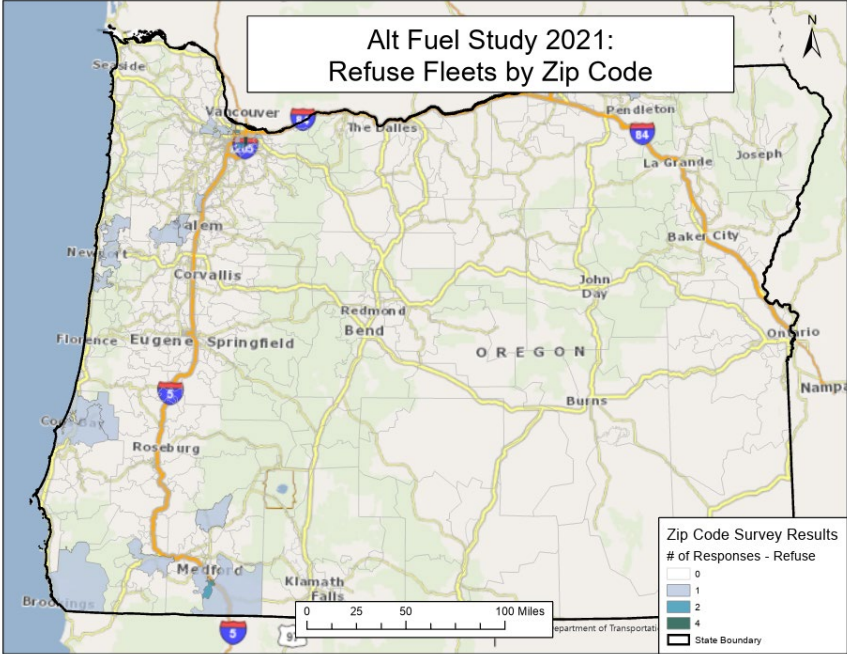
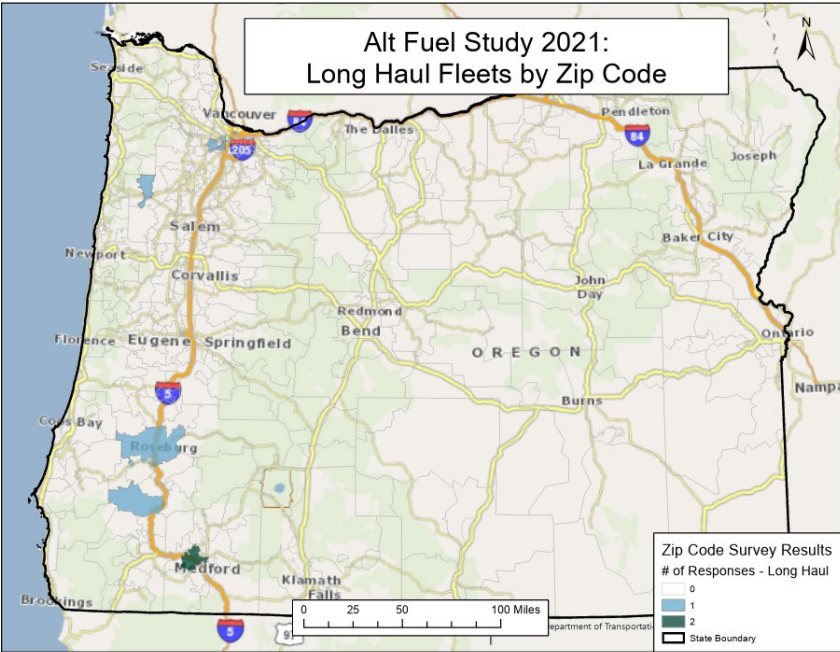
ANSWER CHOICES	RESPONSES	
Yes	78.54%	161
No	21.46%	44
TOTAL		205

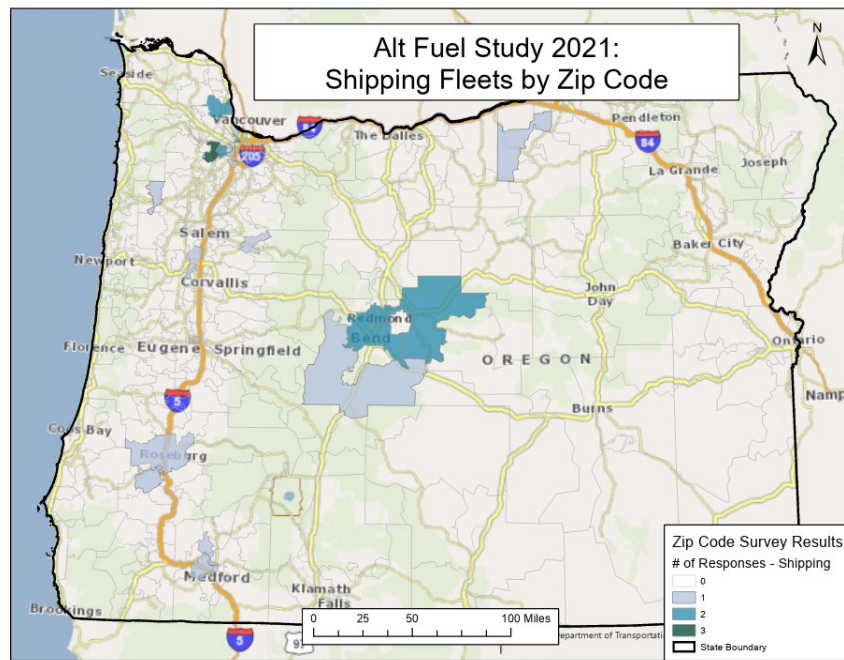
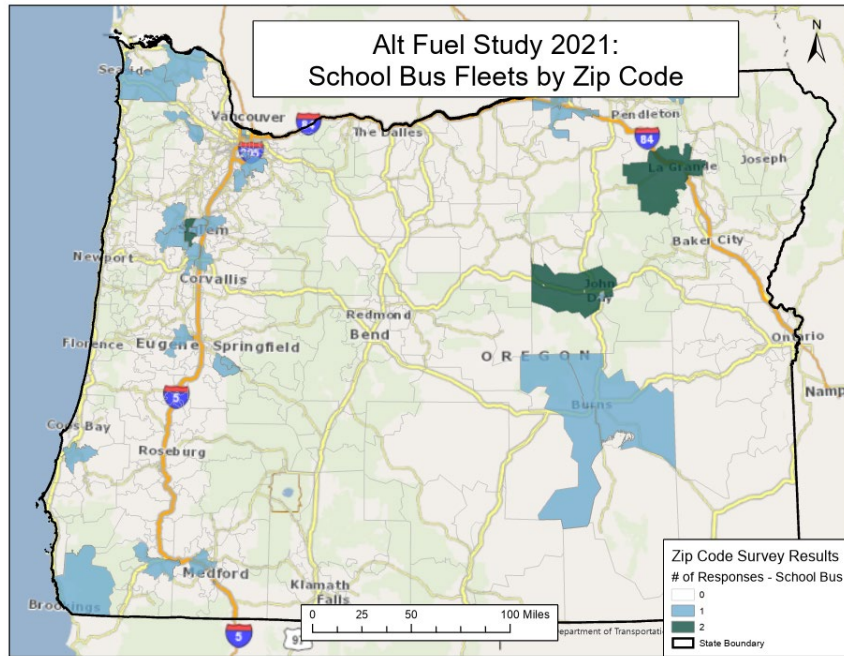
Question 8. The location of company headquarters is not always where a vehicle operates.

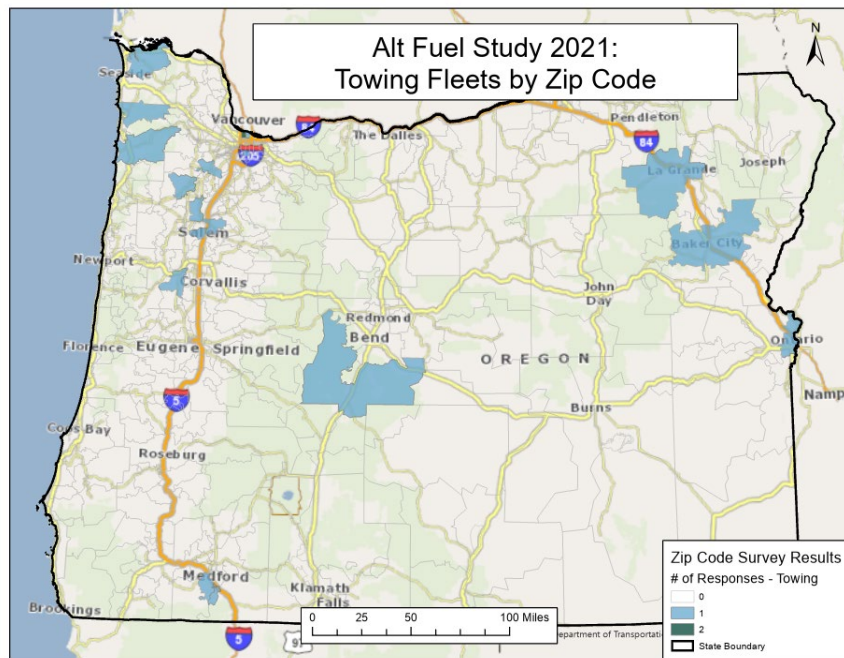
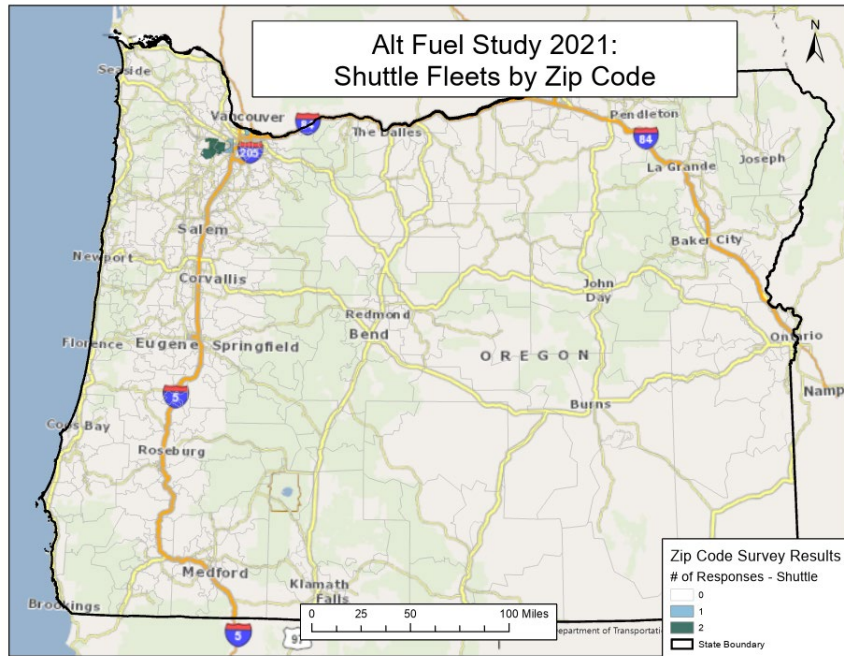
Please provide three zip codes where most of your fleet's miles/ hours of operation have occurred in the last year: Use the "other" box if you aren't sure or track this data by county.

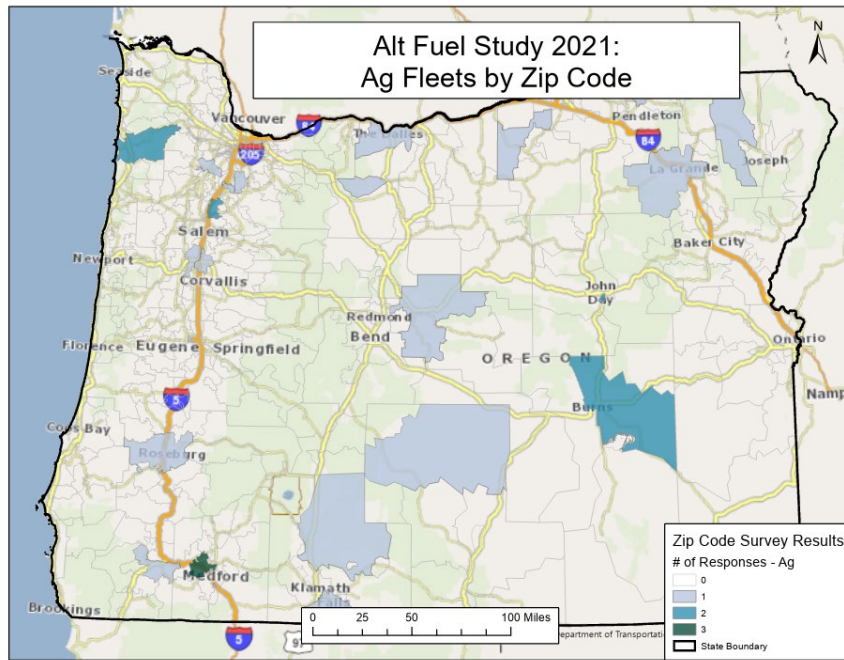
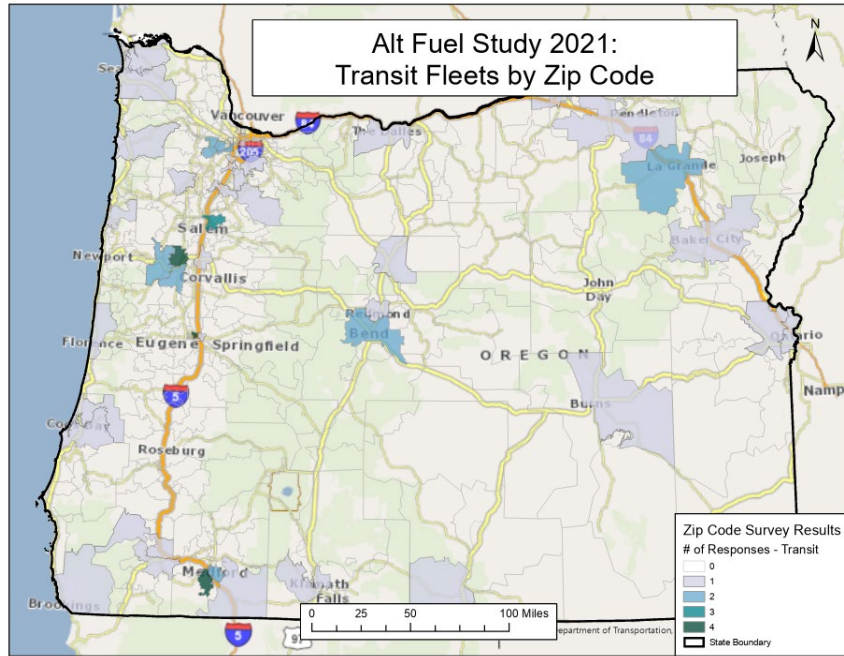


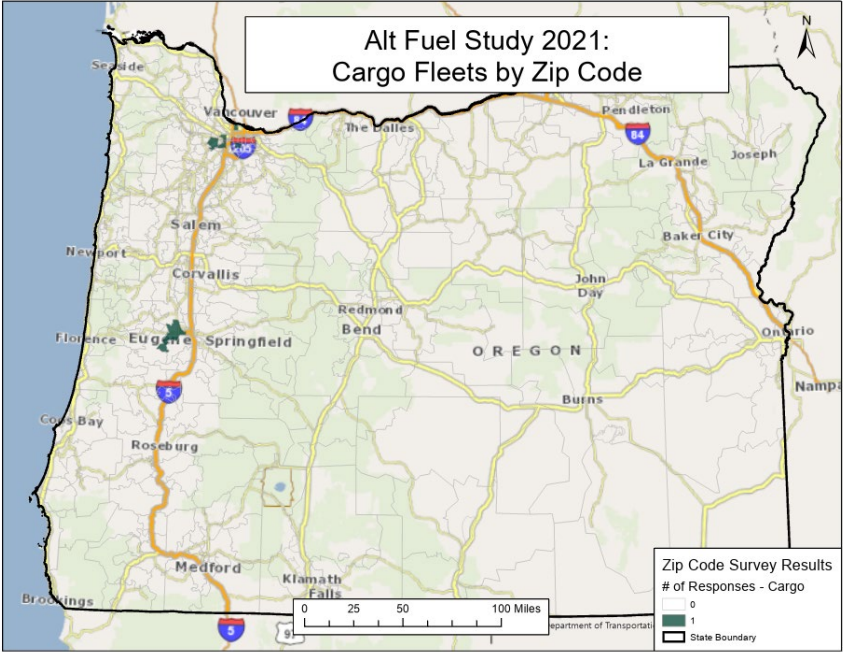






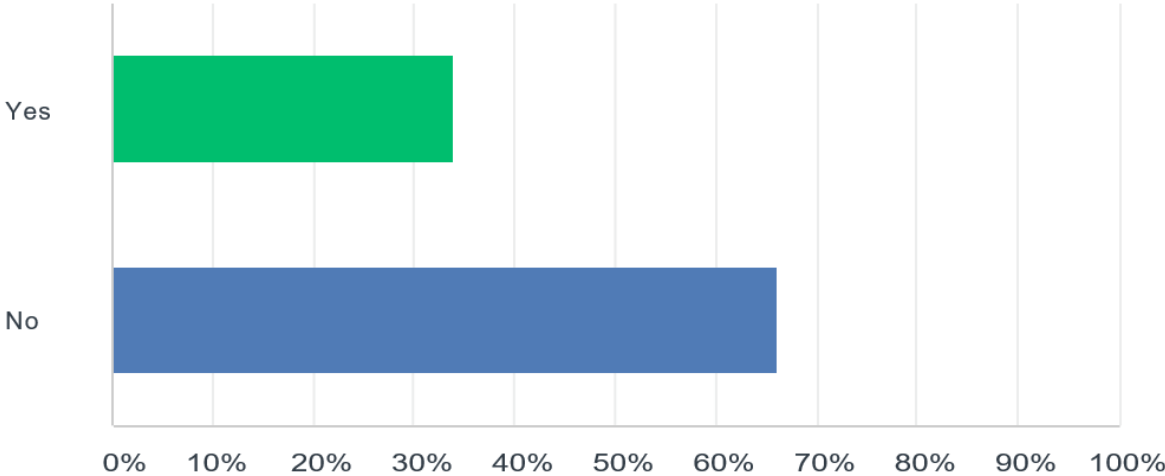






Question 9. Have you switched any of your vehicles to alternative fuels?

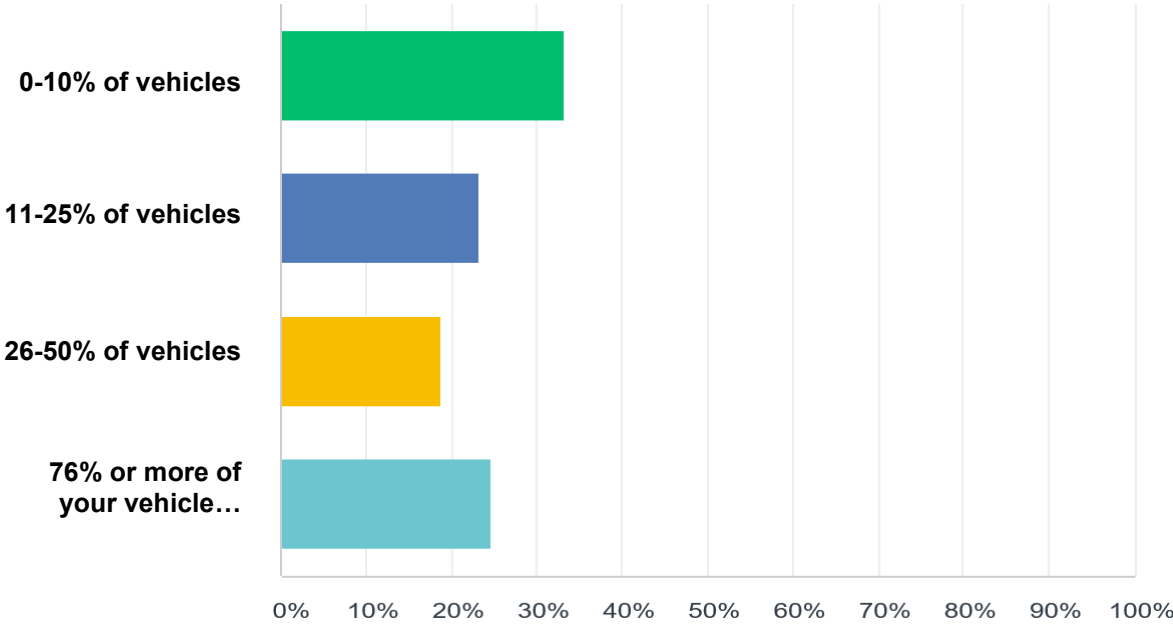
Answered: 204 Skipped: 8



ANSWER CHOICES	RESPONSES	
Yes	33.82%	69
No	66.18%	135
TOTAL		204

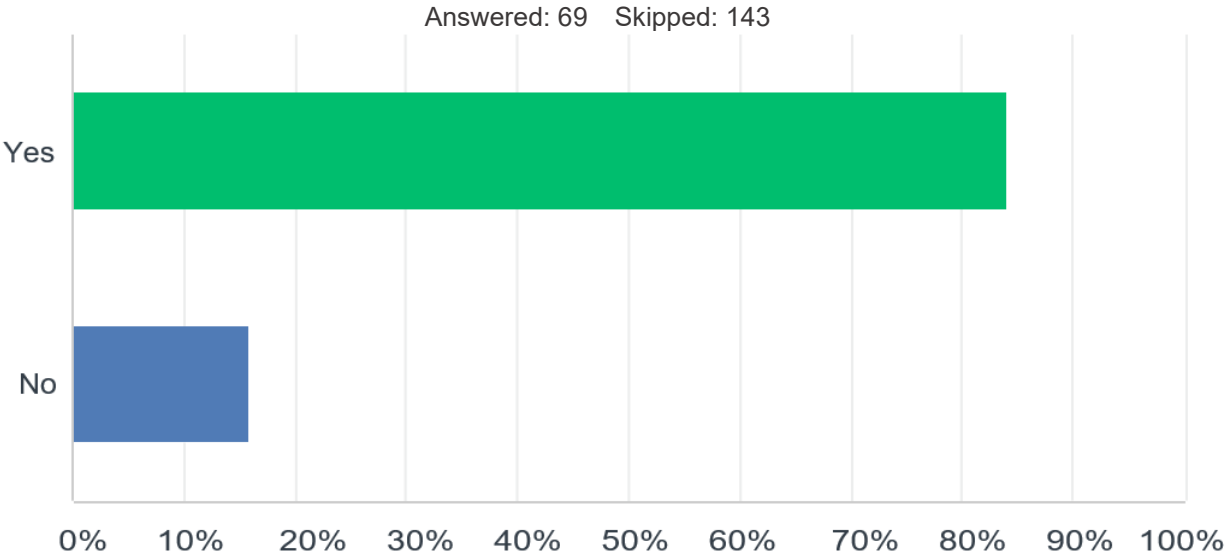
Question 10. Approximately how much of your fleet has converted to Alt Fuels?

Answered: 69 Skipped: 143



ANSWER CHOICES	RESPONSES	
0-10% of vehicles	33.33%	23
11-25% of vehicles	23.19%	16
26-50% of vehicles	18.84%	13
76% or more of your vehicles use alternative fuel	24.64%	17
TOTAL		69

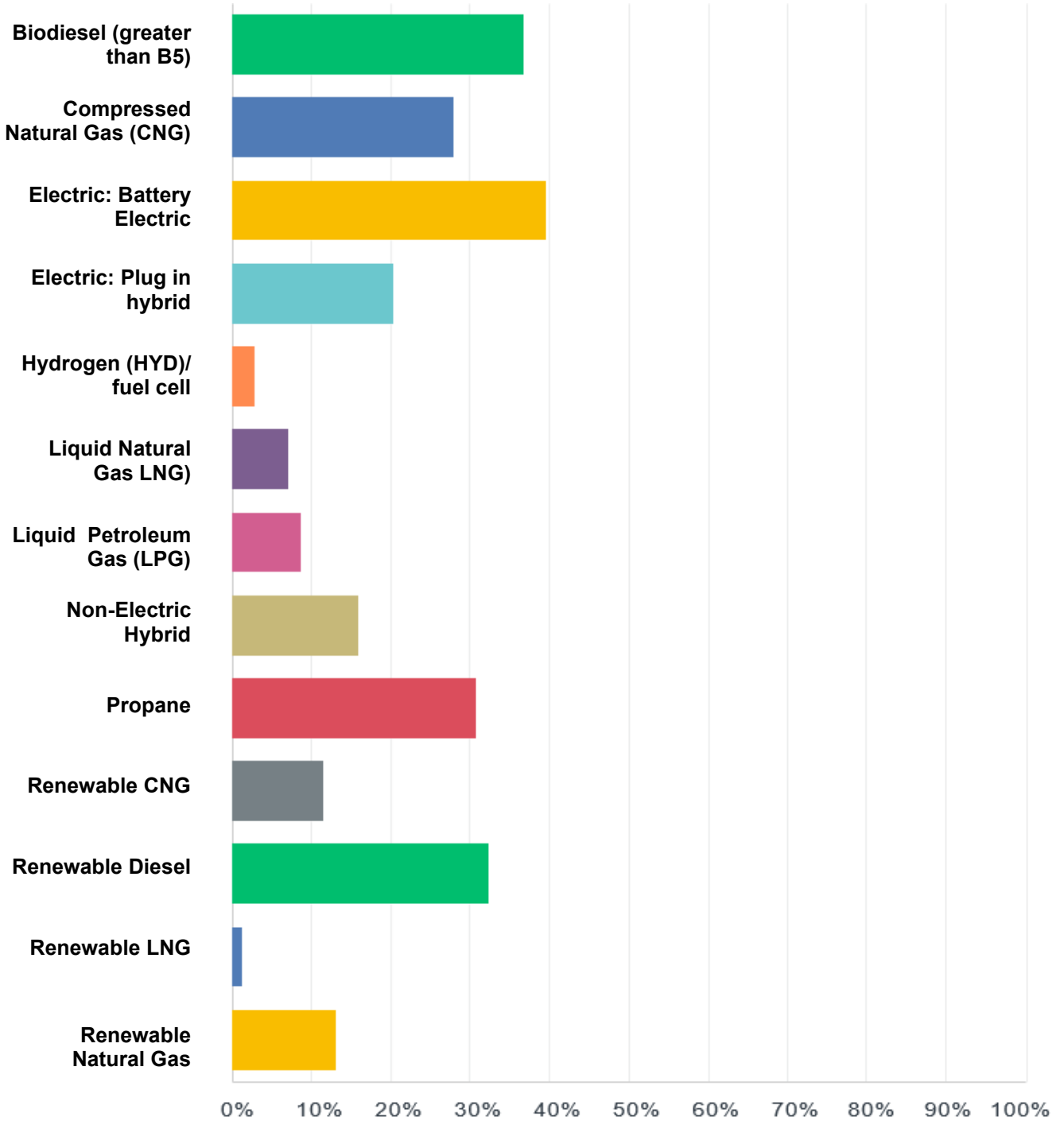
Question 11. Do you intend to convert more of your fleet to alternative fuels?



ANSWER CHOICES	RESPONSES	
Yes	84.06%	58
No	15.94%	11
TOTAL		69

Question 12. What alternative fuels are now used in your fleet? Select all that apply

Answered: 68 Skipped: 144



ANSWER CHOICES	RESPONSES	
Biodiesel (greater than B5)	36.76%	25
Compressed Natural Gas (CNG- Fossil)	27.94%	19
Electric: Battery electric vehicle	39.71%	27
Electric: Plug in hybrid electric vehicle	20.59%	14
Hydrogen (HYD)/ fuel cell	2.94%	2
Liquid Natural Gas (LNG)	7.35%	5
Liquid Petroleum Gas (LPG)/ Autogas	8.82%	6
Non-Electric Hybrid	16.18%	11
Propane	30.88%	21
Renewable CNG	11.76%	8
Renewable Diesel	32.35%	22
Renewable LNG	1.47%	1
Renewable Natural Gas (RNG)	13.24%	9
Total Respondents: 68		

Question 13. What issues, if any, have you experienced with alt fuel usage?

Answered: 62 Skipped: 150

Open responses to this question included themes such as fleets who have had no issues, power and range issues, Insufficient refueling/ recharging locations, higher cost concerns and fuel storage issues.

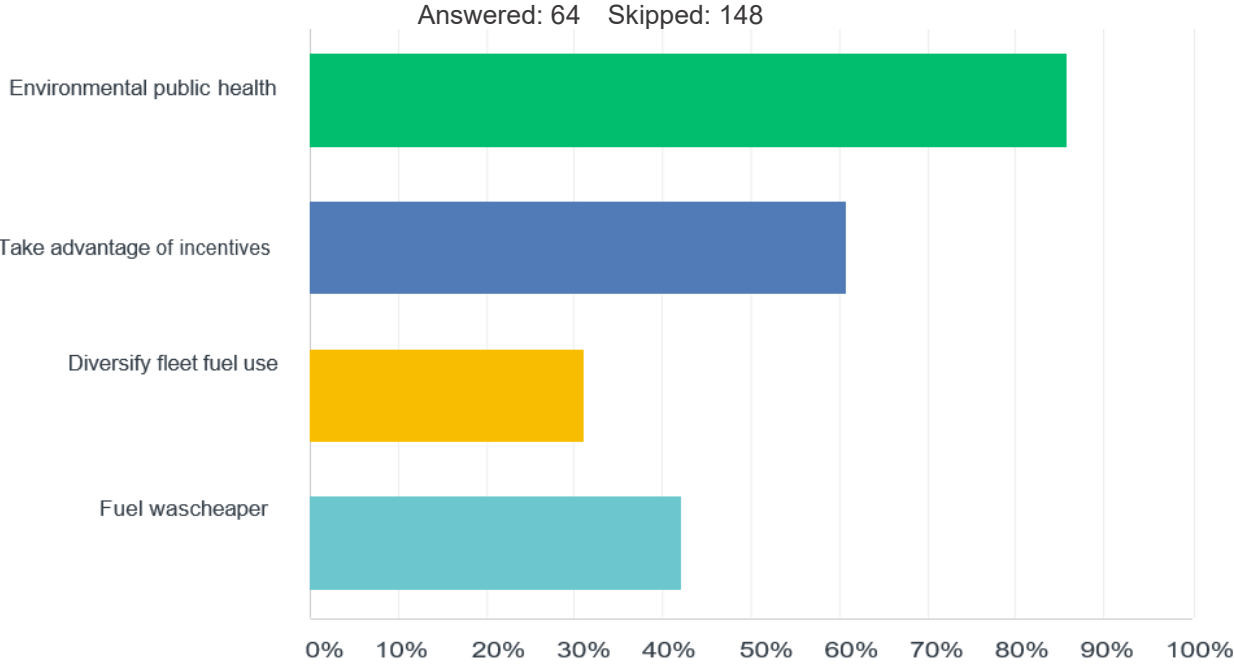
Question 14. What benefits have you realized from alternative fuel conversion?

Answered: 61 Skipped: 151

There were eight main themes in the responses provided:

- No difference
- Better air/ lower carbon emissions/GHG
- Lower maintenance costs/ needs
- Employee safety/ support
- Community support
- Lower fueling costs/ increased MPG
- Less noise
- Cleaner shop/ less soot

Question 15. What reasons lead you to switch to alternative fuels? Select all that apply.



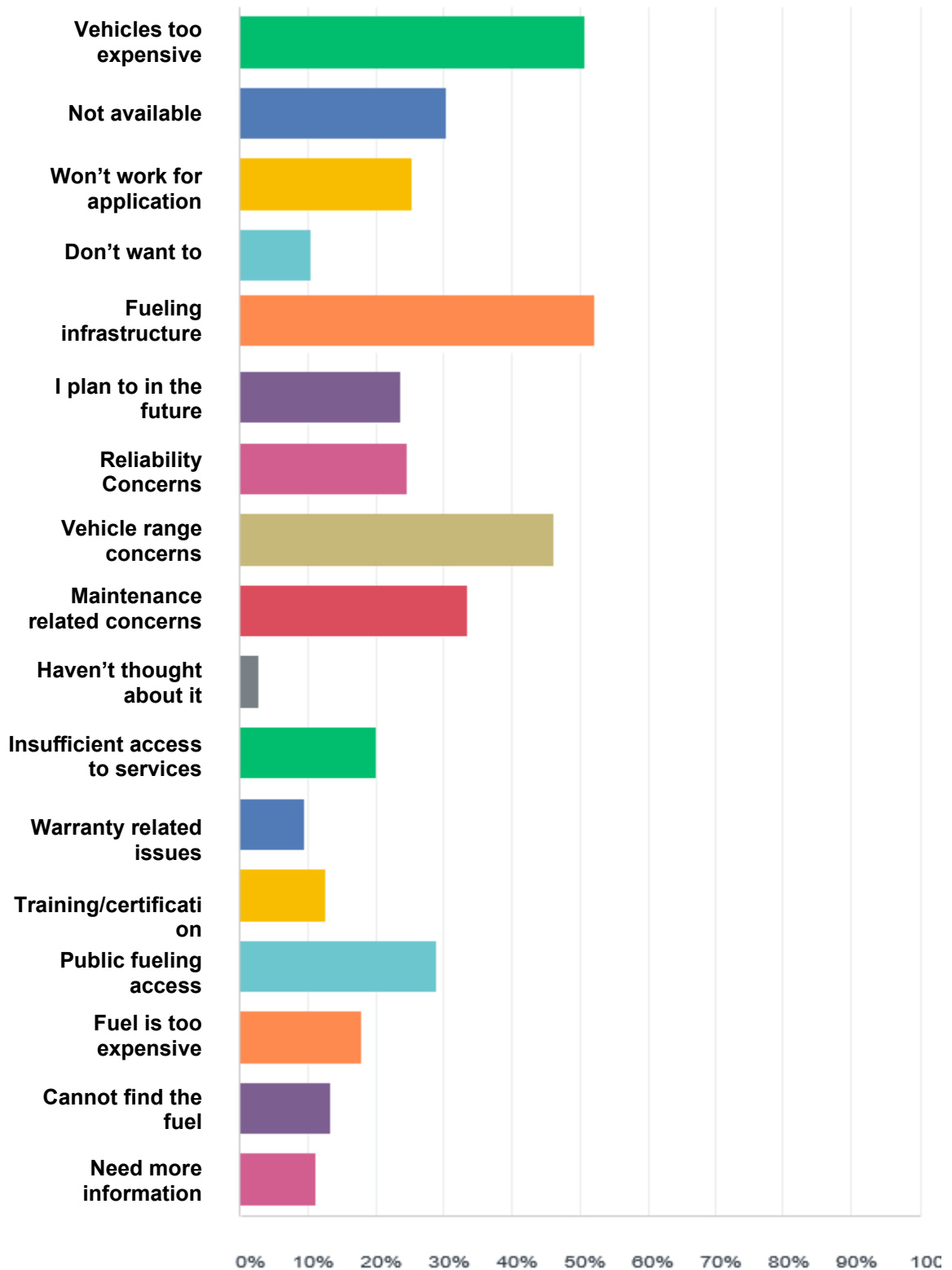
ANSWER CHOICES	RESPONSES	
Environmental/ public health benefits	85.94%	55
Take advantage of incentive programs	60.94%	39
Diversify fleet fuel use	31.25%	20
Fuel was cheaper	42.19%	27

Total Respondents: 64

Additional reasons for switching to alternative fuels include organizational goals, cheaper alternative fuel process, safety for employees, and lower total cost of ownership.

Question 16. Why haven't you switched your fleet to alternative fuels? Select all that apply.

Answered: 134 Skipped: 78



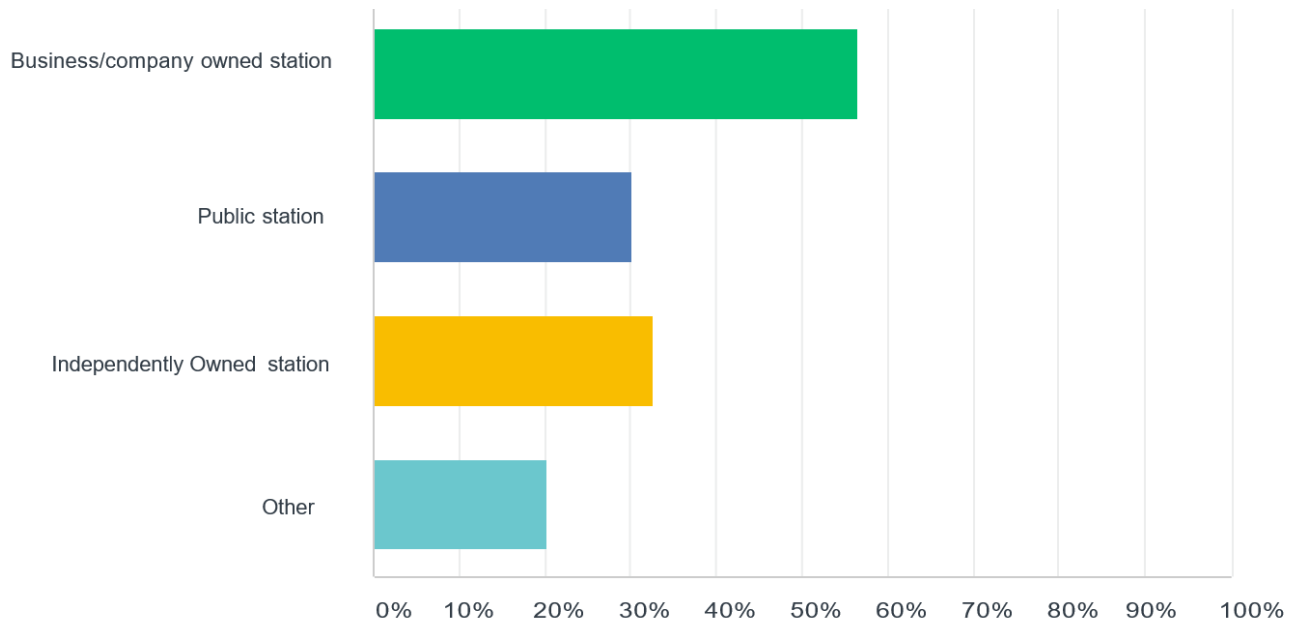
ANSWER CHOICES	RESPONSES	
Vehicles too expensive	50.75%	68
Not available	30.60%	41
Won't work for the type of application	25.37%	34
Don't want to	10.45%	14
Fueling infrastructure costs/ access	52.24%	70
I plan to in the future	23.88%	32
Reliability concerns	24.63%	33
Vehicle range concerns	46.27%	62
Maintenance-related concerns	33.58%	45
Haven't thought about it	2.99%	4
Insufficient access to maintenance services	20.15%	27
Warranty related issues	9.70%	13
Training/certification required for personnel	12.69%	17
Public fueling access	29.10%	39
Fuel is too expensive	17.91%	24
Cannot find the fuel	13.43%	18
Need more information	11.19%	15

Total Respondents: 134

Additional reasons provided in the comment box as to why some fleets have not switched to alternative fuels include: older vehicles, overall financial impact, current vehicles are efficient and newer, current alternatives are not able to handle the work, failure of alternative fuels (electric and natural gas), alternatives for industry is in its infancy and not fully vetted, location of facility will not accommodate infrastructure, too administrative or down time to dedicate to learning about this, terrain concerns, geographic isolation, mechanics aren't trained on alternative fueled vehicles.

Question 17. Do you get your fuel from a:

Answered: 193 Skipped: 19



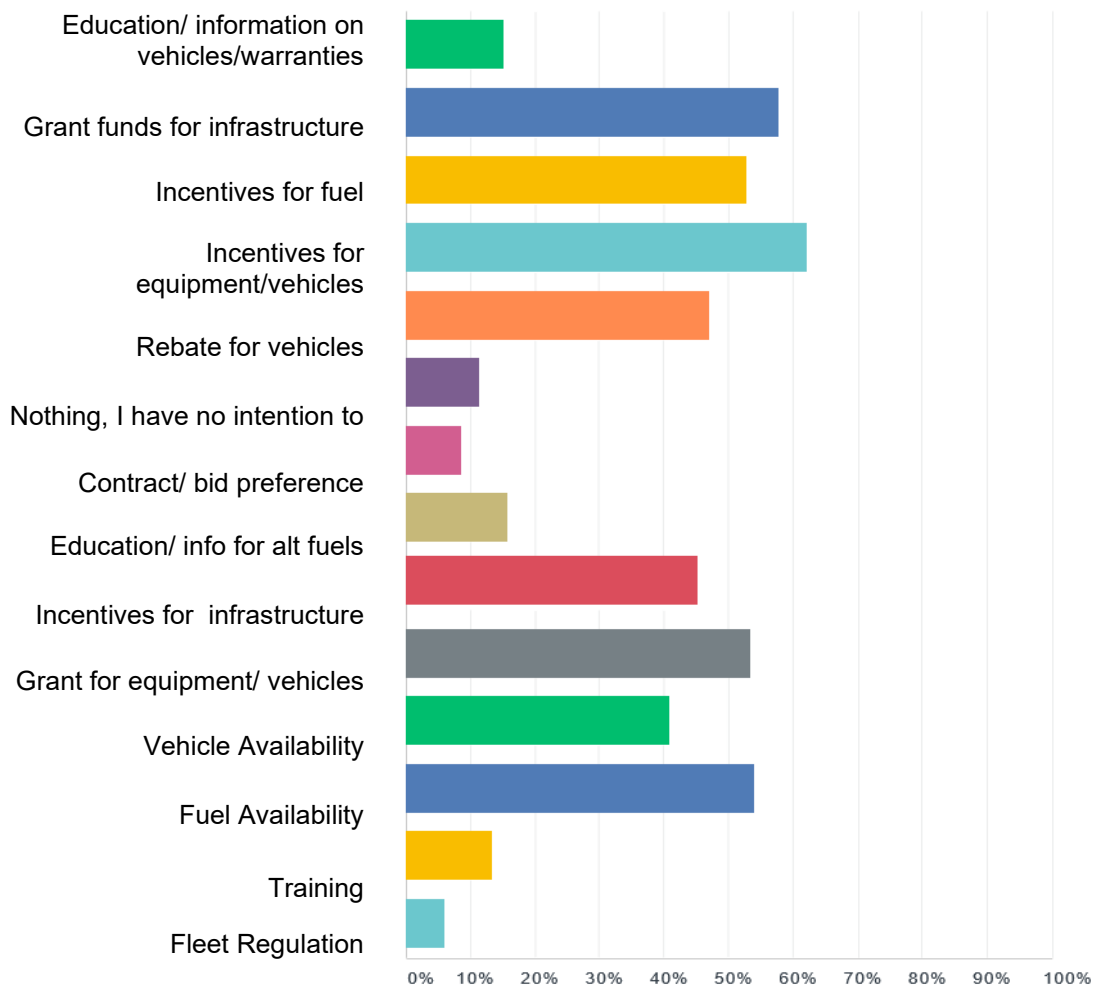
ANSWER CHOICES	RESPONSES	
Business/company owned station	56.48%	109
Public station	30.05%	58
Independently owned station	32.64%	63
Other (please specify)		
Total Respondents: 193		

There were many additional responses explaining where fleets get fuel from such as:

- card locks
- fueling trucks/ mobile
- bulk fuel plants
- delivered to sites/ direct onsite
- utility for CNG
- ODOT station
- Any where it can be found
- From jobbers (terminal to site delivery)

Question 18. What would aid in converting your vehicles to alternative fuels? Select all that apply.

Answered: 183 Skipped: 29



ANSWER CHOICES	RESPONSES	
Education/ information on vehicles and warranties	15.30%	28
Grant funds for infrastructure	57.92%	106
Incentives for fuel	53.01%	97
Incentives for equipment/vehicles	62.30%	114
Rebate for vehicles	46.99%	86
Nothing, I have no intention to switch	11.48%	21
Contract/ bid preference or other non-monetary benefits	8.74%	16
Education/ information on alternative fuels	15.85%	29
Incentives for infrastructure	45.36%	83
Grant funds for equipment/vehicles	53.55%	98

Vehicle availability	40.98%	75
Fuel availability	54.10%	99
Training	13.66%	25

Fleet regulation

Total Respondents: 183

Many of the multiple-choice answers were emphasized in the responses:

- Vehicle innovations for range, reliability and power
- Greater understanding and education on alternative fuels
- Knowledge about vehicle warranties and incentives
- Infrastructure development, particularly for rural areas
- Lower costs for fuels vehicles and maintenance

6.01%

11

Direct response examples:

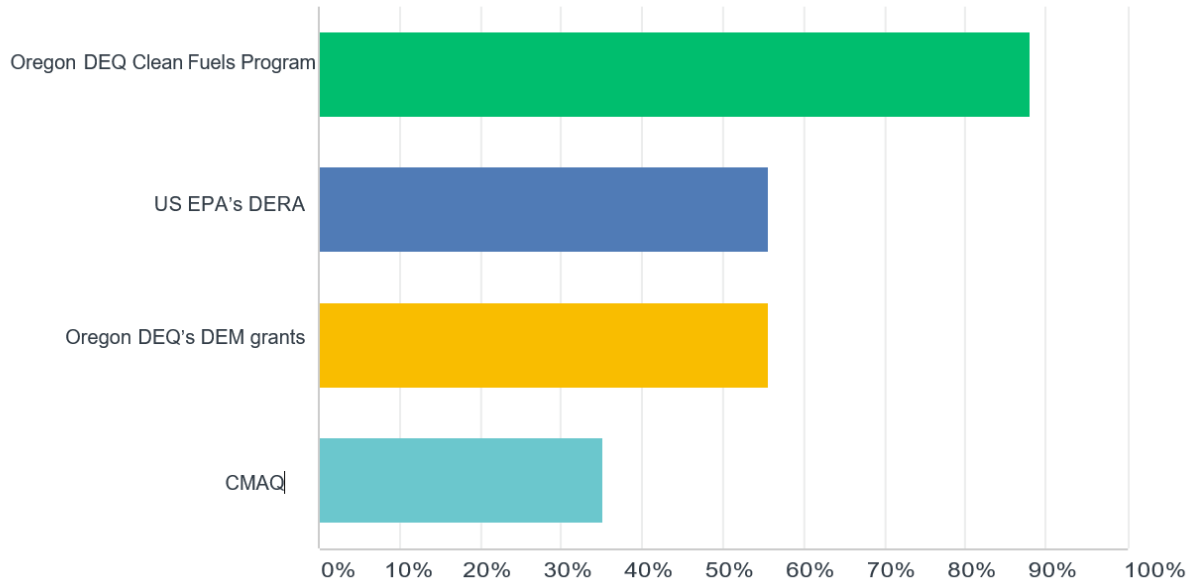
"Fuel is one of this businesses major expenses, and tends to dictate profit or no profit. Must be cost effective not matter what fuel we are using. We do not have options here so be careful. Oregon is going downhill fast putting small businesses out of business as they cannot afford all the new taxes and regulations. Keep it up and all businesses will leave this state. So many are already packing it up and that is revenue, so they just keep taxing the little guy."

"We are so rural and remote it is unlikely we will ever switch. When we built a large structure for our company we tried to go solar. Oregon energy trust would not provide rebates or insights on solar in Grant County. We see this effort largely as a ruse. Our ranch is noted for all we do for fish habitat and environment but we find what Salem offers tailored only to urban areas and without regard for industry"

"The biggest hurdle to fleets making the switch to alternative fuels is the incremental cost of the alt. fuel vehicle or fuel system. We also operate in WA State where incentives are available to assist with the cost of alt. fuel conversion or vehicle purchase. These incentives have been very helpful in driving adoption of alternative fuels, specifically propane Autogas."

Question 19. Are you aware of: (Select that apply)

Answered: 142 Skipped: 70



ANSWER CHOICES	RESPONSES	
Oregon DEQ Clean Fuels Program	88.03%	125
US EPA's Diesel Emissions Reduction Act grant program	55.63%	79
Oregon DEQ's Environmental Mitigation Grant Program (VW Environmental Mitigation Program VW)	55.63%	79
Federal Highway Administration Congestion Mitigation and Air Quality Improvement program	35.21%	50

Total Respondents: 142

Question 20. Are there any additional barriers or concerns that you have relating to your vehicle/fleet's ability to transition using alternative fuels?

Answered: 110 Skipped: 102

The majority of responses for this last question fell into one of four categories: access/infrastructure; Cost concerns; education, outreach and training; Vehicle/ fuel.

Access /Infrastructure

- Support for renewable hydrogen production and infrastructure
- Having commercially available hydrogen is a concern.
- Availability of fuel in remote locations
- Infrastructure and range for BEVs
- Electric Power Charging Grid Station availability
- The biggest issue we face are conversation cost, lack of infrastructure, remaining load capacity and range.
- We run transit routes in very rural areas that do not have infrastructure in place.

Cost concerns

- Time, money, technology
- We would love to transform our fleet to more efficient diesel engines equipped with cleaner tech. We do not believe it will be feasible for us due to the cost
- We view ourselves as environmentally responsible and would probably start a gradual changeover once a suitable vehicle was available but cost considerations would make it a slow process.
- The costs associated with doing so.
- Yes money. It costs too much money and likely is a make you feel good policy pushed by a government which sees environmental concerns as a method of control over the people and an incentive to implement more taxes.
- Mainly cost and time frame to convert
- Would like to switch to renewable natural gas. Vehicle and infrastructure costs prohibitive.
- Diesel fleets are built to last decades & switching before those trucks are no longer useful is a waste of other resources (steel, petroleum, etc). A phase out as they are no longer able to operate is more acceptable.
- Our vehicle trade in values will be zero.
- Initial capital expense is the prohibitive factor for us right now.
- Mostly the costs not enough budget
- Converting existing diesel vehicles to Renewable is feasible if that fuel is incentivized to equal diesel cost-per-mile. Our engine OEM tells us to avoid biodiesel above B5 (and experience confirms it). Ideally, get rid of combustion in favor of fuel cell or battery electric (doing that will initially require incentives and grants well beyond VW settlement).
- Conversion to medium and heavy-duty electric is complex and expensive
- Too expensive. We are an extremely small company with limited funds.
- Up front capital cost, maintenance training and support, sustainable partners to provide equipment and support
- Cost of transition, compatibility

- The biggest barrier is cost. We have a very large fleet of 700+ buses that will likely grow to 1000+ buses by 2040. Transitioning our fleet will require substantial infrastructure investments. We do not have adequate funds with existing funding sources to make this change.
- The cost to convert our fleet would be cost prohibitive to a small municipality.
- The main thing is charging infrastructure needs for converting state light fleet to ZEV's and additional capital outlay needed to cover the incremental cost of the vehicles. Estimate is between \$200 million and \$250 million to convert state agency light fleets to ZEV by 2035 on top of current fleet expenditure levels.

Education. Outreach. Training

- Maintenance training for mechanic staff.
- Additional maintenance cost. Training , education. Do alternate fuels really pencil out? What is the true carbon footprint reduction?
- Greater guidance from municipalities whether they be government or private regarding clean fuels. Oregon as of now, for the most part seems to thumb their nose at this subject. It's going to take a considerable effort to turn this smoke belching ship around. We are going to need a very smart public M private education process
- The regulatory confusion surrounding the various pathways to transition. Many pathways require little or no change to the power unit. Some pathways require significant change that can lead to fleet obsolescence. How does a fleet operator plan in this environment to remain in compliance?

Vehicle/ Fuel

- They just need to make them... not the leaf(beta) but the Tesla
- Cost and dependability
- America has so much fossil fuel in the ground that we won't run out for years. Also, it will keep American energy independent from other countries.
- Cost and travel abilities.
- They are unreliable, fuel is too expensive, etc...
- Concern re: cost-effectiveness and vehicle performance
- We have vehicles that have 10-15 years left on them. Why force me to buy new vehicles?
- Cost and performance
- As I mentioned, moving to alternative fuels is extremely expensive and the technology (especially for electric) is nowhere near being ready for the solid waste industry. The weight of these vehicles alone will drastically reduce the payload making them only realistic to collect recycling. The lifespan would force these trucks to be charged every 4 hours (which is half of a route).
- Not much effort has been into alternant fueling sites to this point in the PDX try counties. However, your dates for eliminating have been posted. This mandate for alt fuels will affect areas and industries no one taken into consideration.
- Effectiveness, Productivity, height restrictions, weight restrictions, availability, common structure
- I believe the government is forcing change not allowing technology to develop for voluntary change
- Availability of electric vehicles and the ability for them to meet performance expectations.
- RVTD has been involved with alternative fuels since the 1990's. We have recently begun looking into the possibility of using BE Buses. Concerns regarding the current

technology and the ability to integrate BEB vehicles into our current fleet with their limitations.

- Distance traveled by vehicles
- Ability of the fuel (battery) type to produce the required power (BTU) for the terrain and distances that need to be operated over.
- Electric hybrid cutaways not yet available; concerns about enough power to handle hills; Plug in electric buses do not have enough mileage range for fixed route and no availability to rapid charge stations; Propane fueling only exists in one town along our route.
- We would like to switch to electric delivery trucks but there are none available in the class of vehicle which we use. (19,500 GVW box truck)
- Major manufacturers outsource alternative fuel modifications and don't support the products they sell.
- Not suitable for a vehicle that is parked. Not suitable for heavy equipment left outside during winter
- We want to go to electric drive train but with hydrogen. we do not have ability to generate hydrogen from solar and wind which is the preferred course because the solar and wind resources are not developed but would like to convert natural gas to hydrogen to start the transition and eventually get to electrolysis - converting the solar to hydrogen. need help with this but as a transit agency we can help develop the infrastructure for hydrogen freight too.
- Access to RD by more suppliers and providing clearer pricing structure. How will RD be decoupled from B5 in the OPIS pricing index. RD needs to become cheaper than B5 through the Clean Fuels Program to help tip the scale.
- Technical capacity of alternative fuels to serve our entire fleet (range, CI score, cost, driver and maintenance staff training, capital costs)
- It is important that supply be available and the prices stay near (+/-\$.25) B5.

Additional Responses

A number of response either covered all categories or addressed additional ideas outside of these categories.

- Republicans are obstacles to any kind of climate progress at the local, state, or federal level.
- This state should be the first to go all electric
- Life Cycle of electric buses is still unknown.
- How will it affect Emergency Vehicles looking forward?
- This is absolutely the most ridiculous idea and it will cripple all small business.
- No intention of switching. Existing diesel exhaust emissions are low, and the infrastructure and generation of "alternative" fuels will generate more emissions than the state of Oregon existing diesel exhaust emissions ever will. Oregon must not engage in touting "clean fuels" as we are just pushing emissions to other stacks without actually realizing benefits to both our lungs and pocketbooks.
- Sourcing the pipe dream supply side that doesn't and will not exist for a drawn-out period time.
- The administration has existing contracts with third party providers where alternative fuel usage was not required. These contracts are holding us back from increasing use of alternative fuels.
- Too much money is still going to change out diesel vehicles for other "cleaner" diesel or hybrid vehicles. This should be eliminated and only support full EV fleets which would match the President and congresses global warming initiatives.

- Oregon to update to the federal weight exemption and include fuel cell electric/hydrogen vehicles. <https://afdc.energy.gov/laws/6277>
- Until there is a reliable replacement for alternative motors/fuels for large front-end loaders with cost effective alternative fuels, this won't happen. The same would be true for farm equipment since this the equipment is comparable.
- State and region need to prioritize an electrified ferry operation, to get commuters off the road.
- Most of our commuter routes are 60+ miles round trip with hills so not sure electric is feasible yet may be feasible for other services. The vehicles are 2 to 3 times more expensive and there is infrastructure needed. Politically- there is some support but not sure it is overwhelming support.
- Lack of transit vehicles on the Oregon State Price Agreement.
- Expense of vehicles, fuel not available, doesn't work for all type of applications, fueling infrastructure costs, reliability concerns, vehicle range concerns, insufficient access to maintenance services, training/certification required for personnel, fuel too expensive.
- The Oregon DEQ Environmental Mitigation Program is awkward to use and has too many hurdles to jump to be effective for smaller fleets.
- I'd like the CFP credits for EV charging to go to vehicle owners, rather than utility or charging network. I have software to track usage and charging amount.
- Yeah. All those Federal grants Oregon appears to be impossible to overcome the extreme cost of archeological review. There isn't a defacto map, we have to pay an Oregon state certified archeologist to review the project (time and money is unreasonable to other states). When looking at it we have tens of thousands of dollars up front and after spending that still will have unknown ability to complete the project. Two grants we have applied for this was an extreme hurdle where other states don't have that problem.
- DEQ Clean Fuels Program has been a wonderful program.
- Too many unfunded mandates
- Many fleets want to do the right thing but lack the financial means/budget flexibility to do so - incentives are crucial It is not as easy as "switch this, switch that" - alt fuel conversations entail an entirely new ecosystem ranging from operational duty cycles, fueling, staff training (drivers, operators, planners, technicians, etc.), and requires an organization champion to not only spearhead the project but work through the hurdles. There will be setbacks, and someone needs to be that champion to persevere.